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In partial fulfilment for the requirements of  
Doctor of Professional Practice (DProf)

An exploration of women's experiences of wellbeing and  
peer support during pregnancy, through attendance at  
midwife-led aquanatal exercise classes.

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## **Abstract**

This thesis examines my professional midwifery practice interest of aquanatal, by means of a research study anchored within a Professional Doctorate. Clinical midwives promote positive public health messages as a part of pregnancy observation, in order to improve the health and wellbeing for women, babies and families. In addition to support offered by family, friends and work colleagues, pregnant women can be observed networking in social groups and in a variety of community settings. Social connections can augment their personal knowledge directed to preparation for motherhood, by contributing to wellbeing adjustments and to the development of social capital during this life transition.

A case study approach explored the experience of women (n=11) who attended a midwife-led aquanatal class. Participant data collected from questionnaire and transcribed focus group audio-recordings aimed to explore their motivation for physical activity during pregnancy, experience of wellbeing and peer support through aquanatal class attendance. Thematic analysis offered the relational perspective of professional midwife support on the development of social reciprocity through networking between peer group members and myself as instructor.

Findings suggest that peer support characteristics refine the emotional, influential, and informational attributes for network situations where social support in community settings can supplement health promotion by a clinical midwife. The participants experience of wellbeing during the transition to becoming a mother emerged as being negotiated within the interrelationship of biological, social, psychological and ecological systems of pregnancy.

Knowledge gained from this study can be used to inform the practice development element of the Professional Doctorate by midwives and maternity care professionals exploring and developing ways to promote strategies for peer support during childbearing in a range of contemporary settings.

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## Chapter 1 Introduction

Attending Aqanatal.....  
*"...is your opportunity to do a bit of exercise  
and to have a good chat with people.."*

(Participant 7/Study Focus Group 2)

### 1.1 Prologue

This thesis explores women's experiences of wellbeing through attending a midwife-led aquanatal exercise group, and the impact of peer support during pregnancy that aquanatal classes may offer. The introductory chapter establishes the background for this study, importance of this topic to professional practice and the specific setting for the research. Literature from a range of perspectives was examined for the context of midwifery provision and public health agendas, therefore a methodological approach was adopted whereby the ethical considerations, sample selection, data collection and analytical processes addressed the research aim. My reflective approach is included as a narrative style thread throughout the document, highlighting aspects of professional development in keeping with the nature of Professional Doctorate (DProf) study.

From the start of my midwifery career, I have been passionate about seeking to provide support for women within the community where they live. My journey as a qualified professional has taken different paths but has always focused on the support and facilitation of childbearing in a holistic context that maintained women at the centre of their journey to parenthood whether for the first or subsequent times. My philosophy for holistic care, views psychosocial aspects of families as inextricably linked to the physical health and emotional transition for women to becoming a mother (Leap 2009; Department of Health (DoH) 2010a). Being a community midwife for a third of my career allowed me to build-up additional skills, underpinned by professional knowledge that ensured women had the information needed to continue or change their health habits and that of their families, during the period I had the privilege to know them.

### 1.2 Background and Overview

Childbearing brings physical and psychological changes which may impact on the experience of wellness for women and their experience of daily life (National Perinatal Epidemiology Unit (NPEU) 2015). Public health seeks to promote and protect health and

wellbeing through prevention strategies within communities. These policies aim to reduce inequalities by social or economic factors and improve the responsibility for illness, associated morbidity and disease prevention in populations (Public Health England (PHE) 2016). Pregnancy is often viewed by the public as an adjunct to a normal life event where the practical concerns of childbirth processes become the priority focus. However, pregnancy and birth do not occur in isolation, and the impact on women as they journey to becoming a mother offers a range of changes in social, physical, personal, psychological and spiritual development.

My midwifery career has advanced from novice, through experience and additional training, to a level of expertise based on education, research evidence and tenacity to provide holistic care which includes aspects some would not always see as essential; for example, psychosocial support (Seefat-van Teeffelen et al. 2011) or mentoring (Darvill et al. 2010). There have been times when giving physical or technical care has been a priority and individual needs for health information have appeared less crucial aspect of care provision. Despite this, public health is intertwined with so many aspects of midwifery and the provision of current information that makes sense to people at the time of our contact with them and arguably should be integral to the holistic approach we take at every professional contact (Public Health England (PHE) and National Health Service (NHS) and Health Education England (HEE) 2016).

The challenge for any health professional providing maternity care for the 21<sup>st</sup> century, is to meet the diverse needs of the women we come into contact with. This uses a full range of professional skills and evidence-based knowledge to maintain high standards of individualised care through planning, implementation and evaluation (DoH 2003). Women provide us with a unique perspective of their individual transition through childbearing which also informs the opportunity to truly reflect on our practice and the care we have provided. For professional self-development (Nursing and Midwifery Council (NMC) 2015), these challenges can be utilised to develop a different perspective through insight and experiential learning to widen our academic horizons and extend our technological and practice skills.

Providing up-to-date public health research information is challenging in itself, but when faced with the breadth of health challenges faced today, the complexity is increased (Bowden 2006a). Resources are available from a range of areas of expertise, including

health, social and public related sources, but critical examination of these is often fraught with issues and contradictions which impact upon their translation and understanding in order to develop practice (Finlay 2006; Sanders et al. 2016).

Public health can evoke very different meanings to communities and thus provision is driven by the perceived needs and uptake of facilities meaningful to individuals (Her Majesty's (HM) Government 2010a), and the agenda for organisations who determine some of the community focussed social or health messages from local or national programmes. For some, the motivation to seek information or consider behavioural change is underpinned by a specific health issue which they identify predictable benefits to either themselves or their family. Drivers may also be purposeful in line with government policy or from health promotion targets for social or health improvements (National Institute of Health and Care Excellence (NICE) PH6, 2007; NICE PH25 2010a; Centre for Maternal and Child Enquiries (CMACE)/Royal College of Obstetricians and Gynaecologists (RCOG) 2011; DoH 2011; NICE PH35 2011). Many of these documents highlight increased physical activity as fundamental to behavioural reform.

Activities of daily living, inside (care giving and housework) and outside (shopping, gardening and employment) the home contribute to general physical activities and behaviours. This is in addition to more formal undertakings of greater physical effort is exerted for a set timeframe constituting modes of exercise which seek to improve or maintain fitness. Such approaches to exercise are associated with intentional skeletal movements which are planned, comply with a structure over a timeframe, and offer repetitive sequencing of muscle actions and body postures. The maintenance of physical function may contribute to women's perceptions of health and well-being during childbearing (Poudevigne and O'Connor 2006; Derbyshire et al. 2008; Smedley et al. 2014).

The benefits of exercise during pregnancy include; reducing physical discomforts, improving general sleep patterns and enhancing psychological wellbeing (Rankin 2002; Baker 2006; Cioffi et al. 2010). This information is often used to encourage women to participate in active lifestyles during the antenatal period. Thus, the attendance of pregnant women at specifically structured exercise classes seeks to promote the 'active for life/active lives' core philosophy within leisure industry provision (Sport England

2013 and 2016; Cummings 2017; Swim England 2017) and the Government supported agenda to address specific public health issues within society (DoH 2006; DoH 2010b; HM Government 2010b; DoH 2011; DoH 2014) and childbearing (NICE PH27 2010b; NICE CG107 2010c; DoH 2016). Currently, the variety of provision in community leisure centres, school or village halls, include land-based classes as well as water-based modalities with instructors from professional fitness groups and midwives. Whilst some women continue to attend classes aimed at the general public, some seek targeted sessions instructed by qualified ante and postnatal specialists (Baker 2006; Barakat et al. 2011).

The changes to the anatomy and the varied physiological adjustments within most systems of women's bodies are associated with the development and nurturing of the fetus, plus the preparation for the activity of the birth process, requiring resources to be ready and able to support the events (Rankin 2002; Rankin 2017a; Soltani and Fair 2017). Pregnancy discomforts are often associated with physiological benefits, postural changes and reduced general mobility (Baddeley 1999; Duncombe et al. 2007) as pregnancy progresses, while mobility is impacted on by changes to body alignment and weight gain (Baker 2006; Benelam 2011). A concise outline of these topics is summarised in the initial appendix (Appendix 1, p311-317).

Swimming is viewed as an excellent way to promote health and remain active during pregnancy and is often recommended by healthcare professionals (RCOG 2006; Baines and Murphy 2010). Women may choose water-based activities due to the soothing mental atmosphere and comfort the aquatic environment can offer (Hatch 2008). The buoyancy of water provides a cushioning effect for weight-bearing joints, relieving the stress of extra body weight and reducing the risk of extreme range of movement within such joints. Maintaining some flexibility, muscle strength and functional mobility is viewed as desirable to reduce musculoskeletal dysfunction (Baker 2006; Melzer et al. 2010), and to enable women to remain mobile during childbirth.

Aquanatal exercises during pregnancy consist of a series of active and passive moves that link progressively together. The aim is to maintain muscle strength and mobility for pregnant women in chest high water, moderated by the instructors to account for physical adaptations and limitations due to changes during pregnancy and post birth (Baddeley 1999; Baines and Murphy 2010). Maintaining core stability when the

abdominal muscles are stretched and weakened by the growing uterus, requires the women to maintain good posture, balance and exercise techniques during the entire class (Baker 2006; Hatch 2008). This is a challenge for many, particularly within the water environment.

The Baciuk et al. (2008) study suggested that regular water-based aerobic exercise programmes for low-risk or sedentary women are not detrimental to the health of either mother or unborn baby. They found that women who had undertaken such programmes made fewer requests for analgesia during labour (Baciuk et al. 2008), specifically reducing pharmacological side effects which would have the potential to impact on the individual's perception of labour pain (see wellbeing link in NICE CG190 2014a), experience of wellbeing and coping mechanisms at the time of birth and the initiation of breast feeding (see wellbeing link(s) in Li et al. 2008; RCM 2012). These findings support regular, moderate intensity physical activity during childbearing (including water-based exercise programmes) and confirm the significance for public health themes [cardiovascular disease (Brown et al. 2015), weight increase that leads to obesity (Gore et al. 2003) and gestational diabetes as a precursor for type 2 diabetes (Löbner et al. 2006)]. Exercise in water may therefore be viewed as safe, and even beneficial, for low-risk women during childbearing (Granath et al. 2006; RCOG 2006; Smith and Michel 2006; Baciuk et al. 2008; Hatch 2008; Cavalcante et al. 2009; Vallim et al. 2011).

Working as a midwife in clinical practice I became involved in the provision of aquanatal sessions for pregnant and postnatal women. Through my continuance of instruction over twenty-five years, whilst employed as a clinician and later as an educationalist, I have undertaken specific midwife and other instructor training to enhance my knowledge, skills and ability to provide these classes.

Over time, the women who attended the aquanatal group were often observed engaging in conversations with other members and discussing a range of pregnancy topics. Sometimes a question was directed at me for midwifery knowledge and at other times the group support appeared to be the most crucial aspect of the dialogue to the participating women. The phenomenon of group support in this context was highlighted as something which could be seen to positively affect the women who attended such groups. More recently I have seen that some women have continued social contact between the weekly class and maintained this into the post-birth phase of motherhood.

These observations have encouraged me to continue to challenge my knowledge and skills through a research project which would investigate women's experiences of participating in water-based exercise activity during pregnancy, identifying those who have undertaken physical activity previously and those who take up this mode of exercise for the first time. Fundamentally, in terms of physical activity and public health, participation in the sessions would be seen as an active change for previously inactive women or infrequent exercise attendees. The literature review highlights a paucity of research linked to midwife-facilitated aquanatal classes and I explore this further in chapter 3 (p78-95). This study provides new knowledge which can contribute to the development of public health strategies which address issues such as physical activity (NICE PH6 2007; NICE PH13 2008c; NICE PH27 2010b; NICE PH42012a), obesity (NICE PH27 2010b; NICE PH42 2012b) or isolation (NICE CG110 2010d) amongst specific groups of women during childbearing.

### **1.3 Research Aim and Objectives**

This study sought to examine the provision of aquanatal classes for pregnancy with a midwife instructor. The experience of attending such classes is not universal in terms of access or provision. Exploring the women's involvement in this group, their reasons for attending and what, if any, are their perceived benefits for well-being or support is the basis for the research question. At this stage, the research question is presented, together with the aim and objectives which arose as the literature and research design evolved.

#### **1.3.1 Research Question**

What factors may influence pregnant women to join and continue to attend midwife-led aquanatal classes during the antenatal period, specifically those that relate to the effect of group activity on their experience of personal wellbeing.

#### **1.3.2 Research Aim**

To explore women's experiences of wellbeing through attending aquanatal exercise, and the impact of peer-support during pregnancy that aquanatal classes may offer.

### **1.3.3 Research Objectives**

To achieve the research aim, the following study objectives were developed to inform the research design and processes:

- Explore the experience of group midwife-led aquanatal provision for antenatal women
- Explore women's motivation and what benefits they experience by attending group midwife-led aquanatal exercise classes during pregnancy
- Develop an understanding of women's experience of well-being through attending group midwife-led aquanatal classes
- Explore the impact of attending group midwife-led aquanatal classes on women's experience of peer support during pregnancy.

### **1.4 Methodological Summary**

The research used a case study approach with the researcher as an 'insider' to the exploration which would contribute to the knowledge from an original perspective of women's experience of well-being and social community as part of this group. I aimed specifically to examine the community aspects of social 'bonding' during group exercise on women's perceptions of well-being during the pregnancy phase of childbearing. I realised that a number of additional questions could be asked such as, is this 'change in behaviour' maintained after birth, and if so, what supports this phenomenon, however, this would take the study beyond the time frame for doctoral work. As such, both questions could be subject of future post-doctoral study.

### **1.5 Research setting and context**

The research narrative begins with the focus on the specific study environment and context from physical, social and cultural viewpoints. In this instance the specific environment, its function and complex socially bound systems are presented for the aquanatal group who feature as the case study. This provides multiple spatial and temporal perspectives (Sandelowski 2011) for exploring the participant's construction of pregnancy experiences and my researcher interpretation of data collected whilst these women are members of the group.

Thomas (2011 and 2015) and Simons (2009) indicate the researcher needs to present a full-colour 'three-dimensional picture' (Thomas 2011, p146) or detailed case 'profile' (Simons 2009, p73) based on the relevant time frame of the study. To ensure the context is described according to the research approach, I sought a framework from a qualitative research perspective to provide consistency with the study design. Stake (2000) indicated the importance of detailed description of the qualitative context and endorsed a defined structure first suggested by Stouffer (1941 cited by Stake 2000, p438). This includes:

*"The nature of the case; the case's historical background; the physical setting; other contexts e.g. economic, political, legal and aesthetic; other case through which this case is recognised; the informants through which the case can be known"*

(Stouffer 1941 in Stake 2000, p438).

The six part nature of this specific structure provided me with a coherent way to express the context in a meaningful format that could be utilised in the design and later to enhance the data analysis by a reflexive approach within the context description via the physical setting (see section 1.5.3, p23-24), other contexts (see section 1.5.4, p24-25) and the informants (see section 1.5.5, p25-26). The relationship between context and interpretation is highlighted by Stake (1995, 2005 and 2008) so the case boundaries, relationships and holistic context are integrated coherently.

This description presented here (see section 1.5, p19-26) follows Stouffer's (1941) composition. In describing the narrative snapshot 'case', care has been taken to protect anonymity as University guidance recommends.

### **1.5.1 The nature of the case**

Aquanatal exercise is a derivative of water-based activity for pregnant (and/or early postnatal) women and is offered at leisure centres and other aquatic venues across the UK and beyond. Many are facilitated or instructed by fitness professionals or more rarely by suitably qualified midwives. The membership of such groups is by necessity flexible to local services provision and the client base of facilities where such classes are held. Group size is determined by pool capacity and safety recommendations associated with specific centres.



The case itself is an aquanatal class provided within the physical setting of a leisure centre which antenatal women can attend from the end of the first trimester of pregnancy until labour begins. Whilst there are exclusions to participation (see Table 1-1, below), women were provided information on class availability by local midwives, leisure centre on-line information, social media and word of mouth from other women.

**Table 1-1                      Contraindications to exercise participation and Study Exclusions**

	Absolute Contraindications	Consultation and Advisory Conditions
Pre-term labour	X	
Vaginal bleeding or placenta previa after 26 weeks gestation	X	
Pre-labour rupture of membranes	X	
Cervical incompetence	X	
Anaemia or haemoglobinopathies		X
Cardiac or severe respiratory conditions		X
Raised blood pressure that is considered to be pre-eclampsia		X
Established Labour		X
Severe intrauterine growth restriction		X
Abnormal fetal lie or position after 36 weeks gestation		X
Thyroid disease which is untreated		X
Un-controlled diabetes or epilepsy		X
Smoker – more than 20 per day		X
Significant orthopaedic disease		X

(Adapted from ACOG 2002 (reaffirmed 2009) and RCOG 2006).

The group participant numbers remained dynamic as they join, interrupt their attendance and leave at intervals, governed by the women themselves as their pregnancy advances, altered personal circumstances, episodes of sickness, clashes of attendance at local parent education classes or the birth takes place. To encourage wider participation the session price is below other pool-based sessions. Attendance is variable but generally between 10-25 women ranging between 14 weeks gestation to term.

These statistics will vary throughout the year due to weather and the changing seasons (Sport England 2016). One distinct advantage is the continuation during school, and summer holidays, although the centre is closed on Bank Holidays and for a two-three week period over the Christmas holidays, which is possibly partly responsible for maintaining attendance despite seasonal holidays being taken.

Student midwives may attend intermittently to explore the public health aspects of locality provision and often participate in more than one class in order to meet learning objectives around the topic area they are considering. Prospective students who cannot attend other venues due to meeting the minimum age and checks required prior to being in contact with vulnerable members of society, are invited by me who will supervise their contact with class attendees throughout their visit. For some this also allows them to examine the role of a midwife by observation and discussion before applying for a University programme.

The participant demographics are varied (maternal age, employment status, marital status, location of home or work in relation to the centre etc), and the principle of general health and pregnancy risk-assessment is used by me to screen attendees prior to their first visit. Routine questions regarding any alteration to health or pregnancy issues are asked before entering the pool on each visit and thereafter.

The format of the class is beginner level which can be adapted by regular attendees who prefer to work at a faster pace or adjusted exercises for women who are less agile as pregnancy advances. The principle of warm-up, stretch, aerobic, muscle strength and conditioning, finishing with a mobilising stretch is congruent with most main-stream exercise classes, while the aerobic section is shorter and less intense. Five years ago, I adapted and added circuit type exercises (six variations relating to upper and lower body muscles) to each class for the strength and conditioning section, and with up to four women per group found this encouraged interaction and other benefits between attendees. During the summer of 2012 and 2016 we undertook our version of Olympic style class which was enjoyed by attendees and myself, with the circuit stations adapted for themed sports style-based exercises.

### **1.5.2 Other case through which this case is recognised**

Midwives and fitness instructors provide a range of exercise classes that accommodate women during pregnancy either as specialist classes or alongside gender specific or mixed classes. Group and individual activities where person-to-person contact or high-risk of joint/other injury may occur are generally not recommended within leisure centres. Whilst other community venues may offer such provision, women are

encouraged to review their participation with the instructor and seek advice from their primary practitioner (Baker 2006).

### **1.5.3 The case's historical background**

The antenatal and postnatal classes were set up by community midwives originally as part of their provision of NHS care and seen primarily as an extended parent education arrangement for women and new mothers during the 1990s. Gradually this aspect of the community role was eroded as resources were reduced and managers saw the service as a luxury in a more integrated model of midwifery care between acute and community settings. Whilst day-time classes ceased in 2003, women continued to make requests for classes to be resumed even if this meant being retimed. I secured support from the centre, arranged to be employed as a midwife instructor to facilitate the weekly class on a part-time basis outside my main employed hours.

I have provided aquanatal classes since 2005 at this centre, on a weekly basis. This is focused primarily on antenatal women as the pool time available has impacted on access by post-natal women who may have required crèche facilities. Local midwives continue to support this provision by advising mothers of its availability and I maintain contact with these midwives intermittently.

As a midwife I see my personal philosophy as one of working alongside women, to provide a safe-haven for information exchange and the development of peer support within a group of women, all of which supports the evidence-based care a midwife can provide in her clinical practice. Thus, the focus for class is that of fun with some structure, where information or advice relating to physical activity can be given, while safe activity in a water environment is fundamental, and a consistent approach to women who attend is provided.

### **1.5.4 The physical setting**

The leisure centre is situated on the edge of the town with good communication links to the nearby town centre and the bordering residential areas. There is on-site parking which is situated between the local football ground and co-located sports ground with skate park provision. It is owned by the Borough Council (Community sports and leisure

facilities) who also provide subsidised parking facilities for 3 hours and run by a registered charity (a part of a portfolio of leisure facilities) on their behalf.

The facility was built 27 years ago as a features pool and a nursery pool which was extended 12 years ago to provide an extended gym with state-of-the-art equipment aimed at cardio, strength and functional exercise, studio classes of various modes and intensity, personal and functional training. Some classes are specifically aimed at the teenage group participant and two years ago a Toning area was added which is attended by older centre members primarily. The café is run by a national chain (Costa) with mezzanine seating area. There is a small office area and Beauty/Hair/Sports Massage facilities which are also run separately to the main facilities. Crèche facilities are available at scheduled times during the morning (Monday to Friday only) to sport and leisure participants and is monitored by Ofsted.

An extensive programme of studio, gym, pool and other activities are available to members and non-members during opening hours. Limited alternative activities currently exist for antenatal and early postnatal women within the published range of provision. There is also a well subscribed swim school and additional community focussed provision (birthday parties, youth groups, etc). Active involvement with many local schools is in place for a varied schedule of regular and specifically timed activities. The centre also has adaptations for disabled users with lifts on both sides of the building, access ramps, hearing loops, and graded access into the pools via a slope. The acoustics in the main pool area will bring significant challenge for some users, but staff and individual instructors are available to provide guidance and support in these areas.

The main pool is used for the aquanatal class which is shared space with a small group of children being taught to swim in one third of the area for 30 minutes. After this the whole pool is used although the maximum pool capacity for this particular class is 25 attendees. The water is chest height (1.2m), accessed via steps at either end of the rectangular area or via graduated entry through a features pool which has a gate during the class. The water temperature is recorded by pool-side staff four times per day, and the group number is limited based on maximum 'bather load' (25) with one lifeguard available during the whole class. The pool features are suspended during the class duration (rapids, fountains, flume etc) due to their proximity within and adjacent to the

main pool. The timetable schedule continues following our class with the local swimming club session.

#### **1.5.5 Other contexts, for example economic, political, legal and aesthetic**

As a leisure company, they assert their commitment to community partnerships for national, local and regional plans relating to health and wellbeing, sport and leisure to promote the positive lifestyles in respect of the four age groups covering the life span e.g.: “foundation for life, engagement for life, active for life and older active for life” (Sport England 2013 and 2016). The key objective of the varied programme of activities is to ‘encourage social activity’ which is open to members and non-members to enhance participation in physical activity suited to the individual.

The company has five centres which it manages and runs, each providing similar and unique ranges of services for the community where they are sited. Publicity of events and specific activities during the year are made available on the company and council web-sites as well as in local publications, and leaflets in business premises and leisure venues in surrounding localities.

The borough council covers a total of 243 square miles situated in the south of England. The borough is mainly rural with approximately 40% of the population living in small villages and the remaining residents inhabiting towns and urban areas found in the northern and southern areas of the borough. The estimated population in 2012 was 114,000 and is expected to increase by 4% by 2016. Generally, the borough is considered to be well-off with small areas of deprivation.

Major employers provide 70% of the upper area population with work in the town they live. The opposite is true of the lower area where employment opportunities result in a high proportion of outward commuting to adjoining areas or inward to two major valued employers.

The five leisure sites (all run by the registered charity) can be found within the localities of the two major towns and urban areas. There are also a number of other facilities in adjoining boroughs. The main route between these two towns is 19 miles and

approximate travel time is 34 minutes. The two sites at the north end of the borough are 1.2 miles apart and the two main centres in the southern area are 6.3 miles apart. The fifth centre is adjacent to one of the centres in the southern area of the borough.

#### **1.5.6 The informants through which the case can be known**

Some five years ago some of the aquanatal group participants established a Facebook page which continues to be message board primarily for announcements and communication with some of the class attendees past and present.

The informants for this case study context are the antenatal women who currently attend or who have attended previously, the local midwives who know of the provision, the public who access the Leisure Centre web pages and the specific Borough Council web pages, social media e.g. the aquanatal Facebook page, and general word-of-mouth.

#### **1.5.7 Context and research methodology**

The choice of case study methodology is confirmed in chapter 4 (section 4.2; 4.3; and 4.4, p101-118) and presents how the setting and context contributes to this research study. In some research studies the case context may evolve as a dynamic process especially when studies span substantial time-frames. However, this case did not require 're-casing' (Ragin 2010a; Ragin 2010b; Sandelowski 2011) as the contextual variables linked to bounded systems did not alter significantly during the fieldwork phase (section 4.4, p117-118).

### **1.6 Thesis Style**

Academic reflection (Ryan 2011) embraces professional growth and development of self through the use of 'reflection-in-action' or 'reflection-on-action' (Schön 1991) as critical tools during clinical research activities. My reflective exploration of myself in this social setting and context, aims to offer a methodical explanation through reflective narratives within this thesis. Additionally, early in the research design, the need to ensure the women's voices were heard throughout the study became of paramount importance. In order to allow this emphasis, I needed to monitor my values and beliefs so I could set these aside during every research process (Holloway and Galvin 2016). Chapter 4, (p96-151) sets out more detail of my reflective approach or 'bracketing' as a researching

professional as described in Husserl's descriptive phenomenology (Husserl 1967) and later by Tufford and Newman (2010). As a novice researcher, I used a strategy of keeping a reflective journal throughout, enabling me to acknowledge thoughts and feelings as a continuum (Ortlipp 2008). The nature of DProf study means that I have been intensely connected to the study context and class membership over considerable periods of time (Fiske 2000; McNeill and Nolan 2011) and found complete detachment problematic to attain and consistently control (Holloway and Galvin 2016).

This thesis is written in the first person as my presence as researcher within this qualitative exploration allows the integration for reflexivity of professional practice and the social context aligned to the process. Webb (1992) identified that the use of first-person language to present personal interpretation is crucial for consistent 'formal' expression of the evidence grounded in a reflective lens for the study. While Lillis and North (2006) identified that the features of informal researcher journals illustrated the disorganised or cluttered reality experienced during research practises, the language is later reformed into a more formal style for the written text or narratives. This is achieved by 'I' being linked to research activities, mental actions, and writer 'acts', and professional terms and nouns are used to express clearly the actions undertaken, and finally any affective or colloquial phrases are removed. Therefore, rigor and objectivity can still remain competently embedded within the academic presentation of information, decisions, problem-solving and conclusions of first person writing.

The integration of the women's voices specifically as extracts from study data is offered throughout, but especially in chapters 6 and 7 (p172-261), attributing them to participant and group. My voice as a researcher or as the class instructor is added to indicate where field notes or journal entries respectively offer perceptions from another critical lens at the time of data collection or during analysis.

## **1.7 Thesis Structure**

This introduction presents a brief outline of the research topic from a personal perspective. The role of the midwife is central to this focus, together with the significance of the public health agenda in contemporary care provision. The importance of community delivery of evidence-based information in co-operation with NHS

maternity services may offer significant opportunity to promote behavioural change for physical activity engagement that has impact for healthier lives of women and families.

The framework for the thesis moves forward as a progression through the professional research process. The literature review in chapter 2 (p30-77) opens the broader elements for critical appraisal using themes derived from a bio-socioecological framework (Sallis et al. 2006). The main body of literature was identified using a variety of inclusion/exclusion criteria linked to publications and more formal critical appraisal of previous work in health, sport/physical activity and sociological fields (see Table 2-1, p34 for detail of literature searching strategies). Chapter 3 (p78-95) presents a methodical approach to the review of pregnancy aquatic research studies (Table 3-1 (aquatic studies), p83). These reviews were then used to clarify ideas of applicable professional perceptions for the planning of the research study seeking to provide new direction for professional practice.

Chapter 4 (p96-151) provides a synopsis to the preparation of the methodological approach and study design, which examines in detail the research aim and objectives presented in section 1.3 (p18-19). Links are made to specific aspects of the study whereby theoretical constructs are considered and integrated into skills training (in respect of ethics applications, see section 4.6, p120-124; and section 4.11, p148-149) or study processes (such as the preparation for focus group moderation see section 4.9.5, p134-137).

The practical application within field-working of the theoretical concepts relating to case study methodology and the study design are reported in chapter 5 (p152-171). I offer a detailed and honest appraisal of professional and researcher experiences during this period of time, demonstrated by the reflective narrative punctuating the writing of the data collection processes.

As the journey continues through presenting results (chapter 6, p172-210) and then data analysis (framed around the debate and discussion within chapter 7, p211-261), the women's experience of wellbeing and peer support from attending aquanatal classes is provided in their own words as data extracts, together with researcher annotations made within this process. The 'insider researcher' positionality within a familiar,



although dynamic group culture, offers both insight and challenge to the interpretative processing of data.

The analysis of results and findings (chapter 7, p211-261) offers the reader my professional perspective as a midwife, of how women view their pregnancy well-being in relation to a specific physical activity and social connectedness associated with class attendance. The collected data was scrutinised using an inductive style taking account of the individual journey to motherhood within the case study context of class membership and their wider bio-socio-ecological framing where applicable.

As a researching professional, one recurrent theme during the completion of this thesis has been developing practice specifically related to this area of study. This is tethered to a range of encounters and activities during the processes and procedures of undertaking this research study. Reporting my personal journey is woven within each chapter in reflective narrative format with a summary presented in the final chapter (see section 7.11, p258-260). Together with research journal excerpts throughout the thesis, I report honestly the path undertaken as a midwife, researcher and academic.

## **Chapter 2    Background Literature: the bio-socioecological perspective for women and pregnancy**

This chapter provides an examination of background literature assured by the biological, social and ecological context of pregnancy and childbirth. The selection and review process incorporated the need to identify key published literature in order to gain understanding of the topics underpinning my research question. Evaluation of this literature highlighted the importance of practised reviewing skills, ensuring consistent and cogent explanation of the topic focus can be achieved which in turn would justify the choice of methodological approach (Hart 1999; Aveyard et al. 2016).

A bio-socioecological focus allows the examination of social frameworks for pregnancy while remaining bound by the contextual (childbearing, maternity care and public health policies) and situational environments women encounter during this time. Primary consideration of the societal, community and relationship factors which underpin the transition from woman to mother is presented in a narrative style beginning with my own reflective account demonstrating how the study objectives underpinned and interspersed this particular phase.

This chapter ends with a review of adaption of social roles alongside the parallel physiological and psychological adjustments women encounter during the perinatal period. Further analysis and synthesis of women as individuals experiencing pregnancy and attending aquatic exercise classes is then advanced in a more methodical way within the subsequent chapter (chapter 3, p78-95).

### **2.1        Reflective narrative**

As a midwife, my philosophy places the mother at the centre of my role; she has the principal part in being able to choose a plan of care for antenatal, intrapartum and postnatal episodes (see section 1.2, p13-18). Her choices are guided by the decisions she makes based on her own knowledge and additional expertise from the health professionals she consults. Each woman is unique; her pregnancy and childbearing experience is dynamic, bounded by her beliefs, values and decisions. This takes place within her personal life journey structured by the framework of society, where the

provisions of health, economic, employment and leisure services are available and accessible to her.

The aquanatal topic focus was identified very early, but the research objectives proved more challenging to determine and were debated at length over many months for applicability to the overall research aim. This deliberation impacted on the timeframe of this study and the direction of progress. Reflecting on this later highlights the danger to project management progress and timelines of this type of procrastination or being 'blocked' by the size of the task in hand.

*Setting research aims and objectives*

*The transfer viva was supposed to be a transition; I feel deflated as even the research objectives need more refinement! I feel bogged down in such details when I need get on with the research.*

*I need to see this differently. What is it I want to discover? The words I use, may not necessarily 'fit' the objective – so is this about language, single words, or phrases? Can I see this from the woman's perspective and in her words? Have I really defined the aim competently?*

*Clean sheet of paper and write possible objectives again in different ways. Let's have a think, talk it over with a colleague or two, and come back to it later.*

*A week later: This was actually like a précis exercise from school where you play with the sentence construction and individual words. Everyone has a view, but ultimately I need to own this process!*

Researcher Journal: First supervision after transfer viva report

Whilst there is a dearth of research covering aquanatal group exercise, antenatal exercise has been examined from a variety of perspectives by researchers of health professions, social sciences, and physical therapy groups. I found maintaining a clear focus at times highly challenging especially where the breadth and depth of literature was unpredictable, or the themes were capricious to my initial thoughts. The dissimilarities of focus, especially for many quantitative and qualitative studies, provoked an approach to critique that included flexibility of any review framework used.

With the initial research aim and objectives determined, the themes for the review of studies and publications could be defined. Reviewing and critiquing then became a more manageable activity, although there was a series of fruitless forays into less useful sub-themes as I was tempted by alternative ways of considering a theme or a research approach to study. General template tools such as those provided by CASP were

considered (Caldwell et al 2005; Critical Skills Appraisal Programme (CASP) 2017) but subsequently adapted to aid a be-spoke structured approach to critique of both qualitative and quantitative studies associated with the defined themes (see Appendix 2, p318-320 for a study review table).

## **2.2 Method for this review of the literature**

As a researching professional, (a registered practitioner researching an area of their practice (Taylor and Hicks 2009); see also section 4.3.1, p115) the primary task was to examine the theoretical basis for the subject and develop a framework of principal theories and key studies relating to the area of research. For this literature review, I have used an iterative approach which promotes a woman-centred thread to the critique, taking account of each wide-ranging subject area and relationship between each of these and childbearing women. This has been specifically selected so the perspectives of physical, psychological and sociological studies are combined with the public health, midwifery and exercise science literature to bring together a comprehensive range of viewpoints. To enable this broad perspective, key terms are defined within a social science integrative lens relating to my philosophy of upholding the holistic provision of care (see section 1.2, p13-18).

The core activity involved the critical assessment of previously published work in this subject area (Aveyard et al. 2016), to establish the design and processes for the research. An orderly approach to identify and investigate prior publications and research sought to examine in depth the knowledge and methods of inquiry used by popular and less well known authors in the field(s). Thus the appraisal of literature enabled the research focus to be aligned to the current study aims and to challenge my prior observations of the phenomena (Aveyard et al. 2016). Reporting the review engaged me in extended discussion of research studies, critical examination of the data available and preparation of a coherent critical analysis of presented results from these publications (Hart 1999; Boote and Beile 2005). Once this was complete, I acknowledge the gaps in published knowledge which have not been scrutinised in detail prior to this study (Potter 2006).

Literature searching used various electronic data bases (British Nursing Index, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline complete,

Maternity and Infant Care, Academic Search Premier, Google Scholar, Science Direct) to consider broad perspectives of exercise during pregnancy and peer support for women during childbearing. The approach used Boolean operators ('AND, OR, NOT'), truncation and parentheses techniques (EBSCO 2018) to maximise the search for relevant materials using search strategy 1, 2 and 3 ('pregnancy wellbeing and quality of life', 'pregnancy and peer support' and 'pregnancy aquanatal and wellbeing'; Table 2-1, p34). The Ethos (Electronic Theses Online Service) was searched for the use of 'aquanatal' and 'antenatal exercise' or 'pregnancy and exercise'.

Initial searches considered a timeframe from 2000 to present; the rationale for the timeframe is based on three publications. The NHS (National Health Service) Plan (NHS 2000) offered a revised vision for a conjoined service between health, social and private sector provision promoting self-care to 'consumers' and preventative public health strategies to targeted populations. This policy document, together with the Local Government Act (Her Majesty's (HM) Government 2000) legislated selected powers to every local authority for the responsibility to promote or improve wellbeing for sustainable communities, through economic, social and environmental strategies. By combining health with wellbeing at community level, national policies sought to reduce inequalities to service access for everyone, but specifically families. A third publication, (and third edition) of the 'Guide to effective care in pregnancy and childbirth' (Enkin et al. 2000), posed systematically reviewed research evidence to support care identified along a continuum from beneficial to ineffective or harmful. In the summary of 'Lifestyle in pregnancy' (Enkin et al. 2000, p35), four lines of text offer the advice that 'aerobic' exercise is linked to enhancing or sustaining physical 'fitness' and that data reviewed at that time did not support the undesirable outcome of pre-term birth. Specific studies are not identified for further scrutiny although the authors direct the reader to the Cochrane Library (<http://www.cochranelibrary.com/>) where a database of varied topic reviews could be found for pregnancy and childbirth. Together, these publications link health, wellbeing and public health into a matrix of provision from NHS, social and community contexts.

**Table 2-1 Search Keywords and Sample Strategy**

<b>Aim of search strategy</b>	To identify key literature and texts (published and unpublished where appropriate) to set review into current and related topic knowledge	
<b>Element: Key search terms</b>	<b>Alternatives or Variants</b>	
Aquanatal	aquanatal aquatic exercise* aquatic therap* aquatic fitness	water aerobic* water exercise* water aerobics water activit*
Midwife-led	midwi* midwife led	midwife-led
Peer Support	CenteringPregnancy peer support*	peer group* support psychosocial
Pregnancy	pregnan*	pre-natal
Wellbeing	wellbeing well-being well being	quality of life QOL
<b>Search Strategy 1</b>	(pregnan* or pre-natal) = 2,683,448 results (wellbeing or well-being or well being or quality of life or QOL) = 2,295,489 results (midwi* or midwife-led or midwife led) = 364,151 results 1 AND 2 AND 3 = 2,446 results	
<b>Search Strategy 2</b> NB: CenteringPregnancy is a registered trademark but the superscript ® was removed from searching activities due to sensitivity of the literature search tools	(peer support or support psychosocial or peer group) = 348,437 results (pregnan* or pre-natal or CenteringPregnancy) = 2,683,578 results (midwi* or midwife-led or midwife led) = 364,151 results NOT breastfeed* or internet or teenage* or smok* = 8,924,796 results 1 AND 2 AND 3 NOT 4 = 1,086 results Further reduced by adding: or "pregnancy loss" or "perinatal loss" or miscarriage* or diabet* or HIV or male* = 906 results	
<b>Search Strategy 3</b>	(aquanatal or aquatic exercise* or aquatic therap* or aquatic fitness or water aerobic* or water exercise* or water aerobics or water activit*) = 200,867 results (pregnan* or pre-natal) = 2,683,448 results (wellbeing or well-being or well being or quality of life or QOL) = 2,295,489 results 1 AND 2 AND 3 = 15 results	
<b>Search technique</b>	Boolean operators used to combine search terms	
<b>Databases accessed</b>	Academic Search Complete, BNI, CINHALL Complete, Cochrane Library, Internurse, Journals @ OVID, NICE Evidence Services, Medline Complete, PsychARTICLES, PsychBOOKS, PsychINFO, Science Direct, Scopus, Social Care Online, Social Theory	
<b>Inclusion criteria</b>	Primary studies that included pregnancy exercise in the medium of water, pregnancy wellbeing and pregnancy peer support, regardless of study design Systematic literature reviews Studies published in English language, undertaken within the UK, North America, Brazil, Australia, New Zealand and Europe.	
<b>Exclusion criteria</b>	Animal based studies Specific focus on postnatal exercise or wellbeing and specific pregnancy associated disorders (such as diabetes, pre-eclampsia) or peer support associated with breastfeeding, pregnancy loss, HIV, smoking or teenage parenting	

Key midwifery and social science texts on public health, social aspects of midwifery and health related fitness/exercise were reviewed for material related to the research themes. Literature from the sport and fitness viewpoint relating to childbearing was

sourced, scrutinised and reviewed to maximise the perspectives attained. The research papers (quantitative, qualitative and mixed methods) were considered relating to the pertinent issues for this study. The bibliographies of each key study were further examined for additional relevant materials.

Selection and exclusion criteria were set for peer-reviewed journals limited to English language from the United Kingdom (UK), North America, Australia, New Zealand and European research regions where keywords appeared for the two main search strategies defined in Table 2-1 (p34). Studies where the maternity provision is similar to the UK were prioritised for inclusion. Three studies from South America (Prevedel et al. 2003; Baciuk et al. 2008; Vallim et al. 2011) were identified within the initial aquatic exercise search and are included, as their focus took account of physical capacity or psychosocial aspects as an outcome measure. Primary research studies were identified and review articles screened for additional primary projects including pilot studies.

A visual representation of one of the search strategies is presented in Appendix 3 (p321) using a recognised illustration from PRISMA [Preferred Reporting Items for Systematic Reviews and Meta-Analysis] (after Moher et al. 2009) for the results identified (Strategy 3; Table 2-1, p34). An itemised table of aquanatal studies can also be found in the Appendix 4 (p322-328).

I have presented the literature as a narrative evaluation of the contemporary experience of pregnancy from the perspective of the woman. The reporting is located within a socio-ecological framework (after work by Bronfenbrenner 1977 and 2001) for childbearing women then substantively explored for the expectant individual (after work by Sallis et al. 2006) (see section 2.4.3, p52-56 for detail and description) and I offer a timed snapshot of the chronosystems of childbearing for these participants. This is bounded by the cultural, societal and maternity health structures pregnant women encounter, which together are crucial to the case study research design.

## **2.3 Women, pregnancy and a bio-sociological perspective**

### **2.3.1 Continuum of contemporary childbearing**

Childbearing is a part of human life with many physical, social and psychological adaptations for women and their families (Raynor and England 2010). Pregnancy for many women is an anticipated event although the timing may be unplanned and unexpected, or for some women will be long awaited and planned with precision. Life adjustments and changes occur over time, often accompanied by responses which may be punctuated in stressful but also joyful episodes along a journey that is largely unfamiliar (Wilkins 2006). The myriad of changes can be significant, accompanied by cognitive, emotional, social and psychological evolution to a stage of new motherhood at the time of the baby's birth, to maturation as an established parent as the baby grows and develops during childhood (Wilkins 2006; Chambers 2012; Davis 2017).

The outcome of pregnancy may not always be positive, and some uncertainty and apprehension may occur for women at critical times as expectations and anticipated hopes are disrupted by doubt and the ebb and flow of hormonal variations (Gross and Pattison 2007; Raynor and England 2010). Hence the continuity of the midwife as key professional during pregnancy, with knowledge and understanding of the psycho-social changes in addition to the physical changes that occur, may be important to the supportive framework for women at this time (ten Hoope-Bender et al. 2014).

Modern maternity care in the UK follows a prescribed regime of appointments and screening tasks outlined by government guidance and delivered by healthcare professionals during pregnancy (NICE CG62, 2008a; RCOG 2013). Women assessed as having a low risk of pregnancy complications may be seen in community locations by midwives, using a model whereby the midwife is the lead professional. Such locations may be primary health venues, women's homes and local children's centres. Current policy recommendations support the continuance of these settings for services as either community hubs or community bases (National Health Service England (NHSE) 2015; Duff and Dodds 2012 respectively). The regime of care provision is amended if there is deviation from normal physiology and pregnancy adaptations and for women who are diagnosed with enduring or acquired medical circumstances.



Controversially some maternity professionals would offer an increasingly technocratic model (described by Davis-Floyd in 2001) suggesting that mind and body need to be treated separately or that the ‘...body as a machine...’ (p55) is integral or even essential to require additional medicalised activity (NHSE 2015). This is specifically recommended in this government document whereby diagnostics, GP access and obstetric community services, must essentially be available on site so they function as ‘one stop shops’ (NHSE 2015, p54-55). Whilst this may shape a seamless approach to obstetric and maternity services, a limited public health focus for parenting may occur, whereby access for diverse parental needs such as play, leisure or sports, and mental health facilities may not comfortably co-exist without significant alterations to the built environment.

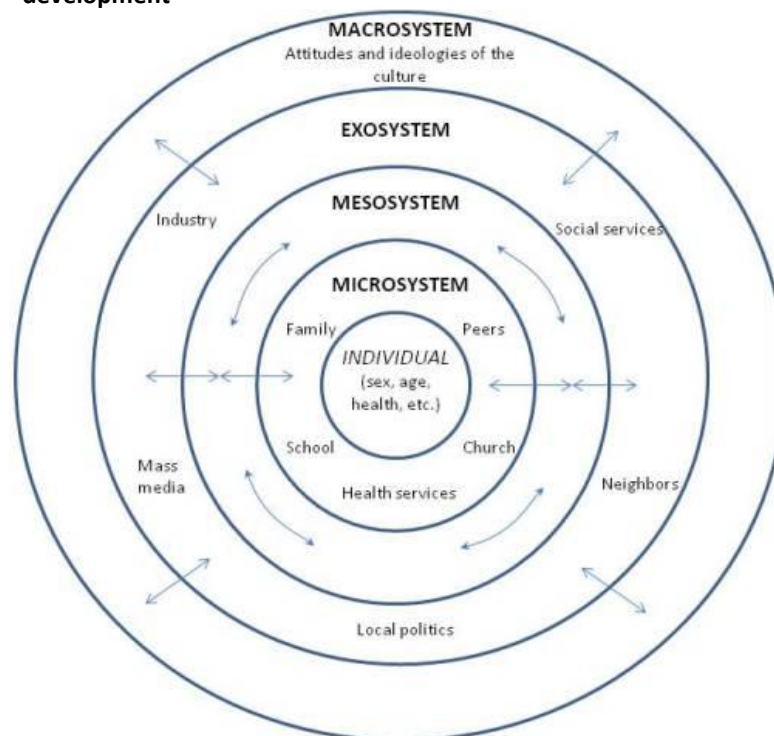
Societal views of pregnancy are deeply rooted in broader terms of family culture, often seen through the collective lens of experience of generations of relatives and friends, related to spiritual and ethnic perspectives of individuals (Squire 2003). The role and position of women within social structures of populations has historically been heavily influenced by patriarchy both in society and maternity care. Indeed Squire (2003) argues that feminist theories (specifically liberal feminism as professed by Kanter in 1977, [Kanter 1993] and postmodern feminism as proffered by Butler 1990, [Butler 2006]) can contribute to the significant gender differences observed within societies but also aid understanding to underpin woman-centred care for contemporary midwifery provision.

The remainder of this chapter will explore the interrelated aspects of the contextual background with women’s experience of pregnancy, and relate to the nature of this research study. The environment where we live and public health policy are inevitably linked and guided by national organisations in terms of law, regulations and societal moral or ethical codes. Environmental issues include the positive and negative effects of populations on the natural and built surroundings we inhabit. Indeed the physical surroundings together with relationships between community members and the cultural ambiance, contribute to group processes and affect each participant entirely differently (Barnett and Casper 2001).

### 2.3.2 Outlining bio-socioecology for pregnancy

A logical framework was required to view the complex relationship between women and their specific contextual environment of pregnancy. Bronfenbrenner's work on ecological theory (from 1977 onward) combined specific social and anthropological life-span development of individuals with the environmental influences of political, cultural and economic conditions. His original socio-ecological systems theory is based on the affective modification of our biological history through interactions with the context of various settings we occupy (Bronfenbrenner 2005; Vélez-Agosto et al., 2017) (see Figure 2-1, below).

**Figure 2-1** An illustration of Bronfenbrenner's socioecological framework for human development



(From Vélez-Agosto et al. 2017 p902).

While Bronfenbrenner's (1997) work originated to explain child development, the socioecological model has evolved and been discussed by others (Evenson et al. 2009; Foxcroft et al. 2011; Santos et al. 2014) for a range of applications. The evolutionary adaption has specifically included the biological perspective (Sallis et al. 2006) which allows us to investigate trans-disciplinary approaches towards individuals, environments and policy arrangements across the life-span (Darling 2007). This innovative bio-socioecological concept is in essence a fusion of systems theories, combining the

perceptions that influence and define an individual within their cultural context. The core nature of the 'individual' relies on the dynamic inter-relations between them and the various environmental systems, resulting in action, reaction or responses which consequentially shape their personal developmental processes (Darling 2007). Stimuluses emanate from a variety of internal (genetic, physical, psychological or behavioural attributes) and external factors (social, cultural or legal facets of living) which are in turn accepted or rejected by people as they make their journey through life. Whilst some characteristics are set before birth, others are learned or acquired through development within the inhabited environment.

My study aimed to explore women's experience of attending aquanatal classes, which required an appreciation of the motivators, barriers and experiences of this in their social and physical environment. Therefore, the bio-socioecological 'Active Living' model proposed by Sallis et al. (2006, p301) was chosen as a framework as the four stated domains (societal, community, relationships and individual) offered a more compatible life transition perspective for women during pregnancy (see also Bronfenbrenner and Ceci 1994).

These same four domains are used later to underpin the discussion of the study findings (see sections 7.3 and 7.4, p219-241). The inclusion of biological factors alongside social and ecological variations specifically offer greater appreciation of the interrelations between health and social impacts on individual pregnant women as they become mothers.

### **2.3.3 Viewing pregnant women through a bio-socioecological lens**

This literature review is framed by the bio-socioecological perspective of pregnant women as they interact with health provision during this life transition, the environments and the various established and novel social options they encounter. The nature of this timed snapshot has adopted the use of the 'Active Living' chronosystems from societal, through community and relationships, to individual (see Table 2-2, p40; Sallis et al. 2006). I begin with the influences of societal systems on pregnant women.

**Table 2-2 Mapping socio-ecological and bio-socioecological models**

Experimental Ecology of Human Development (Bronfenbrenner 1977, p514-515)		Active Living model (specifically anchored within Social and Health factors) (Sallis et al. 2006)	
Macrosystem	"..patterns of the culture or subculture, such as the economic, social, educational, legal, and political systems.."	Societal	Larger scale influences on health such as economic policies, or religious and cultural beliefs
Exosystem	"..an extension of the mesosystem embracing other specific social structures, both formal and informal, that do not themselves contain the developing person but impinge upon or encompass the immediate settings in which that person is found, and thereby influence, delimit, or even determine what goes on there.."		Areas and organizations where social interactions occur, including schools, workplaces, churches and neighbourhoods that influence a person's health
Mesosystem	"..comprises the interrelations among major settings containing the developing person at a particular point in his or her life.."		
Microsystem	"..complex[ity] of relations between the developing person and environment in an immediate setting containing that person (e.g home, school, workplace, etc.).."	Relationship	The individual's family, friends and peers who have the potential to shape a person's behaviours and range of experiences
Individual	Individual attributes of health and personality	Individual	Personal beliefs, attitudes, behaviours or characteristics that influence health status

## 2.4 Society: women, wellbeing and public health within a national framework

Societies are determined by situational boundaries for groups of human beings, sharing living spaces as well as culture, customs, legal and moral limitations and organisational states (Allen 1991; Merriam Webster 2018). Community as a social construct offers individuals' options to extend their societal networks beyond the family or employment bound by either location, by characteristics, interests or beliefs in common (Douglas 2010). Social interactions can bring cohesion between members through relationships via constructive network arrangements where reciprocal values offer shared capital between participants. Health knowledge is one component that may form the base for development of a 'community of interest' (Le May 2009). Health and wellbeing are invariably presented as a single item especially within public health reporting, appearing

to have a co-dependant relationship for UK government policy being reported through the Department of Health (DoH) as measurements of inequalities in society (DoH 2014).

#### **2.4.1 Wellbeing for health (or well-being or well being) unwrapped**

The definition of these terms appears to be complex and depends on the perspective of the person who asks or answers this question. This debate includes the notion of *wellbeing* or *well-being* or *well being* as terms used by or within societies. Fundamental links between wellbeing and health or welfare occurs frequently in the literature (see for example DoH 2014), where two themes emerge: subjective wellbeing or objective wellbeing explanations for individuals (or groups) in respect of medical, social, economic, spiritual or psychological status (Department for Environment, Food and Rural Affairs (DEFRA) 2010; DoH 2010b). These subjective and objective experiences of wellbeing are inextricably associated with contextual perceptions of health during the life journey. People may express high levels of wellbeing when their experiences are positive and conversely for low levels as negativity. For the purposes of this study the term 'wellbeing' has been chosen being the most common iteration of terminology used in UK literature (Ereaut and Whiting 2008; White 2009; Waldron 2010; Angner 2011; Redshaw 2012; White et al. 2012).

The holistic nature of the approach to use of the term, divides our comprehension into various sub-categories whereby individuals can express the detail of their situational wellbeing. Two of these are cognitive and affective which tie in many of the themes identified above and come together with the thinking and feeling explanations of subjective wellbeing for people. This is further reflected within the report *Our Health and Wellbeing Today* (DoH 2010b, p13) and expanded by DEFRA (2010) where personal objectives align with a person's aspirations and ability to contribute to society. Essential to this are positive relationships, resilient communities, good financial and physical health, and a sense of security plus engagement in worthwhile occupations and an appealing environment.

Since the global economic and financial crisis of summer 2007, levels of socio-economic austerity have impacted on various aspects of our socio-ecological experiences (Hossain et al. 2011; Conley 2012; British Medical Association (BMA) 2016) including employment, family and leisure. There have been increasing moves by governments to

measure wellbeing in societies and communities nationally and internationally, illustrated by the OECD Better Life Index, from 2011 onwards (Organisation for Economic Co-operation and Development (OECD) 2015 and 2017). This was partly to monitor the impact of job losses, the credit crunch and economic difficulties across employment, insurance, banking and housing sectors primarily, but also the impact affecting trade, industry and manufacturing across the world. By 2010 in the UK, the Office of National Statistics (ONS) launched a programme of 'measuring wellbeing' motivated by public discussion (ONS 2011). Regular reports and publication of data at both national and local level has seen the development of a measurement tool encompassing 10 domains. The All Party Parliamentary Group on Wellbeing Economics report (2014) followed a year of consultation marking the transition from "evidence into policy" (New Economics Foundation (NEF) 2014), which contends 'the time is right to move from national wellbeing measurement to a national wellbeing strategy' (p3). Within the fields of health and social care, the National Institute for Health and Care Excellence is viewed as a source of independent evidenced guidance for the health economy and clinical judgements within the UK Government Department of Health (DoH).

The ONS describe wellbeing as:

*"...‘how we are doing’ as individuals, communities and as a nation and how sustainable this is for the future. We define wellbeing as ...10 broad dimensions which ....matter most to people in the UK as identified through ...national debate. The dimensions are: the natural environment, personal wellbeing, our relationships, health, what we do, where we live, personal finance, the economy, education and skills and governance. Personal wellbeing is a particularly important dimension which we define as how satisfied we are with our lives, our sense that what we do in life is worthwhile, our day to day emotional experiences (happiness and anxiety) and our wider mental wellbeing".*

(Self 2014; Snape et al. 2017, p1).

Throughout the literature, wellbeing is examined within social frameworks and linked primarily to the national views of the health economy. Specific exploration of the wellbeing experience of pregnant women who chose a specific leisure activity (such as aquanatal) may be significant to modern health promotion and helpful in maximising the provision of health messages to a diverse group within society.

While health and wellbeing are inevitably connected (see DoH 2014), the context of welfare - social, economic and spiritual - offers an additional dimension to the perceived

experience of individuals (DEFRA 2010; DoH 2010b). The term 'Quality of Life' (QoL) may be applied where life satisfaction takes account of personal expressions of our relationship within the context of our lives, aspirations, education, expectations, economic attainment and the broader cultural value systems we encounter (World Health Organisation (WHO) 2018). Wellbeing as a concept is bound up with health and may also be expressed in terms of contentment with our stated life experience.

#### 2.4.1.1 *Health, Wellbeing and Quality of Life*

For many women their identity is built around the creation of home and family which may be challenged by internal and external factors, as individuals and as part of their broader community (Raphael-Leff 2005; Chambers 2012). Exploration of the experience of transition to motherhood has been examined from anthropological, feminist and social perspectives to identify pertinent factors for health and sociological perspectives (Gross and Pattison 2007; Gross 2010). The current global impact of austerity is altering economic structures within employment and communities which may influence perception of health messages when priority of action may be altered by personal situations (BMA 2016). One aspect of influence can be considered as the personal experience of wellbeing.

Wellbeing as a construct can be simply defined as a state of homeostasis between the 'psychological, social and physical resources' and 'psychological, social and physical challenges', whilst recognising any imbalance between resources and challenges as an opportunity to adapt/adopt strategies to regain the balance in determining wellbeing (Dodge et al. 2012). However, the breadth of meaning for wellbeing in terms of social and cultural context and wellness, will ultimately depend on personal interpretation in terms of specificity to circumstances, for example, subjective or objective, general or specific (Ereaut and Whiting 2008; Dodge et al. 2012); and influenced by cultural, gender-based inequalities (Tesch-Römer et al. 2008) and age (Inglehart 2002).

Dolan et al. (2011) after Waldron (2010) selected three concepts – evaluative (cognitive), eudemonic (psychological) and experience (affective) – to underpin measures for exploring personal/subjective wellbeing for the general UK population, using four questions, which utilised a 0-10 Likert-type reporting scale (Table 2-3, p44). The

individual answers would clearly be time specific as well as subjective, and alone offered a limited view of each concept.

**Table 2-3                      Questions to explore wellbeing**

<p>The four questions:</p> <p>Overall, how satisfied are you with your life nowadays? [evaluative]</p> <p>Overall, to what extent do you feel the things you do in your life are worthwhile? [experience]</p> <p>Overall, how happy did you feel yesterday? [eudemonic]</p> <p>Overall, how anxious did you feel yesterday? [eudemonic]</p>
---

(From Dolan et al. 2011).

The Dolan et al. (2011) research highlighted that personal autonomy, competence, and general environment contribute with health, relationships, ethnicity and employment to the experience of wellbeing as defined by individuals. The holistic nature of the interrelationship between subjective, cognitive and affective elements suggests clear exploration of wellbeing requires consideration of the social and specifics of culture as well as self-reporting individual perceptions.

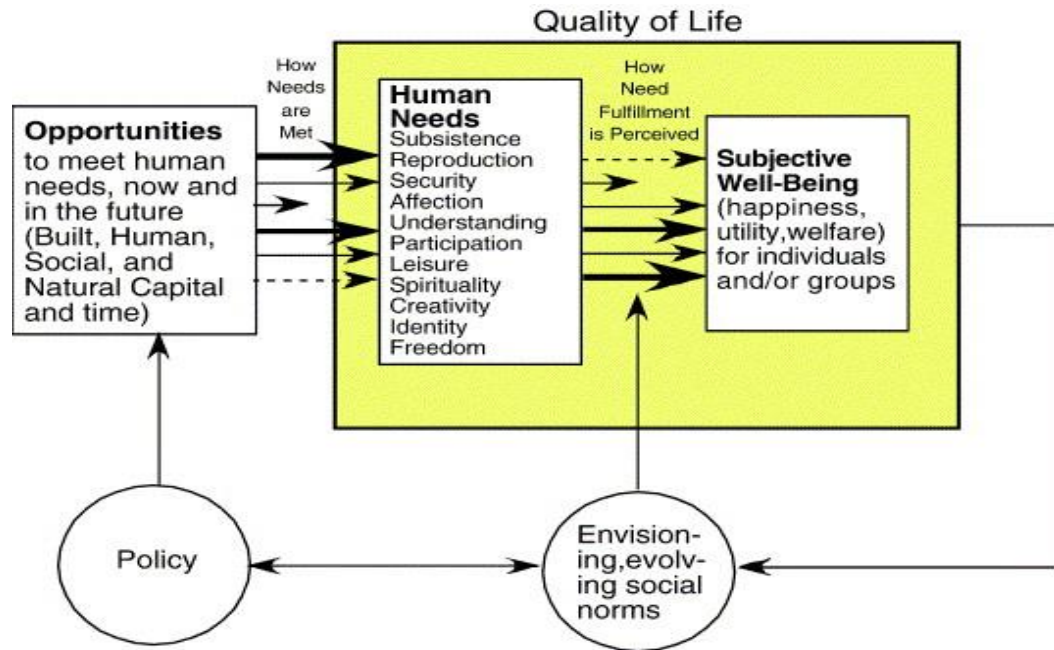
Camfield and Skevington (2008) would suggest that life circumstances and the relationship with cognitive response are not well understood for illness and therapeutic interventions. During pregnancy ‘identity’ in terms of body image is challenged by the significant adaptations happening within the woman’s body and within society, in a physical and psychological sense through changing of visible and opaque aspects of self. The ‘natural’ life transition to motherhood reveal that the process of objective perception by respondents of their wellbeing relies heavily on self-reporting and subsequent analysis by the research and bounded by the context where measures were taken (Laney et al. 2015; Hassall 2016).

An additional feature to personal wellbeing is the perception of Quality of Life (QoL) and has been analysed by professionals in relation to healthcare (Meeberg 1993; Symon 2003). Meeberg, (1993), initially lead the development for a definition of this concept in nursing and by other authors for mothers (Symon 2003; Symon et al. 2003). Indeed Meeberg’s (1993) original analysis defines quality of life as a ‘feeling of overall life satisfaction’ as determined by individuals and others based on both ‘subjective and objective’ factors. Contanza et al. (2007) presented a diagram to demonstrate the



interrelationship of needs, opportunities and individual perceptions (see Figure 2-2, below).

**Figure 2-2**      **Quality of Life – the interaction of needs, perceptions and opportunities**



(From Contanza et al. 2007, p269).

Symon (2003) and Symon et al. (2003) reviewed available health-related QoL tools and developed the 'Mother-Generated Index' (MGI), a quantitative instrument that allows women to demonstrate their 'subjective and qualitative' 'evaluation' of life during their childbearing years. Symon and Dobb (2011) studied the use of the MGI tool for assessing maternal QoL for both ante and postnatal women. Their study used the MGI (minor adaptations for antenatal use of an already validated tool (Symon et al. 2003)) followed by the General Health Questionnaire (GHQ - 30 item) (original by Goldberg 1978; Goldberg and Hillier 1979) in late pregnancy (28-36 weeks) and at 6 weeks postnatal. Such an instrument could be viewed as an important consideration for other research where health and wellbeing are considered for women during childbearing. However, such tools are also quite lengthy and thus over onerous for participants.

The Health-Promoting Lifestyle Profile is a 48 item (HPLP after Walker et al. 1987) or 52 item (HPLP II modified to reflect balance within the subscales used after Walker et al. 1995) survey questionnaire respectively seeking to quantify psychosocial wellbeing and health promoting behaviours. Although non-specific to pregnancy, the questionnaire

has been used to gather data in two aquatic studies: the HPLP (used by Smith and Michel 2006) and HPLP II (used by Liquori et al. 2003). Two of the six subscales offer a Likert-type scale through scores of 1-4 for spiritual growth (formally self-actualisation in HPLP) and physical activity.

Other tools that can be used in the health research to specifically measure aspects of women's wellbeing during childbearing could include some of the following: antenatal and postnatal mental health as depression (Edinburgh Postnatal Depression Score (EPDS) (Dennis 2004)) and anxiety (State-Trait Anxiety Inventory (STAI)) (after Spielberger et al. 1983; Bayrampour et al. 2014); Parental Stress Index (PSI) (Mazzeschi et al. 2015), worries and concerns lists, problems checklists; adjective checklists (self, others); self-esteem measures and wellbeing in pregnancy scale (WIP) (see Redshaw 2012). An alternative Pregnancy Symptoms Inventory (also labelled PSI) has been developed and validated more recently by Foxcroft et al. (2013) who, from an initial 38 pregnancy related symptoms checklist, described the top five as 'frequency of micturition, fatigue, pelvic pressure, insomnia and lower back-ache' (p5 of 9).

The choice of tool is viewed as significant to the sample chosen and the objectives of the research study (Michaelson et al. 2012). Although use of a pre-evaluated tool would be an advantage, the focus of information I intended to seek meant a specifically designed new tool may be preferable which would be composed to achieve the research objectives for this study (see section 1.3.3, p19; and section 4.9.3, p130-131).

#### **2.4.2 Promoting physical activity to the national population**

Public health has relevance and significance to individuals, healthcare professionals and health and social care practice across the globe (WHO 2009; Hossain et al 2011; White et al. 2012; Santos et al. 2014; ten Hoope-Bender et al 2014; OECD 2015). There are many definitions aligned to the approach and importance of the subject for national and international communities and wider society origins. As a midwife I have selected a description which encompasses the social and health elements of the broad topic appropriate to midwifery practice. Therefore, public health can be defined as:

*“The science and art of promoting and protecting health, well-being, preventing ill-health and prolonging life through the organised efforts of society”*

(Attributed to Faculty of Public Health (FPH) 2010; and Public Health England (PHE) 2013, p1).

Research provides a succession of ‘snapshots’ during the life-course, for example adults, examining links between activity and health at specific times or longitudinal studies of certain populations (Boreham and Riddoch 2003). The inter-relationships between ‘biological’, ‘behavioural’ and ‘sociological’ aspects have informed some evaluation of disease processes and risks or benefits associated with physical activity. Riddoch and McKenna (2003, p6) define physical activity as “any force exerted by skeletal muscle that results in energy expenditure above resting level”. As physical activity is composed of different types of motion, undertaken at various frequencies, of varying durations and a range of intensities, research has to provide evidence of these activity components and their direct links to health benefits in order to be meaningful. Patterns of physical activity behaviours may be subject to internal and external moderating factors which may manifest as barriers or motivational influences.

Priority influences for physical activity alters for individuals beyond the structure of the UK education system. In addition, the breadth of enduring and acute health disorders may be complicated by sedentary life choices impacted on by various life events and lead to poor activity levels for portions of the population (Boreham and Riddoch 2003). The variables that are measured and the definition of a baseline level of physical activity is therefore ambiguous and potentially subjective in terms of general adult populations. Explanations using descriptive or analytical studies within epidemiology may produce patterns for health data in populations but not at an individual level to examine causality or preventative potentials (Jakes and Wareham 2003).

Exercise and sport are two sub-sets of physical activity. Exercise is viewed as actions which promote personal improvements to health and/or fitness, whilst sport embraces the elements of competitive leisure events (Thurlaway and Upton 2009). Riddoch and McKenna (2003) describe five facets of physical activity – volume, frequency, intensity, duration and mode. While each element can produce quantitative data, for example kcal per day, sessions per day, rate of energy expended, time doing activity, and the description of the exercise type; the perception of health or fitness outcome is confined

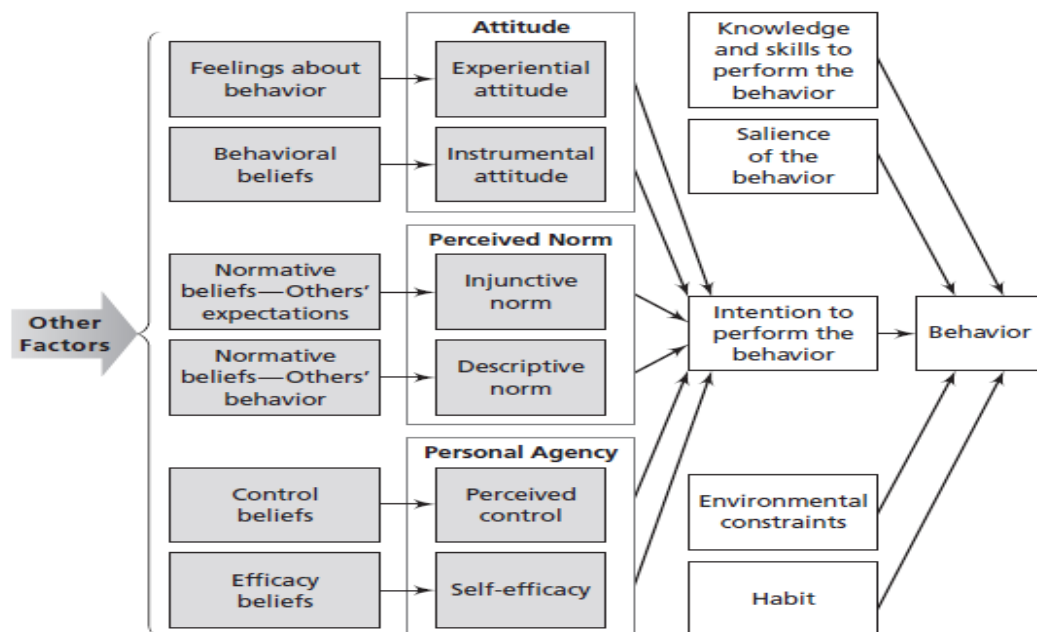
to the physical or behavioural nature of interpretations and perspectives. One acronym used within exercise prescription is the FITT principle (Artel et al. 2003; Mottola 2016), whereby professionals offer four constituent elements as a basis for adopting, maintaining or improving fitness. These features are the *frequency* of undertaking the physical activity; the *intensity* which is adapted to challenge the individual's perceived exertion for the activity; the *time* the activity is undertaken which tend to gradually increase to a maximum; and the *type* of exercise where the larger muscles are used in such activities such as swimming or walking. Exercise prescription seeks to support functional movements associated with daily living to maintain muscle strength and endurance as well as prevention of injury or restriction to the body.

Within health psychology and sociology, authors have presented theoretical concepts to explain the how and why of behaviours and cognitive function related to life activities individually and within socially bound situations. Some concepts offer specific approaches for disciplines such as psychology, while others can be adapted to apply for a broad approach across health, social and psychological subjects, for example health promotion (Raynor and England 2010). One such approach is the health belief model (HBM) (Rosenstock 1974) and described elsewhere (see for example Jones et al. 2015). I have chosen not to define this formally as the essence of the HBM model focuses primarily on beliefs and attitudes rather than the emphasis of this study which is to examine the objective evaluation of underpinning health behaviours.

The relationship between physical activity and behaviour is seen as aligned principally to the individual and two key theories have emerged in research. Behaviours are generally intentional, based on our individual judgement and attitude towards the 'action'. Hence one is the theory of planned behaviour (Ajzen 1988, 1991 and 2006), whereby we apply our singular opinions in relation to the outcome and our evaluation of the expected result. Such behaviour is guided by a set of social standards relating to acceptability and appropriateness of our conduct which may be based in subjective norm values linking our principles and mind-set for specific activities. Thus, it could be asserted that our reasoning and planning behaviours relating to physical activity need to be considered together as an integrated model.

This model (Figure 2-3, below) combines the theory of reasoned action [TRA] (after Fishbein (1967 cited by Ajzen 1988) and the theory of planned behaviour [TPB] (Ajzen 1988 and 1991). Fishbein and Ajzen worked collaboratively from 1967, publishing together in 1975 suggesting a fusion of theories; therefore I have used an integrated example figure to illustrate this model. However, the relationship between our beliefs and intended behaviours may be impacted on by multiple factors including age, gender, educational experiences and personality traits, meaning intention is not always followed by sustained behavioural action as complexity of social situations add dimension to reasoning and behaviours in our individual reality.

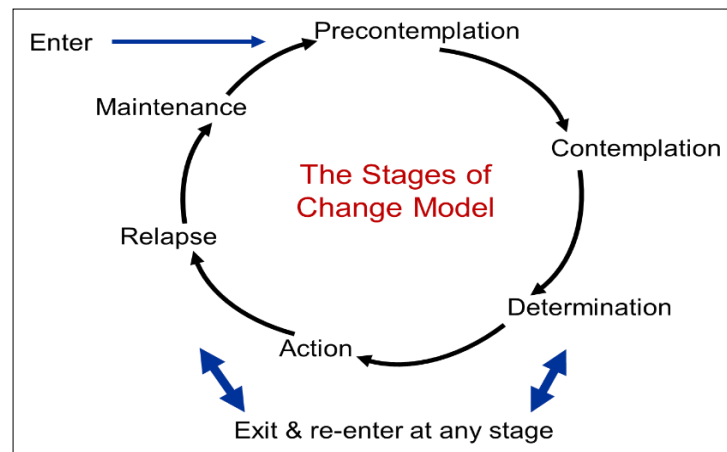
**Figure 2-3 Integrated theory of planned behaviour model**



(From Montaño and Kasprzyk 2008, p77).

The transtheoretical model of behaviour change (Prochaska and DiClemente 1983) is the second key theory where intention and behavioural change are combined more coherently for intended change to be integrated into everyday living based on personal context (see Figure 2-4, p50). The stages of change embedded in this model support a self-efficacy approach for staged alteration of behaviours ensuring decision control remains with the individual who can balance cognitive and affective experience in relation to the behavioural actions.

**Figure 2-4**      **Transtheoretical model of behaviour change**



(Adapted from Prochaska and DiClemente 1983).

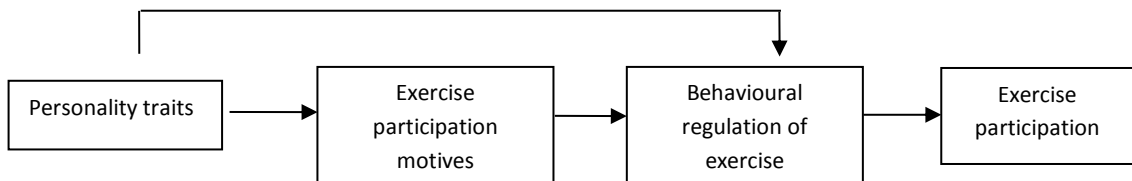
While Prochaska and DiClemente's transtheoretical model (1983) may be more applicable to broader populations and a greater range of settings, there is a sense that a more holistic understanding of behaviour relating to physical activity is needed. A third theoretical concept – the bio-socioecological model (Sallis et al. 2006), adds the environmental perspective which extends the examination of behaviour and physical activity in context.

The correlation between social or peer support and health is acknowledged as impacted upon by intrinsic and extrinsic factors. Sallis et al. (2006) describe the social ecological (or bio-socioecological) conceptual model that describes how the health of an individual is prejudiced by their attitudes and practices, by their personal relationships within local communities, and the interaction with wider society. It also attributes multiple levels of intercession, starting with individual level change and concluding with societal change (Sallis et al. 2006) (see application to antenatal exercise in section 2.7.4, p73-76).

The development of communities during pregnancy may promote the experiences of the individuals developing personal strengths and knowledge and therefore self-reliance. Relationships cannot generalise values or attitudes of members although group dynamics may lead to potential for behavioural change along a continuum. One could question the motivation to attend or continue to attend such groups based around activities. Motivational models for exercise participation, such as that proposed by Ingledew and Markland (2008) (Figure 2-5, p51), suggest that personality underpins

both motives and behaviours in relation to participation. This model may indicate a link between the development of communities during pregnancy and the social-ecological model of health (see section 2.5, p56-61).

**Figure 2-5 Motivational Model for exercise participation**



(From Ingledew and Markland 2008, p808).

For women during childbearing one could argue that weight-gain and appearance may for some increase participation in physical activity, but for others may reduce participation due to external regulatory controlling influences (Ingledew and Markland 2008). Bainbridge (2008) has indicated that weight-gain adversely affects some women's perceptions of body image distorting their participatory behaviour towards extremes accompanied by strict dietary controlling behaviours. This may be further fuelled by researched guidance (NICE PH27 2010b) in the public domain and the media portrayal of obesity especially resulting from childbearing (Luce et al. 2016).

Inskip et al. (2009) reported on a specific sub group of recently recruited participants of the prospective cohort Women's Survey study, indicating that pre-conception recommendations for nutrition and lifestyle are not generally followed for folic acid supplements, dietary fruit and vegetable consumption (and alcohol) modifications, smoking cessation, and improvements to physical activity levels. Strenuous exercise as a lifestyle outcome measure before conception may however be difficult for women to justify as perception and interpretation is tied to assumption of risk versus benefit.

The examination of physical activity for health has opened up consideration of aspects of behaviours relating to women's reception to public health messages, individual values and approaches to their own broader physical, psychological and social factors. Thus, there is a need to accept personal perspectives can limit or expand the adoption of change to an established engagement in activities for physical health.

### **2.4.3 Public health role of the midwife: policy and practice**

Concentrated contact with health care professionals may promote lifestyle habits that seek to benefit the woman and her developing baby (Wadsworth 2007) in respect of improving health outcomes for significant morbidity; namely obesity and coronary heart disease. The opportunity for education and monitoring of behavioural change over time within a supportive professional contact arrangement could proactively support the adoption of improved health routines (Stoddart et al. 2014a). The promotion of good health and reduction of ill health is the foundation of the National Institute of Health and Care Excellence (NICE) and the guidance publications judge to use the best evidence in relation to many topics for a range of organisations involved in health and social care disciplines (Kirkham 2010). General populations are likely to experience positive outcomes for public health issues from undertaking physical exercise outside the home (NICE PH41 2012a) or within work (NICE PH13 2008c). Whilst obesity is a highlighted national/international high income country issue (NICE PH42 2012b), type 2 diabetes also features in the UK government focus as a co-morbidity (NICE PH35 2011), along with stroke and heart disease (NICE PH25 2010a), which all make links to physical activity as a preferred intervention.

Personal contact with midwives during childbearing is often a period of time whereby health messages are highlighted as part of the scheduled appointment (Bowden 2006a). There has been increasing awareness of health promotion during the perinatal period as midwives provide increasing levels of care to complex pregnancies involving co-existing medical conditions and/or where natural physiology is strained by obesity, inactivity and socio-economic factors (Finlay 2006). However, continuity of care by named midwives can be interrupted by shift patterns, and the information relayed may be imprecise or untailored to specific individual care planning arising from the initial booking interview and subsequent pregnancy transitions, leaving interpersonal challenges for women and midwives (Hunter et al. 2015; Sanders et al. 2016). The increase of immigrants to the UK is also challenged by issues of language and problems understanding NHS service provision, meaning extra time is required to address translation and implementing plans of care (Blake 2008).



The midwife-mother relationship should offer a unique and proactive opportunity for interactive socio-cultural connectedness in presenting tailored public health information to women (Stoddart 2012; Stoddart and Bugge, 2012). Communicating health messages is one aspect of a midwife's role which often takes place in a face-to-face mode at intervals during the antenatal period (Hunter et al. 2015). Leaflet distribution, small group topic discussion and displays of posters are also witnessed in home, clinic and community settings often supplementing specific topics within a general health belief model (Manning 2006). Sanders et al. (2016) highlight a view of how midwives often feel frustrated by the lack of relationship with women reducing individualised content and provision of resources, often resulting in a "wall of information" (Sanders et al. 2016, p259) negating any message from being coherently received by the pregnant woman or her family.

Increasingly media and information technology have gathered influence, producing an almost instant (and continuous) availability of positive, negative, ambiguous, part and full messages in relation to real and sensational information relating to health and childbearing (Manning 2006; Luce et al. 2016). Midwives are therefore pivotal to ensuring real communication of information that is relevant and correct to context is provided in a professional supportive relationship to women on their caseload within continuity models principally (Sanders et al. 2016). Perceptions of, values and individual attitudes are also encountered from the other expectant mothers they meet as part of new social groups (an example of which is preparation for parenting) which may impact on acceptance of information and their experience of fitting in to this new set of people (Bowden 2006b).

The literature which examines midwives' promotion of public health, highlights that evidence exists identifying midwife provision of many of the main themes relating to childbearing in NHS settings. However, there is little evidence of how midwives may deliver messages to promote health related guidance elsewhere in community settings and the impact on women of these health-related communications. Midwives have acknowledged the need for consistent, unbiased and appropriate material on these subjects for sharing with women, but they identify that local training focussing on priority areas, specifically the breast feeding initiative. This leaves wider public health

topics such as physical activity, seemingly under-valued or compromised for deep learning, by time constraints on mandatory education (Hunter et al. 2015).

Bick (2006) highlights that public health themes should be central to contemporary midwifery practice as maternity services can contribute to influencing maternal and infant health through the unique relationship with midwives. Midwives should view themselves as public health practitioners (Carlson 2005) with the opportunity to design, signpost and implement personalised interventions which can influence the health of populations during the time period of childbearing. Undeniably, the notion of 'health literacy' is fundamental to the public ability to access, comprehend and utilise such health messages within their intellectual capacity (WHO 2009). Indeed, social situations may enhance and stimulate their potential to seek and adopt health information (Kickbusch and Nutbeam 1998).

The importance of weight management during childbearing has specifically driven public health guidance produced by NICE (PH27 2010b) as requested by the Department of Health which sought to address diet and physical activity in relation to weight "before, during and after pregnancy" (NICE PH27 2010b, p59). However, this is conflicted by a lack of sound guidance about 'normal' parameters of pregnancy weight gain in the UK, and imprecise information about calorie requirements during pregnancy or post-birth (NICE PH27 2010b).

Powell and Hughes (2012) examined midwife support for obese women during the antenatal phase. They concluded that improving the nutritional content of diet and adding elements of exercise to their life that was principally set by the women, was more likely to be adopted as the social and cultural factors were embedded by the women. Whilst midwives can be seen to sensitively support by promoting interventions that take account of the psychosocial issues around weight management (Furness et al. 2011; Heslehurst et al. 2011), there are also indications that peer support may also be an advantage (see Heslehurst et al. 2011), which could develop from group exercise. Indeed, Furness et al. (2011) noted the positive reduction in isolation through 'mutual' support where the location was felt to be 'non-judgemental', and 'non-threatening' (p7). Powell and Hughes (2012) point to the midwife needing to harness the theory of social cognition in relation to how family demands' and women's own risk perception will

influence the adaption of behavioural change to their lifestyle (Rosenstock 1974; Azjem 1991).

Whilst obesity is a significant issue, public health also emphasises more general lifestyle elements which may improve health of all family members and considerably reduce the projected requirement of substantial medical support during the lifespan of individuals. Midwives are therefore involved at each of their contacts with women (PHE and NHS and HEE, 2016) in seeking opportunities to promote health changes, which may be small or much bigger in terms of significance to individual women, communities or society. Self-autonomy of individuals is viewed as desirable in the change process fostered by public health messages (Mutrie and Woods 2003). Within this are the components of wellbeing and the interpretation of its meaning for individuals. Wellbeing is a concept that is often challenging to define, due to the complexity of being bound by health (physical and emotional), cultural and social constructions (see section 2.4.1, p41-46 for discussion of this phenomenon).

The decision-making process requires the practitioner to seek and apply the best research evidence to clinical practice, working in partnership with the 'patient' to determine the most suitable plan of care within the options available (Grey 1997; Jefford et al. 2011). The Cochrane Collaboration is one resource where healthcare professionals can access systematic and evidence-based reviews of published research (Cochrane 2015) in order to inform themselves and the public in receipt of health care. Such reviews are weighted towards quantitative methodologies using empirical evidence, strictly chosen to meet criteria and then subjected to meta-analysis within 53 themed review groups. Promoting effective decision-making relating to an entire and balanced synthesis of relevant evidence is seen as imperative in terms of improving health worldwide (Cochrane 2015).

Practice based on evidence is essential to clinical care and to support the dialogue between practitioner and the recipient of care. Midwives are required to demonstrate continued professionally focused lifelong learning to maintain their registration thus enabling them to practice (NMC 2015). Research literacy skills that include searching for evidence, critique of evidence and application of evidence into practice is established (see Caldwell et al. 2005 and 2011 for an example framework) within the health

professionals training programmes and as part of continued clinical governance (Cluett 2006; NMC 2015; Wilmore et al. 2015). The professional institutions, the Royal College of Midwives (RCM) and the Royal College of Obstetricians and Gynaecologists (RCOG), collaborate on national and world-wide strategies to produce quality standards for care. Standards based on scrutinised evidence for various maternity themes produced through education, audit and ethically grounded research projects (RCOG 2015; RCM 2015).

Midwives view evidence for practice not just for the knowledge it brings, but the potential for outcomes which impact positively for women, babies and families. The overt implications of quantitative trials on service delivery is often challenged by the qualitative studies which elicit broader considerations for maternal and family health, specifically for 'hidden' consequences of morbidity (see Bick 2011, p569 for consideration of routine episiotomy versus restrictive use and subsequent sexual or personal health implications). Many facets of care provided by midwifery services are examined through research and the results of these projects disseminated in various modes for health and social care employers and employees. Thus, there is a necessity to examine evidence from both contrasting approaches (and broad perspectives) for research outcomes and to balance resource effectiveness ahead of implementation.

Having explored a societal view of pregnancy, this next section moves to a review of neighbourhoods, and the formal and informal social opportunities aligned to locality based health provision.

## **2.5 Communities: women and localities**

Whilst society provides a macro-system perspective of pregnancy for women, specific influences for health, wellbeing and quality of life is offered by local area facilities and organisations. Specific provision for health, social care and leisure is guided by national policy frameworks (NHSE 2015) but where funding is dependant principally from local governments for social care, public health and leisure (National Audit Office (NAO) 2016).

### **2.5.1 Women and social communities**

To explore the communities to which women belong I initially examined the concept of community from a sociological perspective. 'Community' has several meanings including those living in a specific locality as well as the social inter-connectedness by ecology of a specific area of interest often ascribed by similarity in life-experience such as a community of professionals (Stevenson and Waite 2011). Closer examination of social connectedness within such communal gatherings led to fundamental theoretical ideas being considered. Pierre Bourdieu's key concepts relate to his expertise as a sociologist, philosopher and anthropologist and are available in numerous published writings which include extensive analysis of power and social order (see Bourdieu 1977 and 1985). Contemporary authors continue to seek to de-mystify Bourdieu's theories of 'field' (Thompson 2010), 'habitus' (Maton 2010), and 'capital' (Moore 2010). The social space of 'field' is often imprecise due to the nature of communities having 'fuzzy' borders, being dependant on the inter-relationships between members and the shifts caused by technological advances plus idealistic alterations within the community. Behavioural commonalities exhibited by group members shape the 'rules' from their fundamental learning, and the unconscious beliefs and values suited to the social field known as 'doxa' (Deer 2010). Aligned to this is an innate underlying intuitive perception for harmony of social norms between individuals within the community.

Bourdieu (1984) described the relationships between individuals and the local environment as habitus, bounded by social norms and perceptions of interactions in response to singular or combined procedures often evoking altered behaviours over time. He broadened the view that economic nature of exchange in social worlds is only one of the networks, and that further circuits or networks within relationships are built on symbolic values, culture, lifestyle and educational exchanges (Moore 2010). The natural habitus for women during childbearing will extend to new relationships with healthcare practitioners from the biomedical NHS community and, also with others experiencing change along health and/or motherhood journeys. Thus pregnancy, birth or postnatal transitions may be in common or in contrast with other women, which can consciously or unconsciously alter and shape their constructed habitus. The sharing of material experience will be driven by social context, often diminishing inequality, but

providing symbolic capital through the environment each relationship inhabits (Bourdieu 1986).

The various distinctive resources of capital (cultural, social and economic) (Abel 2008; Moore 2010) are combined by individuals and set within their habitus and experience of community 'fields'. Historically, capital from cultural (education, expertise) and economic (monetary, possessions) resources lead to societal spaces occupied by people belonging to constructs of social classification according to Bourdieu (1987). These similarities of life and work are understood to evoke class unconsciousness (Bourdieu 1985 and 1991) where similarities for occupation of social spaces are bound up into socially constructed groups based around class. The symbolic capital arising from attributes (educational or life experience) or categories (ethnic, religious or political) can establish a sense of group identity, and member interactions are related to collected participation allowing a degree of social mixing (Crossley 2010). However, Crossley (2010) also argues that symbolism originating from unbalanced and unequal material and social resources can negatively affect the position and value applied by self and others for membership of a society in terms of social class reinforcing inequity.

Specificity of activity as seen to be available through a health-related class may afford focused social interactions (Putman 2000) between community members. The mechanism of socially based networking forms a basis for behavioural norms to be visible, which contributes to 'trust' being established between group participants, so that resources for social capital are developed within individuals and invariably the overall group (Johns 1998; ONS 2001; Crossley 2008). The nature of collective time, proximity with other members and repeated acquaintance set into routine-based activities offers opportunities for casual interactions to evolve into sustaining relationships with specific sharing of interest as a community (Crossley 2008; Stevenson and Waite 2011).

Social space as habitus for pregnant women is likely to be impacted in part by social class but arguably also by a sense of mutual mobilisation through transitioning to becoming a mother. Reay (2004) indicates that a sub-set of social capital is emotional capital which can be observed as gendered. Such capital is based through "devotion, generosity and

solidarity” (Bourdieu 1998, p68) where security of relationship is pivotal specifically for mothers. Transformational capacity for developing economic to cultural, and cultural to social capital(s) uses complex processing of reserves through mechanisms of social networking opportunities based on developing maternal reproductive responsibility (Reay 2004). This interaction of a range of capitals may therefore be influenced by activities which promote belonging and enhance supportive social resources conceivably built from health literacy (Abel 2008).

The common characteristics of wellbeing and quality of life appear to indicate that perspectives may be complex in nature for physical, social and psychological tenets bounded by our capacity in resources or ability to adapt to challenges during childbearing. Relationships (intimate and social) and aspects of psychological health (sense of self, emotional health) seem to have resonance for both ante and postnatal women (Symons and Dobb 2011) along with physical discomforts or adaptations to childbearing. The interweaving of domestic, work and recreational activities needs to be combined with all elements of daily life which resonate with additional advice and guidance from various sources and expectations from their broader social communities (Gross and Pattison 2007; Gross 2010).

The literature presented examining wellbeing during pregnancy, supports the evidence that wellbeing is a complex phenomenon with clear associations to perceptions of health and the experience of quality of life for individuals. The impact on woman's wellbeing during pregnancy by attending midwife-led aquanatal classes has not yet been subject to closer examination.

#### 2.5.1.1 *The principle of homophily*

Social world experiences are often bound by demographic or behavioural features which are suggestive of geographic or organisational constraints for broader social integration and potential for evolution (McPherson et al. 2001). Network ties are developed and built through relationships between individuals where similar characteristics or personal qualities are commonly seen. Homophily is in principal suggestive of similarity using the phrase ‘birds of a feather’ when such networks are observed. Drivers for these social networks may occur along gender, age, ethnicity, education, other single or grouped

characteristics behind the connection between people along societal dimensions in 'status homophily' (after work by Lazarsfeld and Merton 1954, expanded by McPherson et al. 2001).

An alternative type is "value homophily" (McPherson et al. 2001, p419, attributed to work by Lazarsfeld and Merton 1954) where "values, attitudes and beliefs" and "advice, friendship, and association" (p428) set the developmental basis for connections within other networks. Behavioural co-ordination may be influenced by patterning of influence either positively or negatively for relationships where religion or politics can encourage or discourage the networking arrangements. They also argue that social intelligence and interpersonal values may have particular impact on specific network building arrangements.

During the life course individuals encounter other networks where social structures are outside their previous experience, for example, changing school, starting work, moving house, or marriage, where disequilibrium can alter the socioecological experience. Pregnancy may be seen as one such occasion for women to build social communities that cross outside their usual localities of experience. Women at this time are stepping outside what they already know based purely on interpersonal contact, but this can be seen to be culturally driven by participation in 'new' associations or social arrangements as well as the altered personal attributes that becoming a mother will bring (McCourt 2003; Chambers 2012).

It is known that most common experiences of social interaction for individuals takes place face-to-face which is therefore instantaneous although bound up in the experience of social reality (Peräkylä and Ruusuvilori 2011). The networks in this aquanatal class context offer these women the option to exchange information through interpersonal communication in an interactive environment (Butts 2008). Butts (2008) also identifies that such specific networks are also framed by 'friendship and affiliation' or 'social support' which set such networks into a cultural capsule. Thus such networks offer a unique homophily to the intergroup relationships which may extend into postnatal integration of social affiliation within their broader personal social networks.

The social networks are dependent on in- and cross-group ties for any uniformity of homophily within a homogeneous group. However, as Currarini et al. (2016) argue this



is principally due to the size of the group based on the “meeting opportunities” (p2) within the membership. Groups are not formed of identical individuals or always have constant membership, making engagement reflective of the status or value homophily and the “meeting pool” (p6). There are also suggestions that interactions between individuals may be based on common traits such as like seeking like or like seeking unlike (Carrarini et al. 2016). There is a sense that this may cause limited social relationships based on status alone, but for a group that encounters continued dynamic membership this would be less likely.

For pregnant women, their established communities offer a range of social network opportunities which contribute to their wellbeing and experience of transitioning to becoming a mother. In addition, networking based on homophily of life situation could enhance the potential for supportive reciprocity of social and emotional capital.

## **2.6 Relationships: women, wellbeing and support**

The relationship between the examination of social roles and behaviour is derived from the discipline of sociology and tradition of symbolic interactionism (after Mead, 1934). Social interaction involves shared symbols where language and cultural role determine the sense of self and socially constructed behaviour in the setting. Words (as one type of symbol) represent or illustrate an individual’s interpretation of experience and reality bound by a specific context (Ormston et al. 2014). Non-verbal symbols include gestures, diagrams or images can add depth and breadth to the understanding of the phenomenon.

An exploration of social relationships between women during pregnancy may provide perspective on mechanisms of support that may be already available in health and community environments. The importance of individual resources, resilience and capacity to support others or indeed be supported in transition to motherhood, and for development of additional mechanisms specific to enhance support during this period of time, can be viewed as essential.

The layering of social relationships between professionals and individuals in health and wellbeing contexts are likely to provide some explanations for supportive health behaviours during childbearing where groups develop in community settings (Dennis

2003). Peer support is often viewed as situated between professional support and the informal family or friend support (Casey et al. 2013). The nature of the experiential knowledge and information together with mutual reciprocity of sharing solutions appropriate to the cultural context of the community provides assistance and reduces social isolation when encountering challenges to personal resources through health or other change (Casey et al. 2013).

Haines et al. (2012) propose that the experience of wellbeing can be inextricably influenced by such psychological labels such as 'fearful' where emotional health during pregnancy and birth outcomes were negatively affected. Availability of and access to healthcare professionals at critical times during pregnancy, may positively benefit women's psychosocial transition to motherhood and the experience of wellbeing. Sensitive and meaningful engagement by midwives with women is viewed as a clinical imperative with positive clinical implications for psychological role adjustment (Wilkins 2006; RCM 2012).

### **2.6.1 Peer support during pregnancy**

Whilst there are many forms of social support, peer support is unique as the support is a 'peer' – someone with a position of equality in the relationship by virtue of relevant experience and is thus able to offer support that takes account of the situation or context. Mead et al. (2001, p136) offer this explanation:

*"Peer support is a system of giving and receiving help founded on key principles of respect, shared responsibility, and mutual agreement of what is helpful..... It is about understanding another's situation empathically through the shared experience..... When people find affiliation with others they feel are 'like' them, they feel a connection. This connection, or affiliation, is a deep, holistic understanding based on mutual experience where people are able to 'be' with each other without the constraints of traditional (expert/patient) relationships."*

Whilst Mead et al. (2001) refer to formal peer support mechanisms specifically within psychological therapies, a number of opportunities exist through relationships with family, friends, work colleagues and 'social' peers who offer informal peer support in a variety of community and social settings. Indeed, informal peer support offers several facets of support including: sharing of personal experience, provision of emotional sustenance and empathy, enabling key information and knowledge to be distributed.

Sometimes social relationships that are bound by shared experiences, and sometimes to promote practical assistance.

Peer support can exist in varying forms, for example: one-to-one, groups, on-line, or educational and environments such as home, NHS setting, community centres, schools/universities, or web-based (Dennis 2003). The structure can be formal or informal with purpose defined either by the primary provider or by the facilitation or empowerment role assumed by at least one member. Dennis (2003) rationalises that the health intervention application is one which promotes 'diffusion of information' with 'positive encouragement' across diverse populations in order to promote health and reduce illness.

Research into peer support has been directed towards two main areas for women – breast feeding support (in the postnatal phase, see NICE GC37 2006; NICE PH11 2008b; and Jolly et al. 2012) and support of abused women (Dennis 2003). Further use of peer support has been extended to perinatal mental health and other high-risk groups of women where training, on-going links with health professional services and evaluation of outcomes are seeking to explain the phenomenon. One model of antenatal care, facilitated by midwives, which harnesses the group approach in a framework of 'peer advice and support' in a social situation, is CenteringPregnancy® (Schindler Rising 1998). This model consists of a programme of eight group discussions spread over 16-20 hours contact time where two midwives work with a group of 12 women all of whom are due to birth at similar dates (Schindler Rising et al. 2004; Gaudion et al., 2011). This scheme is currently being trialled in the UK for defined cohorts of women in NHS settings. The remit is risk-assessment, education and support, with women encouraged to share responsibility for themselves and the group thus building self-esteem (Schindler Rising 1998). The findings of one implementation programme cite 'trust' and 'bonding' with the familiar members of the group (including the continuity of midwife), aided the supportive relationships and preparedness for birth and parenting (Gaudion et al. 2011).

CenteringPregnancy® could be an example of a 'community of interest' which Le May (2009) describes as a situation where people share a common topic of interest and where membership is not dependant on being a practitioner or an expert in the given field. Another example of such a community is the Twins and Multiple Birth Association

(TAMBA), a charity where parents-to-be, parents and professionals share information, research knowledge and support using various modes of contact. The bond between those in such a community revolves around commonality of social attachment. The nature of social networks is greater than the relationships alone as there are elements of dynamic change specific to the individuals and the drivers for any group that forms around a specific theme, namely support during pregnancy and childbirth. The development of groups during pregnancy appears to cross several levels of social communities which meet individuals' needs, present opportunities for personal development and influence wellbeing for members.

Bourdieu's (1986, emphasised in Moore 2010, p101) 'Forms of Capital' aligned economic assets and the exchange of 'capital' in cultural and social fields, suggesting the move from material exchanges as the primary driver to a balance of additional non-economic transactions within communities. Other authors have broadened the concept to include aspects of class, division and power within the community and relationships therein (DeFilippis 2001; Moore 2010). In describing personal social capital, individuals contribute resources within a network of positive relationships to promote purposive outcomes within the confines of shared values, trust, norms and mutual reciprocity (Bourdieu 1985). Putman (2000) indicates that while social capital promotes democracy, the underpinning networks are dependent on individual participation, which may be balanced by degree of trust, connectedness, perceived reciprocity and co-operative action within the community. Community in such circumstances is described through three facets: i) the social condition which may, for example, be altered by the impact of austerity, ii) the social capital encompassing the availability of resources and individual's capacity for resilience and iii) the environmental location where contextual setting and conditions may affect the community ties.

In examining the literature around social and peer support in pregnancy, social capital as a concept may explain some of the underpinning cultural and social tenets which can build individuals participation in communities (ONS 2001). The relationship between social and peer support to enhance health behaviours through network connectedness and mutual reciprocity within communities, may explain why some pregnant women are motivated to attend aquanatal classes, however, this is not the subject of current

literature. There is also limited evidence exploring the impact of peer support in relation to networks for women during pregnancy.

### **2.6.2 Relationships between women and midwives**

Traditional support during childbearing, provided informally or formally by other women, has been known throughout history. Increased medicalisation since the 1500s, significantly relate to an increased financial burden on the user, by engaging the expertise of male attendants at the time of birth (Donnison 1988; Borse and Hunter 2012). The 1902 Midwives Act and the founding of the National Health Service (1948) altered the economic necessity that emphasised the divide between access to skilled practitioners and services, although responsibility by the two main professional groups has continued to fashion the social context of childbirth regulation. NICE (2012c) present the quality standard for antenatal care (QS22) highlighting ‘consumer’ choice, together with continuity of care by midwives (NHS 2015; Sandall et al. 2016) promoting high quality maternity care where midwife-led models underpin care provision and government policy. Conversely the Royal College of Obstetricians and Gynaecologists (RCOG) continues to promote standards of care that embrace the study of obstetrics and advances made in scientific training and use of clinical guidelines (RCOG 2015).

Relationships between women and midwives are complex and seen to be built around the provision of clinical care. The informational and management aspects of continuity contribute to the development of therapeutic relationships between professionals and women, founded on effective communication of providers and consumers (Stoddart 2006; Duff and Dodds 2012; Stoddart 2012; Sandall 2014). Midwives provide a range of care elements over their contact with childbearing women and families. Much of this is embedded in a holistic approach associated with ‘needs’, identified through direct or indirect contact and initiated by either the midwife or the woman. Within the context of transition to motherhood, the processing of individuals perception of role identity and associated changes to internal psychology and external behaviours may be linked to the women being able to express personal interpretations and meaning through communication (Squire 2003; Winson 2003). The interrelation between social, emotional, psychological, spiritual and physical development during childbirth may evoke stronger ties with gender relationships. This may be specific to support and

reinforce positive mothering (Winson 2003; Dunn-Toroosian 2003; Wilkins 2006; Darvill et al. 2010).

This specific section of the literature review has raised a number of questions relating to the impact of location on communities and relationships for pregnant women. These include an examination of whether the effect of regular (or irregular) attendance at a midwife-led group is linked to the development of midwife-woman relationship(s) or the between group member relationships; and if the shared group-based experience contributes to social or peer support specifically for a pregnancy specific aquanatal class. One view may be that the nature of the social environment and shared networks within such communities may develop guided by the group members and the evolution of peer relationships to promote resources for members during the group gatherings or indeed at other times.

The final domain of the chronosystem (after Sallis et al. 2006; see section 2.3.2, p38-39; and 2.3.3, p39-40) is the individual, which examines the pathway women navigate from pregnancy to initial motherhood.

## **2.7 The Individual: social role adaption; physical and psychological changes**

The proceeding evaluation of contextual societal, community and relationship systems (after Sallis et al. 2006) was appraised for individual pregnant women and then for aquanatal attendees, as the central theme of the bio-socioecological model. Whilst support from established and newly constructed communities during pregnancy has been identified as built around sharing experiences, there is in addition significant transitioning for individuals within childbearing. Social and psychological adaption offers complexity alongside the bio-physical changes which occur in an exposed complex environment of family and employment. Strategies for this most personal of journeys may provoke responses that are unfamiliar, encouraging or worrying to their view of self (Wilkins 2006).

In consideration of the pregnant woman as an individual, I initially present pregnancy as a prelude to becoming a mother (see section 2.7.1, p67-69) through a journey of transition associated with adaptations of a physical (see section 2.7.2, p69-71) and

psychological nature (see section 2.7.3, p71-73) and the potential for social engagement by physical activity during pregnancy.

### **2.7.1 Women and Motherhood or Matrescence (becoming mother)**

The notion of motherhood is often assumed to be a rite of passage (as defined in social anthropology in work by van Gennep in 1909; reviewed by Starr 1910) for women and therefore something that is an element of the transition from child to adult in many cultures (Starr 1910; Yearley 1997; Winson 2003). Van Gennep's work categorises the stages as separation or 'preliminal rites', transition or 'liminal rites' and incorporation or 'postliminal rites' which have been described elsewhere (Turner 1977, p21; Wendling 2008; Reed et al. 2016). The nature of moving from or adding one social group to another, suggests evolutionary behaviours and transformation of self by conformity and affiliation to the new or additional set of individuals.

The process of cognitive development during childbearing is attributed to Rubin's theories from the 1960s and 1970s (maternal identity) and by Mercer's research during the 1980s and 1990s (role mastery). As both are embedded in historical views of development, the singular definitive appraisal arose from logical interpretation of empirical data (Parratt and Fahy 2011). Parratt and Fahy (2011) would suggest that a much broader humanistic perspective protects a 'with woman' approach with women firmly at the centre of their maternity care, is required for present-day midwifery practice. Midwives can promote a more nurturing relationship underpinned by empowering partnership within a model of care, for instance, caseload practice (Sandall et al. 2016).

According to Raphael-Leff (2005) a psychoanalyst and social psychologist with noteworthy publications in the field of maternity and motherhood, women can be viewed within four orientations based within psychology, in addition to the physical considerations of general wellbeing and the broader psychosocial adaptations during pregnancy. These are described below (Table 2-4 p68). Haines et al. (2012) would also suggest that local health culture and delivery of services will combine with the individual's beliefs and attitudes creating the platform for her psychological orientation.

The consideration of medical risk awareness can influence the cognitive responses that contribute to behaviours that remain positive or negative, or that oscillate between the two, according to the gestation of pregnancy. A critical aspect to consider is not only the woman's individual life experience, but also the relationship of personal attributes to their involvement with maternity care provision and experience of wellbeing before, and during childbearing.

**Table 2-4          Raphael-Leff's psychological orientations.**

Orientation	Description
The 'facilitator'	Sees conception as the culmination of her feminine experience. She regards women as uniquely privileged in pregnancy: 'Russian-doll-like, each carrying the baby as she herself was carried. Thus, identified with both her mother and the baby with whom she communes in introspective thought, she resolves to minimise the transition with as natural a birth as possible.'
The 'regulator'	'Dreading the pain of childbirth, she plans as 'civilised' a delivery as possible, making use of medical innovations to decrease the damage.' An elevated incidence of elective caesareans was seen amongst the women she identified with this orientation. She interpreted this as an indication of a preference for predictability and a way of bypassing the potentially humiliating experience of vaginal birth.
The 'reciprocator'	Sees birth as both stressful and exciting. These women tend to take on a 'wait-and-see' attitude.
'Conflicted'	These women shift between the extreme 'Facilitator' and 'Regulator' orientations. It is difficult for these women to manage both the contradicting feelings of 'Facilitator' and 'Regulator' and the uncertainty of the outcome.

(Adapted from Haines et al. 2012, p3).

Alongside the adaptation of their social role, women experience a range of physical changes through their pregnancy and childbearing journey. Features of this have already been given in this thesis as wellbeing is inextricably linked to the experience of individual health (see section 2.4, p40-56 and section 2.5, p56-61). The following section presents an overview of the biological impact of pregnancy which in combination with the socioecological perspective of becoming a mother, creates a bio-socioecological framework (Sallis et al. 2006).

The physical changes during pregnancy have been the subject of literature, examining the various perspectives including: medical physiology, kinesiology, sports and exercise science. These perspectives can be viewed in many texts, journals and publications with



varied readership and audiences. Generally, the literature seeks to describe the physical adaptations women's bodies undergo during the 40 weeks of pregnancy and the immediate postnatal months, aiming to inform the reader within the context of human reproduction and alteration to anatomical systems (see for example Baker 2006). Increasingly, specialist authors in collaboration with academics and fitness professionals are seeking to address the interrelationships between physiology, health and leisure in terms of improving public health and reducing medical morbidities (see for example Baines and Murphy 2010).

### **2.7.2 Physiological adaptations of pregnancy**

Physiological changes occur progressively during pregnancy to ensure fetal development is sustained, protected, and for maternal preparedness for childbirth (Carlin and Alfirevic 2008; Martini et al. 2011; Tan and Tan 2013). These alterations of all body systems are complex, beginning at conception and are generally seamless in order to protect and maintain normal function during the childbearing continuum. Whilst healthy women should encounter no significant difficulties with these adaptations, older women, women with co-existence of medical disorders and women with 'multiple gestations' may find the changes more physically demanding.

The greatest physical changes occur within firstly the cardiovascular and secondly the haematological systems. Other systems (respiratory tract, renal system, gastrointestinal tract and endocrine system) are also altered to meet the physical demands of childbearing (Carlin and Alfirevic 2008). There are added effects of these physiological and anatomical changes in relation to the musculoskeletal system which leads to postural changes, alteration to mobility and to whole or single body movements. A succinct descriptive account of anatomical and physiological adaptations can be found in Appendix 1 (p311-317).

Women's perspectives on physical changes associated with childbearing will be bound by the changes they witness to their body shape and body weight which may be viewed as dramatic or challenging (Boscaglia et al. 2003; Baker 2006; Bainbridge 2008). Minor disorders of pregnancy are common for many women, occurring in episodes punctuated through the 40 weeks gestation. Many symptoms associated with such disorders (such

as nausea, vomiting, heartburn, constipation, varicose veins, haemorrhoids, oedema, backache, pelvic pain and many others) can cause distress and angst for women leaving some in significant discomfort which cannot be suitably relieved (Hofmeyr et al., 2008).

During pregnancy women are monitored by healthcare professionals despite the physical adaptations being a 'normal' physiological process which is physically driven by human reproductive evolution. Despite the stated normal adjustments to physiology, these alterations may result in various symptoms or require biochemical testing (such as haematological investigations), associated with both minor and major anatomical adaptations impacting on physical and emotional needs (Baker 2006; Carlin and Alfievic 2008; Tan and Tan 2013). The current model of face-to-face contact with practitioners from midwifery or obstetrics for a low risk pregnancy is likely to be at 3-6 week intervals for seventy-five percent of the pregnancy with other communication confined to telephone or text, to report queries from women or test results and advice from care providers (NICE CG62 2008a). For first-time mothers-to-be this is no more than 10 appointments and for second and subsequent pregnancies no more than 7, often with a focus on routine tests, structured assessment and pre-determined focus for discussion directed by national guidance (NICE CG62 Appendix D 2008a). The setting for clinical examinations and pre-stated referral pathways may hinder the natural individualisation of care, driven in part by heightened emphasis on maternal, fetal and specific screening, thus reducing risks of potential or actual obstetric conditions and identification of abnormality in the baby before birth. Aspects of public health, principally relating to lifestyle, are stated in the guidance (NICE CG62 2008a) and may interrupt the clinical examination which depends heavily on the medical focus rather than any minor disorders of pregnancy, and the psychological or social needs of each women.

Literature appears to focus on explaining the adaptations to the various bodily systems and changes to specific female organs. Whilst understanding the changes and the consequences to physiological processes is important it does not take account of the impact of reproductive adaptations on women in a holistic sense. Seeking to integrate psychological and sociological considerations adds a complexity which requires review of publications outside obstetrics, thus opening up allied health and social anthropological perspectives of pregnancy.

### **2.7.3 Psychological adaption to approaching motherhood**

Psychology has roots in five interrelated approaches (“behaviourism, psychoanalysis, cognitive psychology, humanistic psychology and biopsychology”) (Raynor and England 2010, p1). They highlight that two themes evolve from these as social (seeks to explain behaviour in social contexts) and developmental psychology (attachment and processes attributed to the lifecycle). Within developmental psychology the importance of lasting and significant attachments to a parental figure (commonly the mother) is pivotal to normative transitions throughout life, bounded by the norms of society and promoting positive outcomes (namely motherhood). The examination of social psychology involves the processes of thoughts and actions in specific social circumstances with a focus on personal self-concept and interpersonal awareness (Mayer et al. 2000; Raynor and England 2010, p8-9).

In themselves the two theories link together the social and psychological aspects within pregnancy and motherhood as women transition through childbearing. Science and medicine have evolved, reducing risk through technology and innovation and promoting women’s experience through education and empowerment bounded by evidence for service provision (Davis-Floyd 2001; Gross and Pattison 2007). The uncertainty women experience during what is viewed as a ‘natural’ event is woven into today’s healthcare system, where increasingly responsibility ultimately rests with her for care choices based on information and knowledge, provided by what may still be patriarchal sources or increasingly varied types of media.

The complex inter-relation of behaviour, social and emotional processing that begins before birth, will then continue through labour and into parenthood. Childbearing is a major event within the life course where adjustment and conflict impact on relationships, responsibilities, roles and dynamics within families, employment and communities (Raynor and England 2010; Chambers 2012). Within couples this may mean strengthening bonds through partnership, adjustment and review of responsibilities. Alternatively, weak bonds may disintegrate between them or with their social network leading to some relationships ending completely.

The family is one of the most well-known institutions in many societies (Giddens 1997; Chambers 2012). This is despite the varied structural, cultural and demographically prescribed roles experienced in such groups, and influenced by the social construct of marriage and wider social relationships (Dunn-Toroosian 2003). Social perspectives of the family depict it as a necessary sub-unit of society, upholding order and reproduction in a safe environment where individuals are ascribed to a role, or achieve a new role, with life skills acquired through interactions within their group or wider society.

For many women, personal identity is built around the creation of home and family which may be challenged by internal and external factors, as individuals and as part of their broader community. Exploration of the experience of transition to motherhood has been examined from anthropological, feminist and social perspectives to identify pertinent factors for health and sociological perspectives (Oakley 1974; Gross and Pattison 2007). In addition, the relationship between mothers and daughters change when the daughter becomes a mother and the baton of nurture moves onto the next generation with the construct and role of parenthood (Darvill et al. 2010). Motherhood is practiced differently in many cultures, driven by societal features, socio-economic factors, national politics or the legislative framework.

Individuals experience role conflict and relational alterations during adjustment to parenthood as in the 'rite of passage' (Yearley 1997; Raynor and England 2010; Jacinto 2013) (see section 2.7.1, p67-69), most graduating through the changes to lifestyle and their role in society with normative adjustment. Psychological adaption may be hindered by reduced social support and socio-economic factors which can influence fetal and/or maternal wellbeing during pregnancy and into motherhood (Oakley et al. 1996; Wiggins et al. 2004). Societal judgement alongside personal ideals about childbearing may cause conflict and result in emotional responses which are unexpected or alter self-perception to pregnancy as a life event.

Vulnerability (sectors of the population who may be either physically or emotionally exposed to harm) (Allen 1991) and limited socio-economic means are known to be associated with social exclusion (DoH 2007; CEMACE/RCOG 2011) and disadvantage. Social issues (for instance: domestic abuse) and risk of morbidity (examples may be:

obesity, diabetes) also create potential inequalities and have been part of public health messages for many years (The Black Report: Black 1980; Whitehead 1992; DoH 2007; Marmot Review 2010). The current global impact of austerity is altering economic structures within employment and communities (Hossain et al. 2011; Conley 2012; Rubery and Rafferty 2013; BMA 2016) which may influence perception of health messages when priority of action may be altered by personal situations. One aspect of influence can be considered as the personal experience of wellbeing during a time of significant change.

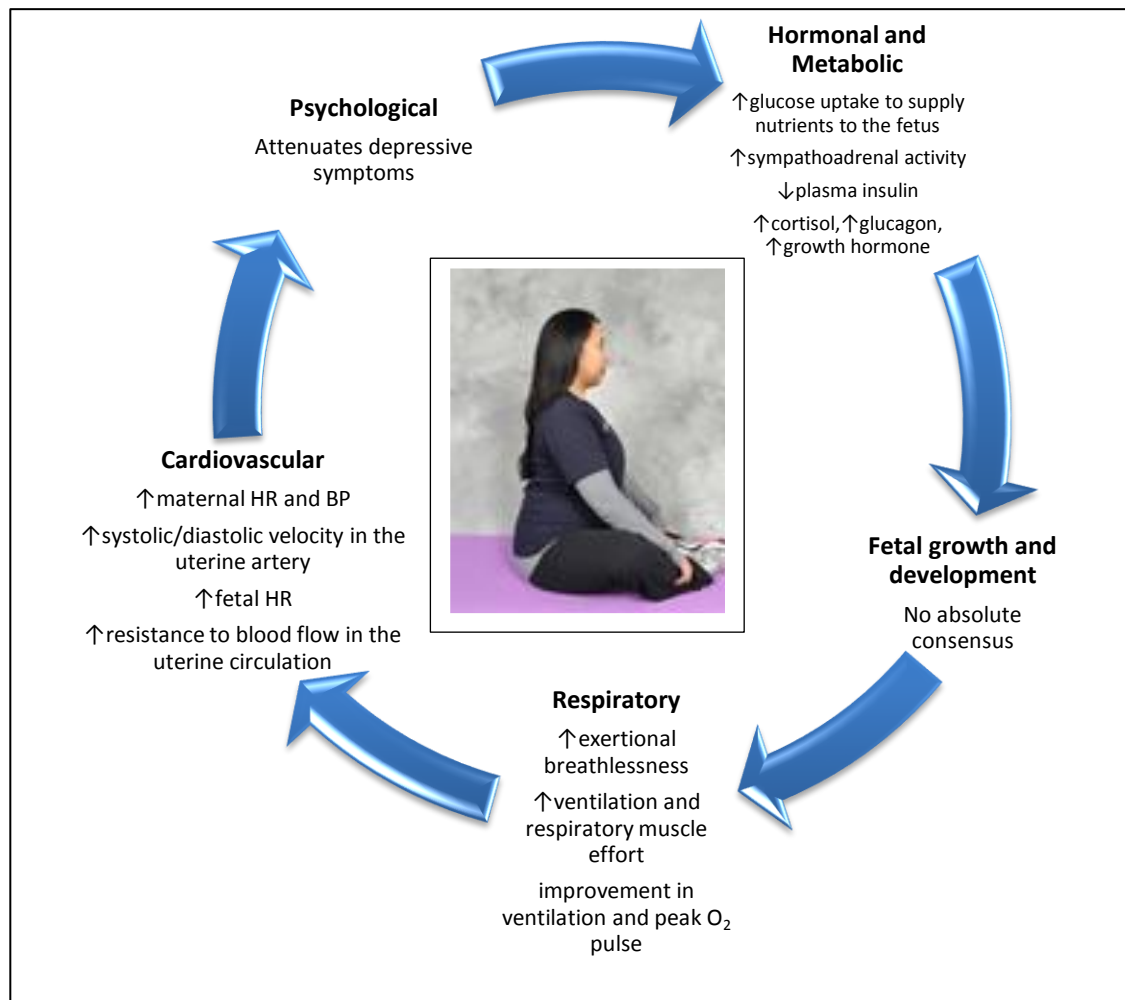
An area where psychology could be significant during pregnancy is within the work environment wherein social and psychological context have altered considerably over the past forty years (Squire 2003; Gross and Pattison 2007; Gross 2010; Wattis et al. 2013). World War Two saw women employed in many work roles traditionally seen as masculine and a concerted effort by women to maintain such roles in the workforce post-war. Today, many women continue to encounter unplanned conceptions, personal adjustment difficulties and life events which destabilise their physical and psychological transition to motherhood (NICE 2012d; Barrett et al. 2015; Laney et al. 2015). Financial independence, personal fulfilment and social engagement outside the home are some of the positive psychosocial measures (Chambers 2012; Wattis et al. 2013). The social relationships forged outside the home (whilst working) may be significant to women and the interruption to paid employment from maternity leave, could impact on the nature and longevity of social communities in workplace settings.

#### **2.7.4 Engaging in physical activity and exercise for health and wellbeing during pregnancy**

Whilst 'physical activity' and 'exercise' are often seen as interchangeable in meaning, the reality is bound up in social context and community culture (see section 2.4, p40-56). Women's activity levels vary through personal choice, motivation and physical capacity; especially while pregnant (Smedley et al. 2014). Despite the various minor disorders associated with pregnancy and potential fears about safety, pregnant women continue to participate in varied leisure exercise modalities. Barakat et al. (2015, see Figure 2-6, p74) identifies the positive effects experienced from such activities most of which align with improved physical factors. Bennett et al. (2013) suggested some

specific psychological or sociological features are also enhanced by pregnancy group-based activities. This qualitative study indicated that women amended their attitudes, type of physical activity and intensity of participation, based on individual perception and experience of physiological pregnancy changes as gestation progressed. Findings pointed to the adoption of group fitness and exercise behaviours where social networks with other pregnant women were sought specifically outside the existing support of family, friends and spouses/partners. Additionally, women's personal health and the concurrent influence on the health for their baby are cited as a consideration of preserving existing fitness capacity.

**Figure 2-6 Positive effects of exercise on pregnancy physiology.**



(Adapted from Barakat et al. 2015, p1380).

Fitness gradually gives way to function and mobility, relating primarily to work and leisure activities, rather than competition, due to inhibitory factors of weight, body shape and energy levels as pregnancy progresses. In addition, Duncombe et al. (2007) would suggest that beliefs about safety may be a contributory factor to modified

patterns of exercise participation by women specifically during pregnancy. This study used a specifically designed pre-study piloted self-report questionnaire (Exercise Safety Beliefs Questionnaire (ESBQ) described on p432) for specific modalities (including swimming), intensity and frequency. Exercise safety beliefs (as subscales) were then related to frequency and intensity of diarised exercise activity and explored, in addition to weight-bearing and impact of such exercise modes. Whilst 'low to medium exercise' (defined as low intensity, less than 3 times per week, p436) was seen by participants as unsafe, the same level appeared to be adopted by them within their study diaries for later trimesters. The modification of exercise behaviours was clearly linked to tiredness, time constraints and discomforts due to shape and mobility issues as pregnancy advances. For aquatic modalities, this publication lacks weight-bearing and impact focus data aligned to any of the given examples making it difficult to equate with the specific issue of safety as experienced by women. In contrast Derbyshire et al. (2008) indicated that higher intensity physical activity was undertaken during the first trimester using measures of energy expenditure in kcal/kg per day, than at later stages of pregnancy or particularly postpartum. This study was inclusive for a review of general physical activities both inside and outside the home enabling some comparison of physical activity and exercise activities. They also identified the impact for postpartum women of changing house-hold activities as lifestyles alter once the birth has occurred.

Public health initiatives for improving uptake of physical activity present a plethora of recommendations in the media, general materials and specific publications and as advisory discursive information from health professionals in respect of lifestyle change. Crozier et al. (2008) assert that behavioural change may be reduced for younger women or for those with fewer educational qualifications. Identifying predictors would suggest targeting health publicity would alter the behaviours of particular populations positively (such as sedentary or obese), but compliance may be fleeting or short-lived when real identification with the modification is limited or viewed as too difficult to execute. The social context of family or other networks are likely to have some limited influence on the reaction to or adoption of some health messages. However, a study by Bennett et al. (2013) in Canada proposed that women also seek to connect with other pregnant women through exercise classes where tensions and attitudes for adapting behaviours are mediated for by homophily of membership (see section 2.5.1.1, p59-61).

Whilst walking is the most common leisure activity, aquatic activities feature as highly popular in the UK, according to Sport England (2013 and 2016), attributed to greater participation by women and children. Recreation options for regularised events exist around adult aquatic group exercise classes, parent and toddler sessions (Evans et al. 2017) and swimming clubs aimed primarily at children. Swimming has been noted to offer women a leisure culture that allows a variable degree of social interaction in a community setting (Henderson and Gibson, 2013) which has been identified as important to activity engagement. Indeed, mothers often, in their care-giver role, facilitate family swimming as fathers tend to be unavailable at such times (Currie 2004; Evans et al. 2017), therefore may unwittingly see this as an embodied gender role.

The nature of pool environments presents a 'panoptical quality' (Evans et al. 2017, p973) where recreational attendees experience internal and external regulatory factors by self-observation as well as public scrutiny through surveillance. While for some this is perceived as non-critical, other women may find such attention gendering (Henderson and Gibson, 2013) in terms of physical body image and of an effect on mental wellbeing. Currie (2004) would suggest that presenting an option of freedom to be active empowers women in their 'control of (leisure) space(s)' (p225). Women's adoption of healthy behaviours within the context of pregnancy could influence their self-discipline positively especially as they negotiate other observational experiences from health care professionals.

## **2.8 Summary of the bio-socioecological perspective**

The 'Individual' is central to the Bronfenbrenner's bio-socioecological model (1977 and 2001); and modernised for the 'Active Living' version by Sallis et al. in 2006, (Figure 2-1, p38). This chapter has focused on the bio-socioecological background for pregnant women, predominantly setting out the contextual and theoretical fields relevant to the research study underpinning this thesis. Literature identified for two specific themes 'pregnancy wellbeing and quality of life' and 'pregnancy and peer support' (Table 2-1, p34) has been critiqued as separate threads applied to the bio-socioecological themes (society, communities, relationships and individuals) and then interrelated to present this narrative evaluation set around pregnancy.



This review illustrates that women's contemporary experience of pregnancy and childbearing is a complex interrelationship between social, biological and ecological features associated with their life transition to becoming a mother. Each woman interacts with individual bio-socioecological topics differently based on her beliefs, values and choices as she navigates her perinatal path. The link between health and wellbeing during pregnancy may well positively influence women's experience of supportive relationships with their peers within established and newly created socially-based communities.

Women share common interests during pregnancy and may develop supportive relationships which enable them to capitalise on social networks specifically within group situations. Midwives are seen as significantly important in delivering positive health messages to women during the antenatal phase of pregnancy promoting healthy lifestyles and behaviours that reduce morbidity and mortality which contribute to enhance the experience of wellbeing for mothers and their families.

The following chapter adopts a logical approach to a review of literature specifically related to pregnant women's option to undertake aquatic exercise as a choice of activity relating to their health and wellbeing experience.

## **Chapter 3 Literature Review: Aquatic exercise during pregnancy**

The review of literature examines the interaction of individual women with a specific physical and social environment and the potential for specific health benefits associated with behavioural activities, motivation and experience of wellbeing during pregnancy. A methodical approach will specifically expand knowledge from the bio-socioecological perspective (see chapter 2, p30-77) to appraise aquatic exercise activity during pregnancy.

Using water for improving health and wellbeing is rooted in historical texts, through various settings and activities including swimming. Studies identified for this review all featured aquatic exercise interventions with pregnant women using varied measures of pregnancy discomforts (such as back pain), perceived psychological benefits (as in body image) or advantage for labour outcomes (for example length of labour). This chapter concludes with an evidence summary based on the results of reviewed research publications.

The structure of this review of literature retains an iterative narrative style with a holistic focus to the critique. This review was essential to the understanding of the potential benefits to women and what evidence was already available to support this provision.

### **3.1 Aquatic exercise and pregnancy**

#### **3.1.1 Brief historical view of aquatic therapy**

Hydrotherapy (or hydropathy) as partial or full immersion of the body in water is associated with both healing and rituals for many centuries and across the world (Katz 1996; Becker 2009). Baptism is a widely practiced ‘cleansing and re-birthing’ ritual in many cultures over the centuries (Katz 1996, p285), while the more sinister ordeal by water (or dunking) was used to reveal witches during the 16<sup>th</sup> and 17<sup>th</sup> centuries (Lindsay 2014). History records the Greeks and Romans used hot or warm water environments for circulatory improvements and relaxation, whilst cold thermal settings are often used by athletes to reduce inflammation and increase muscle recovery. Some societies use cold-water swimming to relieve symptoms of depression or as pain relief (van Tubergen and van der Linden 2002). Others undertake activities using still or agitated water

immersion and may vary the mineral content of the aquatic environment (in balneotherapy or use sea water as in thalassotherapy) which are linked to therapeutic use of water therapy and medicinal prescriptions across many cultures (van Tubergen and van der Linden 2002; Mooventhana and Nivethitha 2014).

The contemporary UK report 'The health and wellbeing benefits of swimming' (Swim England 2017) examined the physical, mental and social impacts of aquatic activities across populations. Popularity, versatility of activity type and accessibility of opportunity are identified as significant cost-effective positives in respect of health conditions for health care, public health and social care providers. Swimming constructively contributes to aerobic fitness, physical strength, rehabilitation, balance and cognitive skills throughout the lifespan (Swim England 2017).

A specific critique of water exercise during pregnancy was essential to confirming the research aim, methodological approach and in settling the focus of research objectives. While it is recognised antenatal exercise had been studied by professionals from several perspectives, and the value of hydrotherapy for several populations, I acknowledge that aquatic exercise during the months before birth had not featured in quantity within published literature ahead of this project.

By taking a methodical approach to this specific body of literature, considerations for the choices of databases accessed, inclusion and exclusion criteria remained as previously stated in Table 2-1, (p34) and a PRISMA template (see Appendix 3, p321) completed for this specific task. The goal for the organised approach to this review of aquatic research was to identify relevant studies, appraise and analyse the results and to present a summary to direct professional care or further research (Centre for Reviews and Dissemination (CRD) 2009). In addition, it was important that some fundamental principles for exercise in water associated with pregnancy and the nature of aquatic spaces, is given as an introduction to this arena of review.

### **3.1.2 Pregnancy aquatics: the essentials**

Water-based exercise offers a mode of exercise which is soothing within an environment which promotes relaxation for pregnant women (Bolitho and Hatch 2014). The assets of immersion in water include buoyancy (Archimedes' principle), hydrostatic pressure and resistance. Buoyancy reduces the impact of any bodily movement on joints and the

arms/legs, allowing better range of movements than on land. Women experience the lowering of gravity through buoyancy as water below the body produces an 'up-thrust' of feeling lighter in weight (Aquatic Exercise Association (AEA) 2010). Hydrostatic pressure promotes an even pressure exerted by the water on the submerged body producing a therapeutic effect by promoting venous return from limbs. The stroke volume increases, reducing the heart rate and blood pressure during aquatic exercise, and also has a mildly diuretic effect due to venous blood changes. Respiratory effort is encouraged during immersion of the thoracic area of the body during movement patterns (Bolitho and Hatch 2014).

Resistance is composed of three types – frontal, eddy and drag (AEA 2010; Bolitho and Hatch 2014). Frontal resistance exists as actions in water are harder than in air which is associated with slower muscle movements generally. Muscles work in pairs concentrically – one shortens as one extends across a joint and vice versa. The addition of hand positions and propulsion of the body can add intensity by altering surface area or harness water pressure as resistance. Eddy equates to the turbulence associated with movements in vertical, horizontal planes or both. Water moved by any action whilst immersed, flows around the body and creates a backward force or drag (AEA 2010).

Within an aquatic exercise class these three properties of water are used to construct a set of active movement combinations to encourage whole body mobility, promoting cardiovascular function along with strength and endurance muscular work, in order to maintain or enhance functionality (Baker 2006; Bolitho and Hatch 2014). Buoyancy and hydrostatic pressure challenge the pregnant woman's stability and balance, thus posture and quality moves defined by progressive altered body shape and size feature as essential to the class template (AEA 2010).

### **3.1.3 Aquatic spaces and women**

Whilst walking is the most common leisure activity, aquatic activities feature as highly popular in the UK according to Sport England (2013 and 2016), who attribute greater participation by women and children. Recreation options for regularised events exist around adult aquatic group exercise classes, parent and toddler sessions (Evans et al. 2017) and swimming clubs aimed primarily at children. Swimming has been noted to offer women a leisure culture that allows a variable degree of social interaction in a

community setting (Henderson and Gibson, 2013) which has been identified as of importance to activity engagement. Indeed, mothers often, in their care-giver role, facilitate family swimming as fathers tend to be unavailable at such times (Currie 2004; Evans et al. 2017), so may unwittingly see this as an embodied gender role.

The nature of pool environments presents a “panoptical quality” (Evans et al. 2017, p973) where recreational attendees experience internal and external regulatory factors by self-observation as well as public scrutiny through surveillance. While for some this is perceived as non-critical, other women may find such attention gendering (Henderson and Gibson, 2013) in terms of physical body image and of an effect on mental wellbeing. Currie (2004) would suggest that presenting an option of freedom to be active empowers women in their “control of (leisure) space(s)” (p225). Women’s adoption of healthy behaviours within the context of pregnancy could influence their self-discipline positively especially as they negotiate other observational experiences from health care professionals in a similar timeframe.

### **3.2 A methodical approach to aquatic exercise literature**

#### **3.2.1 Background reflective memo**

My initial introduction to aquanatal began with Sylvia Baddeley, a community midwife in Staffordshire, in the 1990s (Baddeley 1996). She offered midwives a training programme for both land and water-based exercise activities in collaboration with the YMCA who offered exercise education to the fitness industry (Baddeley and Storrie 1998). Following training I supported an initiative for local provision, followed gradually through additional training (namely Royal Society of the Arts (RSA) Exercise to Music) and study, to add this to my professional provision in practice. The term ‘aquanatal’ is often used as an alternative to ‘pregnancy aquatics’ and as such is synonymous. Pool timetables may use other terms (for example aqua-bumps (see [Medway.gov.uk](http://Medway.gov.uk)) or other registered provider monikers, for example: ‘turtle tums’ as part of ‘turtle tots’, a world-wide franchise business or ‘puddle ducks’, a UK franchise company) to aid marketing the specific style of class to the public. In the UK, these are dotted across the four countries, with midwives who offer this in various settings, often outside their NHS employed role. The debate of such provision is outside the scope of this specific thesis, but may contribute to the barriers of provision or access experience in some area.

### **3.2.2 Overview to the approach for this review**

The logical approach was applied to the specific literature review (for the period of 2000-onwards) of aquatic pregnancy exercise which examined the published research from a range of sources. Table 3-1, (p83) provides a brief listing of studies which are presented as a tabulated detailed review as an appendix (Appendix 4, p322-328). This process revealed a lack of internationally published studies with papers produced from Sweden, USA and Brazil recognised as part of the original and continual review process.

These included four randomised controlled trials and five other experimental studies (inclusive of three pilot studies). I included the South American literature as the consistent authorship for three of the four studies from Brazilian authors offered advancing knowledge of aquatic exercise during pregnancy from the collected trial data. Three key areas of focus for the studies were acknowledged as i) physical discomforts of pregnancy, ii) cardiovascular changes, labour and birth outcomes, and iii) psychological effects.

As no studies were identified of a qualitative approach, a logically designed process was used to explore and evaluate each journal report in order to guide the identification on what was already known about aquatic exercise during pregnancy (see Appendix 4, (p322-328) for detail). One study (Liquori et al. 2003) was identified when the literature was revisited following data collection via a systematic review (Kamioka et al. 2011). This review by a Japanese author, had originally been discounted as the focus was obscure (“...curative effects of aquatic exercise...”) and the original source publication journal (Journal of the Section on Woman’s Health) for the study by Liquori et al. (2003) was not captured in the overall search strategy employed. This study report (Liquori et al. 2003) was added and integrated into the review approach presented here.

**Table 3-1 Aquatic studies identified for review**

Author(S) Year (Pub)	Publication Journal	Country	Title <u>Study Design</u> Study Year
Prevedel Calderon De Conti Consonni and Rudge  <b>2003</b>	Revista Brasileira de Ginecologia e Obstetrícia	Brazil	Maternal and perinatal implication of hydrotherapy in pregnancy. <u>Prospective, cohort, RCT</u>
Granath Hellgren and Gunnarsson  <b>2006</b>	Journal of Obstetric Gynecologic and Neonatal Nursing (JOGNN)	Sweden	Water Aerobics Reduces Sick Leave due to Low Back Pain During Pregnancy <u>RCT</u> To compare the effect of a land-based, physical exercise program versus water aerobics on low back or pelvic pain and sick leave during pregnancy 1995/1996
Baciuk Pereira Cecatti Braga and Cavalcante  <b>2008</b>	Reproductive Health	Brazil	Water aerobics in pregnancy: cardiovascular response, labour and neonatal outcomes <u>RCT</u> To evaluate the association between water aerobics, maternal cardiovascular capacity during pregnancy, labour and neonatal outcomes.
Cavalcante Cecatti Pereira Baciuk Bernardo and Silveira  <b>2009</b>	Reproductive Health	Brazil	Water Aerobics II: maternal body composition and perinatal outcomes after a programme for low risk pregnant women <u>RCT</u> To evaluate the effectiveness and safety of water aerobics during pregnancy.  2002/2004
Smith and Michel  <b>2006</b>  <b>Smith – PhD 2002</b>	Journal of Obstetric Gynecologic and Neonatal Nursing (JOGNN)	USA	A pilot study on the effects of aquatic exercise on discomforts of pregnancy <u>Prospective, quasi-experimental</u> To examine if Pender’s Health Promotion Model (HPM) can explain usefulness to explain willingness to participate in pregnancy exercise.
Lox and Treasure  <b>2000</b>	Journal of Applied Social Psychology	USA	Changes in feeling states following aquatic exercise during pregnancy <u>Experimental</u> (To examine) if aquatic exercise participation improved feelings of positive wellbeing and reduced psychological distress and fatigue

Parker and Smith  <b>2003</b>	The Journal of Perinatal Education	USA	Aquatic-aerobic exercise as a means of stress reduction during pregnancy <u>Quasi-experimental pilot study</u> To explore the association between 1. psychological stress and adverse fetal outcome, 2. aerobic exercise and psychological stress reduction 3. associations between aerobic exercise and fetal outcome.
Liquori Widener and Clark  <b>2003</b>	Journal of the Section on Woman's Health	USA	Effects of a 6-week prenatal water exercise programme on physiological parameters and well-being in women with pregnancies in the 2 <sup>nd</sup> -3 <sup>rd</sup> trimesters: a pilot study <u>Experimental pilot study</u> To evaluate an established water aerobics program and the impact on physiological function and wellbeing, for low risk pregnancies in the 2 <sup>nd</sup> and 3 <sup>rd</sup> trimesters
Vallim Osis Cecatti Baciuk Silveira and Cavalcante  <b>2011</b>	Reproductive Health	Brazil	Water exercises and quality of life during pregnancy <u>Comparative observational study</u> To evaluate the effects of a physical exercise program of water aerobics on the quality of life (QOL) of sedentary pregnant women 2003/2004
<b>NB:</b> The pilot study (Liquori et al. 2003) did not appear during the various literature searches as detailed in Table 2-1, p34. This study was identified within the systematic review Kamioka et al. (2011) when the paper was identified and then evaluated despite its origins being outside the original inclusion criteria to this study.			

### 3.2.3 Comparison of aquanatal studies: methods and interventions

The dearth of publications posed some challenges to specificity of review processing as whilst all appeared to originate from a quantitative methodology, the focus of each group of researchers proffered a range of designs, data collection timing and collection tools. Some employed baseline physical evaluations (anthropometric – body mass or fat measurements; or ergonomic – VO<sub>2</sub> max or maximal oxygen consumption during increased intensity exercise) ahead of the intervention, whilst other researchers did not identify this or alternatively indicated the use of a demographic self-report questionnaire or subjective experience questionnaire pre-intervention. Subsequent randomisation techniques included use of dates of birth (Granath et al. 2006), admission to project order (Cavalcante et al. 2009), or self-select (Smith and Michel 2006). Interestingly only two studies (Parker and Smith 2003; Smith and Michel 2006) indicated that participants came from a range of ethnicity, cultural or physical activity engagement backgrounds despite the range of research settings for the identified studies from Brazil, USA and Sweden.



It was impossible to determine for most of the studies, the training or professional background of the instructor (physical therapist identified in Prevedel et al. 2003; physical therapist or physical therapy assistant trained by the physical therapist in Liquori et al. 2003), or if these individuals were part of the research investigation team. One study (Granath et al. 2006) suggested a physiotherapist assessed participants at each antenatal visit by means of a standard examination and classification. The information garnered by this examination procedure is not explicit within the published reporting and its integration within the study is thus unknown. The classification between low-back pain and pelvic girdle symptoms is presented as a table (p467) but the specialist application does not provide data related to degree of severity or impediment to mobility for study participants. In reviewing the stated process, the link between data around classification and incidence of sick leave does not appear in this report. Therefore, this publication cannot progress any knowledge for this specific symptom of pelvic girdle pain.

Indeed, none of the publications declared the involvement of a midwife in the published studies except by inference of 'routine antenatal care' and the identification of obstetrician review and monitoring. As studies took place in Brazil (four), USA (four) and Sweden (one) the nature of the midwife role in participant's maternity care cannot be corroborated as similar between services across the timeframe of this review. Local readers would have an appreciation and knowledge of local maternity and obstetric service provision, but others would not. In addition, the nature of obstetrician overview and level of intervention for participant sample cohorts, who were identified as low risk, is also difficult to quantify with the exception of recording sick leave for one study (Granath et al. 2006).

Inclusion of control groups for the RCT studies offered unspecific general activity or that normal physical activities were undertaken by these participant groups or they attended land-based classes where the mode, class length, frequency, or intensity are not identified. Whilst a comparison group should aid the research in clarification of intervention outcome data, any cross and between study evaluations lacks coherence within these specific publications. For example, the study by Granath et al. (2006) compared their aquatic intervention to a land-based programme, but the results cannot be attributed to any specific exercise mode, as a positive benefit to alleviation of low

back pain, pregnancy-related pelvic girdle discomfort or incidence of sick leave are not shown specifically by this publication.

Equally the detail of planned class content for the water exercise intervention groups is not evident in all reports. The only reports which gave aquatic programme details were those of Liquori et al. (2003) and Smith and Michel (2006). Indeed, Liquori et al. (2003) provide specific exercise scheduling and precise timing for warm-up, aerobic phase, cool down and relaxation in their paper. Some use of resistance equipment such as 'board', 'tubes' and 'upper extremity paddles (p13)' was also identified in this same study. Cross study comparison for water exercise content cannot therefore be quantified as congruent to enable conclusions for pregnancy (or indeed health) outcomes from these study reports alone.

Class length (stated intervals of 45 or 50 minutes, and one hour) and frequency of exercise classes (weekly, twice or three times a week) were diverse as were the programmes (a six week intervention or continuous throughout pregnancy). The four RCTs (see Table 2-1, p34) examined aerobic exercise although each report appeared to employ a different schedule of exercise in a broad category of moderate aerobic exercise class and did not explain what this consisted of, meaning cross-case analysis of studies is not possible. The remaining studies (Liquori et al., 2003; Parker and Smith 2003; Smith and Michel 2006; Vallim et al. 2011) (see Table 2-1, p34) indicate an experimental approach and/or design but with the exception of Liquori et al. (2003) present no interpretative detail to indicate the definition of moderate aerobic activity by the researchers or the interpretation of this by participants.

Each study employed data collection designs consistent with pre-, during and post-intervention information using: self-report questionnaires and diaries, specific measurements (VO<sub>2</sub> (rate of oxygen consumption), temperature and HR monitoring, sub-maximal treadmill (ergometric) tests, anthropometric measures), unspecific 'physical evaluations' by investigators and retrospective labour and birth data. Data was subjected to quantitative analysis using analytical and statistical frameworks to quantify results for discussion. In addition, the outcome measures offered varied information related to their contemporary focus which individually proposed additional studies of women undertaking aquatic exercise whilst pregnancy.

### **3.2.4 Comparison of aquanatal studies: results and outcomes**

Three studies examined the effect of their research intervention on general antenatal discomforts. Smith and Michel (2006) used a six week intervention during the second and third trimesters, examining altered mobility, adoption of healthy behaviours and perception of body image changes contrasted with 'normal activities'. Their report was focused on the effects of water exercise on a range of pregnancy discomforts using three questionnaires (Pregnancy body shape (PBSQ); Health promoting lifestyle profile (HPLP); and Smith's pregnancy discomfort intensity index (SPDII) and the Timed Get Up and Go mobility test to assess specific outcomes. They state that for their aquatic participant group, even being mindful of ethnicity, the group data indicated a more positive body image and increased motivation to attend antenatal education or other exercise provision, which may link to peer connectedness and confirm the reported increase in mobility from pre-intervention testing. The authors assert that physical discomforts associated with pregnancy were improved overall for the aquatic group.

The second study by Liquori et al. (2003) also used physical measures to review benefits derived from aquatic pregnancy programme attendance over 6 weeks as well as the HPLP (Version II) questionnaire to explore coexistence of wellbeing through participating in physical activity for health as a motivator. Strength test for biceps and quadriceps were statistically significantly improved for the intervention group and increased for all other muscle groups tested. This group also demonstrated higher scores (HPLP II) for physical activity engagement after attending the water exercise classes together with some greater stress management and improved health responsibility scores.

The third study (Granath et al. 2006) specifically explored low back pain or pelvic girdle discomforts throughout pregnancy using comparison of a land-based programme as control. The physical measurements by physiotherapists used pre-set criteria for each set of symptoms (p467) but while the authors state symptoms of low back pain (and incidence of sick leave) decreased for the aquatic exercise group, the level of sickness reported for pelvic girdle pain remains the same for both groups.

Whilst these three studies (Liquori et al. 2003; Granath et al. 2006; Smith and Michel 2006) concluded that water-based exercise during pregnancy provides benefits for

physical discomforts the significance of a six week aquatic exercise intervention on symptoms is unspecific for the outcomes under investigation. Indeed Granath et al. (2006) posited that their aquatic programme can be recommended for treatment of pregnancy-related low back pain and to generally decreased the incidence of sick leave during pregnancy, however their evidence is not compelling as land-based classes may also have aided some of the control group.

Cavalcante et al. (2009) aimed to evaluate the relationship between body composition during pregnancy and hydrotherapy for a cohort of low-risk sedentary women. Outcome measures (BMI and body fat percentage) demonstrated no significant difference in their statistical results. Regular participant attendance was problematic for this study which may indicate barriers presented to women during pregnancy effect prioritisation of participation in regularised events. A focus on cardiovascular capacity and metabolic adaption during pregnancy was investigated for the studies by Prevedel et al. (2003) and Baciuk et al. (2008) with similar protocols for oxygen consumption ( $VO_2\text{max}$ ), cardiac output, fitness and skin temperature measures. Whilst aquatic exercise programmes may support metabolic and cardiovascular adaptation, the evidence presented is not clearly matched with identified controls for comparison. In addition, all three publications suggested the outcomes for length of labour, use of analgesia (decrease reported only by Baciuk et al. 2008 study) and mode of birth, together with incidence of premature birth and birth weight for the newborn for their research participants (Prevedel et al. 2003; Baciuk et al. 2008; Cavalcante et al. 2009) is not significantly improved through aquatic exercise participation.

Two principle psychological areas of study were acknowledged. Lox and Treasure (2000) examined if participation in water aerobics prompted positive feelings of wellbeing using a six week intervention (unspecified gestation) and reported by weekly subjective questionnaires. As their research proposal was to set up a pilot study to examine how pregnancy discomforts are affected by aqua-aerobics participation, the quantitative approach was prioritised. Minimal attention is made to common stressors (physical discomforts of pregnancy, fetal and forthcoming health for the baby, and adapting to becoming a parent) by the authors in this article (Lox and Treasure 2000) and the potential for women to develop psychological mental health morbidity. The study results propose enhanced positivity, together with reduced negative feelings and fatigue

associated with gestation. Alternatively, an investigation of the experience of Quality of Life by Vallim et al. (2011) used the WHOQOL-BREF and a 12 item SES (socioeconomic status) questionnaire at three set times at 8 week intervals during the second and third trimester. Ironically, although initial evaluations appeared to show benefits from aquatic exercise, the QoL data presented no link between the control and intervention groups. Another paper by Parker and Smith (2003) presented their own quasi-experimental pilot study which explored aquatic aerobic exercise as a means of stress reduction, including 25% African-Americans as a specific ethnic group within the participant cohort. However, it was difficult to extract if aqua-aerobics was viewed by participants as stress management per se, or if the group of nine pregnant exercisers were aided by attendance over a six week period to a group activity in relation to their experiences of psychological stress symptoms of pregnancy.

One study stated that within its design there was an intention to promote group social interaction (Liquori et al. 2003) although opportunity for this is not specified within the class programme. However, the researchers do describe that instructors offered participant's tuition for increasing or reducing intensity during the activity, based on modified Borg RPE measures, fatigue or symptoms of obstetric disorders (see Borg 1998). This appears to be stated as to corroborate the American College of Obstetricians and Gynaecologists (ACOG) recommendations. Within this programme, women were also taught to monitor their heart rate at the start, after the aerobic phase and post relaxation exercises. What is not known is if this was purely during the research or a continuation of the existing classes held at this venue (p13). Measuring group cohesion during or at the end of the six week intervention is not specifically described nor is data provided in this reporting.

### **3.2.5 Other related publications: systematic reviews**

One systematic review of 'aquatic-aerobic' exercise literature (Parker and Smith 2003) offered a consideration of antenatal psychological stress and anxiety state patterns (such as fatigue, emotional distress, maternal serum cortisol/corticotrophin-releasing hormone levels, marital adjustments) mapped against perinatal outcomes (such as prematurity, neonatal length, Apgar scores and birth weight), where various interventions of physical activity or exercise are stated. This review proceeded the

reporting of their own quasi-experimental pilot study. In essence the focus of the 25 papers (identified from one decade starting at 1991) was towards the physiological responses from varied stressors encountered during pregnancy which produce a result within the mother-to-be by a physical, structural and systematic effect. The published paper by Lox and Treasure (2000) is one of these papers, which considered if aquatic exercise participation contributed to positive feelings of wellbeing combined with relief of fatigue and psychological distress.

A Japanese Ministry of Health sponsored review (Kamioka et al. 2011) into “...curative effects of aquatic exercise” collated a systematic review of non-randomised controlled trials worldwide which included two studies with pregnant women (Liquori et al. 2003; Smith and Michel 2006). This was published in the International Journal of General Medicine and featured studies where the therapeutic use of water in tandem with conventional (and sometimes alternative) medicinal options were measured for improvement to neurological conditions, musculoskeletal function and/or reduce/relieve pain. There is a feel of epidemiological style and presentation throughout this review with emphasis on effective practices and positive outcomes for public health built around the medical professional. Two studies where pregnant women featured as the review sample (Liquori et al. 2003; Smith and Michel 2006) had already been identified, and included for the discussion of aquatic studies.

### **3.2.6 Discussion of pregnancy aquatic exercise literature**

This review of aquatic studies has presented an overview of the varied methodological application for RCTs and experimental research by reports reviewed here. The evidence presented relies heavily on the reporting of the authors and highlights the challenges of extrapolating knowledge to underpin developing aquatic exercise which offers benefits to pregnant women. The level of benefit offered for general physical discomforts can be related to outcome measures reported primarily by Smith and Michel (2006) associated with trimester 2 and 3. However the degree of relief is not specified, and while Granath et al. (2006) recommend water-based exercise for treatment of low back pain, the association to sick leave may not reveal if symptom reduction is the reason for pregnant women being able to continue attending the workplace. Whilst general antenatal

exercise offers some benefits to pregnancy discomforts, the review studies do not promote that aquatic exercise attendance offers specific advantages.

Interventions reported by this review sought to relate water-based exercise with improvements to muscular strength, cardiovascular response (by measures of stroke volume, cardiac output,  $\text{VO}_2$ , BP, HR) broadly linked to physical capacity, metabolic adaption, use of analgesia during labour, the impact on length of labour and delivery type. Sample size, measurement protocols and timing of data recording varied between studies whereby comparison was problematic even where research personal are involved with more than one study and publication. There was some cross-over of questionnaire data tools and statistical strategy applied for reports which offers a level of confirmability to some reported results. The findings from these studies did not provide significant results to enable recommendation of aquatic exercise specifically in enhancing metabolic or cardiovascular advantage. Reduction in requirements for pain relief in labour was indicated by one study (Baciuk et al. 2008), but the sample was small ( $n=34$  for experimental group) and corroboration through additional research for antenatal exercise as well as water-based activity should be advised.

Other specific experimental measurements included weight gain, BMI, and percentage body fat. No specificity of data from findings supported that aquanatal aided women in body fat or weight regulation during low risk pregnancies. An interesting comment in Smith and Michel's (2006) article suggested that 75% of their sample was obese but pre-test reporting offered low reports of 'negative body image' which they attribute to the ethnic diversity of their sample (60% were African American) whereby they suggest this group reflect a more positive body image regardless of BMI.

Data result to support the psychological benefits for body image, psychological stress, negativity and fatigue also featured in these studies as outcome measures. Varied pre-validated questionnaires were used to collect such information and presented by use of tables, graphical representation and critical discussion. Whilst some evidence may be elicited via questionnaires, additional qualitative tools could give greater depth to participant perspectives in these areas of experience. Stress reduction may be attributed by pregnant women participating in regular activity programmes that promote health and wellbeing behaviours and the active personal responsibility to adopt physical activity.

Finally, whilst most studies did not specifically identify compliance of study participants as a challenge, Baciuk et al. (2008) and Cavalcante et al. (2009) indicate that some women encountered barriers to regular attendance by way of travel costs or travel distance, health-related issues, employment schedules, body confidence or conflict with family priorities. As both studies appear to have utilised the same sample, and share four authors, the Cavalcante et al. (2009) article presented these difficulties in detail as a critical limitation of their study as 21 women from the original 34 exercise group having discontinued by the 32-36 weeks data collection episode. Location and suitability of the pool environment with access to public transport, effective scheduling of class times and experienced instructors are recommendations to support positive adoption of aquatic exercise provision.

### **3.3 Summary of current knowledge and gaps for further investigation**

Aquatic exercise is viewed as safe and beneficial for low risk women during pregnancy (Granath et al. 2006; RCOG, 2006; Smith and Michel 2006; Baciuk et al. 2008; Hatch 2008; Cavalcante et al. 2009; Vallim et al. 2011). There is also some evidence that it can reduce the incidence of low back pain, ease pelvic girdle discomforts (Granath et al. 2006), reduce the need for opiates during labour, decrease length of labour (Baciuk et al. 2008), encourage health behaviours and perception of body image (Smith and Michel 2006). Vallim et al. (2011) study has not shown significant enhancement to QoL when WHOQOL-BREF and a 12 item SES (socioeconomic status) questionnaire were used during pregnancy at trimester intervals.

#### **3.3.1 Evidence and direction for additional study**

The studies reviewed offer some insight into water exercise as a helpful additional activity for low-risk pregnant women, based on the small sample studies reviewed. The discrepancy between methodological approach and outcome focus, present some difficulty in comparison of exercise programming for class frequency associated with beneficial effect, duration and intensity of provision and the significance of barriers of physical, emotional or access to suitable professional and evidence-based sources of activity. Presenting public health messages to specific populations without a clear association to the key health professional involvement may hinder the acceptability and



potential for women to adopt behaviours which they see as beneficial both at the time and for the future.

A dearth of qualitative research presents an incomplete and unbalanced review for the acceptability of aquatic exercise formats specifically in community environments securing health and leisure physical activity options for pregnant women. Integration between the NHS maternity services and communal wellness for women and families spans all facets of childbearing where links to public health can be advanced. The key health professional for low- and medium-risk women classically is the midwife. Further research into aquatic provision (including shallow or deep water mode, frequency, intensity and duration), the potential for public health messaging, the education and training of aquanatal instructors, and the specific benefits of undertaking such activities to pregnant (and postnatal) women is recommended. Additionally, exploring how professional expertise can be made available in non-NHS environments is worthy of study and collaborative consideration.

### **3.4 Reflective Narrative**

The process of literature retrieval and critical consideration according to the themes within this bio-socioecological framework has led to several periods of deliberation when midwifery seemed to play a minor role within the critique. Whilst this could have potential to impact on the professional practice aspect, there are themes within the literature which appeared to re-inforce the importance of the holistic approach. The need to broaden the review strategy to include research and theories from social science and physical therapies was key to seeking to examine the provision of care in an evidence-based professional context. Physical activity specifically features often as an element of public health priority associated with obesity and cardiovascular morbidities in social care, physical therapies and midwifery publications.

Many hours of reading and deliberation of some studies led to frequent episodes of tangled thoughts as the complex task of critique and analysis of presented results suggested more questions and indistinct answers from projects that intended to explore one aim but presented data that seemed to focus on another. The use of critiquing tools was helpful but did present some challenges when study processes were unclear or

limited in detail. One positive outcome of this was that it led to an appreciation of how critical attention to aspects of the method would be needed, to enhance the rigor and trustworthiness of the data collected and the subsequent analysis phase of the research process.

When working as a clinical midwife, I observed pregnant women in clinical settings which was often limited to surveillance for abnormalities, rather than true promotion of quality of life and long-term health of women and families specifically. Such thoughts were uncomfortable leading to the renewed focus on professional skills and taking the opportunity to participate in provision of aquanatal classes as an option to promote healthier living generally. The exploration of wellbeing as a concept for this study gave me the opportunity to re-examine the individual and community perspective of pregnancy before this research was developed. This review of the literature has embedded many of the considerations of wellbeing, extending my perspective of working with (and learning from) women to better understand how social relationships may benefit the transition to being a mother. I found some of my previous thinking was flawed which led to additional pressure to put aside some personal beliefs, so I could focus more coherently on the contemporary evidence-base from the women's view.

The writings of Bourdieu added new concepts of 'habitus' and 'field'. The consideration of these, together with 'doxa' and 'capital', offered a fresh approach to examining the culture of the aquanatal group and the health behaviours of pregnant women who attend such a group. As a novice researcher I came to consider the key notion of accepting complex theories, further developing understanding of these whilst continuing to develop skills though managing a project, was compatible to a genuine research study.

### **3.5 Conclusion**

This aquatic exercise literature review summarises evidence which supports current advice that it is safe to remain physically active during low-risk pregnancies and that engaging in these activities may reduce the necessity of medical interventions during childbearing for mothers and babies. However, the literature reviewed for this study (chapters 2 and 3, p34-107) was not exhaustive as this research study embraced a

qualitative approach requiring the setting aside of my values and beliefs during the research processes (Holloway and Galvin 2016). I aimed to avoid influence from existing beliefs through considered reflection (see section 1.4, p19; also section 4.2, p101-112) and the 'bracketing' of information gained from extensive review of publications on possible selected themes (Streubert and Carpenter 1999; Tufford and Newman 2010) ahead of the data collection phase.

The gaps in the literature would suggest that further research is needed in the following three key areas:

- The benefits to women and the impact on their wellbeing through attending midwife-led aquanatal classes.
- The receipt of public health messages by pregnant women from midwives working in leisure centres and the impact of these on group participants.
- The development of social and peer support through group participation and the impact of associated networks on physical activity during pregnancy.

These areas have been used to formulate, direct and confirm the research question, aims and objectives of the research project (see section 1.3, p18-19). Building from the research objectives and literature review, I began the process to identify the methodological approach to enable the study processes to be framed and designed which was sympathetic to the professional theme and focus.

## **Chapter 4 Methodology**

The underpinning rationale and purpose of this study shaped the pathway for the most appropriate methodology and research design to be established. This process requires a suitable paradigm choice to support the validity of the chosen approach and ultimately the quality of the research findings. Various methodologies and qualitative approaches were considered taking account of the research purpose and study objectives. This chapter presents the sequential approach to the specific issues of project management rooted in the chosen case study methodology and a systemised approach to my practical application of each research design stage.

### **4.1 Research paradigms to support practice development**

Midwives may consider research questions to examine their professional role, the culture and settings where maternity services are provided and their expertise in the provision of effective care to women and families. This study for the Doctorate of Professional Practice (DProf) was embedded within my sphere of practice as a researching professional to examine the experience of a specific group of women. The overall aim of the study was set to understand the experience of wellbeing and peer-support by attending an aquanatal midwife-led class during pregnancy. Various approaches are used to design frameworks and gather data to gain critical understanding of focused phenomenon. The underlying theory and concepts of midwifery care were scrutinised to develop the evidence in the areas highlighted previously and for related healthcare topics, as the field of midwifery evolves within the dynamic health and social care arenas (Bryar and Sinclair 2011).

The scientific paradigm is viewed as objective, seeking quantifiable evidence upon which to base a legitimate claim for knowledge to inform care. In contrast, the naturalistic model would present the opposing view by seeking knowledge of the 'real world' from the experience of those in receipt of the care (Rees 2011). These two approaches, quantitative and qualitative, represent contrasting paradigms which both seek to develop evidence to enhance efficient decision-making within professional practice. For midwives a holistic appreciation of participants' experiences, significantly bounded by context, points towards a more naturalistic structure to examine their (and my) practice

and profession (see section 1.2, p13-18; section 2.4.2, p46-52 and section 2.4.3, p52-56).

To fully explore the multiple aspects of any question, both approaches can be considered as part of the concept, initial design and planning stages to ensure a competent process is developed (Rees 2011). Within the consolidation of the chosen approach, the investigator is required to choose an overall epistemology based on the nature of their inquiry which fits to the general methodology to be used. The research design was determined by the purpose of the study and the interpretative strategy envisaged thereby understanding the phenomenon being investigated (Cohen et al. 2000). In addition, the sample, data collection strategy and the process devised for dissemination contributes to the overall perspective of the researcher in the study design.

#### **4.1.1 Reflective narrative: The methodological journey**

My primary plan was to utilise a qualitative method, although this was considered as too general an approach and highlighted the danger of becoming descriptive rather than evaluative in designing the project. The original thought was to use a mixed methodology by gaining demographic and other data from a survey questionnaire, and to proceed to follow up the participants via qualitative individual interviews to determine women's experience during pregnancy of wellbeing from attending aquanatal provision. This focus was considered too broad and too large for doctoral study at the initial review stage and required substantial refinement. The size for the study was a constant dilemma in honing the focus and gaining momentum to arrive at a meaningful project but one that also 'fitted' the Professional Doctorate requirements and the interest I have in the topic area.

The research question is fundamental to identifying the correct research approach and was revised many times before I moved to consideration of a final overall approach. Each qualitative methodology was identified and characteristics considered carefully in relation to the overall research premise (Holloway 1997). Plummer (2001, p120-121) proposes five criteria to ponder as part of this journey. Primary to this is the topic under scrutiny and the focus of the research question. The second criteria relate to the type of

knowledge being sought as either objective/measurable or subjective/interpretative (Taylor and Hicks 2009, p72). Thirdly, the practicalities of undertaking the study which may significantly impact upon the researcher or participants, linking fourthly with the ethical position to justify the value of undertaking the project and finally (the fifth criteria), the merit of ethical burden to participants or the research team. Each criterion must be robustly deliberated during this process and can be critical to the final theoretical position and methodological stance together with competent choices for data tools and design of processes (Taylor and Hicks 2009).

One of the drivers was the clear perspective of the research question and the holistic view set by the aim and objectives. An 'emic' outlook where the study seeks to promote the participant experiences, beliefs and behaviours and those of myself as an insider researching practitioner, are faithfully presented to illuminate the phenomenon. The journey through choosing a research approach meant that several methodologies within the qualitative paradigm were reviewed and critiqued for suitability. Significant to this process was the need to strategically study methodologies previously known and some less well-known ones. Whilst this aspect was time consuming, the reflexive element of this rite of passage became central to finalisation of the design strategy and the clarity to define the research question. I have captured a range of methods in this reflective narrative, but this narrative is not totally exhaustive of this phase.

One popular methodology is grounded theory which originates from symbolic interactionism as defined by Mead (1934) and was developed by Glaser and Strauss (1967) who suggested that behaviours are linked to participant's interpretation of their situation. The dynamic underpinning for this methodology is the creation of 'new' theories relevant primarily where little knowledge of a topic is recognised. A significant feature of grounded theory is that it is both inductive and deductive, where theory deduced from initial data is additionally re-tested to confirm or reject interim theories, before a core theory which relates to all previous ones emerges to explain the phenomenon (Bluff 2005). This approach was rejected as the aquanatal midwife instructor perspective could not be fully integrated into the study design because my role could prejudice the women's reporting of their experience and impact on group-led

pregnancy peer support. Thus, Plummer's (2001) primary criteria of research focus and the practicalities of the research would not be wholly evaluated by this methodology.

Another early consideration was a phenomenological approach, where a small sample of women would be chosen for their specific characteristics. Husserl's (1967) writing and work on descriptive phenomenology promotes the need for the researcher to 'bracket' their beliefs, to allow immersion in the 'lived experience' of the participant. In contrast Heidegger's interpretative approach (Creswell 2006; Reiners 2012) would indicate that the researcher cannot disengage from the phenomenon, meaning the investigator 'combines' knowledge and experiences with the participants ('being within' the phenomenon). Whilst a phenomenological approach could have been used as the basis for the research, there would be less emphasis on exploring the wellbeing of women associated with group aquanatal exercise. I felt the selection of the specific sample from a group of women could impact the data collection timing and a sense of group experience as 'wholeness' could not be achieved.

The approach chosen must enable the entire research question, aims and objectives to be met by the design and processes of the study. The potential use of an ethnographic approach was envisioned at this stage as the study needed to include myself as part of the group. Ethnography has a holistic stance to examining a culture together with the coinciding participant interactions and behaviours, taking account of physical and social characteristics bound by the setting (Donovan 2006a; Holloway et al. 2010). However, this approach posed particular issues relating to ethical positioning of myself as a researcher observing the group and how I would 'self-manage' the influencing reaction I might have during the study. The potential for either observer-as-participant and complete observer stance was likely to lead to compromised data and invalid results due to 'observer effect' (Donovan 2006a). This in essence is because the emergence of my 'tacit' knowledge of the participants as the sole researcher and of being an established 'native' of the group could lead to a desensitized approach for the enquiry by my being unable to adopt an outsider stance (Rees 2011, p42). Consequently classical, critical or interpretative types of ethnography were discounted.

Other defined naturalistic methodologies (feminist research, narrative inquiry and action research) were evaluated where subjective participant experiences could offer meaning to social patterns and realities through qualitative analysis. The essence of feminist research involves the adoption of a feminist view for reporting, the use of feminist study criteria in devising research or for the researcher to use a feminist stance within their scholarship role (see Letherby 2003; see also Oleson 2011). Feminist researchers seek to balance the 'male-defined' medically-led dominance of scientifically objective knowledge by examining power and control relationships (Donovan 2006b). Whilst the aquanatal group is female by gender, using a purely feminist epistemology alone was likely to narrow the overall topic view. For me, the women's understandings of pregnancy and aquatic exercise are tinged with their whole life experiences at home, work and leisure which are likely to include male influences and relationships. In addition, the leisure centre is a mixed public arena and thus using such an approach felt to be unsuitable as a primary methodology.

Researchers using narrative inquiry harness participant information through storytelling which the researcher then re-constructs as narrative of their specific experience (see Chase 2011). Bruner (1991) clarified that participant stories seek to capture the event as active, allow meaning of the moment to retain the emotion within communication so the information can be stored and retrieved by the researcher within a narrative methodology.

*"Story makes the implicit explicit, the hidden seen, the unformed formed, and the confusing clear."*

(Atkinson 1998, p7).

The women's stories in this context could not be guaranteed to elicit the specific focus for data collected to answer the research study question and objectives. My perspective both as the aquanatal midwife instructor and as an insider researcher would impact on ethical equipoise. The number of women able to be part of the sample would be potentially limited as data collection would be impractical for a large sample.

Whilst action research harnesses a dynamic approach to the assessment, collaboration between researchers and researched, the proposal of a change to practice, the action of implementing the change, and the analysis of the evaluation of the change (Cohen et al. 2000), meant that the second phase would present impractical timing for pregnant



women and for the researcher to develop and implement change. Together with the unpredictability of processes, the ethical and practical procedures would be confounded, both of which may need significant amendment during data collection, therefore for this research question would be unduly problematic and thus the methodology was not appropriate.

In retaining the 'wellbeing' perspective and the peer support characteristics, the exploration of methodologies led to consideration of the class as a singular case study or individual women as multiple case studies within a 'bound' context. A critical aspect of case study research is that the research question should be refined ahead of the choice of approach (Thomas 2015) which ensures the purpose and research question are at the heart of the research design and framework for the study. In examining several qualitative methodologies, the research question was appraised over time, refined and revised ahead of finalising the methodological choice as case study.

#### **4.2 Confirming the study methodology**

Consideration of Plummer's (2001) criteria allowed me to reflect on theoretical, political and evidence-based factors that would direct and potentially impact on the research design. Clear appraisal of my research perspective was required so the theoretical stance and methodology were grounded in professional practice aligned to both roles as a practicing midwife and an academic (Taylor and Hicks 2009).

Ontology is the theory of being and the reality of the world. Two diverse 'social reality' options are described: external as in imposed, or internalised as part of a cognitive process (Cohen et al. 2000), originating from the nominalist or realist perspective respectively. Appreciation of the subjective and objective stand-points can be helpful in seeking to describe the basic discipline lens and research paradigm so that coherent decisions about studies can be defined.

The nature of knowledge or epistemology is at the root of the underpinning study of the scope and boundaries of understanding (Denzin and Lincoln 2011) aiding practitioners to consider many types of knowledge to inform practice (Cluett and Bluff 2006). These types of knowledge can be derived from broad views of areas of practice for instance,

feminist or constructionist, and together with our philosophical position or theoretical perspective, lead us to focus research studies within those general definitions (Crotty 1998).

Our beliefs constitute our theoretical perspective for thinking and actions, composing a paradigm which may fit within a defined discipline, namely 'post positivism' where context is highly important to the exploration of a phenomenon or 'interpretivist' (also known as constructivism) which recognises that an individual constructs reality for themselves (Cohen et al. 2000). Research practice can be patterned by our personal belief preferences or expanded through adopting a more holistic range of strategies to examination of a specific phenomenon of interest.

Given the wide continuum of inquiry concepts, the use of objectivist and subjectivist base(s) of reality to promote some order to knowledge of social constructs (see Table 4-1, p103) promotes some clarification (Cohen and Manion 1994; Cohen et al. 2000). Consideration of the theoretical dimensions and contextual realities offered comparative options to be considered carefully.

In essence the research envisioned from the question, aims and objectives (see 1.3, p18-19) would connect with a subjectivist base, bound by the practice context, and the beliefs of the practitioner-researcher. These would use a post-positivism methodology thus understanding the individual's interpretation in their own words (and the researcher's interpretivism beliefs) together as vital to the development of practice. Furthermore, the data generated would be scrutinised in an inductive (theory generation) rather than a deductive (theory testing) set of processes (Denzin and Lincoln 2011).

A person-centred and inductive approach promotes humanistic qualities taking account of situational context for emergent notions that seek to explain and understand a particular view of the world. Indeed, participants would present multiple realities upon which the researcher can build meaning for their reality (Cohen et al. 2000; Cluett and Bluff 2006). The exploration of social reality constructs, offered links to personal change based on previously expressed values and beliefs that are embedded in social situations (Ragin 2010a; Cohen et al. 2011). Whilst these can be tied to choices, there was also an

element of action that would have positive impact on their life experience from engagement and discovery in specific social groups.

**Table 4-1 Alternative bases for interpreting social reality**

Conceptions of social reality		
Dimensions of comparison	Objectivist/Positivist	Subjectivist/Interpretivist
Philosophical basis	Realism: the world exists and is knowable as it really is. Organizations are real entities with a life of their own.	Idealism: the world exists but different people construe it in very different ways. Organizations are invented social reality.
The role of social science	Discovering the universal laws of society and human conduct within it.	Discovering how different people interpret the world in which they live.
Basic units of social reality	The collectivity: society or organizations.	Individuals acting singly or together.
Methods of understanding	Identifying conditions or relationships which permit the collectivity to exist. Conceiving what these conditions and relationships are.	Interpretation of the subjective meanings which individuals place upon their action. Discovering the subjective rules for such action.
Theory	A rational edifice built by scientists to explain human behaviour.	Sets of meanings which people use to make sense of their world and behaviour within it.
Research	Experimental or	The search for meaningful relationships and the discovery of their consequences for action.
	Quasi-experimental	
	Validation of theory.	
Methodology	Abstraction of reality, especially through mathematical models and quantitative analysis.	The representation of reality for purposes of comparison. Analysis of language and meaning.
Society	Ordered. Governed by a uniform set of values and made possible only by those values.	Conflicted. Governed by the values of people with access to power.
Organizations	Goal oriented	Dependent upon people and their goals. Instruments of power which some people control and can use to attain ends which seem good to them.
	Independent of people.	
	Instruments of order in society serving. Both society and the individual.	
Organizational pathologies	Organizations get out of kilter with social values and individual needs.	Given diverse human ends, there is always conflict among people acting to pursue them.
Prescription for change	Change the structure of the organization to meet social values and individual needs.	Find out what values are embodied in organizational action and whose they are. Change the people or change their values if you can.

(Adapted from Barr Greenfield 1975 by Cohen and Manion 1994; Cohen et al. 2011, p8).

Based on the requirements for a DProf, my theoretical perspective and the aim of the professional study, the research question was refined and matched with the methodology. The methodological choice presented was a case study approach (see synopsis of methodology in section 4.3, p112-117). This methodology was viewed as the most appropriate given the holistic requirement of examining women's wellbeing over a period of time (pregnancy), within a very specific setting (leisure centre aquanatal group), which may be subjected to complex social interactions (peer support and dynamic membership). The perspective of each woman would be determined by their personal reality and interpretation of the group impact on themselves and others.

This case study would be formed by women attending aquanatal exercise sessions, where the researcher critically evaluated the motivation to attend, experience of wellbeing and the impact of peer support during pregnancy through group attendance. The study would provide insight into the broader experience of wellbeing and peer support during pregnancy and explore if specific groups, such as an aquanatal exercise group, may provide added benefits for the women. An additional dimension to this would be the inclusion of myself as a midwife practitioner and instructor for this group, being an 'insider'. Exploration of practitioner researcher and insider researcher was necessary before confirming the final methodological choice.

#### **4.2.1 Practitioner research**

Researchers who are practitioners have an exclusive position within a study context alongside access to participants who know them in their professional role. The dynamics of relationships within the group setting will influence the informational network specifically between researcher and individual participants (Appleby 2013). My perspective as a practitioner researcher is rooted in personal interest where familiarity with the setting, stakeholders, group members and community of practice can benefit the study integrity or may confound, by presenting quandaries to the insider-researcher (Drake and Heath 2011). The intricate inter-relationship between practitioner and academic researcher roles relies heavily on the adoption of knowledge embedded in reflective practice which requires practitioner researchers to acquire critical distance. As a reflective practitioner I am familiar with the continuous thought required to uphold the professional values, standards, delivery and development of effective midwifery

care in my practice (NMC 2015). In addition, reflexive strategies seek to define competence in application of research processes and evidence within the field of practice (Lambert et al. 2010). The reflexive approach promotes some protection to practitioner researchers in the path to practice development and the 'new' knowledge Quality Assurance Agency (QAA) for Higher Education benchmarks (QAA 2011; QAA 2015). Thus, the interweaving of experience and reliable knowledge can positively influence change in practice driven by practitioner research (Appleby 2013).

To achieve the necessary critical distance, the practitioner researcher must put aside all assumptions and pre-considered theories, so that they can integrate understanding of advanced knowledge principally from progressive study at doctoral level (Drake and Heath 2011). Situated learning in the workplace is associated with confounding factors of social and cultural exposure supplementary to context driven learning within the community (Appleby 2013). Practitioner researchers juggle two communities (academic and practice) seeking to develop an objective stance to both research and personal learning, taking account of beliefs, attitudes and values.

Confounding issues of power imbalance can be seen in terms of knowledge dominance within some communities but certainly not all. Practitioner researchers therefore need to be mindful of the need for trust within the sharing of information during the community experience within the research context (Appleby 2013). As a member of the aquanatal group with an additional role as instructor/educator there is potential incongruity between adoption of shared involvement and disclosure within the research process. An appreciation of ethical concerns needs to be evident within the research design and a planned approach to the capricious nature of sample participants (Lester 2004).

Reflection on the practitioner researchers awareness of the study context and the critical approach to the insider-researcher role are fundamental to the subsequent thorough examination of themselves (beliefs, values, judgements), as well as the data collected. Thus, the focused, multiple perspective approach to scrutiny and adherence to objectivity are essential to avoidance of biases through analytical reflexivity (Appleby 2013).

#### **4.2.2 Insider researcher**

Credible qualitative research requires the researcher to clarify their membership role within the group or study setting (Adler and Adler 1994) along a continuum from non-participation to complete participation. Insider-researchers study a group which they belong to, whilst outsider-researchers study a group to which they have no affiliation (Dwyer and Buckle 2009; Greene 2014). The position of the complete insider-researcher can be seen to pose potential contextual, situational power and data interpretation conflicts which may impact on the ethical underpinnings of such studies (Dwyer and Buckle 2009).

Such insider-researcher studies are usually observational or ethnographic in design, where no manipulation of participants takes place. Both broad approaches rely on research designs where data collection is a direct field activity by the researcher within the confines of a group setting. The objective neutrality of the researcher is likely to be reduced, due to poorly considered assumptions of the study phenomenon, reduced appreciation of group sub-culture and likely bias in data collection and data analysis contributed to by familiarity to the site (Hewitt-Taylor 2002; Dwyer and Buckle 2009).

The purpose of a case study is to examine a process or situation comprehensively where data are collected rigorously from multiple sources (Thomas 2011). As an insider-researcher there are responsibilities attached to this role not least in respect of prior and intimate knowledge of the case culture, and potential research participants, plus prior access to the site and facilities (Unluer 2012). There are benefits from the privileged knowledge of the group culture, the group structure, and the advanced appreciation of the values and knowledge base of the group members. Researchers who are insiders have potential for continuity specifically in data collection and consistency of data records which could contribute to greater trustworthiness for data processes.

Conversely the weaknesses which an insider-researcher must consider reveal that some key issues and actions must be identified to ameliorate the possible biases ahead of fieldwork starting (Unluer 2012). Being an instructor for the group meant there was a transition to researcher to be considered from the participant perspective. Brannick and Coghlan (2007) suggest the tension between role duality of researcher and group

membership, is likely to present as clash of values where the degree of detached objectivity can be challenged. Therefore reflexive positioning as an insider-researcher is pivotal to the competent management of the research. The informed consent process is therefore viewed as the critical event to monitor the duality of role required, together with the setting of 'ground rules' for the focus groups.

It has to be recognised that having two roles within a group is likely to affect some group relationships, so elements of confidentiality and the potential to alter group interactions must be managed to augment ethical research practice (Brannick and Coghlan 2007). The consideration of respondent bias (sometimes labelled social desirability bias) was one area where participant's behaviours during data collection is viewed as a potential for one-sided findings specifically in qualitative research (Polit and Beck 2004; Collins et al. 2005). Firstly, the physical environment for data collection could be viewed as disabling or coercive to participants in respect that the researcher is also their midwife aquanatal instructor. Secondly, social norms based in the community of the group could also afford perceived influence by the instructor in terms of authority attributed by their professional role. Lastly, cognitive responses to stimuli by participants (in this case the data collection tools) are based on individual attitudes and interpretation based on prior life experience (Collins et al. 2005).

Self-report or interviews are two data tools that are often cited for such consideration within the research design process, when data interpretation or reporting of findings lead to disappointing outcomes for a specific study (McCambridge et al. 2014). Orne (1962) an eminent psychologist, writes that human participants are not passive in such situations, but they incorporate experiential and broader information bases to form their response bound by a specific context at the time. His research described this as 'demand characteristics' whereby being researched unconsciously alters participants responses. Consideration of these events require me (as a researcher) to embrace potential steps in the methodology when respondent bias may occur, including the words used in the questionnaire, my approach as the focus group moderator, and a thoughtful reflective style ensuring any negative effect to the research project has minimal impact on the findings (Furnham 1986; Polit and Beck 2004).

One well known bias is the Hawthorne effect (after studies undertaken at the Western Electric telephone factory between 1924 and 1933) affecting research participants, where the impact of being considered by a study may promote specific behaviours (McCambridge et al. 2014, p267; McNeill et al. 2016). Agreement of how such bias of respondents manifest and the effect on research outcomes continues to be elusive as controversies and understanding to research communities persist. McCambridge et al. (2014, p268) describe a 'social psychological explanation' where 'beliefs about the researcher' anticipation affect the behaviour of participants to elicit 'conformity and social desirability' which produce complex effects challenging interpretation, particularly in the study findings. Observational studies of health professionals within this systematic review, were linked to text and context, and suggest the Hawthorne effect is not a singular bias as the control groups demonstrated no effect.

Entering as a participant is associated to self-determination of respondents who may be influenced by altruistic or personal drivers of self-development or even social desirability of attention through study participation. There may also be a level of peer pressure owing to study participation of other peer group members. It is proposed that respondents may actually be reacting to the 'content of the questions' which encourage 'new thinking' rather than perform to the social norms of the situation or expectation of the investigator (McCambridge et al. 2014, p275; McNeill et al. 2016).

A level of researcher vulnerability could be anticipated relating to role uncertainty (Ballamingie and Johnson 2011), despite specific pre-study consideration of strategies about the anticipation of emergent challenges during data collection. Other disadvantages could include lack of sensitivity to routine behaviours of participants or myself as instructor, so that these are not collected within the data and inform the analysis (Unluer 2012; Greene 2014). Guidance on ensuring comprehensive detail would be advantageous therefore experienced researcher advice is viewed as essential to develop researcher skills in this area. Alongside this, participants may assume that all group members (including myself), have shared knowledge and understanding, for example 'that I already know what they know' or even that the researcher is already aware of their opinions and concerns (Unluer 2012). The focus groups would thus provide opportunities for clarification of researcher observations, gather extra information to seek participant perspectives of group processes during the aquanatal



classes and confirm views, knowledge and/or additional issues arising within or without the group.

Within my researcher role there is a close connection to the study site and some of the group participants, thus the case context needed to be carefully considered before the study was designed. The detailed exploration of the context of the case study informed the design and data tools selected to answer the research question. Knowledge of the context was seen as a preventative approach to minimise insider-researcher difficulties. The bias of failing to focus on a broad deliberation of the whole area of study may prejudice data obtained (Unluer 2012; Greene 2014). I made every effort to develop an approach to reduce bias within my researcher role and the design processes to protect the validity of the study. Strategies to meet these requirements include the integral development of a comprehensive audit trail of research records, triangulation by the researcher, effective reflexivity especially during periods of data collection, and data analysis through discussion with supervisors to construct knowledge within the research context (Greene 2014). This will involve a significant level of reflection-on-action and reflection-in-action which will be integrated into the narrative thread for the thesis (Schön 1983).

The issue of situational power within research studies can fluctuate for both insider-researcher and group members. The importance of emphasis on relationship building between insider-researcher and research participants within preliminary contact with the site cannot be underestimated. Attention to the pre-study information for group members was considered carefully and 'road tested' by non-attending women as part of the development phase.

#### **4.2.3 Foreshadow Issues**

Malinowski (1922), an anthropologist and leading ethnographic researcher undertook a study in the Trobriand Islands which identified that scientific, theoretical and conceptual exploration ahead of fieldwork is fundamental to observational competence in identifying potential vulnerabilities in data collection processes. There is evidence that the inter-relation between insider researcher and researching professional is complex, but an essential consideration to all processes is pre-fieldwork continuously from study

design to final completion. Simons (2009, after initial explanation by Smith and Pohland 1974) identifies the explicit requirement to address foreshadow issues ahead of the design phase and after the research question is established. The concerns are seen to aid the exploration of the topic, but not limit or constrain, so the 'problem' can be investigated comprehensively. Many of the considerations centred on my role as an insider researcher in relation to participants.

One core consideration was the need for bracketing to minimise researcher bias. Whilst qualitative research approaches (except grounded theory) necessitate the researcher to be an essential part of the data collection (Rees 2003 and 2011) this can pose difficulty for study rigor processes. Tufford and Newman (2010) define bracketing as a technique whereby researchers seek to prevent pre-knowledge of a situation or aspect of the study from affecting the sampling, data collection or analytical processes. This allows more effective reflection-on-action or reflection-in-action improving sustained and resilient research processing for data gathering and synthesis. However, bracketing is also identified as a protective mechanism for the researcher when engaged in research elements which may lead to emotional fatigue or potential for harm from extended exposure to the 'field' environment.

As part of the process of pre-consideration of risks to the researcher and participants, the various foreshadowed issues around 'bracketing' were identified and ameliorated for by the methodological procedures of the design. Ethical awareness and professional reflective resources were utilised to aid this stage of preparation for fieldwork. Informal researcher journals were kept throughout which assisted with putting aside personal beliefs, thoughts and interpretations in a place away from the field, but could be retrieved to illuminate the reflective narrative and later the writing up of the findings.

#### 4.2.3.1 *Reflective narrative*

The inhibitory potential of me as an insider researcher to the group was anticipated as part of these foreshadow issues. Deliberation of the role is presented within the methodology (see section 4.2.2, p106-109). It should be noted that this was a recurrent component for consideration from research design to thesis writing alongside progressive focusing which I consider to be closely linked and a key tenant of DProf research work.

The key issues that needed to be addressed included a requirement to be objective as a professional which, as the group met outside an NHS setting, meant I needed to be alert to the difficulties of subjectivity at all times I interacted with the aqua-natal group. This was brought into sharp focus during the ethical review process when the necessity of identifying pregnant women as a vulnerable group revealed a need for committed vigilance during the entire study. Professional commitment to preserving confidentiality particularly during focus group discussion prompted careful consideration of moderator skills ahead of fieldworking.

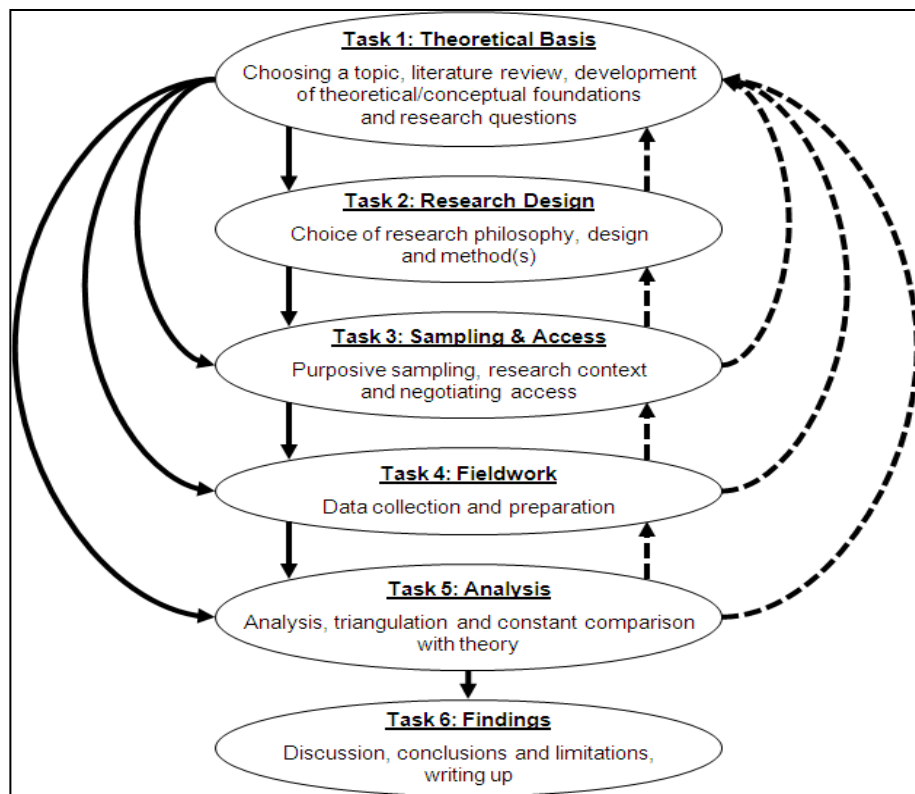
Another foreshadow issue was identified as the potential to conflict with the woman's 'named midwife' care plan or advice through class interactions. A requirement for the focus group moderator role was to avoid engaging with the participant discussion threads as a midwife and thus minimise this. General class discussion was perceived as more tricky, although inter-professional courtesy has always been the basis for any advice I offer.

#### **4.2.4 Progressive focusing**

The term 'progressive focusing' was identified by Parlett and Hamilton (1972) who emphasise how researchers follow emergent and pertinent data themes (Stake 1981; Simons 2009). Some writers have suggested the appearance of an evolving process of formalisation to the qualitative design whereby a linear approach is not standard, as data collection and data management primarily rely on the continued objective stance of the researcher throughout the study. Sinkovics and Alfoldi (2012) describe this cyclical approach of the growth of research 'perspective', presenting this diagrammatically which reflects some of the processes encountered during the management of this project (see Figure 4-1, p112).

My experience followed this evolutionary course, in part, as development of the research design took place, but later during the fieldwork phase, specifically through research skills development around the entire period of data collection. The recursive nature of analytical stages contributed further as I continued with the examination of data themes recognised within this process, and for the attribution of considered meaning for the text and other study findings.

**Figure 4-1 Path of Progressing Focusing**



(From Sinkovics and Alfoldi 2012, p825).

### 4.3 Defining case study research

Case studies can be considered by researchers using either a quantitative and qualitative approach, to explain, explore in depth, or describe in analytical detail the case under scrutiny (Merriman 1998; Yin 2003; Stake 2008). Used initially from the 19<sup>th</sup> century, case study research has been utilised within the disciplines of psychology, law, politics, and more recently in medicine (Cresswell 2006; Crowe et al. 2011). From 1920, various qualitative research fields, principally in humanities and social sciences have increasingly used case studies. Practice-based professionals are especially drawn to case studies despite its limited inclusion in social sciences as a bonafide methodology (Denzin and Lincoln 2011; Starman 2013). The debate for case study definition centres on whether it is a type of research or a research method (Sandelowski 2011; Hyett et al. 2014).

Conceivably the ambiguity arises from case studies being part of both quantitative and qualitative research methodologies, but can also embrace a combined approach using elements of quantitative and qualitative strategies within the design. Some researchers indicate that whilst it may not be considered as a methodology in a traditional paradigm,

the recognised authors on this approach clearly expose the identification of the unit of study (Stake 1995; Thomas and Myers 2015), or research strategy (Merriam 2009; Yin 2003). Indeed, Stake (2008) presents it as an all-inclusive methodology and therefore case study research is gaining increased main-stream acceptance in social and health research arenas (Swanborn 2010; Crowe et al. 2011; Boblin et al. 2013).

The features of case study as a qualitative methodology focus on an interpretative paradigm wherein experiences and meanings are attributed to single contributors (Thomas 2015). In some investigations, data may be collected with a blend of quantitative and qualitative methods so that phenomenon is scrutinised as a whole, based on the purpose of study exploration. When approaches are combined, the balance of approaches may be equalised or indeed favour one paradigm (for example inductive), to examine the phenomenon which is added to by supplemental results from the experimental (specifically deductive) approach (Starman 2013).

Mesec (1998, p383, translated into English language and selected by Starman 2013, p31) proposes a definition for case study as ‘...a description and analysis of an individual matter or case...’ He states the theoretical purpose is ‘...to identify variables, structures, forms and orders of interactions...’ within the case context, or ‘to assess the performance of work’ or the practice development inside the case. Case studies can be entirely descriptive in approach or may become more exploratory through examination of contributory events during a period of data collection specific to a phenomenon (Simons 2009; Merriam and Tisdell 2016). This creates a more holistic study that is bound by the dynamic context, but not defined solely by an environmental description.

The multiple viewed and detailed examination of a real-time case is according to Simons (2009) not a method in itself, but a framework for the study design where more than one method – both quantitative and qualitative – can be seen. Differences in definition for case study may be ascribed to research emphasis, namely time, context or study focus, which may lead to the tension of classifying single or multiple cases rather than an overall approach (Verschuren 2003, p137). The case can be seen to equal the research ‘unit’ or subject (Simon 2009) rather than a ‘unit’ of description where the unit (as object) and case are jointly weighted. Therefore, the case as subject is selected for

its atypical or unusual characteristics so the subject is viewed as it interrelates with the object under investigation (Tellis 1997; Hodkinson and Hodkinson 2001; Ragin 2010b; Hyett et al. 2014)

The selection of a case can also become biased when a researcher's prior acquaintance with a situation leads to potential favour of assumption for outcome (George and Bennett 2005). Whilst the impact of this should not be overlooked, the researcher can safeguard the study by 'casing' through case definition (Ragin 2010b) and declaration, and 're-casing' by recording the changes within the case boundaries as the study progresses (Sandelowski 2011), together with a more robust research design in relation to accuracy and consistency of processes, use of data collection tools and records through the case study (George and Bennett 2005). Flyvbjerg (2011) also alerts the researcher to the potential for subjective and capricious conclusions greater than in experimental methodologies. Luck et al. (2006) and Starman (2013) both propose that research discipline and verification strategies are vital to ameliorate the biases, through thorough detailed description within data quality and fieldwork procedures.

Reliability is often equated to repetition of studies where results and conclusions consistently recur, except for case studies where the case cannot be the same. To enhance and demonstrate reliability for case studies, the potential for repeated results and findings can only be achieved if the case has identical circumstances and indistinguishably data processes to the original study. Starman (2013) concludes by recommending employing disciplined research practices so that the scientific rigor of case studies is less likely to be called into question. Thus, reliability and validity can and should be intensely integrated within the framework of conceptual and theoretical knowledge, to test the study hypothesis of intricate causal relationships.

One advantage is the multiple strands of in-depth data gathered from a range of collection methods (observation, interviews, documents, and reports, audio or video recordings) which broaden the examination and analysis from many perspectives. Stake (1995), Creswell (2006) and Merriam (2009) all suggest that this exploration of the 'how' something might happen from various viewpoints of the sample enables us to get closer to the 'why' something occurs. The multiple lenses also promote a three dimensional

ideograph of the phenomenon within the research reporting where research subjects can be seen and heard in the specific case context bringing personal perspectives on their actions and reactions.

According to Cresswell (2006) the focus of case study research is 'an in-depth description and analysis of a single or multiple cases'. Cohen et al. (2000 p181) emphasise the definition of case studies as being able to 'evaluate(s) a view of life in its complexity' (Thomas 2011, preface ix) which highlights the framework has potential to explore in depth a phenomenon within social sciences or humanities thus appealing to healthcare disciplines. The case is identified as one episode, a series of events for a single human being or a group exposed to the same experience(s) in a defined context. The comparison of characteristics of ethnographic and phenomenological research approaches was required to ensure that a case study approach was the best choice, given that my focus was to research the understanding of women's experience of wellbeing through group participation and peer support, whilst attending a midwife-led water-based aquanatal class.

Flyvbjerg (2006), Sandelowski (2011) and Thomas (2015), recommend the researcher maintains close connection with the 'subject' so that the singleness of the case examines even the smallest detail and is critiqued within the reality of the context. The context in these circumstances is specific to the group being studied although the culture may be more dynamic as the attendees to each weekly class are likely to differ due to a mix of personal or other circumstances for each woman. These factors would limit an ethnographic approach where culture would remain the same for all participants and also for a phenomenological approach where individual's experiences may not be shared by all participants as the group membership fluctuates.

#### **4.3.1 Advantages and disadvantages of case study research**

The investigation of 'real life' within context is often highlighted as one of the clear advantages of case studies thus maintaining the tight relationship between phenomenon and context (Yin 2003). Accordingly, the unique authenticity of data collected within the contextual boundaries of the case study reflects the journey of the specific 'case' participant(s) from many perspectives, to describe and explain the

phenomenon over time (Simons 2009; Woodside 2010).

A second advantage is that triangulation is an integral element of the case study approach (Thomas 2011). This is achieved primarily as data are collected using multiple methods so 'the case' is viewed from many perspectives to add depth to the examination. Such data collection methods can be inclusive of both quantitative (numeric) and qualitative (narrative) tools. The addition of quality to the study through depth of analysis and robust argument specifically links with the competent choice of the 'case' to research (Stake 1995; Denzin and Lincoln 2011; Thomas 2015).

One of the main arguments against case study research as an approach is the inability to generalise, significantly as the 'case' is individual. This would be an issue if the primary research objectives required this as an outcome which is not the motivation of this study. However, Flyvbjerg (2006) and Thomas (2011) argue that by using a sample which is 'representative' of the broader population, the researcher could attain a level of generalisation. The researcher using a case study approach would find this presents an ethical challenge of looking at a selection procedure with some anticipation of expectation of representation to a broader population and could impact on the holism of the 'case' especially for a novice (see Baxter and Jack 2008). Some stratification in a 'case' sample may occur for specific characteristics but this alone cannot guarantee to signify representativeness for general populations.

#### **4.3.2 Summary of conclusions about case study research methodology**

The consideration of research approaches ahead of composing a detailed design is vital to the decision-making process, in setting out to critically examine the phenomenon set by the question(s) of the researcher. Therefore, the justification of research approach chosen has been influenced by the refining of the question focus, and requirements of evidence to analyse the phenomenon critically within an appropriate approach.

In addition, the consideration of the stance of the researcher as both insider and practitioner prompted the identification of foreshadow issues (see section 4.2.3, p109-111), and relating these to the case study context (see section 1.5, p19-26) within the development of a robust research design and ethically principled processes. Within this I kept in mind the heuristic sense of discovery from the study as the design was shaped



and aspects of the selected methodology applied in relation to the holistic outline of this specific case.

#### **4.4 Application of case study methodology to this study**

The physical research setting and study context is presented in section 1.5 (p19-26). This aquanatal group is the defined context for the proposed research study and is unique in composition, as well as in this setting with a midwife as aquanatal instructor. I am undertaking this DProf study as a midwife practitioner researching my personal professional practice. My proposed approach for the study can be viewed as an intrinsic case study where I seek to develop greater knowledge and understanding of the specific social phenomenon bound by the context (Donovan 2006b). According to Yin (1993) and Stake (1995) the intrinsic nature is concerned with my interest in the case and they further identify the explanatory nature of the examination of causal relationships as a factor within the study. While the intense holistic study and analysis of this group (and a group of non-attending women) will be inherently instructive of any factors which contribute to its function, I am alert to the context being significant and that generalisations to the population outside the sample may be limited to insight to developing trends amongst childbearing women (Tellis 1997; Swanborn 2010).

As case study research uses multiple sources, the detailed 'real life' data is bound by the context to include empirical as well as comprehensive theoretical measures to attain validity, which is both construct, internally valid and uses triangulation within the design (Baxter and Jack 2008). The data for this study was attained from multiple 'lenses' including attendance statistics, recorded focus group(s), my own 'instructor' observations and research field notes after each weekly class, each focus group and throughout the research, and lastly consideration of Facebook group themes during the data collection period (see Table 4-2, p118).

**Table 4-2 Mapping the approach**

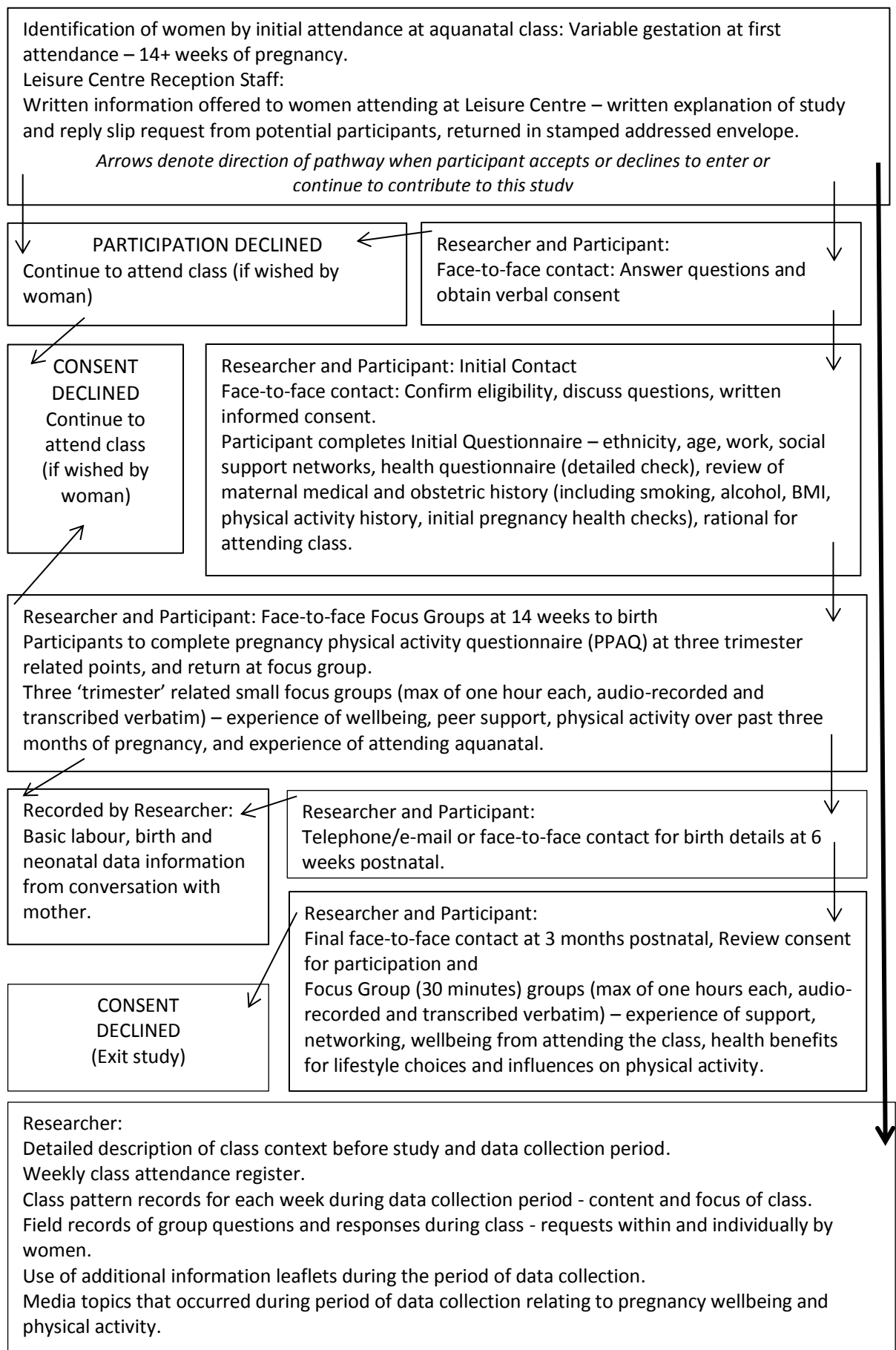
Issue	women's experience of wellbeing and peer support development through attending/participating in a midwife-led water-based aquanatal class;
Focus on issue being studied	self-selective attendance; self-selective networking within/without group; peer support mechanisms sought/used – specific to members; outside networking arrangements for attendees; perspective on wellbeing over pregnancy;
Areas being studied	peer support development; experience of wellbeing during pregnancy; characteristics of group attendees and birth outcomes; public health strategy – integrated within local provision;
Prospective outcomes	professional development of myself as a researcher; identify features for improved public health focus for information and educational material; identify features for developing enhanced peer support for all attendees; development of practice strategy;

Thus, as I am perceived as part of the whole group, I provide additional narrative data which confirm and add dimension to triangulation of participant data. Triangulation is utilised to gain data from more than one collecting method which provides a greater range of information about the source and more holistic validity to the information provided by the participant (Donovan 2006b). The approach is mapped in Figure 4-2, (p119) and the overall aim and objectives (see section 1.3, p18-19).

#### 4.5 Gatekeepers

The Leisure centre management were contacted personally ahead of NHS ethical approval being sought, and the proposed research discussed with them. Copies of the research proposal and information documents were shared with the CEO and the community development manager who was named as the responsible contact for the Leisure centre site. To enhance understanding of the pathway for participants, a diagram was developed which offered clear signposting of entry/exit points (Figure 4-2, p119).

**Figure 4-2**      **Diagram of participants' progression through the study**



Ethical issues were considered over a significant period of time, and application for approval of the research completed online and submitted through the Integrated Research Application System (IRAS). IRAS is a single application system to gain permission and/or approval for research into health and social care, thus ensuring robust adherence to research regulations together with national and local governance standards. Communication took place with research supervisors throughout this process and professional clinical midwifery supervision was arranged and agreed before tender to HRA ethics booking. No women were approached as potential participants for the study in advance of approval being confirmed.

#### **4.6 Ethical considerations**

Consideration to both the ethics of the study and fairness of the research process has been included throughout the thesis. The major issues are informed consent, confidentiality, beneficence, non-maleficence, trustworthiness, honesty and self-governance (Gelling 1999). Authors conversant within the case study approach (such as Simmons 2009; Thomas 2015) include no specific guidance on ethical considerations. Many contemporary researchers give increased prominence to ethics as an essential requirement (Ledward 2011) and that the published government standards documents (DoH 2005; DoH 2008) which state health and social care research necessitates that the domains of 'ethics; science; information; health, safety and employment; finance and intellectual property' are used to underpin the good practice standards and legal policies. The researcher's skill and expertise for the specific study (DoH 2005, p6; DoH 2008; Thomas and Myers 2015) together with the review and approval of the research ethics committee and appropriate NHS research and development personnel, ensure the participants welfare is considered as paramount (Ledward 2011). The current ethics framework for NHS sites seeks to protect the participants from risk, burden and unethical practices.

There is likely to be a tension between academic credibility, alongside the development of critically effective and ethical research skills for doctoral students (Ballamingie and Johnson 2013). Ballamingie and Johnson (2013) suggest this can lead to researcher vulnerability, where public access can be restricted for reasons aligned to educational and doctoral risk of inexperienced researchers, during a process that is complex and

lengthy. A meaningful outcome which can be scrutinised and the dissemination of findings through publication require the proposed research to be reviewed for significant risk. Application to research ethics committee (REC) for approval was therefore required for this study and also NHS Research and development (R&D) permissions (Rees 2011). Both applications were submitted following completion of transfer from MPhil.

The principles of ethical consideration whether it is a therapeutic or non-therapeutic study are intended to protect the individuals involved throughout the process (Ledward 2011). In drug trials (a form of therapeutic study), the ethical considerations include the possibility of causing physical harm or exposing participants to unacceptable risks for example, to harmful substances. For non-therapeutic research, like this, the potential harm to participants relates to issues of emotional, psychological or personal distress which although not immediately noticeable could be equally damaging.

A framework of four main ethical principles are generally considered to underpin practice (Beauchamp and Childress 2013) and research processes (DoH 2005; DoH 2008) (Table 4-3, below), and apply to all stages of the research process from the development of the research question to the findings being disseminated. Each of these principles will be briefly considered in relation to being applied to research studies generally and further considered for the relevant aspects of sample, data collection and data analysis.

**Table 4-3 Four biomedical ethical principles**

- |  |
|--|
| <ul style="list-style-type: none"> <li>• The principle of respect for autonomy</li> <li>• The principle of non-maleficence (doing no harm)</li> <li>• The principle of beneficence (doing good)</li> <li>• The principle of justice</li> </ul> |
|--|

(Adapted from Beauchamp and Childress 2013).

#### **4.6.1 The principle of respect for autonomy**

The autonomy and anonymity for individual participants for the duration of a study are of vital importance and are respected within the research process in a number of ways (DoH 2005; DoH 2008). Prospective participants were therefore given the right to choose to become involved in the project, or not (McHaffie 2000). To honour the belief

that participants have a free, independent and informed choice, initial contact with prospective participants was by invitation letter, explaining the study whilst informing them of the structures within the research approach that promote their autonomy, privacy and anonymity. I sought to make implicit and explicit, that participants should not feel compromised or coerced into participation and that their right to withdraw at any time would not require justification in any way (McHaffie 2000, p75).

#### **4.6.2 Informed Consent**

Gatekeepers to the research setting were approached for access and approval (Simons, 2009) which required the researcher to demonstrate the value of the project, and that no harm will result either in the long or short term to participants from the activities carried out within the research study (Ledward 2011). Abstracts and research proposals were submitted to the Local Research Ethics Committee (LREC) for approval, and formal permission from the relevant gatekeepers within private settings (Simons 2009). Informed consent and confidentiality are assured by accurate verbal and written information for participants.

Ledward (2011) outlines three elements which together structure informed consent: 'information-giving' in terms of practical consideration of language in written or verbal communications, of potential inconvenience, of promotion of autonomy, of process of continued consent for each of the participants; 'competence' in respect of participants being able to process information and make decisions autonomously; and 'voluntariness' meaning consent is free from coercion often akin to a beneficent action by the participant in benefits outweighing inconvenience.

#### **4.6.3 The principles of non-maleficence (doing no harm)**

The ethical principle of non-maleficence or doing no harm applies to any person who is involved in the research process. In studies of a non-therapeutic nature, the main harm that may result from participation could be emotional distress (Stewart et al. 2007). Focus groups may appear to be non-invasive and even passive in essence but for the participants the impact may have the opposite effect. The researcher is required to exercise both 'empathy and distance' during interactions with the research participants (Holloway and Wheeler 2010). Despite the contradiction in this statement, it may be

that the conversation and exchange of information can be illuminating for the research participant. The reflective process of describing their thoughts and feelings about situations may cause them to also confront feelings or anxieties not otherwise considered.

#### **4.6.4 The principles of beneficence (doing good)**

In order to address the ethical principle of beneficence, researchers are required to constantly review their practice, to ensure participants were not inadvertently placed in a vulnerable position from participation (McHaffie 2000). Participants need to freely volunteer to participate, and any conflict from the researcher's position should be removed. There may even be benefits from participating, although these are not often immediately apparent, as there will inevitably be a delay until findings from the study are applied to care for future clients or staff.

#### **4.6.5 The principle of justice**

To apply the ethical principle of justice, it is essential that the research strategy and all procedures are 'fair and just' (Holloway and Wheeler 2010). The research sample is required to demonstrate fairness by 'proper representation in research samples', which includes thought for diversity (age, culture, gender and others) of the sample population. This principle also applies to the giving, receiving and exchange of information by the researcher with the participants (Ledward 2011), the research supervisors, and the gatekeepers and professional colleagues (DoH 2005; DoH 2008). Effective communication is paramount in this and essential throughout the research process.

#### **4.6.6 Professional ethical responsibility and accountability**

As a researching practitioner there were some additional ethically related considerations identified and deliberated during the ethics application phase. One area of issue was viewed as women feeling obligated to take part in the study, which has been addressed by promoting self-determination for participants during research recruitment and consent procedures (see section 4.6.1, p121-122 and section 4.6.2 p122). A second acknowledged concern was my accountability for disclosure(s) which may arise during the study for which my professional role requires me to take

appropriate measures. The arrangement for professional clinical supervision throughout was put into place specifically to conform to The Code (NMC 2015) and Midwives Rules and Standards (NMC 2012).

#### **4.7 Sampling**

Robinson (2014, p26) identifies that researchers need to consider the 'sample universe', 'sample size', 'sample strategy' or sample 'source' as an integral element of the holistic research design. Each of these was considered during this time period and the decisions are identified here. Clear judgements have contributed to the importance, rigour and consistency of methodological approach, aided by the case context and data collection method.

Qualitative studies tend to use non-probability strategies (Cohen et al. 2000). There are a number of major types: convenience, quota, dimensional, purposive and snowball sampling. As the domain for this 'case' is relatively small (Swanborn 2010), it was appropriate to include all individuals who attend this class during the data collection timeframe potential pool of participants. This is 'comprehensive sampling' as defined by Goetz and LeCompte (1984) and Swanborn (2010). These authors would support greater generalization of the results for this group, although as a case study, transferability is targeted instead to the wider population. Cohen et al. (2000) also state comprehensive sampling can be called convenience, accidental or opportunity sampling. Conversely it can be viewed that the intensity of data collection for greater group membership that average ( $n = >20$ ) would be extremely time-consuming (beyond the scope of this DProf) and there could be a need for negotiation between myself and participants regarding data collection or interview mode.

Robinson (2014) describes elements of homogeneity for such sampling based on a mix of theoretical and physical features of the study. Three of these align for this research: physical, as all participants have a common physical characteristic of being pregnant; geographic, as the setting is for a single aquanatal class provision; and demographic, as the sample are all gender specific as female. There are two additional types – psychological or life history – but neither can be applied to this 'sample universe' (Robinson 2014, p 28).



The timeframe of data collection for participants was between 14 and 42 weeks gestation which was a total of 28 weeks maximum. All pregnant women (week 1 n=14; week 5 n=11; week 9 n=14) who attended the group were approached by invitation letter. In addition, all new attendees (n=32) were given an invitation letter at their first attendance. A total of 71 invitations were distributed to aquanatal class participants. It was anticipated that all women who attend the class would be eligible, as exclusion criteria were applied to class attendees in line with those who should not attend exercise classes from ACOG/RCOG guidance (see Table 1-1, p21). Recruitment took place following their reply to the invitation (total n=15), their discussion with me as primary investigator, and informed consent gained over an eight month period. Eleven women were consented (a varied but concentrated group of women for data collection).

#### **4.8 Triangulation**

Triangulation uses multiple methods or data sources to examine phenomena from as wide a perspective as possible (Patton 1999). Four styles are identified by Denzin (1978) and Patton (1999). These are i) method triangulation; ii) theory triangulation; iii) investigator triangulation and iv) data source triangulation. More than one researcher is required for investigator triangulation where observational findings and more than one perspective provides maximal critique of a phenomenon (Carter et al. 2014). Theory triangulation uses several theories to scrutinise and infer meaning from the data which confirm or rebut current study findings. Triangulation of data sources uses information from research samples with differing characteristics to seek wide viewpoints that corroborate other data (Denzin 1978; Denzin 2012; Carter et al. 2014). For qualitative researchers, method triangulation is often used where ‘interviews, observation and field notes’ (Carter et al. 2014, p545) feature as methods to examine a single research focus.

Method triangulation was viewed as the most appropriate to investigate the women’s experience at aquanatal. There are two distinct techniques for this: within-method which is used here, or between-methods, where more than one method from either qualitative or quantitative approaches, or across the two, as in mixed method research (Denzin 1978 and 2012). Three different participant data tools (see section 4.9, p127-139) were chosen – study questionnaire (see section 4.9.3, p130-131 for rationale), focus groups (see section 4.9.5, p134-137) and a pre-validated questionnaire (see

section 4.9.4, p131-134). Whilst each tool gathered individual participant information, taken as a collection of data sources they would offer options to view pregnancy experience as a journey of attending aquanatal and the associated group networking within the defined case study context (see section 1.5, p19-26). Together with data from field notes and researcher class notes, the data sets being collected are intrinsically linked to elicit triangulation of the study findings to aid confirmability. It was hoped overall that the data collected would present complimentary perspectives, although as some data was provided by participants individually (questionnaire), other data was through participant interaction (focus groups), and a third data set provided by me as the researching professional, it was by no means guaranteed.

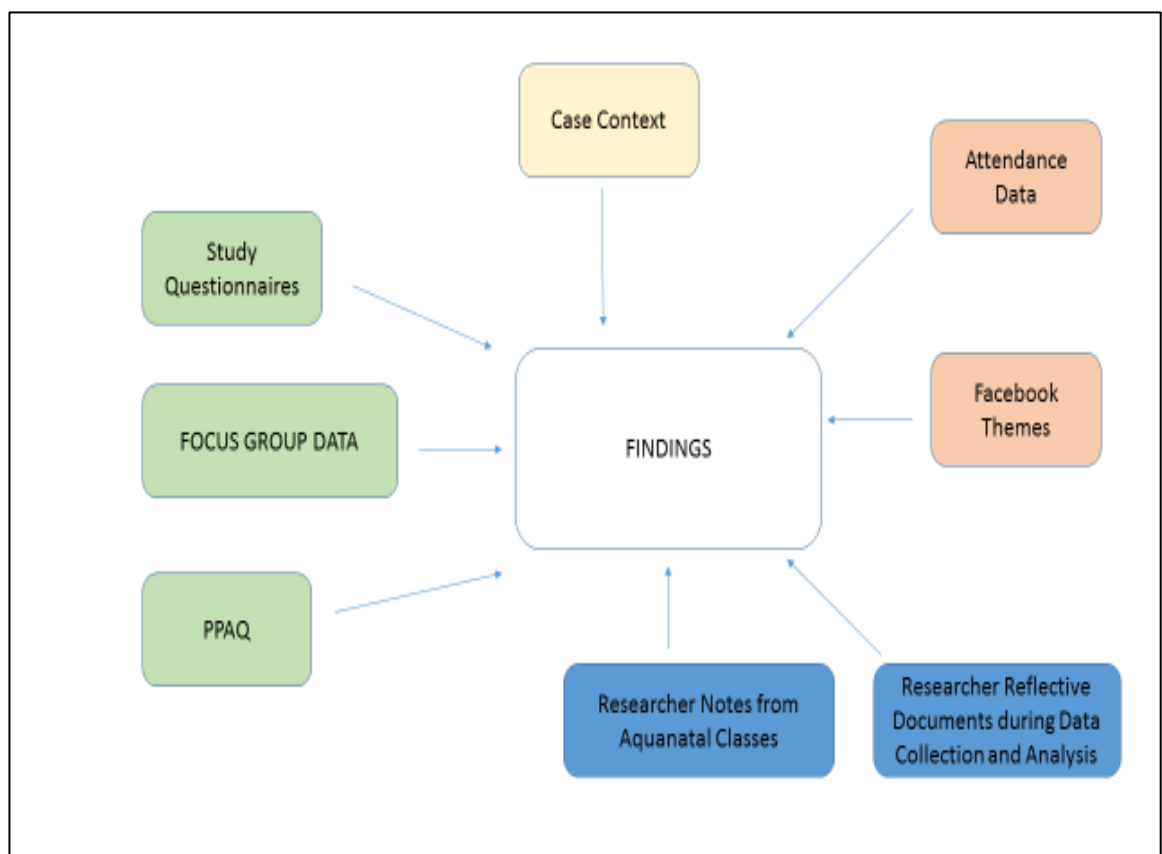
Flick (2014) proposes that triangulation should be built into the research at the design phases and thereby integrated into the data collection and data analysis processes. Triangulation throughout a study was seen as likely to be beneficial so that multiple perspectives from research methods (for example some quantitative in terms of demography but mostly qualitative approaches), data sources (for example questionnaires and focus groups) and interpretative analysis (for example using thematic analysis) would be made of the collected data. In itself, triangulation does not add verification of the data, but can contribute to rich, well-considered and robust investigation and reporting of a phenomenon related to human behaviour (Cohen et al. 2000; Flick 2014, p191).

It is important to note that the data tools offer different levels of openness to participants. For example, in-depth interviews offer the researcher options for flexibility and responsiveness to individuals during the data collection (Carter et al. 2014) or focus groups promote involvement in discussion to encourage sharing of perspectives amongst the members (Carter et al. 2014). Cohen et al. (2000) argues that an addition of time triangulation, that is, data collected to observe social process or change over a specific period in this study from pregnancy to after birth, can offer a longitudinal view embedded into the design. They also identify 'combined levels of triangulation' (Cohen et al. 2000, p113) where data provided by individuals responding to questionnaires and later as a group participant, permit an accumulation of information presenting richer perspective of the respondent in their bio-socioecological being.

Care must be taken to ensure the data tools and the data analysis strategy fits the research question and objectives (Carter et al. 2014). The combination of techniques was examined bearing in mind the need for individual and cross-case analysis which is inherently separate, before final synthesis of findings so the trustworthiness of data is preserved.

The appeal of triangulation offered more structure to the data analysis (see Figure 4-3, below), where I combine four data ‘lenses’ and several collection tools to present stronger processes for research audit and continuously prompt single investigator objectivity. Member checking was proposed in the design so participants could ensure the accuracy of their contributions to the focus group(s).

**Figure 4-3**      **Triangulation sources contributing to Research Findings**



## 4.9 Tools for Data Collection

### 4.9.1 Reflective narrative

At this point in the research design I considered carefully the use of triangulation of data sources to promote confirmability of the collected information. To me there was still

potential for the participant voice to be overwhelmed by my own, therefore, ahead of finalising the plan, I revisited the research aim and objectives in a reflexive way to ensure the quality and coherence of the selected tools within the method triangulation (Carter et al. 2014). I saw this task as principally developmental as a researching professional.

As I nominated each tool, the 'voice' that would be offered by the subsequent data was studied for positive or negative illustration of the women's experiences. The participant 'voice' would be provided by the study questionnaire (immediately after recruitment), focus group transcriptions (one before and one after the birth of their baby) and pre-validated PPAQ information (again one before and one after the birth). Over the timeline for data collection, this would offer five opportunities for women to present their personal experiences in verbal and textual formats, as primary information feeding into the research. I was aware that I would only receive the information they were prepared to share and that this would be bound up in their perceptions (and reception) of me as the aquanatal instructor but also as the midwife researcher.

The study questionnaire had been scrutinised by two women outside the study during the design phase but not as a pilot study: one a pregnant woman who did not attend the aquanatal group who I knew as a non-health professional acquaintance, and the other a service user representative. Both offered very sage advice and constructive criticism which contributed much to the final version. The semi-structured 'core' questions for the focus groups were also cross-examined for potential pitfalls due to the structure of the query or the misunderstanding of the information being sought. The pre-validated questionnaire offered a structure for participants to report engagement in physical activity during a specific time interval, so a comparison between them according at similar pregnancy gestations could be viewed.

My practitioner 'voice' (as a midwife instructor) would be represented by the field notes after each weekly class and the researcher 'voice' (as researching professional) within the reflective accounts following each focus group and the themes and annotations respectively which arose out of these data sources. The organisational 'voice' would present throughout the case context, session attendance data and any informational thread added to the (closed group) Facebook page.

As I progressed this, I acknowledged that additional 'voice(s)' of my research supervisors (or indeed others) could and should be anticipated. Thus, the continued self-awareness of the role I played as researching practitioner, was intertwined with a much larger element of leadership and researcher management skills than I felt I had. The pace of personal change was embedded into the design as I strove to anticipate and critique each decision whilst finalising the design and seeking ethical approval.

This prompted an appraisal of power in relation to my professional role in this research study and the nature of reciprocity on my part to the participants and the wider aquanatal class (Karnieli-Miller et al. 2009). Discussing how I may have a position of 'power' felt out of line with my personal perception and I found during the weeks whilst the ethical review took place, I questioned myself repeatedly over each interaction I had with the aquanatal women, trying to second guess my motivation and professional stance for each. Did my values 'show', did I (or could I) influence their 'choices' by the way I presented information, and even could I be 'objective' enough to interpret their meaning to the data and not fuse it with my own! How could I possibly account for all of this in my journal or the final thesis?

The peak of this angst brought with it a sense that the study would be flawed resulting from a lack of equipoise by myself in my conduct of the research procedures.

*Learning that the study would not be 'perfect' suggested inadequacy and flawed learning or inadequate effort. While self-reflexivity prompted the need to apply realistic limits to delivering the study that was of a high ethical standard and methodologically sound with sufficient researcher competence, I also needed to accept that limitations were permitted and entirely acceptable alongside the appropriate discourse of reflexivity and recommendations.*

During IRAS application and review

A heuristic note to myself at this stage reminded me the flexibility of this approach offered the opportunity to set a research design that aligned to this case study (Hyett et al. 2014). Appraisal of data collection methods showed a degree of understanding of the qualitative research approach and how I was responding to these principles to investigate my chosen phenomena.

#### **4.9.2 Questionnaires**

Questionnaires may be used for data collection where information from research participants of factual (often descriptive), attitudinal (seeking opinions or beliefs) or

exploratory (to explore a pre-determined theory) nature is required within the research design (Cohen et al. 2000; Rees 2003; Wagstaff 2006). The data obtained is survey style with descriptive information as a main feature. However, on their own, questionnaires are unlikely to provide comprehensive research answers.

Designing a be-spoke questionnaire posed practical and theoretical elements as part of the process. Ethically the participant's position must be pivotal to the planning, design, piloting and practicality of the document produced, while the researcher is required to demonstrate validity through the methodological rigour and technical presentation (Cohen et al. 2000). The balance of purpose, research design effort, strengths and limitations of a questionnaire data tool was deliberated. During the design phase I proposed that questionnaires could provide emphasis for the focus groups questions, and corroboration (or not) for data collected from other sources as part of triangulation.

A questionnaire is a familiar tool for data collection in healthcare research (Rees 2003) as they are relatively cheap, and have sound ease of analysis for the researcher. For the respondent, there is high anonymity and are perceived to be easy to complete. However, the use of questionnaires is so common-place that response rates can be low for topics seen as less important to the sample population. If the rate of response is below 50%, it is likely the views may not be representative or indeed generalizable to the group under investigation (Rees 2003).

Two questionnaires were used in this study. The rationale for each document is offered below, and the strengths and limitations (see section 4.9.4.2, p133-134) applied to this study design are presented in table format (Table 4-4, p134).

#### **4.9.3 Study Questionnaire**

The initial questionnaire was used to confirm demographic data, pregnancy discomforts, pre-pregnancy exercise participation, and obtain information about pregnancy exercise participation including reasons for attending aquanatal (see Appendix 5, p329-336). There were also questions about support from healthcare providers and others to this gestation and planned access to the same providers for the remainder of the pregnancy. Measuring levels of physical activity participation pre-pregnancy, during the first trimester and planned exercise participation was included and required the integration of a standardised scale for comparison of exertion.

Perceived exertion is the measure of how strenuous a specific task is for an individual based on their affective and subjective experience of the activity involved and their current capacity for such effort. Borg's Rating of Perceived Exertion (RPE) is a category-ratio scale designed as a means to measure intensity level of physical activity based around the person's acuity of increases to heart rate, breathing, perspiration and muscular fatigue attributed to the specific physical exertion (original work from 1960's and 1970's detailed in Borg 1998). This scale consists of a series of linear numbers and verbal 'anchors' used by individuals to give numerical responses that equate with altered physical stimulus power, heart rate (HR in bpm) and oxygen consumption (Borg 1990 and 1998) categorised by the exerciser. RPE can be utilised in a variety of settings including for pregnant women, especially where self-monitoring is preferable to radial pulse monitoring or clinical measures including accelerometers (Wolfe and Weissgerber 2003; American College of Sports Medicine (ACSM) 2010; Ritchie 2012). Utter et al. (2004) proffered the modified Borg CR-10 scale of 0-10 (the original Borg RPE scale was 6-20 (Borg 1998)), which was viewed as a valid tool to measure effort and exertions ensuring difference to be reliably recorded by participants in this study (see Appendix 5, p329-336).

The design is crucial to the quality of data as once answers are submitted, the researcher cannot clarify interpretation with the respondents (Wagstaff 2006). To address this the fixed choice and open-ended questions were shown to research supervisors and colleagues, revised and piloted by non-pregnant woman outside the class for appropriateness and applicability (Rees 2003; Wagstaff 2006). Care was taken in the instructions, style of question structure and type of answer (in terms of researcher analysis) ahead of NHS ethical submission to enhance simplicity of use by participants (Rees 2003).

#### **4.9.4 Validated Questionnaire during pregnancy.**

An additional questionnaire to obtain leisure time physical activity and exercise participation data was sourced from a range of other studies. Three validated questionnaires were identified and critiqued for suitability for the current study: The Pregnancy Physical Activity Questionnaire (PPAQ) (Chasen-Taber et al. 2004a) the Kaiser Physical Activity Survey (KPAS) in pregnant women (Schmidt et al. 2006) and the

International Physical Activity Questionnaire (IPAQ) a population measure tool (Craig et al. 1993). The Leisure Time Physical Activity (LTPA) questionnaire during pregnancy was briefly considered (Aittasalo et al. 2010) but discarded as it reported to favour moderate to vigorous activity and relies on using pedometers and log records for participants. A tabulated overview of pregnancy activity questionnaires can be found in Appendix 6 (p337-342) – PPAQ, KPAS, and the IPAQ.

The KPAS questionnaire is based on the Baecke physical activity survey (Baecke et al. 1982) and specific measures were attributed to activities based on internal calibration indices, using objective accelerometer measurements compared with and alongside PPAQ results. Schmidt et al. (2006) reported this questionnaire was altered specifically for this research to validate the tool with pregnant women. On closer examination the eleven occupational activities and fifteen on sport and exercise participation appeared to provide emphasis on these areas of physical activity and less on active living (four activities). For example, without consistency across occupations, the data collected would be difficult to analyse due to variations in sedentary and physical activities for participants. The overall document featured 41 categories.

The eight IPAQ instruments (four long for research activities and four short for national observations) are devised for telephone or self-administration originally from work by Booth, and aimed to establish an international set of comparable measures across and within countries around the globe (Booth 2000; IPAQ no date). The validity and reliability has been corroborated by accelerometer and similarity to other self-report questionnaires (Craig et al. 1993; IPAQ Group no date). However, the specificity of each section of the tool may have offered limited or biased reporting (options of vigorous, moderate or walking intensity only) of active living experiences by women.

In contrast the PPAQ appeared more focussed on home and leisure participation activities and a time-interval (past three months) that is more likely to prompt accuracy of recall across the identified categories. Chasan-Taber et al. (2004a) and Cohen (2013) suggests the questionnaire should take 10-15 minutes to complete. The version used was accessed at the Medical Research Council (MRC) within the Diet and Physical Activity (DAPA) Measurement Toolkit (MRC no date; as the PPAQ Questionnaire no date; and PPAQ Protocol and MET values no date). Participant activity estimates are based on six time options with consistency to all thirty-two designated activities consisting of: six



care-giving; three sedentary activities at home; one transport/travel; five housework/gardening; four walking; five active living; and five work related physical activities (see Appendix 7, p343-348). Each participant could add two specific activities which could be either sport or exercise not otherwise stated.

The average weekly energy expenditure ( $\text{MET} \cdot \text{h} \cdot \text{week}^{-1}$ ) is calculated according to a specific value presented on the protocol ( $\text{MET} = \text{Metabolic Equivalent of Task}$  where 1 MET equals  $1\text{kcal}/\text{Kg} \times \text{hour}$ ) (see Appendix 8, p349-354). Each activity is allocated a MET value based on the intensity from: sedentary (below 1.5 MET), light (1.5 to 3 MET), moderate (3 to 6 MET) and vigorous (above 6 MET) (Chasan-Taber et al. 2004b; Brett et al. 2015). The activities included in the PPAQ appeared more compatible with women from a range of life-experiences and levels of participation in physical activity.

#### 4.9.4.1 *Pre-validated questionnaire in this context.*

A pre-validated questionnaire designed to examine pregnancy physical activity was chosen to add data that could be used to seek information on the group, in more general terms for their physical activity level and perception of exercise modes. This questionnaire was viewed as having potential to offer additional information alongside the initial study questionnaire and the focus group data. The completion was linked to focus group attendance as an additional measure of various physical activities by participants during the preceding three months. The calculation for energy expenditure linked to each activity was completed. The PPAQ data presented part of the triangulation for individual and cross-case participant during thematic analysis of physical activity before, during pregnancy and post-birth (see section 6.2.3, p189-195; and section 6.4, p204-210).

#### 4.9.4.2 *Strengths and weaknesses of self-report questionnaires.*

Self-report questionnaires can present objective data to the researcher for scrutiny (Wagstaff 2006). This data from fixed-choice and closed questions can be rapidly combined to offer simple statistical information. The researcher interrogates this data for single, multiple and dichotomous questions using a pre-determined frame for answers. Open-ended questions can present the researcher with more subjective problems during coding of answers, and researcher bias must be avoided (Cohen et al.

2000). I proposed to preserve the participants 'own words' which offers greater 'candour' and 'authenticity' to such data and its presentation (Cohen et al. 2000).

As three quantitative mode questionnaires were presented to participants at scheduled times during data collection, the strengths and weakness were considered as part of the progressive focussing during the research (see Table 4-4, below). While Cohen et al. (2000) suggest responses rates can be enhanced by incentives, I felt this was unwarranted and unnecessary due to the perception of obligation to participants which is ethically unsound.

**Table 4-4 Strengths and weaknesses for self-report questionnaires**

Strengths	Limitations
Measure large numbers of participants for low cost.	Challenge of recall accuracy eg physical activity during first three months of pregnancy.
In theory, does not affect behaviour.	Ambiguous use of language and phraseology within questions eg Borg score may not be familiar with participants.
Various types of physical activity can be evaluated.	Response rate may be compromised by participant comprehension.
Calculation of energy expenditure can be made.	Incomplete or unclear answers.
Can be used for broad population sample.	Relevance of specific activities may not be applicable to the sample eg PPAQ language.
Measures may be adapted for specific population characteristics eg pregnancy.	Sensitivity may be limited as difference may be limited between sequential questionnaires eg scheduling of focus groups.
Potential to cross compare with other locations when same tool is used	

(Adapted from Hills et al. 2014, p11).

#### **4.9.5 Focus Groups**

Focus groups began as 'focussed' interviews (originally Merton and Kendall 1946, the definition used by Stewart et al. 2007, p1) and established as a qualitative science data collection tool significantly since 1980 for anthropology, social and health sciences. Given the increasing popularity of researching the nature and behaviour within community settings, focus groups are seen as a more creatively flexible approach to properly investigate characteristics and performance within and between groups (Stewart et al. 2007). Participants, who share a common interest or situation, are

brought together by a 'moderator', to explore a phenomenon through the gathering of data about individuals experience within that specific setting. The data gathered can reflect a dynamic survey of characteristics, individual and group behaviours, that offers the researcher options to explore sociological, clinical or other perspectives by focus of the discussion. Whilst the collection of data is intended to remain aligned to a predetermined interview schedule, Franz (2011) suggests that an 'unfocussed' focus group will present additional insights into a particular study that can be instructive of the culture and experience of the participants. Unfocussed is assumed when debate occurs that is not directly related to the research objectives.

Franz's (2011) observations compliment the advantage of focus groups in observing group dynamics together with exploring individuals thinking, processing and 'decision making' about sharing of information and knowledge between people. The group situation is likely to offer opportunities that stimulate interactions and considerations as individuals participate in conversations (Stewart et al. 2007). One confounding issue to consider is the effect that 'demographics, personality and physical characteristics' of individuals within the group may have on one another and subsequently the group cohesion (Stewart et al. 2007, p10). Groups may therefore be matched for criteria, for instance market research in particular however, many focus groups have the potential to have diverse membership and thus there may be confrontation and even emotional interludes (Stewart et al. 2007). Alternatively, empathy and commonality may add to disclosure by individuals who then feel validated in their beliefs and decisions (Madriz 2000, p842).

Focus group recruitment of no less than four and no more than twelve is recommended (Smithson 2008) so that participants are comfortable to express perspective of the topic and not inhibited by being unable to participate in discussions (Stewart et al. 2007; Franz 2011). Membership based on selecting participants primarily by characteristics can present difficulty as matching could be problematic. However, the influence within groups due to familiarity with others does need to be established and indeed may devalue the data collected (Franz 2011). Inclusion in group membership should also be encouraged for individuals who may experience barriers to participation (such as

irregular attendance due to shift working) so the balance of opinions in data is enhanced in depth and detail.

Best practice for facilitation or moderator role includes excellent inter-personal competence with the participants whilst also having sound knowledge of the subject area, respect for views but alert and responsive to evolving discussion promoting continuity in themes and integration of varied opinions (Stewart et al. 2007). The need for moderator humility in recognising that the participant role is vital, and showing appreciation by providing refreshments and a suitable environment can be essential to positive participation.

Karger (1987, p54) is quoted by Stewart and Shamdasani (2015) as stating the ‘... best facilitator has...chameleon-like qualities ...’ which would suggest the role is neutral but functionally able to encourage participation of attendees to promote focused discussion. However, it must be carefully considered that some may see a facilitator as a leader even if by token. Care must be taken to remove the potential for the moderator to exert any form of influence or seek prominence during the focus group process.

Moderators must to be mindful of understanding their biases regarding the subject under study and find a suitable way for being able to put these aside during group meetings (Stewart and Cash 2011). Two options include: regular discussions with research supervisors, specifically ahead of the first focus group, and to record field notes without significant delay following the group, to ensure a consistently level approach to remaining professional throughout the data collection procedures. A degree of inquisitiveness about participant’s thoughts, questions and comments that is a normal trait for the moderator is also viewed as necessary. A responsive ability to present questions and a flexible approach to responding to in-group events are valuable qualities for the moderator (Stewart and Cash 2011).

One singular issue that may impact on group dynamics is the intimacy presented by the moderator as a group member. Stewart et al. (2007), present this as a difficulty which may influence the participant responses and skew the data. Additional threats to objectivity are inherent behaviours of the moderator, for example, responses that unconsciously affirm or indicate contrary positioning to the contributor which may

interrupt the discussion through bias and negatively affect the validity of discussion. This specifically links to the tensions of being a novice researcher on the DProf pathway and at the same time a professional midwife. Careful consideration of question type usage, moderator characteristics, presence and the physical situation must be mediated for during the design and preparatory stages of the research (Stewart et al. 2007).

Consistency to preserve internal control by the moderator should be integral to preparing both before and after phases of each focus group discussion, in addition to throughout each stage of the data collection phase. While this may suggest experienced moderators would be preferred, there could also be an argument that a comprehensive understanding of the broad research phenomenon and the group members may actually be productive to establishing focus and encourage verbal participation of attendees. Prepared guides for moderators can actually promote positive facilitation where pre-consideration of question types (namely leading, testing, obtuse, factual), setting of ground rules, and the moderators use of silence, reducing 'sources' of bias (Stewart and Shamdasani 2015).

#### **4.9.6 Audio-recording**

One of the common observation methods for focus groups is to record them, using audio and/or video modes. Good ethical practice (attained through study of the Good Clinical Practice [GCP] certification from National Research Ethics Service [NRES]) suggests that written permission is gathered ahead of the meeting by the moderator with clear setting of ground rules and boundaries ahead of the discussion starting. The role of the moderator begins with careful restating of the confidential nature of the discussion so that individuals are not identified in any reporting. Care should be taken to establish rapport between attendees within the initial agenda and the outlining of the discussion topic. The verbal and non-verbal cues of members need to be used to guide full participation in the group dialogue. While 'observers' may be used, their presence, even if they are seated on the periphery of the group, can be distracting or cause inter-group consciousness affecting interactions (Stewart et al. 2007).

Simons (2009) reminds us that audio recording alone is not without peril. Equipment failure is an unseen flaw for any researcher who may then need to use an alternative

strategy or tool to record data. Ensuring clarity of verbal recordings is also vital as listening to focus group discussions more than once is often critical to the transcription and capture of maximal data (Stewart et al. 2007).

#### **4.9.7 Researcher Observation and Field notes**

Note taking often runs alongside audio recording in that the field notes add depth to the words used by the responding group members. The taking of notes allows the moderator to concentrate more fully on the social and interpersonal dimensions as they will have the audio file to aid memory of the focus group process (Simons 2009). Failure of concentration can still occur which can lead to failure to 'hear' the specifics that illuminate the dialogue, for example, accents on phrases, facial expressions and use of gestures, alongside the occasional need to respond or refocus the discussion.

Developing a tool to record notes may alleviate researcher anxiety positively and aid the interweaving of the data more coherently, especially if the transcription of audio cannot be done in the ideal and timely way. Therefore, the field notes require completion as soon after the event as possible with notes made at the time.

#### **4.9.8 Data records and other sources**

A weekly attendance number and records made by myself as the class instructor were also seen as additional data sources that underpin focus group relationships and have the potential to triangulate the discussion themes. The social media (Facebook) group was also monitored during the data collection period and cross-referenced to physical activity during pregnancy and peer support themes (see 6.3.3.4, p210; and 6.4.2.4, p220). It is noted that social media contributions may be potentially affected by aspects of social desirability and conformability to peers (McCambridge et al. 2014, p267) amongst group members (see section 4.2.2, p106-109).

## 4.10 Design for data analysis

### 4.10.1 Framework for Data Analysis: Introduction

#### 4.10.1.1 *Quantitative data analysis*

Study questionnaire data was to be entered manually into an Excel spreadsheet specific for each question and stratified for each answer option. The identity would be preserved by the identifier given to each participant which enabled comparison with data from each focus group initially and then across the antenatal and postnatal focus groups. At the start the frequencies were to be recorded for example marital state, full or part-time employment and level of education. Such participant characteristics would then aid comparison to illuminate study questionnaire data of exercise motivations prior to and during pregnancy, and later the qualitative focus group data themes.

#### 4.10.1.2 *Qualitative Data analysis*

Qualitative data analysis is a series of steps whereby the data collected within a study is scrutinised for explanation and understanding of the phenomenon being researched (Simons 2009). The transcription and coding framework involved close immersion of myself in the data collected and established the cross mapping of each data set between participants and between collection tools. This interpretation of data requires organisation and the management of data reduction by deliberation and interpretation through a structured analysis using one of the described traditions (Spencer et al. 2014a). The clarity of data coding and theme mapping at all stages is key to deep interpretation of thinking and writing (Bazeley 2009). The final reporting presents additional refinement opportunities after the initial period of formal analysis, providing extended interpretation and practical application capacity.

Qualitative data is essentially non-numeric or textual. The information gathered from various sources, using various tools describes meaning from the perspective of the study participant and is often context specific. Verbal, non-verbal and the written word are the most common types of data collected during research, each emerging from communication. Maykut and Morehouse in 1994 (p17) define an understanding of such data as:

*“Words are the way that most people come to understand their situations. We create our world with words. We explain ourselves with words. We defend and hide ourselves with words.”*

While words form most qualitative data, the information is descriptive about individual participant’s qualities or beliefs and cannot actually be quantitatively measured. Thus, the analysis relies heavily on the informer’s description and the researcher’s understanding of the participant’s meaning. The investigators objectivity (see section 1.6, p26-27) must be maintained throughout the data collection and analytical phases (see section 5.3, p162-169; and section 6.2, p178-195 respectively) to preserve authenticity and trustworthiness for the research findings.

#### 4.10.1.3 *Overview of approaches to data analysis*

Spencer et al. (2014a) state that there are two recognised types of data analysis strategies: ‘substantive’ which is composed of grounded theory and thematic analysis; and ‘structural’ which includes discourse analysis, content analysis and narrative. The former looks for meaning within the text, whilst the latter concerns the interactive nature of the language and structure of the text.

Each type was considered for the advantages and fit for the study design. One traditional approach is conversational analysis, where the investigator focuses on the ‘conversation in terms of interaction and linguistic processes’ (Spencer et al. 2014a). This analysis relies on language to express the behaviour or organized action and is contextualised in the participant’s reality (Silverman 2006). As language was not a primary feature in the research objectives this analysis was not chosen.

Discourse analysis has its roots in language and often uses a specific time and place looking primarily at the analysis of social constructed events (Spencer et al. 2014a). A subjective stance is more likely as the researchers examine social interactions and not the expressed beliefs in the bound context, meaning this is better fitted to single mode or specific time period of data collection. Spencer et al. (2014a) differentiate between induced (produced within a research study including texts and other observational data) and spontaneous discourse (from theoretical frameworks and underpinning social concepts associated with the study phenomena), whilst suggesting that settings are often formally controlled. This type of analysis was not chosen as the dynamic nature of



the aquanatal group over the time planned for data collection, means that language is not the main focus.

Krippendorff (2004) defined an alternative process to analysis whereby the stages equate to defining the source, a process of encoding which is context specific, examination of the relationships and patterns that cross categories and finally decoding using validation and interpretation. This strategy follows the general principles of an inductive process where single codes are combined to form categories and has an iterative plan similar to that described by Braun and Clarke (2006) for thematic analysis.

#### **4.10.2 Methodologies for data analysis**

The analytical strategy adopted for this study was based on a combined approach, namely the inductive style described by Boyatzis (1998) which utilises a data focused approach, and the six stages of thematic analysis described by Braun and Clarke (2006) (See Table 4-5, p142 and Table 4-6, p143). A multiple lens or triangulation approach in this sense takes data from each data set (for example from the study questionnaire, focus group and pre-validated questionnaire), undertaking initial analysis of each and then combining the strands of analysis. Fereday and Muir-Cochrane (2006) describe this as a 'hybrid' approach while describing the process as 'iterative' due to repeated reviewing the original data and the aggregated themes and subsequent links between categories.

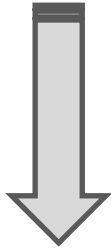


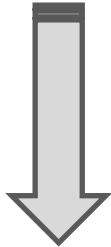


The researcher's role was therefore to seek out patterns in the words and phrases, presenting these for others to scrutinise whilst maintaining the 'construction of the world' as the respondents experienced it in their frame of space and time (Maykut and Morehouse 1994, p18; Spencer et al. 2014a). The embedding of integrity by the researcher into the framework strategy, where there is interdependence with participants and researcher requires the results to be reflective of the 'meanings', 'experiences' and 'participation' of participants in the offered results (Maykut and Morehouse 1994, p18). Braun and Clark (2006) detail the iterative process as a series of six steps to achieve the integration of data to concepts, conveying the expressed meaning of participants through inductive principles (see Table 4-6, p143 which illustrates this application for the current study).

**Table 4-5 Framework for single participant and cross participant data analysis**

For each participant	1	Open coding – participant focused with definitions entered for clarity. Broad general themes – describe rules for inclusion.
	2	Categorising stage 1 themes – consideration, merge and re-label taking account of codes. Organise into framework for analysis.
	3	Review ‘new’ themes and further reduce to seek ‘detail’ of insights of qualitative data. Generate ‘new’ meanings from emerging sub-themes.
	4	Write up summaries of each case.
Cross participant consideration	5	With stage 3 data, start to map across participants. Review and consolidate codes and thematic categories.
	6	Compile analytical summaries for categories, accounting for codes and consider meaning(s). Participant profile and influences on ‘data’.
	7	Validation – review evidence from ‘whole’ data to support findings.
	8	Compile report from analytical summaries which will develop the findings and discussion chapters of the thesis.

Thematic analysis is widely used across research methods as a tool that is independent of the approach but flexible in its potential to engage in a “rich and detailed, yet complex account of data” (Braun and Clarke 2006, p5). An inductive rather than theoretical approach links the identified themes to the data and the ‘analysis is data-driven’ (Braun and Clarke 2006, p12). The process of analysis begins and continues throughout data collection alongside the integration of writing on and of the process, embedding literature that initially informs the researcher on the tool and latterly in enhancing the skills required to develop effective analysis of the data (Tuckett 2005, p77-78).

**Table 4-6 Computer Assisted Qualitative Data Analysis Software (CAQDA) process stages using NVIVO**

Analytical Process (based on Braun & Clarke, 2006, p16-23).	Braun and Clarke (2006) Practical Application in NVivo	Strategic Objective	Iterative process throughout analysis
1. <u>Familiarizing yourself with the data</u>	<b>Phase 1</b>  Transcribing data (specifically focus group(s)).  Reading and re-reading the data.  Noting down initial ideas.  Import data into the NVivo data management tool.	<b>Data Management</b>  <i>(Open and hierarchal coding through NVIVO)</i>  	Assigning data to refined concepts to portray meaning  
2. <u>Generating initial codes:</u>	<b>Phase 2</b>  Open Coding.  Coding interesting features of the data in a systematic fashion across the entire data set.  Collecting data relevant to each code.		Refining and distilling more abstract concepts  
3. <u>Searching for themes:</u>	<b>Phase 3</b>  Categorisation of Codes.  Collating codes into potential 'candidate' themes (p19).  Gathering all data relevant to each potential theme.	<b>Descriptive Accounts</b>  <i>(Reordering, 'coding on' and annotating through NVIVO)</i>  	Assigning data to themes/concepts to portray meaning  
4. <u>Reviewing and refining 'candidate' themes:</u>	<b>Phase 4</b>  Coding on.  Checking if the themes work in relation to the coded extracts (level 1) and the entire data set (level 2),  Generating a thematic 'map' of the analysis.		Assigning meaning  
5. <u>Defining and naming themes:</u>	<b>Phase 5</b>  Data Reduction  On-going analysis to refine the specifics of each theme.  Add the overall story [storylines] the analysis tells.  Generating clear definitions and names for each theme.	<b>Explanatory Accounts</b>  <i>(Extrapolating deeper meaning, drafting summary)</i>	

<u>6. Producing the report</u>	<p><b>Phase 6</b></p> <p>Generating Analytical Memos.</p> <p><b>Phase 7</b></p> <p>Testing and Validating.</p> <p><b>Phase 8</b></p> <p>Synthesising Analytical Memos.</p> <p>The final opportunity for analysis.</p> <p>Selection of vivid, compelling extract examples.</p> <p>Final analysis of selected extracts.</p> <p>Relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.</p>	<p><i>statements and analytical memos through NVIVO )</i></p>	<p>Generating themes and concepts</p>
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(Adapted from Braun and Clarke (2006, p35) and Spencer et al, (2014a, p281).

A qualitative approach takes a methodical and holistic approach to investigating phenomenon where words and actions are critical to examination of study participants inner world to aid the portrayal of their perception, seek understanding and elucidate the associated social processes. The non-mathematical approach or lack of hypothesis takes an inductive method to the thematic inquiry that does not presume generalizability but contextual findings that could offer transferability.

#### 4.10.3 Basic application of Thematic Analysis

The data collection strategy is based on the inquiry focus – case study - and in this instance data from participants collected at focus group discussions, producing verbal recordings, and from two types of questionnaires and completed documents gathered at intervals from consented individuals. The focus group transcriptions offered participant accounts which captured their perceptions or experiences related to the research inquiry (Vaismoradi et al. 2016).

Patterns in common within the data sets is characterised by recurrent meaningful phrases where commonality of explanation presents as a ‘theme’. Subthemes share the central concepts of ‘themes’ bringing together facets of responses which contribute to a main ‘theme’ often by means of related research foci. Alongside participant qualitative

data, the researchers field notes sought to add illumination to the dynamic group over the period of data collection. Thematic analysis then sought to discover the latent level of meaning from the collected data (Maguire and Delahunt 2017) beyond the description attributed to the spoken or written word and then to combine the participant's perspective within the social and contextual precincts for the case study group.

The data are reduced through inductive reasoning into smaller 'units' (Lincoln and Guba, 1985) or distinct 'incidents' (Glaser and Strauss 1967) which form 'coding units' (Stemler 2001). Pre-defined codes are not used as the nature of sense making is based on the process of using the participants 'experiences and world view' (Lincoln and Guba 1985). Labels for codes, concepts, categories or themes may be identified as 'in vivo' (directly from the data), from 'priori' (from literature) or adopted by the researcher to encapsulate the discussion (Spencer et al. 2014a, p272). Each code and label must be clearly described to ensure the replicability of the process when large volumes of data are effectively reduced and the required comparison between coding categories is orderly and logical.

Ely et al. (1997) point out that qualitative analysis is a dynamic and recursive (but not generally a linear) process. This applies particularly to thematic analysis where flexibility to the data is viewed as a significant advantage.

#### **4.10.4 Using computer assisted qualitative data analysis software (CAQDAS)**

The use of CAQDAS does not remove the basic tasks of data interpretation from the researcher. The data management tools offered by such software do offer an enhanced efficiency to support in-depth analysis, where the analysis remains with the investigator (Spencer et al. 2014a). A transparent auditable pathway for coding, identifying patterns, progressing to categories and themes through description, to explanation and academic synthesis of the data analysis reinforces trustworthiness and rigor to a qualitative study.

The main CAQDAS packages are NVIVO, Atlas.ti and MAXQDA (Spencer et al. 2014a) and offer data management and an opportunity to manage the project effectively. In addition, each offer file links between demographic data and 'interview' data, which can then be combined before interrogation to assist interpretation. Benefits include the swiftness that quantities of data can be accessed and once the data base is established

the rigour that can be achieved by consistency of interrogation techniques (Spencer et al. 2014a). Critics have suggested the immersion in the data may contribute to loss of context with the original 'interview', while some would see the ability to link back between various files may encourage short-cuts in the analytical process (see for example Baškarada 2014). Spencer et al. (2014a) highlight that CAQDAS are selected tools to aid, and not to replace, the formal analysis and interpretation.

#### 4.10.4.1 *NVIVO: Theory-building software*

The choice of software package was determined by the nature of the data being collected and the researcher already being partly familiar following a research skills development opportunity. This program is built on a code-and-retrieve function and adds facilities such as sophisticated searches (both text/lexical and code based), diagrams and networks, memos, and ways of developing the code list or codebook. Today, this is one of the most frequently used CAQDAS (Computer Assisted Qualitative Data Analysis) (Lewins and Silver 2007; Saldaña 2016).

Code-based theory building software supports the researcher in the rigorous analysis of qualitative data, utilising thematic coding to collected data passages and allowing data reduction by identified themes (Lewins and Silver 2007). Searches of data sets was within single data transcripts (single participants) and developed later across multiple data transcripts (cross participant comparison) enabling strategic development of thematic analysis between variable sources of data collected during the study. Descriptive data resulting from quantitative demographical answers aided the organisation of cross participant comparison. The researcher directs this analysis and interpretation through a series of phases and processes (Lewins and Silver 2007; Spencer et al. 2014a) where theories are tested and explanations grounded within the data are identified.

Managing and organising data for a novice researcher may appear initially daunting. The framework provided by CAQDAS software allows connection to the 'project file' via a link between internal and external data folders so all sources are simultaneously 'at the researcher's finger-tips'. This closeness is likely to aid greater interaction between data

collections and researcher than that afforded by manual coding and analysis strategies (Lewins and Silver 2007; Bazeley and Jackson 2013).

Building the architecture of the database for the study took place ahead of the first recruitment. This ensured that records during the data collection phase could be 'managed' from the beginning. Focus group transcription, progress notes and demographic categories were stored as data records, memos and attributes (respectively) which, when the coding took place, enabled relationships and queries to be recorded synchronously (Bazeley and Jackson 2013; Spencer et al. 2014a).

#### **4.10.5 Identifying themes**

Ryan and Bernard (2003) highlight the importance of making clear the technique for the discovery of qualitative data themes. They argue that by not clearly identifying and describing these early in the analytical process, the researcher will have difficulty in establishing the credibility of the confirmation phase. A positive outcome of this process is the strengthening of the methodological choices when themes are clearly defined according to the research objectives (Ryan and Bernard 2003). In addition, theme identity which is expressed in terms that are 'jargon-free', allows accessibility for research to reach wider audiences crossing barriers of professions or methodological discipline.

Combining these techniques within a strategy for this study, the researcher viewed the identity of themes as vital to the qualitative data analysis procedure. Whilst the identification is the essence of the technique, the terminology used is often based on methodological perspective, specifically categories (Glaser and Strauss 1967), thematic units (Krippendof 1980) or labels (Dey 1993). As thematic analysis had been the investigator's choice, the term 'theme' was used during initial coding which is consistent with an inductive approach. The essential base for theme identity is that it arises from the text by virtue of concept and expression (Ryan and Bernard 2003) together with the cognitive understanding of the investigator (see Appendix 22, p286-289 and Appendix 23, p290-292).

## **4.11 Achieving Ethical Approval**

### **4.11.1 Reflective narrative**

The significance of undertaking practitioner research while meeting ethical standards cannot be fast-tracked and as such the reflexivity on this process provided an appreciation of rigorous preparation in such instances. Difficulty with gaining REC approval appeared to be because the principles correlate with a bio-medical focus which do not fit easily for qualitative studies (Leisey 2008) where 'procedures' and 'risk-benefit' decisions are less precise than for quantitative studies (p421). The application system was labour intensive and time-consuming and a considerable hiatus to the research flow between the design and data collection phases. In hindsight the complexity of addressing and justification of a qualitative methodology took precedence over the ethical considerations, as I aimed to master the requirements of the IRAS documentation over the research design of the study.

As a midwife I already had a code of ethics within my professional role and responsibilities which I tried to embed within the documents. Initially I did not account for my position as a researching professional in a non-NHS environment to be of concern to fellow health care professionals as well as the lay members of the REC committee where the application was scrutinised. This together with the classification of potential participants as vulnerable (pregnant) and that the activity (water-based) had potential hidden risks meant the balance of risk was pivotal to the approval process.

Following the first REC presentation, the flaws were identified, rectified and embedded in the modified Integrated Research Application Service (IRAS) application. An improved research design also addressed balance of risk such as accidents and incidences, the burden on potential participants of complex data collection and the various elements of potential biases. These prejudices for bias may include: convenience sampling as non-inclusive, omission through exclusion criteria, procedural bias by obligation of volunteering, response bias for respondent's answers and interviewer bias on my part as a researching-practitioner. The dilemma of the practice-self and the researcher-self were observed to be part of the inexperience as a post-graduate researching professional.



#### **4.11.2 NHS Ethical Review**

Applying for and gaining ethical approval for this study required tenacity and motivation. In retrospect, more formal training to support the procedures and completion would have advanced the journey and learning more positively. Research stewardship was not something that presented as a clearly organised or arranged set of steps, thus presenting an often incoherent path through project management. Regularly the documentation appeared repetitive or completely at odds with the qualitative methodology of the proposed research design. The research proposal was re-drafted, re-fashioned and 'fitted' specifically for inclusion in the submission.

Information documents for participants proved that meeting an ethical standard was more patient-centric than anticipated, and required an attention to detail that implied inadequate competence on my part. Concerted effort with input from patient group expertise allowed the phrasing and language to be improved and approved by the NHS REC committee.

The IRAS application for the NHS ethics process, allowed an awareness of practitioner research, where the additional role as an 'ethically competent' researcher is critical to the research environment and to the context of this case study. Documents relating to the application and approval of NHS ethics can be found in Appendix 9 (p 355-356). As part of this process an on-line educational programme of Good Clinical Practice (GCP) was completed as well as the submission of a Research Passport, which together demonstrate adherence to pre-engagement standards required by the HRA approval practises (including for all National Research Ethics Service (NRES) and Research Ethics Committee (REC) processes). Following this, the Research and Development (R and D) Departments provided approval from the NHS Trusts based on the number of women who would be recruited and participate in the study.

#### **4.12 Developing as a researching professional**

Being a novice or emerging practitioner researcher presented significant intimacy as an insider within the context for this study (Drake and Heath 2011) which had relevance to a level of prior knowledge of the participants ahead of data collection. Appleby (2013) and Drake and Heath (2011) suggest this implies that asserting critical distance is

problematic, due to complexities of prior situational learning deep-rooted in the culture and knowledge of and about the community. I was acutely aware that from a historical perspective for professional contact with the group this was a dilemma with potential to hinder my objectivity during the entire research study. Nevertheless, as Appleby (2013) points out, undertaking a DProf presents two differing communities of practice: one within the world of academia and one within professional practice. It could be argued that the dynamic nature of either community offers a much deeper opportunity to harness the familiarity with the environment together with professional values and attitudes, to the required objectivity in the researcher perspective (Lee 2009; Taylor and Hicks 2009).

Professional development, where a topic spreads across and into adjoining health or social perspectives, can direct greater cross boundary working that has previously been known. The specialisms seek to enmesh the two knowledge bases (professional and academic) as well as the professional standpoints (Lee 2009). Practitioner-researchers embrace this focus within their methodological principles and study design, while later working through presenting and discussing the findings from varying lenses and perspectives (Scott et al. 2004; Wellington and Sikes 2006).

Professional Doctorates can be viewed as 'professional continuum' whereby the researcher examines a phenomenon for personal development rather than academic or career advancement (Wellington and Sikes 2006; Lee 2009). The sense of achievement from undertaking the actual process may thus be the intrinsic motivational influence, ahead of any advancement of early career prospects, particularly for health (and social care) registrants. Additionally, the complexity of balancing academia and clinical practice research roles may present very complex and demanding personal and work-based situations (Wellington and Sikes 2006; Taylor and Hicks 2009).

#### **4.13 Completing the research study**

Following the analysis of data, all results were examined and the thesis compiled, ensuring critique of findings and researcher reflexivity on the process undertaken to explore the area of professional practice. Crucial consideration of the multiple 'lenses' was utilised to view the data collected as an aspect of the rigor and validity of the findings.

#### 4.14 Conclusion

This chapter has provided an overview of the methodological journey and rationale for the choice of case study as a method best suited to the research aims and objectives. In this, I have also examined the advantages and disadvantages of both practitioner researcher and insider positionality, relating these into an integrated qualitative approach and the design for this study (see section 4.2.1, p104-106; and section 4.2.2, p106-109). The route through and the experience of ethical approval is given alongside a careful appraisal of the case context, together guiding the principles by which I will govern the data collection phase.

The choice of data collection tools and techniques used for this study are offered, making links to the detail of pre-fieldwork development and testing (see section 4.2.3, p109-111; and section 4.9, p127-139). By using questionnaires and focus groups the research aimed to capture the participant perceptions of wellbeing associated with aquanatal attendance. These together with class records and researcher journal data, presented various data sets which would be combined to address the research objectives. This specifically leads into the strategy for analytical methodology where the use of NVIVO to aid data management is justified to augment single and cross participant thematic analysis of the collected data (section 4.10, p139-148). Site specific permissions, and research and development access was agreed before fieldwork began and my transition to principal investigator for this study.

The next chapter takes forward the fieldwork phase of the study following my journey through data collection processes from preparatory deliberations through project management in the field, to the completion of this period of research work. The importance of various elements of the methodological considerations and procedures became more significant as they were applied practically.

## **Chapter 5 Fieldwork Report**

The next chapter presents the bridge between methodological design and the practicalities of data collection within the specific context of the case. During this period several re-appraisals of specific methodology and research design elements were encountered. In setting the scene, the importance of foreshadowed issues (see section 4.2.3, p109-111) and progressive focusing (see section 4.2.4, p111-112) as a continuation of the research design (Simons 2009) were linked and interwoven into each section of this chapter (see section 5.2, p159-162; and section 5.3, p162-169). In addition, my role as a researching professional required continuous self-awareness and reflexivity as the data analysis commenced concurrently to data collection presented here as reflective narratives.

### **5.1 Prior to entering the field**

Translating the data collection strategies into reality posed extra challenges for the researcher. The pathway through ethical permissions had presented a steady flow of questions and sustained effort to devise solutions in respect of potential bias associated with positionality of the researcher as an 'insider'. Fraser (1997) detailed her experience as a practitioner researcher through the theoretical dilemmas which were considered during pre-planning, and the practical application of research tools where a reflective pro-active approach is required for additional issues as they arose. The consistency of pre-defined strategies and in-action approaches require the flexibility of the researcher to maintain careful application of ethical principles throughout the study. Fundamental to this is the reflexivity of the researcher and the clearly identified motivation for their positionality as an insider within the study (Breen 2007).

#### **5.1.1 Emotion work and reflexivity within research**

Midwifery is principally a female profession with a small number of male midwives, where 'sensitive' and 'intimate' care is provided to mainly same gender recipients (Hunter 2001; Hunter 2010). As an occupation, midwives carry out paid employment which can be viewed as 'emotional labour' (Hochschild 2003 and 2012; Carter and Guittar 2014), directed by internal and external contexts and the techniques of rules to manage social interactions. These client centric interactions embrace cognitive, as well

as physical or sensorimotor activities for the midwife within varied emotionally-laden situations. The emotion experienced by midwives during episodes of care extend from fear and angst to elation and happiness (Gaskin 2002; Kitzynger 2008), bound almost entirely within a socio-cultural model of normality (Davis-Floyd and Sargent 1997). NHS Healthcare seeks to provide systems that streamline professional encounters, but can struggle where individualised planning reduces this sense of order, therefore adding to emotion work in-situ (Mann 2005; Hunter and Smith 2007). The informal structure of encounters between women and midwives in non-NHS environments may enhance the relationship between client and professional and allow either participant to manage the balance of emotion work as different to emotional labour.

Pregnant women specifically undertake 'emotion work' suggesting a journey through learnt processing to manage emotional change alongside the adoption of a new social role through individual social development and by socialisation (Theodosius 2006; Wilkins 2006). The nature of reciprocity in such relationships between women, and between women and midwives, appears to be authentic to the circumstances of the encounter (Hunter 2006; Carter and Guittar 2014). Social bonds and relationships evolve through social contact, directed by environmental situations and individual's emotional regulation responses or behaviours (von Scheve 2012). The shift of emotion work correlates with intensity of perceived need by either party, for example, between a woman and midwife during protracted labour and birth or physiological birth episodes. Communication as well as presence in the meeting (Hunter 2006; Riley and Weiss 2015) feature and contribute to the success or failure of the emotional work.

Dickson-Swift et al. (2009) write of the importance of being aware of emotion work which is integral to the 'lived experience' of the researcher during a project and specifically during fieldwork. They state that the investigation of social phenomenon is one area where emotion is significant. Their study considered sensitive topics, but conclude that much qualitative research should consider emotion of respondents as well as the researcher. Researcher's values will be tested during participant interactions and principally during the reflexivity and reciprocity aspects of project management (Lawton et al. 2015). Dickson-Swift et al. (2009) go on to offer researchers some advice for self-care (including informal/formal supervision and debriefing as minimal requirements) during the design, processes and completion of research reports.

Regular supervisory meetings during the detailed research design phase and NHS ethics procedures were valued, particularly when the process was not straightforward or consistent. Whilst the topic area was not thought to be 'emotional' or specifically sensitive, the REC committee asked probing questions, indicating their consideration of the potential psychological impact on participants from an entirely different perspective. As time went on, the 'emotional work' of the researcher did increase as the requirements altered and the design was amended to meet requests from outside the 'research team'. Signposting that is consistent during such internal and external processes would have been appreciated.

Reflective writing and narrative comment seeks to allow practitioners to explore and question aspects of practice (Bolton 2010). The intensity of reflection fluctuated, but occurred particularly during the data collection. As a novice researcher, skills of reflection-in-action (Schön 1991) posed the need for improvement of reflexive skills often in a dynamic frame of any contact points with the participants. Schön's reflection-in-action (1991) implies the presence of a sound and flexible knowledge base which can underpin the degree of innovation through responsive decision making in context. In writing these accounts in retrospect, I was hesitant that the recall offered a complete set of steps for all decisions, as the sequence of events felt hazy after the event. Uncertainty is difficult and often appears uncontrolled in the critical questioning of a clinical event or any activity. The personal nature of introspection felt at times stressful (Bolton 2010) and at other times indulgent (Boud and Tennant 2006) whereby the educational benefit seemed far off or out of reach.

Bolton's (2010) through-the-mirror approach to reflective writing, seeks to harness the professional responsibility of reflection on behaviour and skills within post experience thinking. Narrative text writing and formal supervision discussion do enable some degree of prior preparation for future interactions. The criticality of reflecting during research management is seen as a vital tool to providing ethical standards of sufficient and effective complexity to fit the study design and research processes, moderating the individual steps throughout. Thus, as a researcher, I used a critical reflexive approach of in-action (Schön 1991) and post-action narrative writing (Bolton 2010) while undertaking the examination of the study phenomenon.

A reflective narrative was derived from the continued accounts recorded during the research. As such the writing does develop in tandem with the critical reflexivity during the experience. Creative narration of personal development strategies and in-action decisions illustrate the journey and pathway taken. At times the emotion work occurred sporadically but at other times seemed continuous which made the researcher (objective and detached) and professional (empathetic and caring) roles appear conflicted. Dickson-Swift et al. (2009) comment on the need to self-manage the suppression of personal emotion, which requires concerted effort and body awareness, is potentially overwhelming or exhausting to researchers generally. The motivation to record my reflections of each focus groups defined a requirement for time to consider the events in a comfortable environment without distractions to expand notes I made immediately after the meeting.

Elements of insiderness (Burns et al. 2012) did impinge on the role conflict whereby moderating a focus group as the class instructor posed the use of 'having my researcher hat on now' phrase to emphasis to participants an objective approach to what they were discussing. I was initially ill-prepared for my personal emotional reaction to this position of detachment. Rapport is not a given, and participants used pre-group chatting to seek self-disclosure between each other and myself. An element of 'guarding' my research objectives felt unnatural and dishonest and challenged the nature of a reciprocal conversation ahead of the audio-taped focus group discussion. I have pondered this extensively, "tuning the stone over" (Dewey 1910, p57) repeatedly, and returning to the pre-group question threads I had planned, but found uncomfortable to use when the women initiated their own conversation topics spontaneously.

The potent mix of emotion work, reflection-in-action and 'through the mirror' reflexivity prompted consideration at many stages of specific skills of patriarchal power and research management, including episodes of self-doubt as well as determination for self-development. It took some time to be disciplined and trust my writing, to overcome my fear and accept responsibility to explore the many perspectives – my own and others – having drafted written and re-written accounts more than once (Bolton 2010). Secondly, I needed to overcome hesitancy or possible negative self-criticism and uncertainty around values and actions which arose throughout and to remain respectful of myself. Lastly, I am required to observe 'unconditional positive regard' (Rogers 1969)

and understanding for participants and myself within writing and any confidential sharing of experiences (Bolton 2010).

### **5.1.2 Social context of the aquanatal group**

This research has an inherent social focus which is fundamental to the aims and objectives of the study. The social space is viewed as critical to the data collection phase and highlighted the importance of the sociological lens during fieldwork. During pregnancy women form new relationships with healthcare practitioners and other women experiencing childbearing journeys, which may mirror or contrast their own and adapt their constructed habitus accordingly (Bourdieu 1984; Maton 2010). Central to this is the context for this group which is described earlier (see section 1.5, p19-26) and defines the setting and characteristics for the singular case being studied. Consideration and parallel understanding of this social context prior to entering and within the 'research field' was viewed as essential.

### **5.1.3 Reflective narrative**

#### **5.1.3.1 *Progressive focusing as a researching professional***

Various stages of the research design were punctuated by reflecting not just on the research aim and objectives but on my development as a researching professional. For much of this period, I found explaining the processing of my deliberations somewhat vague. The understanding of the different viewing lens attributed to my role as a professional involved in researching my own practice, appeared to contribute to a sense of confusion or 'messiness'. Substantial time was spent on investigating two subjects: researching professional and insider researcher upon which to develop theoretical understanding. A third topic was also studied – focus group moderation – which together with colleague discussion of the theoretical understanding, sought to gain specific competence for this role before fieldwork started.

It was much further into the research (the phase of data collection) that some consciousness of the 'progressive focussing' as an approach being followed became obvious. I came to understand that the process of focus was evolving alongside the research study as a developmental system. While some of this path was inevitable, the development of the study design provided a frame upon which to build the focus which



was later consolidated and refined further during the fieldwork phase. The links between stages became reinforced and refined adding emphasis to the 'progressive focusing' required as the study moved to the analytical phase.

As I approached the stage of data analysis and interpretation, I acknowledged the thoughts I had had about a 'progressive lens' which was bound up in the design and case context of the research processes. NVIVO offered a strong architectural structure for data collection and management from where I could commence analysis and interrogation whilst maintaining a thorough audit pathway.

#### 5.1.3.2 *Foreshadow Issues revisited*

The key issues that needed to be addressed included a requirement to be objective as a professional which as the group met outside an NHS setting meant I needed to be alert to the difficulties of subjectivity at all times I interacted with the aquanatal group. This revealed the need for continued vigilance during fieldwork including professional commitment to preserving confidentiality particularly during focus group discussion, which prompted careful consideration and development of moderator skills.

The dynamic nature of the group membership was also observed during data collection as another issue where my researching professional role had potential to engage respondent bias. Self-awareness and scrutiny through reflection after each class and study contact was essential (see Appendix 11, p361) and led to copious field notes which had to be refined to themes separate from the focus group data.

Another foreshadow issue was recognised as the potential to conflict with the woman's 'named midwife' care plan or advice through class interactions. A requirement for the focus group moderator role was to avoid engaging with the participant discussion threads as a midwife (not researcher) and thus minimised this. General class discussion was perceived as more tricky, although inter-professional courtesy has always been the base for any advice offered.

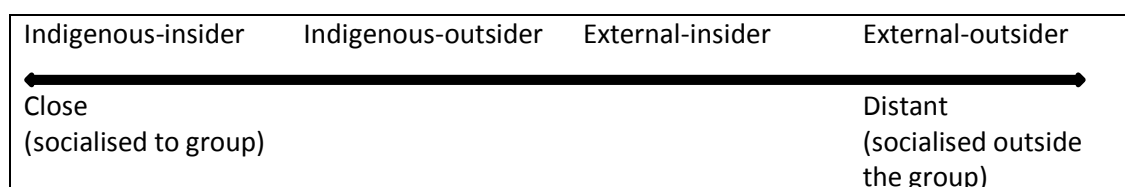
#### 5.1.3.3 *Returning to considerations of positionality*

'Outsiders' are researchers who adopt the perspective and position to study a group to which they do not belong (Dwyer and Buckle 2009). For 'insiders' by contrast, the researcher studies a group to which they already belong suggesting advantages

including developed knowledge of the specific group culture, and an ability to relate to individuals of the groups more easily and legitimately (Dwyer and Buckle 2009). The debate around the insider or outsider stance revolves around the researcher and is required to be considered at every stage of the enquiry: the research focus, study range and parameters, access to the field, the data collection tools, strategy for data analysis and all contribute to the validity and rigor of qualitative studies. Hence the importance of researchers identifying their position early in the design, and making clear their stance of insider (or outsider) (Breen 2007). Fraser (1997) highlights that personal values, potential biases, role conflict and time constraints are vital areas for reflexivity ahead of starting and continued throughout the study. These requirements are observed to underpin the data collection and interpretation during analysis, and can be viewed as sub-optimal for objectivity and accuracy when researchers adopt an insider position (Chavez, 2008). Being objective in settings where the researcher is familiar with the culture and has a prior relationship with some or all of the individuals in the sample, may present conflict from a desensitisation of familiarity (Breen 2007). For professionals, their role ascribes specific social or behavioural responses in specific situations. Such role conflicts can occur at any stage of the research, presenting the researcher with a dilemma in responding to or proposing a solution for specific 'in-vivo' data or situations (Fraser 1997).

An interesting interpretation of the insider/outsider debate is that researchers are not necessarily inside or outside, but may adopt partial positions in their stance between socialisation with the group and distance from intimacy with the culture, suggesting a continuum (Banks 1998; Chavez 2008). Both writers describe this concept as complex linked principally to the crossing into and out of the culture during the research process (see Figure 5-1, below).

**Figure 5-1      Diagram of insider/outsider as a continuum based on intellectual, cultural and social integration.**



(Originally from Banks 1998 and Adapted from Chavez 2008, p476).

Chavez (2008, p479) suggests a range of benefits and difficulties attributed to researchers having insider standing based on 'positionality', 'access' and 'data collection/ interpretation/representation'. Consideration of each requires the individual researcher to develop appropriate skills and perspectives concerning insider research in order to uphold rigor within social and health related studies. The practical basis for this necessitates the researcher to maintain critical reflexivity throughout the design, ethical review, data collection and writing up phases generally, but also specifically around the benefits or difficulties of their insider position (Chavez 2008). In deference to this I sought to maintain adherence to research design processes, and where challenges occurred, to reduce or 'eliminate' bias through effective reflexivity (Breen 2007). In order to enhance qualitative rigor (credibility, dependability, confirmability and transferability), the research design embraced triangulation of data collection, an auditable path through the study using researcher diaries, memos and documents, member checking options with participants and supervisors, and the detailed description of the case.

Fraser (1997) asserts the need for high ethical standards for researchers, and that work by House (1980) suggests motives should be deliberated in relation to the legitimate consideration of consequences of personal values for all field activities. These values relate directly to the social and political culture of the group and identify that dignity and respect of all participants is the minimal standards expected. The four values that House (1980) identifies are cited by Fraser (1997, p165) as: 'moral equality, moral autonomy, impartiality and reciprocity'. The issue of power can be diminished by 'insider-researchers' where the cooperative nature of seeking to produce work that is facilitated by the researcher but belongs primarily to the researched (Breen 2007, p163).

## **5.2 Arrangements for data collection**

### **5.2.1 Triangulation for fieldwork**

The design for this research offered several data tools for data collection. Method triangulation is described (see section 4.8, p125-127) and the specific within-method tools for participant data, researcher data and some attendance data to offer the widest range of perspectives of the study phenomenon. Triangulation was embedded to promote credibility to the findings and analysis. Lincoln and Guba (1985) posit this as a

technique to aid trustworthiness or truth as a quality balance for qualitative studies. In addition, further techniques to enhance reliability include: prolonged commitment, persistent surveillance and 'peer debriefing' by/of the researcher, alongside member-checking with participants.

As the researcher completed the data collection as the sole investigator the commitment and surveillance was always present specifically during focus group moderation. Peer debriefing was provided through research supervision (see research narratives throughout the thesis for reflective accounts of this process). Participant member-checking was included in the research design and offered to all participants as part of the focus group activities.

### **5.2.2 Participant Validation or Member Checking for Data Collection**

Various techniques were critiqued so I could reduce the potential impact of my role as the researcher towards the data (Holloway and Galvin 2016) or by the use of 'bracketing' (Tufford and Newman 2010). As I was the sole investigator, my role in data collection as focus group moderator and later data analyst had significant potential for bias (Miles and Huberman 1994), as well as potentially dominating the participant voice (Mason 2002). Member checking or participant validation is viewed as part of the trustworthiness required by effective good quality research (Birt et al. 2016). For in-depth interviews or focus group participation, the confirmation of the transcription reflecting their experience truthfully is seen as part of validation of data.

However, this specific method had attracted some debate around interpretation and responsibility for the varied interpretation based on participant representation and knowledge of the social reality as perceived by them. Individual's appreciation of the 'whole' research study was based on their reality and likely to be at odds with the investigator (Birt et al. 2016). Clearly the meaning of the participant data is the essence of confirmability and reduces the likelihood of researcher domination both of which is integral to the case study methodology. Careful process design and ethical application of research practices sought to minimise the impact of weakness of technique in the reality of the data collection phase.

Participant validation can be achieved in three ways: i) returning the verbatim transcription to the respondent, ii) an individual interview for member checking

between participant and researcher, or iii) a validation focus group with the same participants. Each has requirements for arrangement and time as well as consistency. This option may be viewed as unassuming, but has inherent potential pitfalls. Reviewing their contribution as text can be disconcerting and provoke requests for editing or deleting dialogue which affects the nature of the collected data and the later data analysis where 'original' text is altered.

### **5.2.3 Managing data during fieldwork**

For any research study, the investigator needs to manage the data being collected (Richards 2005). The choice of using a software package was determined by the nature of the data being collected and the researcher already being partly familiar with one as part of undertaking research skills development opportunity. This program (NVIVO) is built to achieve a code-and-retrieve function and with added facilities such as sophisticated searches (both text/lexical and code based), diagrams and networks, memos, and ways of developing the code list or codebook (Lewins and Silver 2007). Today, NVIVO (QRS International 2016) is the most frequently used CAQDAS (Computer Assisted Qualitative Data Analysis) (Lewins and Silver 2007; Saldaña 2016).

Code-based theory building software supports the researcher in the rigorous analysis of qualitative data, utilising thematic coding to collected data passages, allowing data reduction by identified themes (Richards 2005; Lewins and Silver 2007). Searches of data sets can be within single data transcripts and developed later across multiple data transcripts enabling strategic development of thematic analysis between variable sources of data collected during a study. Descriptive data resulting from quantitative demographical answers may aid the organisation of cross participant comparison. The researcher directs the analysis and interpretation through a series of phases and processes (Lewins and Silver 2007; Bazeley and Jackson 2013) where theories are tested and explanations grounded within the data are identified.

Managing and organising data for a novice researcher may appear initially daunting (Richards 2005). The framework provided by CAQDAS software allows connection to the 'project file' via a link between internal and external data folders so all sources are simultaneously 'at the researcher's finger-tips'. The closeness aided greater interaction

between data collections and researcher than that afforded by manual coding and analysis strategies (Lewins and Silver 2007; Saldaña 2016).

### **5.3 Data collection in action**

The application and approval process of NHS ethics was protracted, so that many revisions of the research timeline were required. With each passing month, versions of modified documents, hinted at the potential to become demoralised by frustration. When the final approval was received (see Appendix 9, p355-356), the relief was palpable alongside the awareness of the scale of project still to be achieved. Previous experience and knowledge of ethical theory did not prepare me for the long and meandering path through the development of a study, meeting the local REC requirements or the myriad of ethical issues that required consideration. The NHS Research and Development permissions were less problematic and once received the actual fieldwork could begin (see Appendix 10, p357-360).

Webster et al. (2014) highlight the requirements for ethical practice, but also the need for researchers to develop 'an ethical conscience' (p107). Awareness of ethical principles alone needs to be supplemented for novice researchers by structured researcher reflexivity and regular discussions with supervisors. Managing the research study and self-management are pivotal to the requirements of research governance, supported by more experienced researchers and colleagues from the same or different professional disciplines (DoH 2005; DoH 2008; Webster et al. 2014). Gatekeepers were also re-contacted at this time to ensure access at the Leisure Centre and the continuing support for this project through recruitment and data collection phases (see Appendix 12, p362 and Appendix 13, p363).

#### **5.3.1 Leadership as a professional practitioner**

As I had stepped into academia some time ago, the leadership role for practice had taken a secondary position as I had not been able to offer comprehensive clinical care in a maternity unit. My clinical exposure amounted to my regular aquanatal provision and the placement link role for supporting mentors and midwifery students in community and varied maternity unit clinical settings. Consideration of my clinical credibility for investigating professional practice posed potential barriers whereby research leadership

with practitioners and stakeholders are inherent to the design and implementation of the project. Even as my knowledge and understanding of research methodologies and data collection strategies advanced (Lee 2009), I sensed the pre-existing boundaries to professional practice could inhibit my inter-personal communication and role behaviours relating to 'leading' research.

The presence of a eureka moment during reflection on skills and attributes I already had for leadership highlighted that whilst some of the skills for academic leadership I had accrued were transferable, I would need to develop additional skills for project management. The nature of specific tasks required exact performance behaviours or approaches bound by the research context or culture (Sanders et al. 2013). Preparatory work for each segment of the research study had to be completed and confirmed ahead of every project milestone which necessitated a level of flexibility in negotiating training for certain tasks when it was needed. Contingency planning became the norm as reflection-in-action (Schön 1991) led to repeated stops to progress as I prepared to meet the next design point by extensive consideration of relevant outcomes.

Knowing about leadership does not equate with the actions associated with managing projects, people or events (Stansfield and Lee 2009). The high level of problem-solving, decision-making and ethical judgement are often required to take place concurrently in unfamiliar research situations and cultures. The broader macro-system offers an alternative focus for requirements for the organisations, which may conflict with the project design or the eventual study participants (Northouse 2007). Often training for such situations is aligned to other leadership styles, including transformational or transactional which do not offer transferable off-the-shelf solutions (Stoddart et al. 2014b).

### **5.3.2 Recruitment and Consent**

The completion of the professional ethical review and NHS Trust R&D permission(s) brought the gatekeeping procedures into prominent view as I prepared for the data collection. Whilst I had already acknowledged the need for sensitivity to the potential vulnerability of the women, I sought to create conditions with gatekeepers as a researching professional to support the research procedures (Holloway and Galvin 2016) within the 'case study' environment. Several contacts were made with local gatekeepers

at the leisure centre to initiate and monitor the overall access, relationships at contact points and to permit researcher reflexivity of progress through recruitment and informed consent to data gathering (McFadyen and Rankin, 2016).

Initial contact with women was carried out by reception staff with prepared letters of invitation distributed to women attending the class (see Appendix 14, p364-366). Reply slips were returned to reception by women some on their next attendance and some later. Women were reminded on subsequent visits and offered second copies of the invitation at monthly intervals. The researcher approached the women following receipt of the reply slips, provided the participant information document and offered to discuss any additional questions related to the study procedures. This often necessitated some extra time spent with specific women before the class started. The general discussion of safety and health changes ahead of entering the pool became slightly reduced which initially felt restrictive of the general conversation within the group. In contrast it did prompt some women to returning their reply slips, as the study recruitment was observed taking place and some aquanatal class attendees then retrieved envelopes from their swimming bags.

The process of informed consent was continued throughout data collection as the dynamic membership of the group during this phase of the study, meant the stage of pregnancy on first visit to the group or once informed consent was completed, often coincided with the second or third trimester. During the preparation of invitations, documents and templates for questionnaire recording, the researcher noted the comments made by the REC committee throughout the NHS Ethics process within the reflective notes template used throughout this period (see Appendix 11, p361).

One observation made at this time, was that the invitation and participant information sheet led to very few questions in the informed consent as women appeared to have the information and understanding of the participant requirements before completing consent forms (see Appendix 15, p367-369 and Appendix 16, p370). The most common questions were: if the focus groups were pre-planned with dates and times already set, or what the length of the focus group discussion was likely to be? The number of participants invited for focus group participation was kept at minimum four to maximum of six, to promote group discussion of the semi-structured questions.



Time constraints of meeting room availability and for women's attendance at times suitable to them were both essential considerations that the researcher was required to manage. Ideally dates and times for each focus group needed to be flexible to the invited participants which meant that forward planning to facilitate attendance needed to be built around the women primarily.

Initial questionnaires were completed once informed consent was given, recorded and confirmed with the participants (see Appendix 5, p329-336). This data presented the researcher with demographic characteristics for each study participant, enabling the connexion to be made with the pre-class health screening undertaken at first aquanatal attendance, which may have been before recruitment commenced. It was from this point onward that participants were identified in research records by identity-number only.

### **5.3.3 First focus group**

Arrangements for the first group were finalised at the point when the first two women who replied gave birth, meaning the potential loss of study participation. The impetus for personal invitation to this focus group arose from participant availability and six women were offered a choice of day and time. Once they confirmed potential attendance I depended on their reliability to come along. In hindsight a follow-up text or e-mail may have promoted full attendance of all six invited and was used for all subsequent focus group arrangements.

On the afternoon the meeting room was occupied until the time I had arranged to begin. This meant I was still setting up the room when the first two participants arrived. To address this for the future, an extension to the booking time was made for all other meetings. Whilst this could have impacted negatively on the women, reflection-in-action encouraged me to use this positively. Therefore, the arrangement of the room was agreed with the participants and meant that when we did begin the focus group, the conversation between the four attendees could be seen as flowing, only minimally interrupted by setting the audio equipment to record.

#### 5.3.3.1 *Semi-structured questions*

In preparation for the first moderation, discussion with research supervisors and experienced researchers in the field of healthcare, offered the opportunity of extensive consideration of presenting myself in my alternative role (researcher) and conduct of focus group discussions. Having identified potential pitfalls, I rehearsed to promote fluidity of delivery and reduce behaviours caused by newness of study-related role. Prior consideration saw me consider phrases which acted as prompts to elicit extra detail and to determine a scheme of words that would minimise 'leading' the direction of participate response.

Participants were asked as part of informed consent at the start of each focus group if they would like to receive a copy of the focus group transcription to provide personal validation of the data. Whilst this was uniformly offered, no participant requested full transcriptions or individual contributed data to be made available to them for comment at this or any other time.

The focus group guide was used to aid the moderation equity for each group (see Appendix 17, p371-374). Following introductions, each participant provided a response to each question with little need for intervention of the moderator. Making notes during the meeting was planned, but not practical in real-time so the moderator adopted an active listening stance which meant the recording of extensive field records immediately after the group ended. These records were written up as soon as possible as a reflective narrative (see Appendix 18, p375-377) and the data produced was significant in the initial analysis phase.

To retain as much detail as possible, the audio-recording was listened to several times and notes made against recording time intervals to aid the addition of memos to final transcribed data of each focus group. Transcription was completed by an experienced transcriber for all groups once a confidentiality agreements was completed. My familiarity with the audio, transcriptions and my initial notes was accomplished by several more periods listening to each focus group before the first 'open coding' activity was undertaken.

The second pre-validated questionnaire (PPAQ) was distributed to each participant at the end of the focus group (see Appendix 7, p343-348). These were completed and returned before the group left. It was noted that some discussion of the questions took place, but the distribution of answers between participants for each group showed minimal corroboration of answers.

#### **5.3.4 Completing data collection**

The remaining recruitment, informed consent, collection of questionnaire data and conduct of focus groups used a similar pattern to preserve consistency. Whilst recruitment and consent were completed after six months, the postnatal focus groups experienced some delays in contacting and liaising between women to set a day and time for the meetings. The postnatal focus groups had different membership due to this. One participant was lost to the postnatal focus group(s) despite three invitations, due to holiday, illness and returning to work respectively.

The environment for the focus groups may have potential to be inhibitory to the interactions. Previously the women met in reception, the changing rooms, by the lockers, on poolside or in the pool, but not the meeting room where these took place. This venue is near the pool area so the ambient noise of pool activities can be continuously heard in the background throughout. Listening to the first focus group audio-recording illustrated the overload of additional noise to initial review of the data and potential repeated interruption to smooth data transcription. Over time the sensitivity to certain sounds decreased as audio acuity to voice improved.

For the participants, the table and chair arrangements were considered ahead of each group meeting. Setting the space to be comfortable and functional to the interaction of attendees was important and was further aided by the provision of refreshments on arrival, so informality was established that was progressed into the focus group discussion as easily as possible. I hoped to capitalise on my usual connection with the group initially to promote more natural interactions between myself and the group.

Each focus group had different membership and thus the observed connections between participants altered each time. In spite of this my reflective accounts sought to apply an even reporting strategy to presenting my impressions and insight into each one. The pre-designed template of semi-structured group topics (Appendix 17, p371-374)

presented an even base for this activity and aligned to my researcher role with prompts for a holistic approach to reporting proceedings. However, I was conscious that my 'presence' was tinged with an element of prior relationship with group members and shared knowledge and information. This had potential for diluting the 'wholeness' of the replies presented within the focus group data. Careful presentation of the core questions sought to limit such possibility in situ and context.

The data analysis started during and continued concurrently to data collection. However, it should be noted that the first three phases of data analysis for each single participant and pre- and post-birth focus groups were completed. The generation of the final themes and interrogation of cross-case analysis took place after data collection had concluded. The field notes recorded after each weekly aquanatal class ceased when the final participant gave birth, although two further reflective accounts were written following the two remaining focus groups. Memos and annotations continued during data analysis and the compilation of the first draft of the study findings.

### **5.3.5 Reflective narrative**

What 'tools' – am I a tool?

The experience of collecting data did present some interesting dilemmas as a novice researcher. Whilst I conducted some semi-structured interviews during a previous degree, moderation of focus groups was something new, provoking cognitive response and a level of emotion work that prompted greater threat to veracity by being an insider. Previously the view of myself as and 'outsider' inside (instructor to the aquanatal group) felt comfortable in being accepted and integrated. Over the period of recruitment, I discovered that as the dynamics altered with group membership, so did the stability of my integration. I found the feeling of being a researcher and an instructor ultimately altered my 'relationship' with some members especially as not all aquanatal group members became research participants.

I questioned my personal ethical approach and values many times: was I exploiting the women (Darra 2008), were they 'pressed' into being recruited (Darra 2008), were the responses attributable to 'desirability bias' of the women or biased data interpretation by me as the researcher (Goffman 1959; Hunter 2004; Darra 2008). I began to consider that whilst many see the research report as the result of a study, there are likely to be

other findings or effects on participants and researcher during and as a consequence of, the processes. I pondered the positivity of such change in terms of the 'researcher' effect for the moment of data collection, post data collection and degree of impact on participants in my dual role.

Every contact with the group members is tinged with the researcher stance, where once I had been the instructor midwife for the sessions, responsible but differently. For the reflexivity of the study this had to occur, but I feel the change may be permanent and alter the group going forward. Responsibility, accountability, and veracity all hover on the horizon.

Researcher confidence is significantly challenged. The requirement to be ever flexible to circumstances 'in research mode' led to emotional work across additional situations and of greater complexity for me within my 'normal' group role. Was I an insider or an outsider I often asked as I wrote notes after class; it was an uncomfortable and frequent debate inside the role conflict experience.

#### **5.4 Closing Fieldwork**

The experience of working in the field presented a sense of purpose to the effort already undertaken as part of this study (Thomas 2015) but also brought an additional need to progress the datum (singular) or data (plural) collected to the next level as evidence in relation to the overall research aim. Changing the informational data into evidence relies on a continued effort seeking to examine such collected data in significant detail seeking to 'answer' the research question and objectives. This process is a continuum using the pre-designed analytical framework (Thomas 2015) to advance the fieldwork almost seamlessly into reporting the findings.

Within this phase of the study I recognised that the sociological construction of the aquanatal class was grounded within internal group dynamics which depend on the inter-relations of the members. The significance for this 'community' may be set by gender specificity, the social class and social capital attributes existing for individual members and may also be linked to the social environment they inhabit (Reay 2004; Abel 2008; Crossley 2008). Changes caused by technological advances for maternity care and idealistic adaptations of individual expectations within such communities (see

section 2.6.1, p62-65) will impact on the integration of members. In addition, the nature of this group would also be affected by the individual membership which is dynamic over any time period, the social interaction of members and the external influences of environment, healthcare policies and cultural impacts. It is also likely that the researcher, who is additionally integrated into the group as the instructor, would affect the 'habitus' that this group constructed whilst data collection takes place.

Methodical reflection at this point did offer some consideration of practice development in deference to the professional practitioner persona I had adopted in order to focus on researching professional development up to this point. As Sanders et al. (2013, p33-39) indicate there is an active learning stance required in developing contemporary practice that links: personal attributes, professional awareness, enabling others, critical evaluation of practice processes as well as 'developing and using knowledge to inform practice' and implementation of change. The insights and discoveries made during fieldwork alone had potential to consider my personal practice approach through the extensive reflective notes I had made during data collection. Looking at some of the situational notes for the weekly classes, there was opportunity to empower women to express their decisions and choices through enabling peer discussions rather than a default of answering the questions from a professional perspective. This style was self-monitored but the rehearsal approach I adopted for focus group moderation did allow preliminary development (Sanders et al. 2013) as noted in later weekly reflections of the aquanatal class. Progressing this strategy further would involve greater flexibility in approach and understanding of the practice principle (Sanders et al. 2013) in such situations, allowing thinking and action to occur with increasing spontaneity.

## **5.5 Conclusion**

This chapter has presented a report of the fieldwork examining the women's experience of attending aquanatal classes. Starting and concluding this phase of the research offered an insight into the development of the researching practitioner role in context; the direct application of insider positionality, revisiting the foreshadow issues, development of progressive focusing and proceeding to the reality of using the data tools (see specifically section 5.2, p159-162; and section 5.3, p162-169). The importance of the choice of data collection tools in supporting triangulation of data sources became

increasingly relevant as the analytical phase began. As field-working drew to a close, the potential for practice development began to show more prominently and will feature more meaningfully within the discussion (see section 7.5, p241-246).

Chapter 6 begins with the presentation of demographic results and moves through the qualitative findings via the analytical structure set out in the research design (see section 4.10, p139-148). Each data set was included to aid the comprehensive approach to triangulation based on multiple data sources to present the various views of the research objectives and seek to explain the experiences from the woman's perspective.

## Chapter 6 Demographic Results and Qualitative Research Findings

The data analysis presented within this chapter, focussed on the exploration of women's experiences as a holistic process alongside their pregnancy and childbirth episode. All research findings are viewed throughout by triangulation (see section 4.8, p125-127 for detail) promoting consistency across the sources and ordered analytical processes.

In setting the scene for the analysis, the various results and data sources have been set into a framework to promote sequential and cross-case source interrogation (Table 6-1, below). The data presented in the thesis are illustrative of the analytical processes with some offered as extracts at this juncture of presenting study findings.

**Table 6-1 Data Source Framework for Presentation of Results and Findings**

Data Source	Element of Research Process	Chapter Reference
Instructor Pre-Class Health Questionnaire – exclusion criteria	exclusion criteria	Table 1-1; p21
Case Description	methodology	Section 1.5; p19-26
Class Attendance data	statistics of numbers attending class for first or subsequent visit	Figure 6-2; p180
Study (Initial) Questionnaire	demographic and baseline information related to study aim and objectives	Figure 6-3 to Figure 6-10; p181-188
Antenatal Focus Group: 1, 2, and 3	extract participant responses with <i>initial</i> codes, memos and annotations	Appendix 19; p378-381
Postnatal Focus Group: 4a - 4d	extract participant responses with <i>initial</i> codes, memos and annotations	Appendix 19; p378-381
PPAQ data	data presented as MET values and contrasted with postnatal data values	Figure 6-11 to Figure 6-15; p190-193
PPAQ MET values	interpretation of PPAQ data based on energy expenditure for activities	Appendix 8; p349-354
Researcher class journal with annotations	extract theme and annotated reflection	Section 6.1; p173-178; Table 6-3; p184; Appendix 19, p378-381 and Appendix 20; p382-384

Each data source provided information framed within the case context and when taken as a whole, contributed to meeting the study aim and objectives. It is important to note that no source was prioritised for importance of support to the research result(s) and therefore findings are presented as a whole set of data records.



## 6.1 Practical application of coding strategy

At the beginning of data collection I set up the task of writing ‘memos’ alongside field notes to ‘track’ the development of personal data management skills and analytical procedures (Bazeley and Jackson 2013). The analytical framework proposed during the research design (see section 4.10, p139-148) presented me with the responsibility to test the complex path through coding in preparation for critical data analysis. To achieve this, pre-coding or jottings (after Saldaña 2016, p20-21) took place continuously but gained momentum as soon as transcription had been completed for the first focus group. This allowed the examination of objectivity in coding patterns for these and subsequent documents. Repeating this with a second copy of the manuscript offered a review of ‘codes’ used as labels and a reflection on the development of analytical skills.

The first phase of ‘open’ coding (Gale et al. 2013; Noble and Smith 2014; Saldaña 2016) revealed some characteristic patterns within the focus group data for the responses to the semi-structured questions (see Appendix 17, p371-374). Emerson et al. (2011) proposes a set of questions which can aid the memo writing during coding phases (see Table 6-2, p174).

Participant responses indicated similarities, differences or frequencies of experience, plus sequenced, corresponding and causative events that happened in relation to their pregnancy and physical activities. ‘Memoing’ included the use of three supplementary questions informed by examples suggested by Sustain and Chiseri-Strater (2012, p 115) which directed linked reflective annotations as the process advanced. These memos gave me a constant way to consider connections between data provided by participants, my field notes and reflections, and then later between focus groups. The continuity of processes during data collection prompted review of coding decisions continuously through the fieldwork phase (Bazeley and Jackson 2013), and contributed to the analysis.

**Table 6-2**                      **Questions considered during coding**

<p>What are people doing? What are they trying to accomplish?</p> <p>How, exactly, do they do this? What specific means and/or strategies do they use?</p> <p>How do members talk about, characterise, and understand what is going on?</p> <p>What assumptions are they making?</p> <p>What do I see going on here?</p> <p>What did I learn from these notes?</p> <p>Why did I include them?</p> <p>How is this similar to, or different from, other incidents or events recorded elsewhere in the field notes?</p> <p>What is the broader significance of this incident or event? What is it a case of?</p> <p style="text-align: right;">(From Emerson et al. 2011, p177).</p> <p>What surprised me? (to track your assumptions)</p> <p>What intrigued me? (to track your positionality)</p> <p>What disturbed me? (to track the tensions within your value, attitude, and belief systems)</p> <p style="text-align: right;">(From Sustein and Chiseri-Strater 2012, p115).</p>
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A rudimentary initial approach provided preliminary descriptive codes for phrases and sentences within the data, some labelled by in-vivo expressions and others by affective naming attributed to respondent values or judgements. It was noted that the women expressed similarities of beliefs and attitudes for much of the content where language and literary expression of experiences was mirrored by more than one focus group attendee. To evaluate these first level codes, I explored the coded data for an additional cycle moving away from any provisional method (for example, using four question themes tentatively linked to the research objectives and literature ('piori') thus seeking a holistic and comprehensive exploration looking for additional codes. This stage followed the principles of 'in vivo' coding (Spencer et al. 2014a, p272; see also section 4.10.3, p144-145) and also embraced a form of words taken from the moderator question statements. Each first level code was confirmed, reflecting the defined descriptive codes and demonstrating the essence of participant's experience, contributing to self-moderation of data processing (see Appendix 22 and 23, p286-292).

The second phase sought to re-organise by reducing through combination ('lumping' or 'bucket') or dividing further ('splitting' or 'slicing') the initial codes (Bazeley and Jackson 2013; Spencer et al. 2014b; Saldaña 2016). The familiarity I had instigated ahead of the open coding of the first phase began to inform the 'coding on' refinement (Table 6-2,

p174). Some broad themes began to emerge as the third and fourth phases progressed. At this point some descriptive processing of codes started to show summary themes that would comprise the foundation of the analysis (Gale et al. 2013; Baškarada 2014; Spencer et al. 2014b). I hesitated to identify extracts for illustration in reporting the findings, however returned to this when the pull of telling the 'story' was confirmed by reviewing the data against the memos (fourth phase), and after I established my processes were consistent.

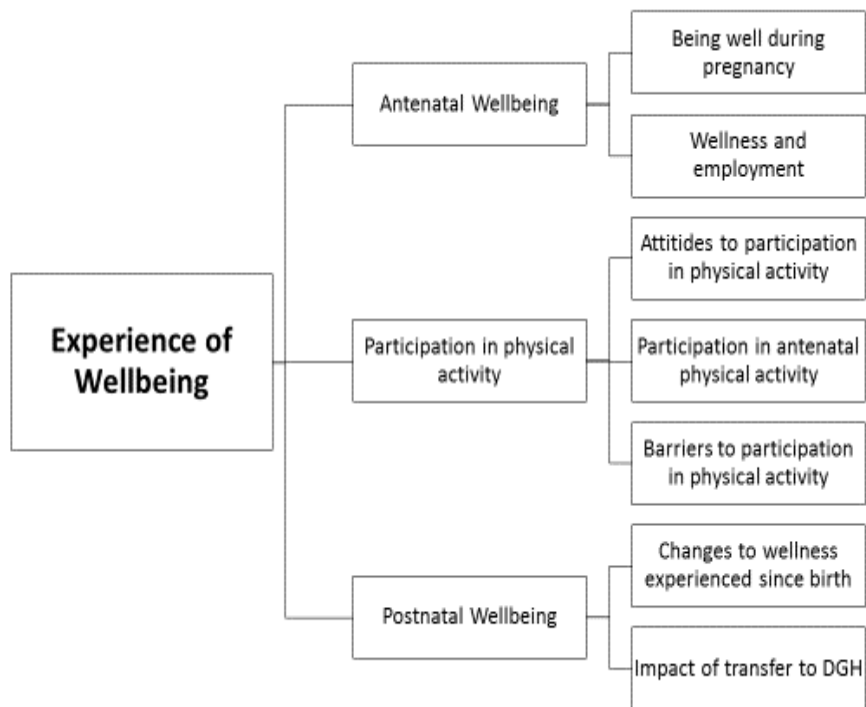
NVIVO allowed visual review of code maps which offered organised diagrams (see Appendix 21, p385) as the phases progressed (Bazeley and Jackson 2013; Noble and Smith 2014). An overview of NVIVO tree nodes is presented in Figure 6-1 (p176) and in detail in Appendix 22 (p386-389) and Appendix 23 (p390-392). Links between focused codes was reviewed through the use of queries and investigation of relationships for individual participants, so themes were confirmed ahead of cross-case interrogation of combined broad themes for final reporting. The data management also demonstrated that some codes were more significant or occurred more frequently. However, themes that presented less often were not ignored but may not feature as central in this thesis.

Once the two main categories were identified from the themes, I continued to interrogate the data by constructing key information that informs the research aim and objectives as a summary of the 'whole' based in the collected data evidence. Objectivity at this point supports the interpretation and insight for the case context, but generalizability cannot be guaranteed (Spencer et al. 2014b; Saldaña 2016) outside the current case.

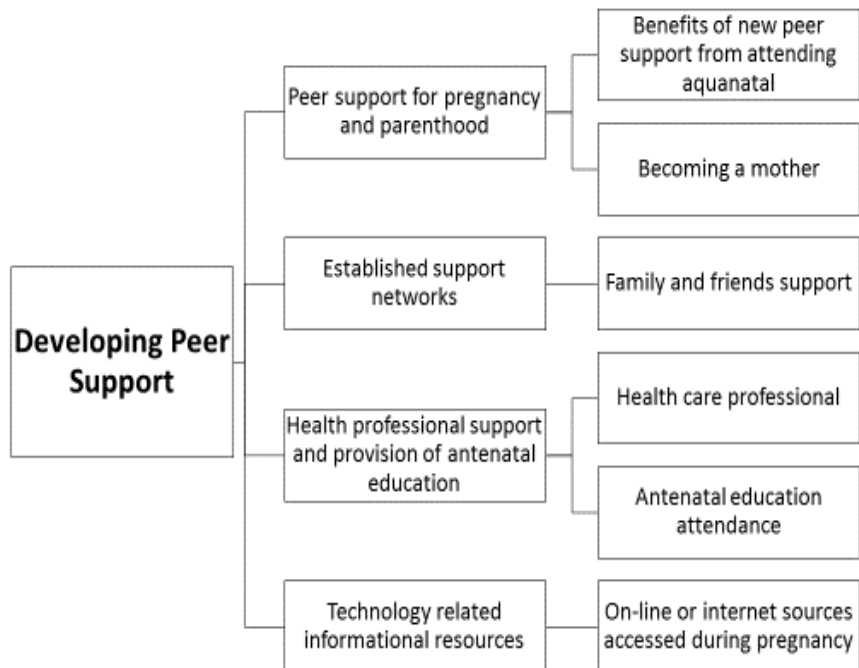
Concurrently the Study Questionnaire results were transferred into a framework so that descriptive extraction of information was possible for individual participants. The demographic data and additional pre-pregnancy answers provided contextual personal participant information. These were later reviewed alongside first trimester pregnancy experience of physical activity and exercise intentions between all contributors. The results were later grouped and viewed alongside other text-based data to provide comprehensive interrogation.

**Figure 6-1 NVIVO Tree Nodes**

**Theme 1: Experience of Wellbeing**



**Theme 2: Developing Peer Support**



Each potential participant was considered in relation to the exclusion criteria (see Figure 4-2, p119) and all met these requirements of inclusion at initial consent. The final data sample consisted of twelve antenatal attendees (n=12) who completed the recruitment and informed consent procedures in full. Following informed consent, one participant gave birth before the data collection phase began and therefore her information was discounted (now n=11). The demographic information: data from initial questionnaires, transcribed discussions from before and after birth focus groups and each participant's Pregnancy Physical Activity Questionnaires (PPAQ) (from pregnancy and postnatal) were analysed to inform the elements of the analytical process from the participant perspective. In addition, the themes from my field notes and reflective writings during the entire data collection and analytical phases were used to provide triangulation to the analysis.

All participant data was interrogated for each individual and for cross-case analysis, promoting the integrity of the thematic analysis for the transparency of data verification. The significance of analytical memos and annotations made to data documents during the investigative process became increasingly relevant to the results, rather than the initial framework for the process. For example, my reflective notes as researcher for the focus groups sought to preserve the critical distance from the data collected during analysis. This aided the progressive focusing for the identification and then critical analysis of themes.

### **6.1.1 Reflective narrative on data analysis**

The interrogation required for data analysis needed a detachment from the participants (Chavez 2008) which meant the interpretation could expose 'patterns' not easily seen as the aquanatal instructor midwife. This distancing was made easier by using numerical identity rather than a pseudonym when using the transcribed documents (see Appendix 19, p378-381 for excerpts of antenatal and postnatal focus group transcription 'first view' codes, and for some examples of annotations and memos). Voice recognition by the researcher did have the potential to hinder the anonymity needed during the 'open coding' and 'coding on' segments and was avoided during this process.

Where possible the 'in-vivo' phrases were used in 'open coding' (Bazeley and Jackson 2013). These 'codes' were then reviewed as the data analysis progressed for attributes

which matched the language and interpreted meaning as the data was broken down further (Saldaña 2016). The 'codes' were under continued scrutiny as each piece of coded data was harmonized as a thread with other participants 'coded' responses for a specific set of coded material into a 'node'. Each time the data was screened for meaning, the 'codes' were inspected for unusual, unfamiliar or unseen new interpretation (Saldaña 2016). The need to bracket the professional values, my own perceptions and potential for expectedness from the data was required to persist throughout each stage of analysis, although at times this posed a challenge to the process requirements.

Over time my role as researcher required me to examine the data for ways in which my developing skills may have impacted on the research procedures, such as use of data tools and analytical processes (Fraser 1997; Breen 2007). The area of research that specifically extended these challenges occurred during 'insider' times. During data collection specifically I used Goffman's (1959) dramaturgical approach to rehearse interaction within the study communities, whilst promoted additional consideration of emotional intelligence attributes (such as self-awareness, and social management) during all types of communication activities (Goleman 1996). Specific impressions based around 'performance' behaviours set consideration of consistency and representativeness for: recruitment, informed consent and distribution of study questionnaires, weekly class observations, and focus group facilitation and moderation. Whilst these may have restricted my social role inside the group, the separation of being a professional rather than a pregnant woman offered a 'safe barrier' of membership but also detachment. As an emerging researcher, the honing and refinement of any aspects of the data collection processes offered a dynamic potential for appreciation within my research reflexivity (Bazeley and Jackson 2013).

## **6.2 Demographic and Descriptive data reporting**

The descriptive and demographic data was obtained from two sources: the attendance data and the participant answers to the Study Questionnaire completed immediately following the informed consent procedure. I entered all data onto an Excel spreadsheet during the data collection phase in order to view the frequencies for each answer option. Demographic participant characteristics of the sample presented a backdrop to the

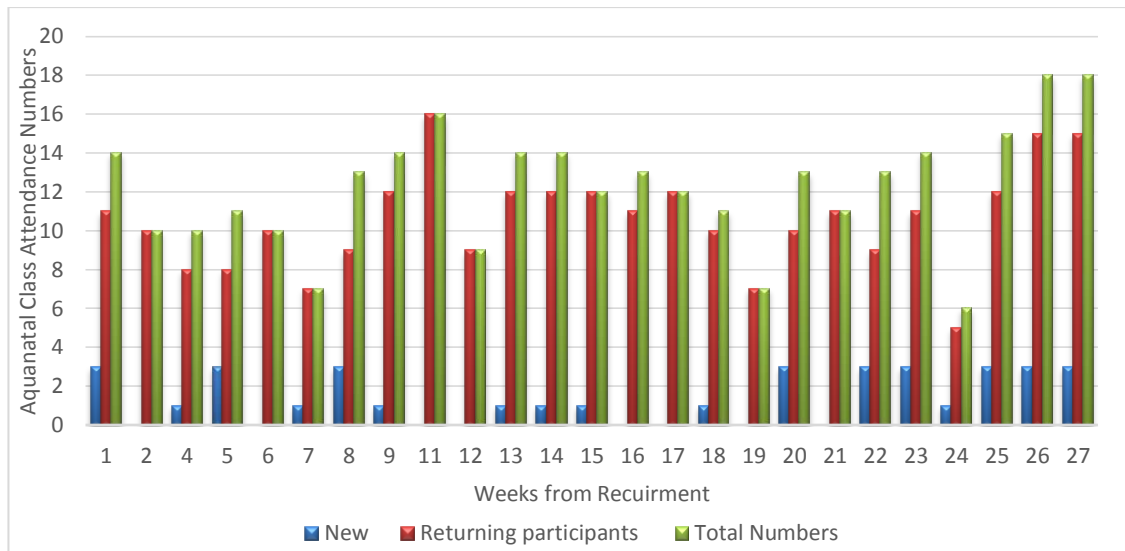
qualitative data from other multiple sources. This base-line questionnaire data also offered information on specific elements for each participant in relation to their current pregnancy, approach to seeking professional and/or other support, and their reasons for participating in aqua-natal and/or other exercise at that specific time during pregnancy. The participant experience of pregnancy discomforts was also considered for links to their access or participation in early pregnancy physical exercise or activities.

#### **6.2.1 Aquanatal attendance data**

Leisure centre data collected during the recruitment phase (27 weeks) indicated that 35 pregnant women attended the class for the first time out of a total 305 overall attendances to the aquanatal class. For recruitment (n=12 overall), eight of the first time attendees became research participants and an additional four came from those who had started attending the class before recruitment commenced. The overall return attendance rate for class attendees was 80.5% during this period. Twenty-three attendances (out of the total 305 attendances) were recorded as leisure centre members over the same weeks, although this rarely rose above 2 per session, suggesting these women attended more than once or regularly during recruitment. The average class number was 12.2 during recruitment, and 13.8 per class (excluding a bank holiday) whilst all participants remained pregnant.

Figure 6-2 (p180) presents the total class attendance numbers during the recruitment period with detail of the number of new and returning class attendees. These figures support consistency of group membership over this period of data collection. Two dates are omitted as no class was held on those weeks due to researcher unavailability.

**Figure 6-2 Class Attendance Numbers**



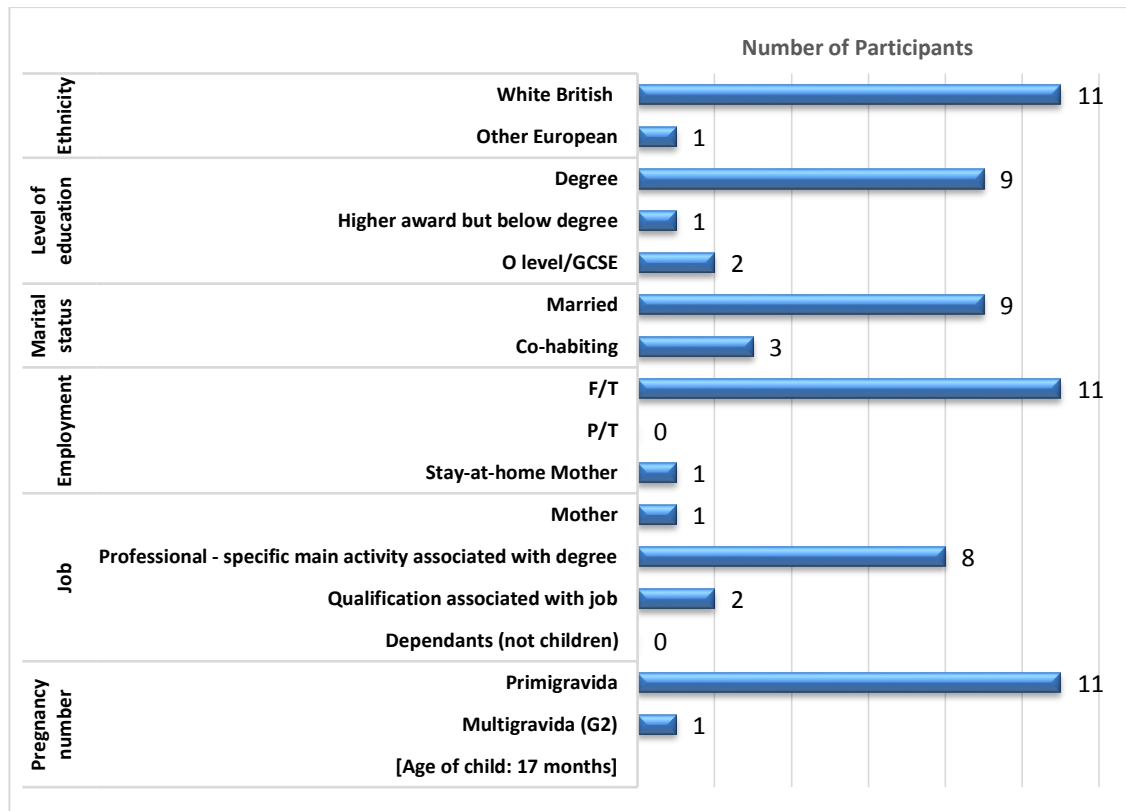
### 6.2.2 Study Questionnaire

The participants characteristics revealed that the group identified themselves as ethnically White British (n=11) or European (n=1). Eleven women were identified as primigravida, all working full-time, and one multigravida who was a stay-at-home mother with a toddler of 17 months at the time of completion. All participants had achieved GCSE qualifications or above with nine educated to degree level and one with a higher award below degree.

The issue of diversity (of group membership, employment status and level of education) was identified for later discussion which continues the exploration of access to support and the impact of social and/or cultural capital associated with these characteristics (see section 2.5, p56-61 and section 2.6, p61-66; discussion in section 7.3, p219-237 and limitations in section 7.7, p249-251). For illustrative purposes the demographic characteristics are presented below (see Figure 6-3, p181).



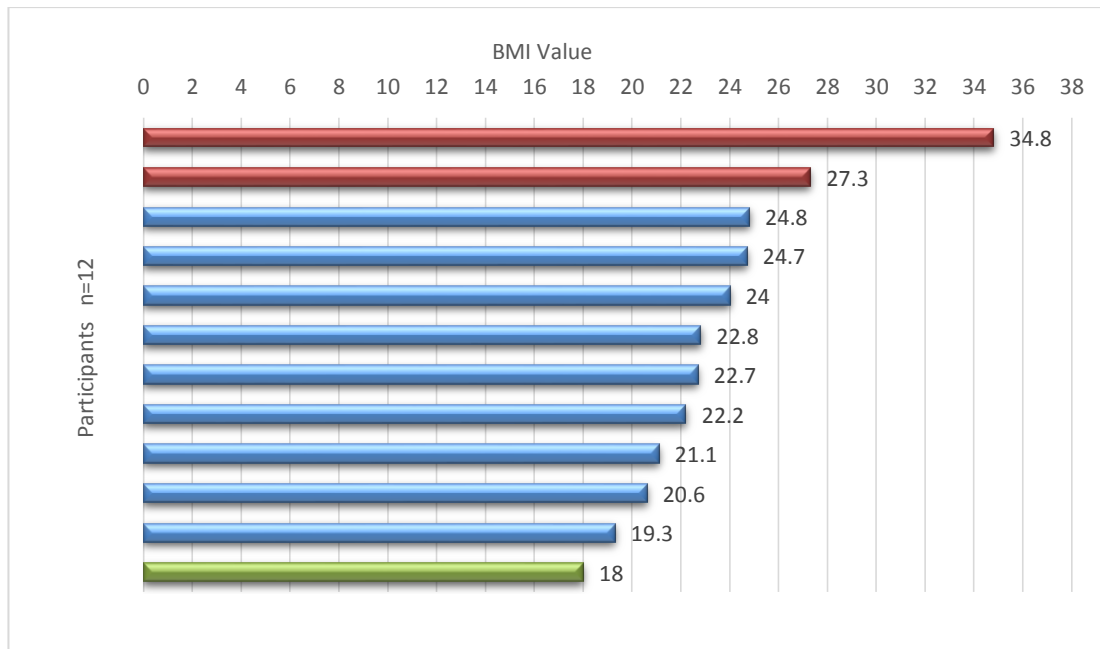
**Figure 6-3 Participant Characteristics**



#### 6.2.2.1 *Body Mass Index (BMI) (calculated as weight in kilograms divided by height in metres $\text{kg}/\text{m}^2$ )*

Individual BMI values were calculated for each participant and mapped against the NHS BMI chart. The data demonstrates the range of BMI values from underweight to obese. In terms of BMI, the participants had a range of 16.8 meaning that the spread was from underweight (below 18.5 range) to obese (between 30 and 39.9 range) highlighting that women who attended the class were not necessarily from the average BMI category (between 18.5 and 24.9 for an adult female) (NICE PH27 2010b; NICE CG189 2014b). Nine participants were in the 'normal range', one below and two above (see Figure 6-4, p182).

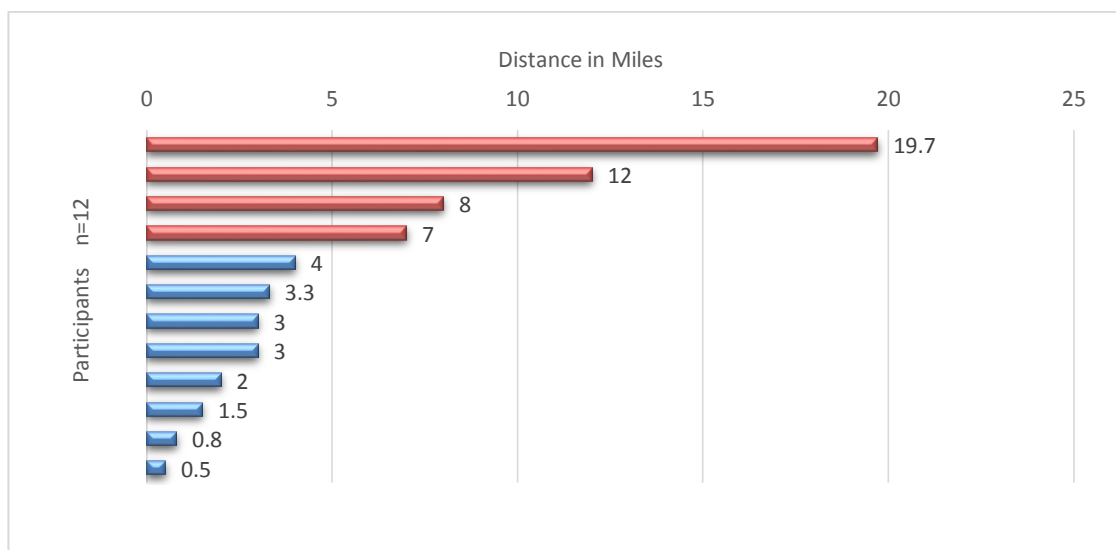
**Figure 6-4 Participant BMI**



#### 6.2.2.2 Distance from Leisure Centre

The distance travelled between home and the leisure centre was also considered to review some potential barriers for motivation to attend midwife-led provision in the locality (see Figure 6-5, below). Whilst most participants (eight) lived within a 5 mile radius of the Leisure centre, four women travelled between 7 and 19.7 miles to the centre to attend the class.

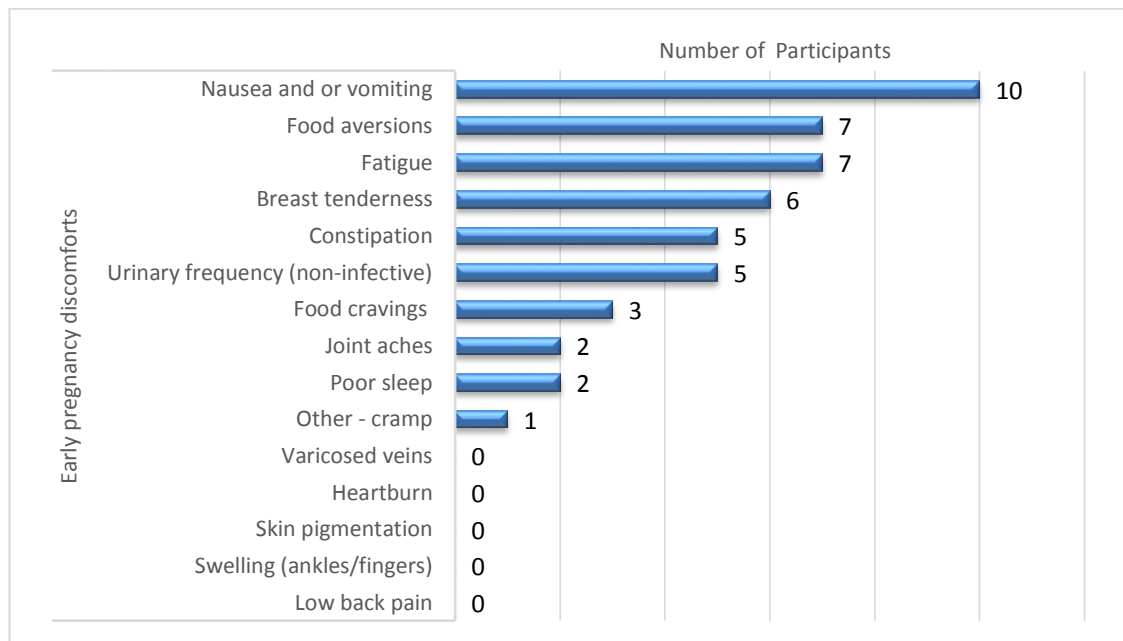
**Figure 6-5 Distance from the Leisure Centre**



### 6.2.2.3 *Pregnancy Discomforts*

Participants reported in the study questionnaire a variety of discomforts and these were suggestive of the stage of pregnancy experience at the time of completion (see Figure 6-6, below). All participants were in the second or third trimester. Interestingly most symptoms corresponded to informal group discussions from my field notes.

**Figure 6-6**      **Early Pregnancy Discomforts**



One symptom that is often reported is pelvic discomfort which did not feature on the initial questionnaire for the participant group. However, field notes indicate such discussion occurred informally with individual class attendees five times during the data collection phase with symptoms described as ‘pelvic pain across the sacrum’ or ‘low abdominal pains when walking’. Professional advice was provided by me based on individual requirements of life style and employment, as well as general advice for day-to-day activity offered by other group members.

The following extracts from two researcher journal entries (Table 6-3, p184) relate specifically to pelvic discomfort/pain and have been annotated (in contrasting text colour) in detail to indicate my internal dialogue within notes I took at the time and combined with the written journal entry.

**Table 6-3 Annotations for research journal entries**

Research Journal	Researcher Annotation (reflective)
<i>Difficulty walking and standing was a focus of discussion</i>	work and general everyday walking – functional necessity for activities of everyday life
<i>between women this evening prior to the class prompted by my routine ‘health check’ as women arrived. Their experience is tinged with discomfort and unavailability of pain relief</i>	women do not want to take anything unnecessary (medication), and paracetamol doesn’t work!
<i>for the feeling of ‘grinding’</i>	this is an awful sounding symptom
<i>between the symphysis pubis joints when walking. I explained the physical symptoms</i>	physiology, gestation and musculoskeletal related – I have found women prefer to know the reason for symptoms
<i>but felt inadequate in offering comfort for a set of symptoms which cause basic functional immobility and pain.</i>	Pelvic Girdle Discomfort (PGD) is an increasingly common symptom possibly due to lifestyle and work practices. I seem to be offering information on this condition and functional activity advice more frequently. Properties of being in water offers some transient relief during the class
<i>Reflective Post-script: I was thanked by two women for advice about getting in and out of bed. ‘Simple information’ which meant they started the day in less discomfort and a prompt for reducing pelvic asymmetry when working or travelling.</i>	

Research Journal: following aquanatal class week 6

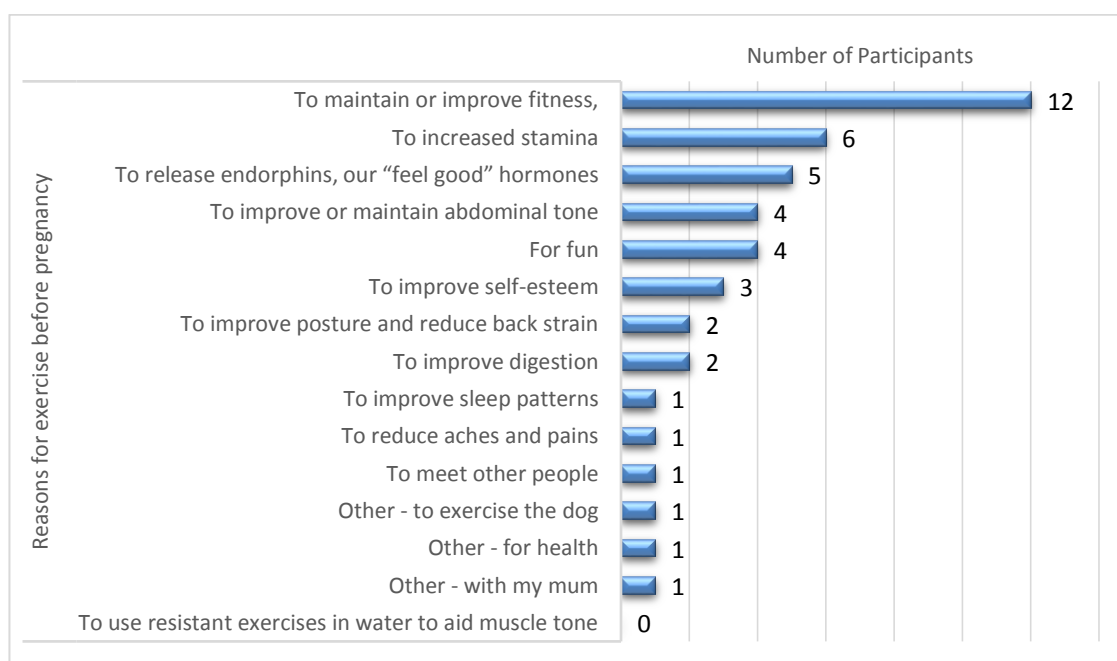
Research Journal	Researcher Annotation (reflective)
<i>Pelvic girdle issues featured as a direct question during this class. Preparation for labour and birth were clearly provoking angst</i>	media portrayal of labour as semi-recumbent – they find sitting with legs outstretched ‘painful’
<i>when dealing with hip/pelvic positions for birthing their babies. One member had spoken to an obstetric physio, who indicated that midwives can adapt care to suit individual capacities</i>	I am not sure they believed this?!
<i>Talking through a few simple options seemed to offer her help to plan an approach to labour and sparked additional dialogue with other women in the group.</i>	I continue to offer a specific specialist leaflet to all women who identify with this symptom which outlines simple practical advice for labour and birth based on obstetric physiotherapy guidance to prevent additional injury

Research Journal: following aquanatal class week 20

#### 6.2.2.4 *Pre-pregnancy exercise participation*

So that exercise participation during pregnancy could be considered against positive motivators for exercise attendance, a set of questions was used to compare pre-pregnancy and pregnancy reasons (for attending aquanatal classes specifically). The maintenance or improvement to fitness level was viewed by all 100% (n=12) as a key reason to exercise prior to pregnancy, although this decreased considerably to just above 8% (n=1) for participants recorded motivations to attend aquanatal provision. In contrast, exercise to improve sleep patterns was identified as a motivator by 8% (n=1) before pregnancy (see Figure 6-7, below), but almost 42% (n=5) of the same women presented this as a reason to attend aquanatal (see Figure 6-8, p186).

**Figure 6-7**      **Reasons for Participation in Exercise before Pregnancy**



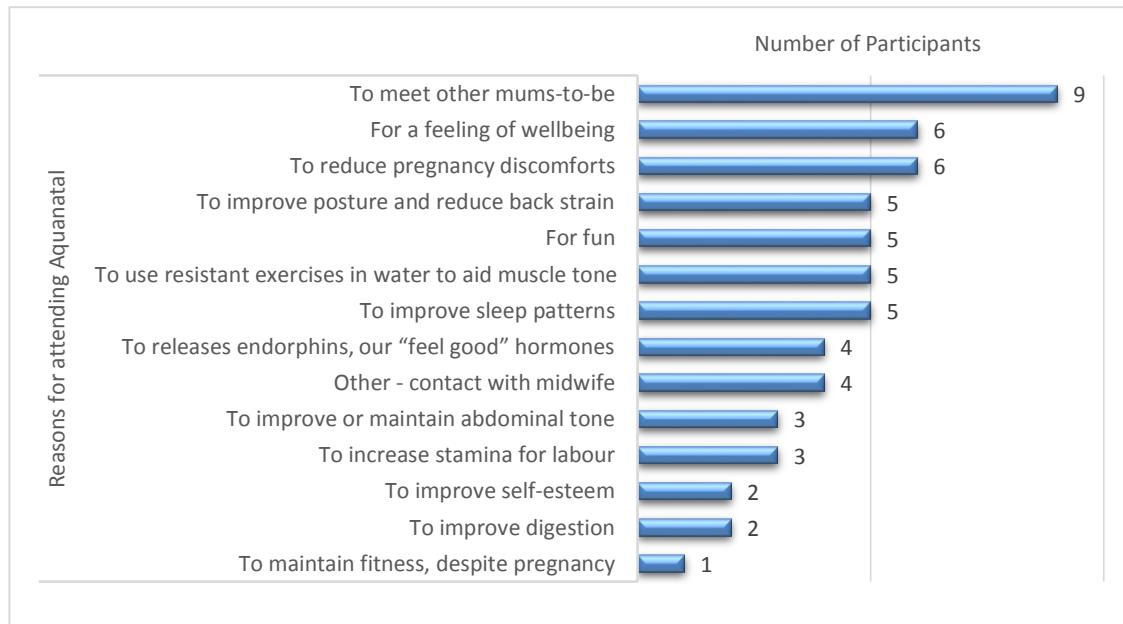
#### 6.2.2.5 *Reasons for attending aqua-natal*

Reported reasons for attending aqua-natal sessions (see Figure 6-8, p186) provided some insight into the associations between pregnancy discomforts and symptoms alongside some illustration of the links to physical activity, fitness and socialisation of their pregnancy experiences. The participants chose whichever and whatever reasons applied to themselves which meant some participants offered up to five reasons.

The main reason reported by 75% (n=9) of participants was to 'meet other mums-to-be' suggesting the perceived importance of networking by group members. Almost 42%

(n=5) identified the reason as ‘for fun’ which may reflect the nature of support being sought alongside the formal antenatal provision within the NHS. Interestingly, 33.3% (n=4) of participants expressed that contact with the midwife was a reason for attending the class.

**Figure 6-8 Reasons for Attending Aquanatal**



In addition, 50% (n=6) expressed their perception of attendance improving ‘feeling of wellbeing’ or ‘reducing pregnancy discomforts’. All listed reasons were reported at least once, although for this group of participants, only 8% (n=1) attended to ‘maintain fitness despite pregnancy’ and 16% (n=2) to improve either ‘self-esteem’ or ‘digestion’ and 42% (n=5) identified ‘to improve sleep patterns’.

Slightly more than 33% (n=4) of women acknowledged the ‘release of endorphins’ as a motive, which can be linked to participants in their PPAQ responses as those who undertook specific exercise outside the home.

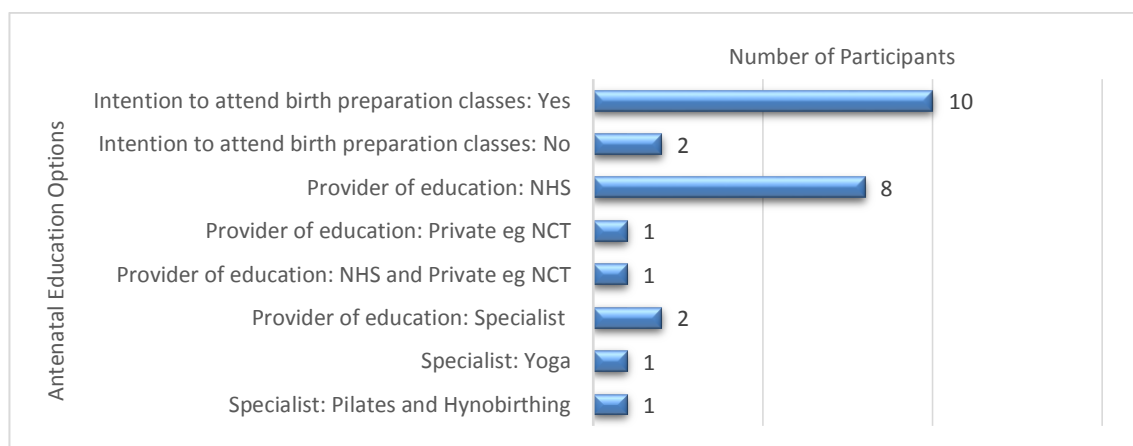
Although back pain was not chosen as a pregnancy discomfort, 41% of participants reported ‘to improve posture and reduce back strain’ as a reason to attend the class, suggesting prevention of back pain was a significant driver for attending aquanatal and awareness of the need to adopt sound postures.

#### 6.2.2.6 *Choices for formal childbirth and parenting educational support*

Preparation for birth and parenthood education was viewed by participants as a significant choice (n=10). One who did not intend to attend was already a mother and one indicated her intention to attend both NHS (n=9) and private (n=2) provision. NHS course provision is four or five weekly sessions (NHS Trust website, April 2016) lasting approximately 10 hours in total. Specialist preparation also appears to be a consideration (n=2) although access to such provision was possibly based on timing, cost and location. Non NHS provision (such as National Childbirth Trust [NCT]) was quoted as £200 (NCT.org.uk April 2016) based on a course of sessions lasting approximately 19-20 hours in total.

Some women chose specific preparation which focussed on specific skills for birth, namely Yoga or Pilates or Hypnobirthing. The reasons for such choices are outside the scope of this study although the factors such as social drive and financial burden of access may overlap with reasons to attend particular provision. (See Figure 6-9, below).

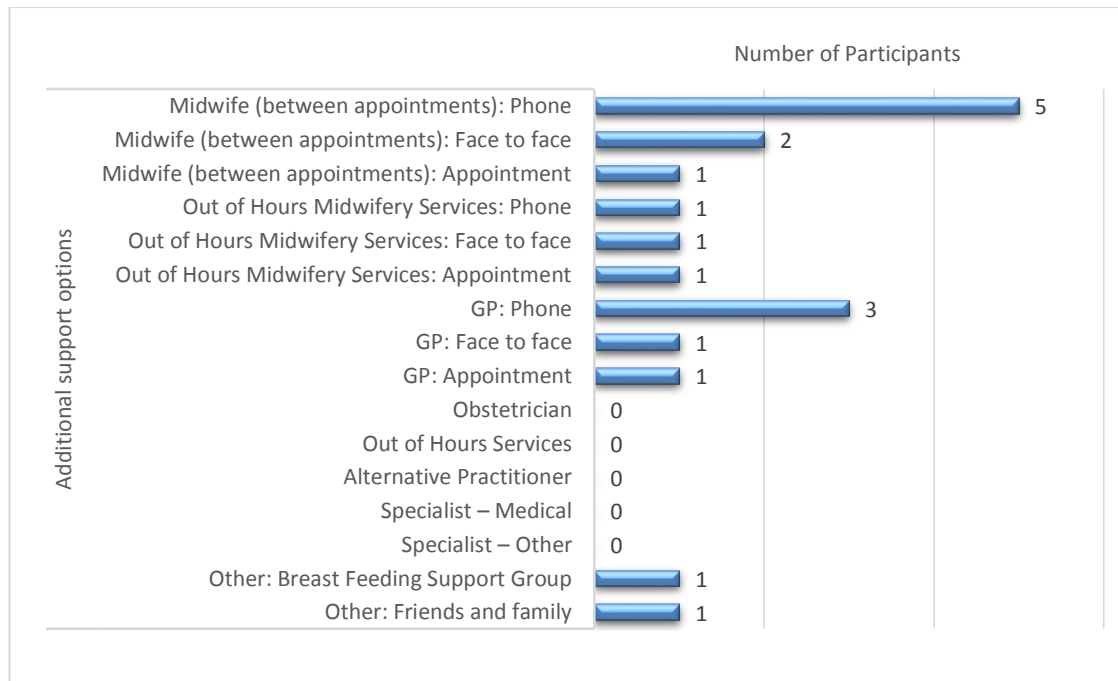
**Figure 6-9**      **Support: Antenatal Education Provider**



#### 6.2.2.7 *Intended sources for additional information and support during pregnancy*

Participants indicated their four preferred professional options: midwife (n=8 and 45% across the three options), GP (n= 3 and 29% across the three options), out of hours midwifery provision (n= 4 and 18% across the three options) and breast feeding (peer) support group (n=1 and 6% as a face-to-face option). Family and friends feature within the additional support (n=1 and 6%). The preferred mode across these was face-to-face at 30% (or 36% if direct contact is assumed) (n=4) (see Figure 6-10, p188).

**Figure 6-10 Support: Additional Support Services**



These provisions are community-based services as the obstetrician, medical/other specialist or alternative practitioners were not chosen by any of the participants. No conclusion can be made from such data as the timing of completing this questionnaire cannot capture preferences for women who have complex medical or pregnancy situations based on the exclusion criteria.

#### 6.2.2.8 *Exercise participation*

One of the sections of the questionnaire concerned pre-pregnancy and first trimester exercise type participation and the intentions for the remainder of pregnancy. A modified version of the Borg Scale for Rate of Perceived Exertion (RPE 0-10) (Utter et al. 2004; see 4.11.3, p145), as intensity of physical activity, was used in the study (see Study Questionnaire, Appendix 5, p329-336). Strolling (n=7; Borg range 2-5/6) and brisk walking (n=9; Borg range 4) featured as the most popular pre-pregnancy exercise types. The next most popular was swimming (n=4; Borg range 4-5/6) although not specifically identified as aquatic classes. Of the remaining exercise types, the participants reported that they participated for 1-2 hours per week with a Borg range of 2-7/9 (median value of 5/6). Women at this time reported a range of activities and for some participants up to three exercise types. Appendix 24, p393-394, presents the data for these sections of the questionnaire.



During the first trimester strolling (n=6; Borg range 2-3) and brisk walking (n=7; Borg range 4-5/6) were chosen suggesting these activities continued to be accessible and preferred. While again the frequency was reported as 1-2 hours per week, the variety of different exercise types was reduced by 50% for participants during this time interval.

Exercise intention for the rest of pregnancy indicated brisk walking (n=5; Borg range 2-4) and aquanatal (n=10; Borg range 3-4) as the two most preferred options, with Pilates (n=3; Borg range 1-3), yoga (n=4; Borg range 3) and swimming (n=4; Borg range 3-5/6) as other anticipated exercise types of choice.

Women tended to indicate their frequency for participation in hours per week rather than time per day which is possibly due to the period of time under scrutiny as recall was easier for weeks as intervals. Two exercise modes were not chosen at all – horse riding and dancing. A third type – gym exercise – featured as an alteration in participation possibly due, as with the previous two, to the perceived risk of injury. Weight and cardiovascular training had been used before pregnancy (n=4), cardiovascular training was used by one participant during the first trimester, whilst neither type was chosen as an intention for the remainder of their gestation.

### **6.2.3 Pregnancy Physical Activity Questionnaire (PPAQ)**

The use of a previously validated questionnaire provided structured data (see section 4.9.4, p131-134) for participant engagement in physical activities from a range of categories, which covered indoor and outdoor undertakings alongside their aquanatal class attendance. Participants completed these following the focus group discussion and returned them to the researcher. The potential of accuracy of re-call as a limitation did not appear to cause concern as the three month timescale posed a manageable time-frame similar to others who attended each focus group. The version of the PPAQ used in this study can be found in Appendix 7, (p343-348 and the MET (Metabolic Equivalent of Task) values in Appendix 8 (p349-354).

#### **6.2.3.1 Information from PPAQ**

The data for all four themes (caregiving activities; housework/gardening; active living; and walking as part of daily living) (Chasen-Taber et al. 2004a; Chasen-Taber et al. 2004b) were calculated as MET values and presented in the following account. One

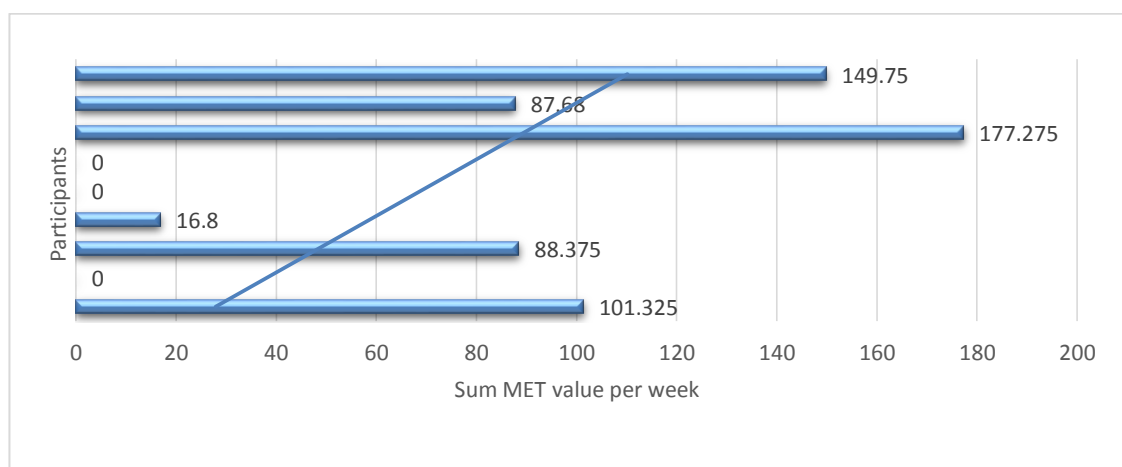
additional theme, physical activity at work, is included, although it should be noted as data for antenatal questionnaire responses only, as women had not returned to work at the time of postnatal PPAQ completion.

There is some definitive difference between before and after birth, especially around caregiving and active living. This was not unexpected and reflects the adjustment to early motherhood correlating with all participants during the first six months following childbirth.

#### 6.2.3.2 *Reported physical activity – pregnancy and postnatal*

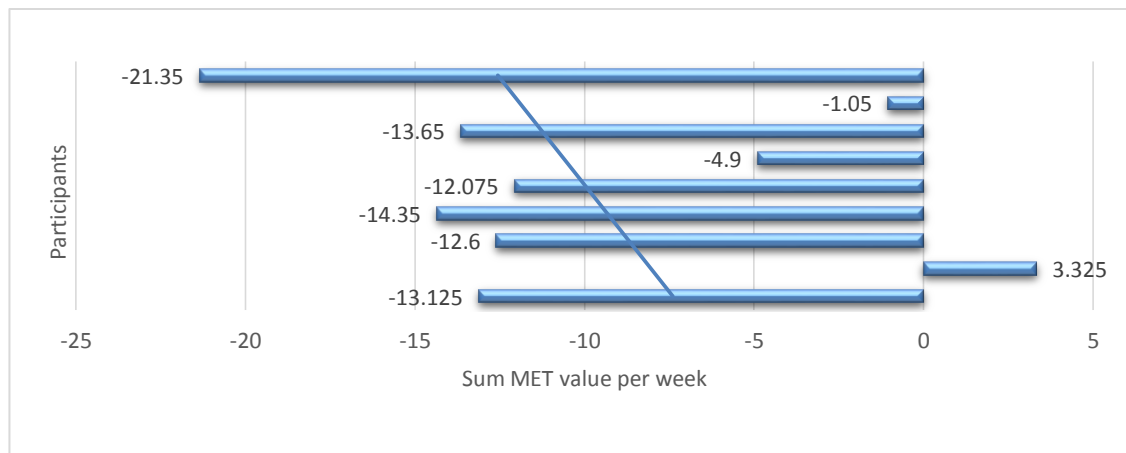
Caregiving comprised of five questions on the PPAQ questionnaire (numbered 5-10 – see Appendix 7, p343-348 for detail). It should be noted that three participants entered no data for any of these six activities during completion before birth, which as this set features at the beginning appears interesting when later sections were completed in full. Participants who responded to this category unequivocally reported a significant increase in activities associated with care following the birth. The trendline reflects an eighty MET value increase in reported caregiving activities after birth for six women, relating to five of the six activities involving children specifically. The correlates with an increase in ‘care’ activities associated primarily with new motherhood, from none (or less than ½ an hour per day) to 3 or more hours per day a significant level of alteration in their daily living activities. The remaining activity ‘taking care of an adult’ was reported by one participant who also reported the same MET value for before birth (see Figure 6-11, below).

**Figure 6-11**      **Caregiving Activities (n=9): Increase after birth**



A second data category is housework and gardening. Five questions (questions 4, 15, 17, 18 and 19 – see Appendix 7, p343-348 for detail) provided data for these activities. One participant reported an increase in housework activities whilst the remaining eight respondents indicated a decrease. At the time of completing the postnatal PPAQ this could be related to their experience of recovery following the birth. Overall the trendline shows that activities in this category show a ten MET decrease for the participants (see Figure 6-12, below).

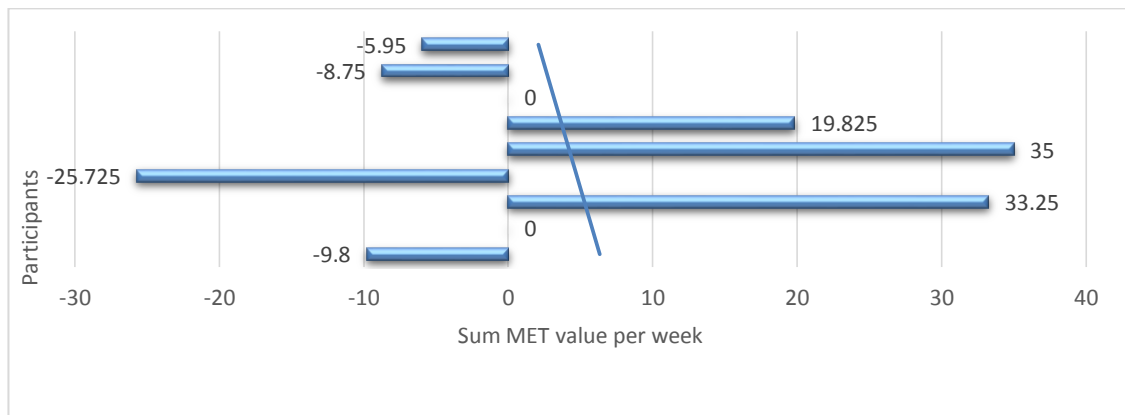
**Figure 6-12 Housework Activities (n=9): Decrease after birth**



Two gardening activities are considered alongside the housework categories, both concerned with lawn mowing. The ‘mowing lawn – ride-on’ was only reported by one participant (likely to be employment related due to her occupation noted as ‘animal keeper’) while four indicated ‘mowing lawn – walking’ as an antenatal activity and two continued this activity following the birth.

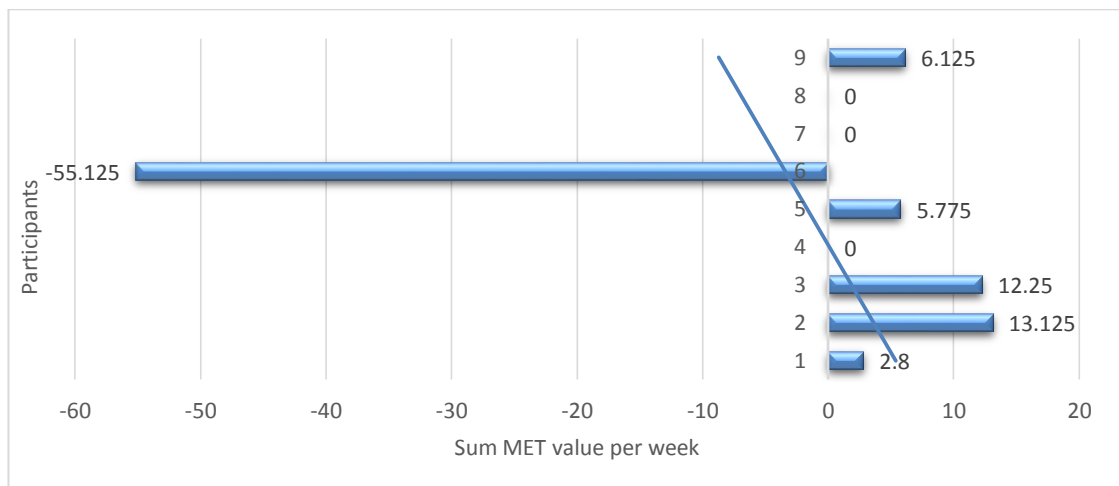
The four questions (number 14, 20, 21 and 23 – see Appendix 7, p343-348 for detail) which offered information about walking as an activity of daily living for these participants is presented in Figure 6-13, p192. Whilst two participants reported no difference in their walking activities, three reported an average increase of 29.358 METs per week (total 88.075 MET), with four stating an average decrease of 12.55 METs per week (total 50.225 MET). The trendline demonstrates an overall increase in MET value for walking activities after their baby’s birth.

**Figure 6-13 Walking Activities (n=9): Increase after birth**



The final category of active living relates to six questions (numbers 24-29 – see Appendix 7, p343-348 for detail) and an additional two specific activity data questions if completed (number 30 and 31). Six respondents provided data on active living which would suggest an increase of 6.679 METs per week (total 40.075 MET), while one reported a significant reduction of 55.125 METs per week. ‘Walking more quickly’ and ‘walking quickly uphill’ were consistently reported in this category, whilst jogging was recorded by one participant as a postnatal activity. The trendline demonstrates an overall decrease in active living for these participants. However, this is primarily due to the decrease in activities for one participant (see Figure 6-14, below).

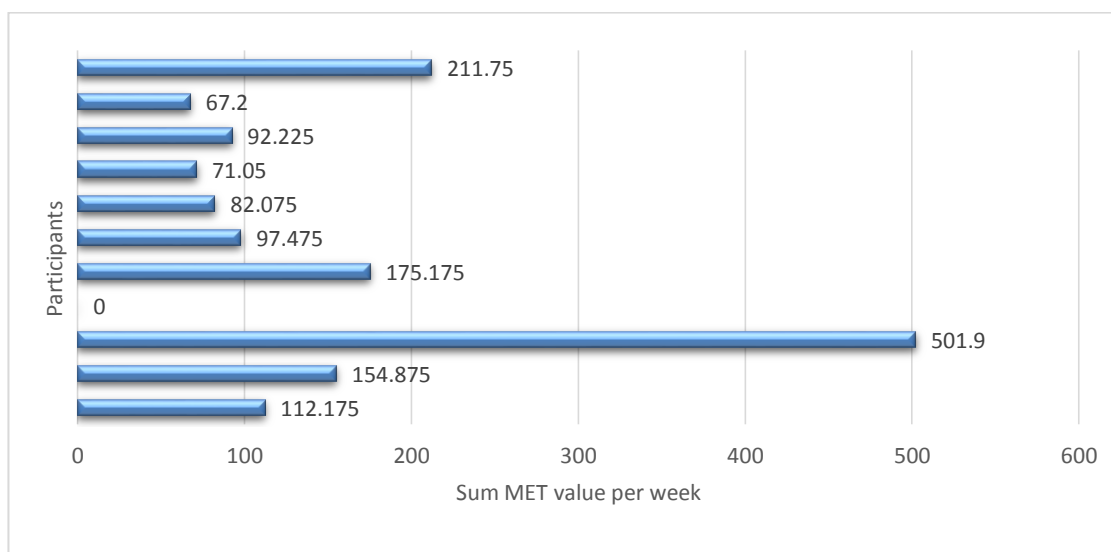
**Figure 6-14 Active Living Activities (n=9): Decrease after birth**



Finally, physical activity data at work was compiled from the antenatal PPAQ data only (numbered 32-36 – see Appendix 7, p343-348 for detail). The data presented for occupational activities correlated with the stated employment for participants particularly for the three highest MET values and the mother who recorded no work

activities. ‘Sitting’ and ‘walking not carrying’ featured as high MET value activities for several women with the two ‘standing’ categories being the next most popular (see Figure 6-15, below).

**Figure 6-15 Physical Activities at Work (n=11): Before birth only**



Arguably the changed MET values for other categories reported after the birth by these participant’s accounts for much of the occupation time spent antenatally, although the metabolic equivalent for the tasks is likely to be significantly different.

#### 6.2.3.3 *Type of exerciser description for study participants*

I sought to identify ‘grouping’ for participants from the exercise activity records presented from the questionnaire data provided, using an adaptation of the descriptions used by Gaston et al. (2012) (see Appendix 25, p395). Taking account of the Study Questionnaire data and the PPAQ data, the women can be identified as belonging to the following categories at the time of antenatal focus group: 01 and 11 – non-exerciser; 02, 03, 04, 08, 15, and 17 – active living; 06 and 07 – regular exerciser; and 10 – excessive exerciser using the adapted descriptions (see Appendix 25, p395).

Such categories of descriptors can be arbitrary and are only scrutinised effectively when corroborated by the antenatal data and in the context of their specific characteristics recorded on the initial questionnaire and answers to the antenatal PPAQ. In essence nearly 73% (n= 8) of the participants came from the active living (54.5%) or regular exerciser categories (18.2%).

#### 6.2.3.4 *Social media group page*

The 'Facebook' closed group page (see section 4.9.8, p138-139) was monitored during recruitment and data collection for its noticeboard messages which primarily consisted of birth notifications (n=9 of which 6 were study participants) and five queries about class arrangements. In addition, one attendee requested information on family support services and another apologised for missing the class. The remaining messages were posted by myself highlighting class arrangements for: Bank Holidays and school holidays, informational posts including pregnancy vitamins, a new public health app, a link to a national radio discussion about discrimination in the workplace, early support for breastfeeding and the first distribution of a 'baby box' in the UK.

Post-birth 'tea and cake' drop-in sessions were offered at approximately two to three months intervals and four were announced on the media page during this time. Two local businesses posted advertisements on the media page, one offering baby massage (twice) and another for newborn photography (three times). Personal messaging between members could not be collated as membership is inclusive of past members who could not be consented for this research study but remain part of a wider social network for local women.

### 6.3 Qualitative Data from Focus Groups and Researcher Sources

Women attended the focus groups at different pregnancy gestations and later on during the postnatal groups following birth. Table 6-4 (below) indicates this schedule timing for each participant. All those who attended the groups are included in the table, and data presented to illustrate the results in the following reporting of data.

**Table 6-4 Timing of Focus Group Attendance for each Participant**

Antenatal		Participant Number	Postnatal	
14-24 weeks	25-40 weeks		8-14 weeks	15-28 weeks
		1		27
	37+6	2		24
	36+0	3		19
	36+4	4		23
	37+1	6	14	
	34+1	7		
20+6		8	13	
19+1		10		
	36+4	11	11	
	36+6	15	8	
	30+2	16	9	
	30+3	17	10	

The focus group data was analysed thematically using a framework defined during the research design (see section 4.10, p139-148). The process enabled me to examine the data for each participant and to explore cross participant data between focus groups and alongside my own annotations and reflections for this data tool.

Two themes emerged from this procedure - Experience of Wellbeing and Developing Peer Support. Each theme will be presented individually at this stage, followed by a summarised report. To present the voice of participants and their similarities and differences in views, edited verbatim quotations are used to illustrate the findings and linked to memos or annotations where relevant.

### 6.3.1 Theme 1: Experience of Wellbeing

#### 6.3.1.1 Antenatal Wellbeing

During pregnancy, women described several aspects of being well. These included lifestyle, health, emotional and physical wellness (see Figure 6-1, p176 and Appendix 22, p386-389). The analysis revealed 'being active' and 'keeping mobile' as most frequently asserted by individuals in all antenatal focus groups. In addition, the women identified that mental health was also equally important to their physical condition, suggesting the appreciation of the holistic nature of the gestation period:

*".....being able to keep active, and keep moving I think, .... is important"*

3/1<sup>1</sup>

*"...it's not just physical, it's the mental as well ...that's really quite key that it is about the mental wellbeing too ....that ....you feel happy and healthy."*

6/2

This interwoven explanation of wellness, health and being active was echoed by other women as part of other focus group discussions:

*"..[that] I can continue to do the types of things that I want to do, without too much extra effort and generally feeling fit and healthy at the same time.."*

17/3

*"..Just making sure my mind stays positive and focussed on what is coming.."*

11/3

*"...It's the ability to kind of get out there and kind of live life really and to do things that you ....want to do and get enjoyment out of it ...be happy out of it.."*

6/2

*"..I think that just being well just ...it's not just physical, it's the mental as well. I think that's really quite key that it is about the mental wellbeing too, that you feel happy and healthy."*

6/2

Participants identified their capacity altered due to advancing gestation, identifying this through their perception of wellbeing and daily life activities, even offering specific symptoms that altered their specific experience:

*"I find it takes just a little bit longer to do certain things but you can still get them done."*

4/1

*"For me it's like the swelling, like the swollen feet I've noticed especially ...like at the end, like now, sort of nearing the end and I'm like you know... I'm going to have to like sit down because your feet kind of stop you from ...[group laughter]..."*

4/1

---

<sup>1</sup> This notation style refers to the participant (3) and focus group (1).



whilst for one woman, her aim was to measure her physical capacity by comparison with peers:

*"...I hope I can keep going like you two...."*

7/1

One participant identified altered anxiety levels around health, specifically associated with pregnancy:

*"..I think I worry about things more about my health than I did before, so when something happens I'm like is that normal, whereas before I would ...just kind of, oh I've just got a twinge its fine, whereas now it's a bit like...."*

2/1

and another spoke of her psychological adaption for engaging in physical activity specifically, which recurred as a common comment during the post birth focus group interviews:

*"I think my expectations have changed"*

17/3

#### 6.3.1.1.1 Wellbeing and employment

Wellbeing at work formed part of one focus group discussion and suggested access to support within the work environment added positively to their capacity to work, especially during early pregnancy when nausea and sickness occurred most frequently. Of interest was the perception of being able to 'cope at work' in relation to the job role expressed by a single participant and linked specifically with her work activities.

*"I found the first trimester was the worst for work because people obviously don't know at that point but you are absolutely knackered and don't feel like you're kind of up to your normal kind of self ...so... now ...in the last couple of weeks when you are working .....people don't seem to expect quite so much from you whereas at the beginning it's quite tough when it's not obvious ....."*

2/1

#### 6.3.1.2 Postnatal Wellbeing

For postnatal focus groups, the 'change in wellbeing' and 'recovery from the birth' featured as the main sub-themes. Ironically the experience of instrumental or caesarean birth or early post-natal complications for over 90% of the participants will have altered how they perceived their wellness, even after three months following birth.

The wording used to describe their altered wellbeing following the birth experience was often tinged with the drama such experiences unwittingly bought with them:

*"I think most of that [wellbeing] is to do with the birth, ...I probably didn't really realise how much traumatic [Toddler name removed] birth was compared to [Baby name removed]'s, ... having [Baby name removed]'s was much easier and much more plain sailing so from that perspective yes I definitely felt much, much better, much brighter in myself, ...and I also think being my second I was a bit more prepared as well, ...kind of what was to come..."*

6/4a

*"That's nice to know because we did have a bit of a traumatic birth .... the after bit and stuff was a bit traumatic so that ....I'd say it probably did take me at least six [to eight] weeks to kind of get over that but ...once you get that out of the way you kind of do feel bit more like your normal self again ...to start feeling slightly like a normal human being again..."*

*"...unfortunately I had quite a bad tear so I ended up having to go to [Main Unit – name removed] for surgery in an ambulance on my own, my husband had to stay with [baby name removed] and bring [baby name removed] over in the car so we all got a bit separated and ... as I say, not a stress free time, it was all a bit traumatic so it did take a bit of time to get over that..."*

3/4a

The language used in the conversation between women at these post birth focus groups sounded negative, singling out how the experience of birth appeared to have affected their perception of recovery whilst caring for a new baby (see section 7.2, p214-219). I was especially struck by no-one mentioning advice or support of healthcare professionals (midwife or GP), specifically during any of the transcripts of the group discussions. Antenatal education from NHS or private providers was linked to additional opportunities for peer support (see section 6.3.2.3.1, p202-203). Participants also spoke of the changes to their daily routines brought about by the impact of new mothering duties, especially related to their own nutritional requirements, homemaker role and expectations of themselves:

*"Trying to eat a healthy diet which isn't that easy sometimes....."*

*"Trying to eat healthily [because]'cos sometimes you just pick up a biscuit..."*

4/4a

*"Time is a massive problem as well [be]cause obviously when he is in bed in the evening it's just my chance to see the other half or clean the house a little bit..."*

1/4b

*"....I felt very tired for the first 6 weeks and even at times quite stressed and upset over things but that has worn off since. ....so it's coming up to 9 weeks and I'm just getting the hang of things now...."*

15/4c

*"....There's no routine for us yet ... I know some people are like feed at this time and we go to bed at this time ....at the moment I still live my day by [baby name removed] so everything is done by her at the moment so there is no routine..."*

11/4c

*"...I think kind of around 3-4 weeks I kind of had this big internal battle with coming to terms with .....I just need to surrender and rest a little bit. I think in that sense the kind of mental wellbeing kind of changed because before that I was kind of battling wanting to be as active and have the life that I used to have, but also have the baby and I think I kind of had a bit of a transition whilst I've ..got to surrender and rest and slow down for a little bit and then I felt a lot better and she got a lot easier to look after and a lot easier ...gradually able to get out for ...walks and things, but .. my perception of wellness [is] definitely different. I don't think functioning and achieving things is less important and ...I think more of a psychological side of it more, the way I look at it is different, definitely, lowering my expectations."*

16/4d

*"..I'm not doing a huge amount at the moment ...which I don't like because I don't like not feeling fit but just finding the time to kind of to fit it in is a bit of a challenge..."*

2/4b

These candid quotes show clearly the dilemmas new mothers face, often with minimal direct professional interaction or indirect support. Women seemed to appreciate that feeling well and recovering their health at a level of functioning they desired had presented extra challenges to their personal bio-socioecological levels and access to available social connections. The coping strategies employed were not given by all participants, but two examples are:

*"...we go to a buggy fit class at one of the gyms ....quite nice to meet lots of other mums, chat to other mums and things like that..... I've managed to start going swimming on an evening again just once a week ...because he's bottle fed I can just leave him with Daddy on an evening to get him all settled and things like that."*

3/4a

*"...it's just been the sleep deprivation to begin with ....you never know how you are going to cope with that to begin with. I think you just adjust to it and I'm finding now that I generally feel pretty good during the day. I find it a struggle to get up in the morning but generally once I'm up and showered and had a large coffee, I'm fine. ....overall pretty pleased at how well I've recovered physically."*

17/4c

### 6.3.1.3 Participation in physical activity

The largest individual and cross participant data set occurred for participation in physical activity linked to perception and experience of wellbeing (see Appendix 20, p382-384 for extract of focus group coded data for 'participation in physical activity').

#### 6.4.1.3.1 Attitudes to participation in physical activity

One sub-theme of wellbeing included the participant's attitudes and motivations to being physically active which presented in both antenatal and postnatal discussions. Whilst for these women the data tends to suggest they engaged in some form of pre-

pregnancy exercise, there was variable frequency, intensity, type and time (see Appendix 24, p393-394) and continued motivation appeared to be driven by personal needs around being active.

#### *6.4.1.3.2 Barriers to participation in physical activity*

A second sub-theme comprised of the barriers to participation which were expressed as frustrations associated with advancing pregnancy (such as oedema and general mobility) and to limitations posed by early motherhood (for example infant feeding and caring role) (see earlier in 6.4.1, p212). The third sub-theme identified participation in antenatal physical activity and comprised of discussion of various fitness class attendance (including aquanatal) and engagement in activities before, during pregnancy and after the birth.

*“.....I was used to doing maybe like 4-5 sets gym classes a week and being ... on the go all the time. I never .... have a nap on the weekends or anything like that so I think that like acclimatising and not having quite as much energy and accepting that you actually can't do everything that you used to do as well, I found quite frustrating at times but I kind of embraced it now, but ...that took a while....”*

17/3

*“....the things you just expect like out of breath.....”*

3/1

*“....was part of the reason we were talking about bottle feeding as I would like to get back to aerobics ..... and also once ..... [Baby name removed] is happy with Daddy and a bottle then that's what I would like to do....”*

6/4a

These focus group discussion themes need to be considered alongside researcher data and the survey data from the questionnaires. The detailed interrogation of results is presented within the discussion (see Chapter 7, p211-261).

Wellbeing was described differently during pregnancy, after the birth and while linked to physical activity participation. Each woman experiences wellbeing in their own reality and will therefore describe the impact over time, relative to self-development during their transition to becoming a mother.

### **6.3.2 Theme 2: Developing Peer Support**

Whilst this study did not examine economic resources, I did seek to explore women's perception of social support within and outside the aqua-natal group (see Figure 6-1, p176 and Appendix 23, p390-392). The context and environment are important

therefore to the bio-socioecology, particularly for inter-group relationships being newly established but also in the reciprocity in such relationships. The aquanatal group dynamics may well have driven the prompting of community by its criteria for admittance – being pregnant, shared experiences of maternity care provision and their individual development of mothering characteristics.

*“...I think when you first come it’s quite daunting [be]cause you just come on your own and not with anybody and you think [xxx] how am I going to start talking to people and then you just do, doesn’t take long to settle in I don’t think. Everyone is here for the same reason, aren’t they? Most people are here on their own, so people [are] more keen to get involved with each other I think.”*

11/3

#### 6.3.2.1 Health professional support and provision of antenatal education

Varied antenatal experience of NHS services and contact with other non-medical provision such as NCT antenatal classes meant that not all participants had similar experiences of midwifery or antenatal care leaving a potential void for those with complex social needs. I did identify one participant (an EU national), who lives away from her extended family and thus may have had limited ‘family support’. In addition, women may have a hidden undisclosed disability which may limit social interactions or find the nature of their full-time working significantly alters their capacity to engage in antenatal activity.

Participant’s verbal comments at focus groups supported their study questionnaire data in respect of the sources of health professional support (see 6.3.2.7, p203 and Appendix 23, p390-392). Women shared their individual experiences and proffered a sense of frustration with the maternity service and communication systems from their perspective:

*“... there’s a bit at the beginning where you don’t see your midwife very often [so] it’s lovely to kind of have access to a midwife every week ... that you can obviously ask questions to, [be]cause otherwise it feels like a really long time .. where nobody is really interested in you.”*

2/1

*“My midwife has been really good then unfortunately she’s gone off sick so I [am] having lots of different midwives so it’s nice to have someone that you see regularly every week....”*

4/1

*“[I] have had contact with my midwife, unfortunately [she] has been off sick so we have had other midwives as part of the team supporting us...”*

6/2

Whilst some ‘bottle up’ their informational needs, other described how they utilised the social capital within the group to address their question:

*“...I enjoy .....chatting to you guys because you’re in the same situation and sometimes I think [about] something I have been worrying about all week, like the Health Visitor coming and then I chat to everyone else who have the same thoughts and I thought that made me feel a lot happier.”*

15/3

#### 6.3.2.2 Established support networks

Both antenatal and postnatal focus groups offered information from participants identifying established support networks (family and friends), as primary sources for most, if not all the women. Family networks were significant for some whilst others found friends to be the main source of emotional and practical support. The availability of support from both these sources appears to have been particularly significant during the period after birth.

*“..I think, ....it’s like all my other friends are kind of single and don’t have any children and things like that so it’s kind of when you’re the first one...”*

3/1

*“ ..It makes a difference doesn’t it [be]cause parents are quite .. out-dated. I’m quite fortunate because I have a lot of friends who have quite recently had babies and ...so I’ve had those to talk to .. ”*

4/1

*“ .... I’ve had family round ever such a lot, I have a big family.  
.....And then friends, I catch up with (name removed) ..... outside of swimming and we’ve been texting each other questions back and forth and pictures of things from textbooks to each other about different problems and I’ve even messaged my friends from work, simple ones of ‘do tights go on the inside of the vest or the outside of the vest?’ ....”*

15/4c

However not all women experienced a supportive environment in the workplace which could have impacted on her perception of positive pregnancy transitions:

*“....I come to the aqua fit then I talk to the other women here, then that’s probably been the second biggest [the first option was online] because I don’t really see anyone else, I work with men, they don’t know anything, and ...I think that’s been quite helpful for me because I haven’t really got any one else, so...”*

8/2

#### 6.3.2.3 Peer support for pregnancy and parenthood

##### 6.3.2.3.1 Benefits of new peer support from attending aquanatal

The data for the sub-theme of peer support during pregnancy and early mothering offered attendance at aqua-natal as a significant option to developing support with others that is viewed as having potential for childrearing. It appears that for some

women, the importance of relationships formed during attendance at aquanatal became linked to their experience of post birth recovery and wellbeing. One comment of significance identified 'night' contact with another aquanatal member as critical.

*"...I've been talking to some of the people I got to know here ....  
.....It's usually a night feed rant or like ... 4am someone like me writing on Facebook going  
'ahhh'....."*

8/4d

*".....still kept in touch with a few people from aquanatal through Facebook and  
WhatsApp messaging....."*

17/4c

*"...If I have got a question, I'm going to text it at whatever time of night and just hope  
that someone will reply with what to do...."*

15/4c

Another data theme for participants seeking support from health professionals, posited that contact and support was not consistent with their named midwife or local midwifery team. However, there was a view by some participants that peer support was also offered by antenatal education which may be accessed by NHS or private providers.

*"...I've seen my midwife but she only works one day a week so she's only available on  
one day so it's like I don't really see her that often and she's not available any other day  
than when I see her....."*

8/2

*"....I've been to the NHS antenatal ones and really enjoyed it, lots of useful information  
and I've kept in contact with 2 people since then because they gave me like a list of  
contacts of people so you can link up ....."*

15/3

Social communities offer varied levels of support tied to relationships between individuals and those they interact with during daily life and work. The experience of networks is bound by each woman's personal involvement with family members, and external contact with work, social and community groups. Again, the emphasis of becoming a mother can be seen to alter their perception of peer support through attending aquanatal.

#### 6.3.2.4 *Technology related informational resources*

The nature of information from on-line sources did not appear to feature as a necessary requirement to these participants whilst developing or establishing networks or communities during pregnancy. The nature and potential for misinformation based on adverse event reporting was presented by the responses of some women in the focus groups,

*"...I've gone online, I've been 'Googling' which isn't always the best thing to do, but I think that has sometimes helped and sometimes doesn't..."*

8/2

*"...I've been guilty of looking at things on the internet which I think is not helpful in a lot of cases [be]cause you get a lot of kind of people only post things on the internet when ....something has happened or something has gone wrong .....so it's a good way of scaring yourself...."*

2/1

with one respondent clearly stating her reason for avoiding this activity:

*"...I can't say that I look at the internet but then I'm a bit of a worry wart so I don't..."*

7/1

Women in this case study appear to choose social connection networking options suited to their particular individual support opportunities and role transition pathways, set within established arrangements or selected pregnancy related structures as offered by the aquanatal class.

#### **6.4 Consideration of the links between demographic data, descriptive results and qualitative findings**

Whilst each set of data was initially viewed separately, combining them offered some additional confirmation between demographic data, descriptive results and qualitative findings. Greater emphasis was given to the qualitative themes, whilst specific quantitative data characteristics such as exercise motivations and specific support options were considered during analysis. This was partly as informational requirements may have impacted on each women's experience of aquanatal classes, the timing of anticipatory educational need, or the range of peer support available through attending this provision.

In striving to explore and analyse each theme the discussion between participants on specific points was considered alongside their entire data set, researcher records and the case context (see section 6.2 and 6.3, p178-204; and section 1.5, p19-26). The discussion reflects primarily the qualitative data but acknowledges where the quantitative data is added. Completion of re-integration of various data sets progresses the interpretative scope and activities, as the commitment to analysis began to intensify. This section specifically combines selected data from the study questionnaire with interrelated PPAQ results and focus group themes.

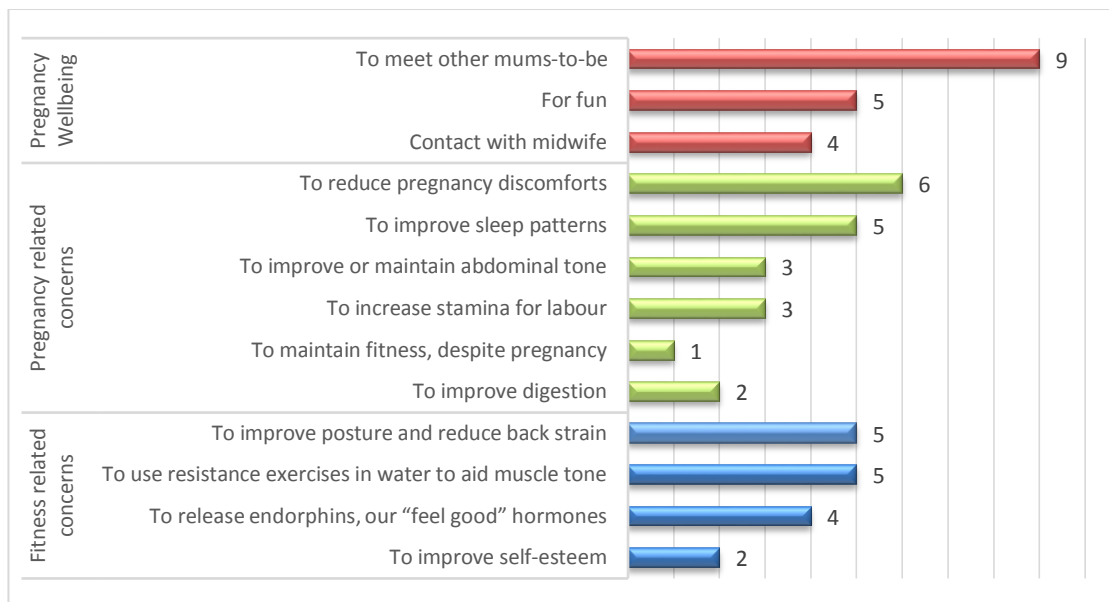


## 6.4.1 Attending aquanatal: women’s motivations and identified benefits or barriers

### 6.4.1.1 *Reported motivations by theme*

The motivations were identified by participants via a questionnaire immediately following informed consent procedures (see also section 5.3.2, p163-165; and Figure 6-8, p186). Consideration of the range of reasons indicated prompted the consideration of their motivations from three sub-themes as indicated in Figure 6-16, below. There is substantial overlap between reasons specifically identified as associated with pregnancy (six reasons) and those for more general physical fitness (four reasons), demonstrated by the pattern of participant choice overall for these two themes.

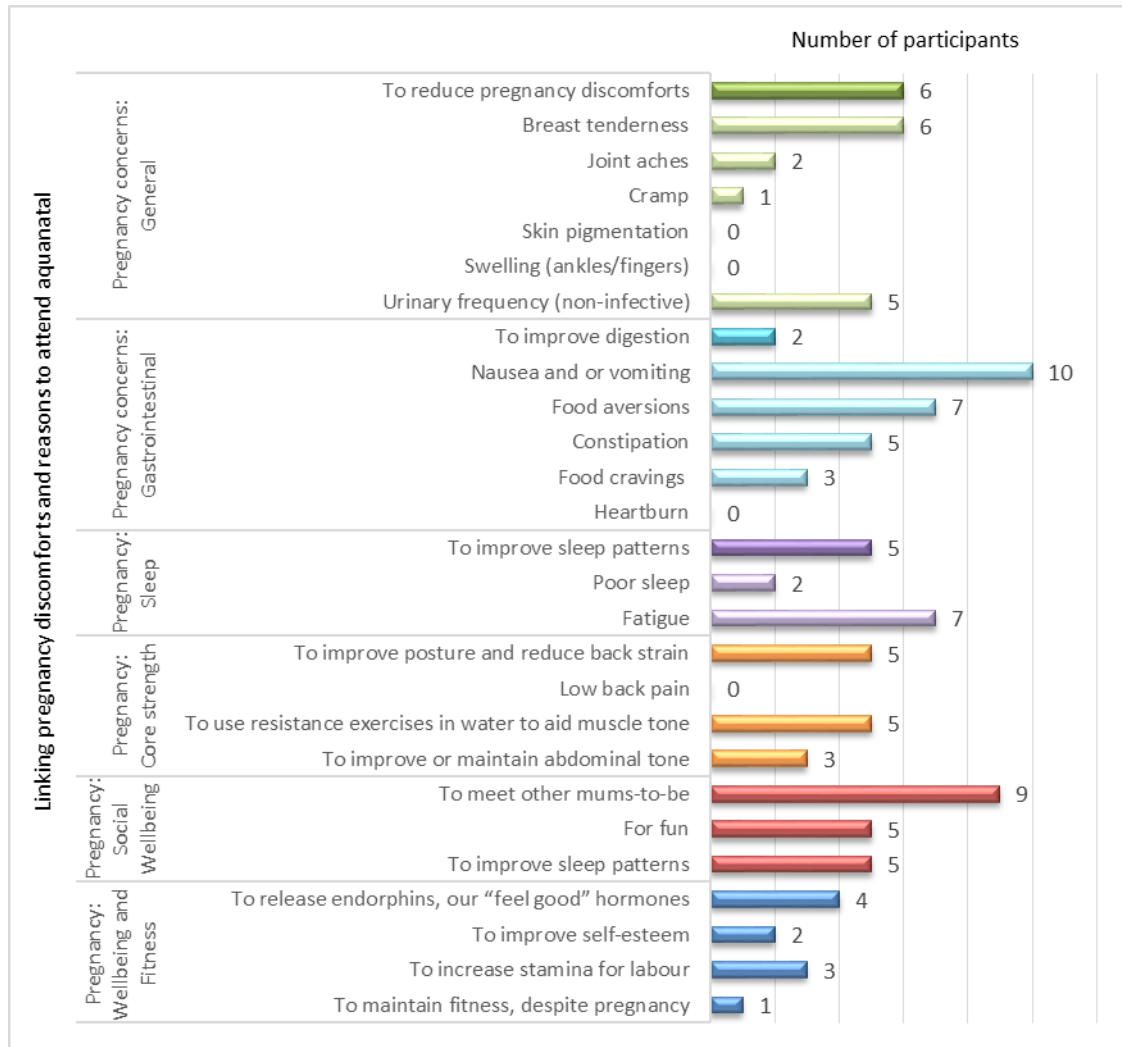
**Figure 6-16** Themed reasons for attending aquanatal – social, pregnancy and fitness



### 6.4.1.2 *Dealing with pregnancy discomforts and attending aquanatal*

As attendance appeared to be for pregnancy associated reasons, I then sought to combine the participants recorded discomforts (see section 6.2.2.3, p183 and Figure 6-7, p185) with reasons to attend aquanatal provision, targeting links between physical activity and wellbeing during pregnancy (see Figure 6-17, p206). Four main reasons were identified for this: general discomforts, gastrointestinal symptoms, core conditioning and altered sleep patterns. These were then related to their stated reasons for attendance.

**Figure 6-17** Linking pregnancy discomforts and reasons to attend aquanatal (n=12)



#### 6.5.1.2.1 General pregnancy associated discomforts

The timing of data collection meant discomforts generally experienced during the first trimester featured more commonly in participant answers, for example, breast tenderness (50%), and urinary frequency (42%). However, the symptoms principally associated with later pregnancy, such as swelling, were not identified in the study questionnaire. Hyperpigmentation was also not reported as a concern by the study participants which may not reflect consistently in the wider population for pregnancy. It may mean that increased skin pigmentation (Muallem and Rubeiz 2006) may cause acute or chronic embarrassment to women who may then elect to stay away from skin exposure prone situations as experienced in leisure centre activities (see also Appendix 1, p311-317).

#### *6.5.1.2.2 Gastrointestinal discomforts*

While nausea and vomiting is stated as a symptom experienced by 83% of participants, heartburn was not reported by anyone in study questionnaire data. This may suggest some discomforts impact on daily life with more debilitating effects; for example, food aversion, food cravings and constipation are reported by 58%, 25% and 42% of participants respectively. It was of additional interest, that the known advantage of physical activity to improving digestion was only given as a reason for engaging in exercise during pregnancy by 17%.

Gastric reflux did feature as a query often brought to pre-class or in-class conversations. The experience of reflux symptoms (Carlin and Alfirevic 2008; Yanamandra and Chandraharan 2012) often occurred during the third trimester, being linked significantly to impaired sleeping patterns and semi-recumbent postures during the aquanatal class. Timing of symptoms was an individual experience as was the need for relief when some women sought medicinal treatment from health care professionals, and others adopted personal strategies to reduce the impact of such conditions.

#### *6.5.1.2.3 Poor sleep and fatigue*

Generalised fatigue was a shared discomfort for the participants (58%) at the time of data collection, although poor sleep was only cited by 17%. Various physiological reasons for altered sleep patterns have been given including: increased circulating oestrogen levels (Patrick 2017), musculoskeletal issues and gastrointestinal symptoms. Pregnancy symptoms of nausea, vomiting, cramp, urinary frequency, depression and anxiety can all contribute to interrupted sleep and associate strongly with consequences of fatigue through impaired mental processing and cognitive difficulties.

Remedies for such issues are often elusive, but as tiredness was more commonly described by study participants, they and class attendees shared their ways to achieve more rest, through managing personal arrangements specifically for evenings and weekends. Rest and sleep positions were often described using examples of soft furnishings that offered modified comfort options for seated and lying postures, especially when pelvic girdle discomfort occurred. Women also indicated a reason for attending aquanatal was to improve sleep patterns (42%) based on engaging in physical activity thus aiding the body's ability to rest.

#### *6.5.1.2.4 Musculoskeletal and core strength*

Postural improvement (42%) and abdominal muscle tone (25%) are reported specifically in relation to resistance exercises (42%) associated with attending aquanatal as a water-based exercise mode. Women would generally anticipate abdominal muscle tone changes due to physical adaptations of pregnancy based on social exposure within family and communities. Core strength may not be as well-known as important to posture or functional mobility, but an awareness of the effects of gravity on standing or walking, especially in advanced pregnancy, is often another fact gained from social exposure. Transferring and assimilating such knowledge for themselves may be routine, and with the addition of health messages can be embedded into positive health behaviours reinforced through aquanatal instruction.

Participants in this study did not report the incidence of back pain as an individual pregnancy discomfort. Reasons for this may be that data was recorded at a stage of pregnancy when these specific participants had not experienced this symptom. Researcher records did not reflect this as a recurring theme for discussion during the field phase of the study.

### **6.4.2 Attending aquanatal: social connectedness and wellbeing**

A second set of themes from combining demographic and qualitative data allows additional consideration of wellbeing as experience by the study participants.

#### *6.4.2.1 Social wellbeing*

At least two of the (three) social reasons (75-83%) were chosen by all participants (see Figure 6-17, p206), suggestive of the importance of the perception of social benefits to pregnant women of attending a pregnancy group activity. Meeting other mother-to-be is clearly one reason (83%) for seeking a leisure-based activity which may cater specifically for women in similar positions. As a rationale for initially attending aquanatal, this can demonstrate the importance of community-based provision for such networking. In addition, 'to have fun' (42%) indicated that such facilities would benefit from a degree of informality where pleasure is allowed as a benefit to connectedness through group encounters.

It is impossible to link social wellbeing with mental wellbeing from the data collected in this study. However, fatigue and tiredness are associated with cognitive difficulties which can significantly impair socialisation. I included 'to improve sleep pattern' (42%) in this theme for this reason, as women appeared to value improved sleep as a general perceived advantage from attending aquanatal.

#### 6.4.2.2 *Fitness related wellbeing*

Interestingly, maintaining fitness (8%) was not viewed as an essential factor, which may be linked with the range of physical adaptations being experienced impacting on their capacity to participate in scheduled exercise activities. However, separating this and three other motivations (see Figure 6-17, p206) suggests discreet processes for behavioural adaptations during pregnancy or reasoning for attending aquanatal.

For wellbeing, the practice of physical activity as an activator of endorphins, and to enhance self-esteem is identified as more important than maintaining or improving fitness levels. Endorphins are released during physical activity and have a therapeutic action on the body improving perception of 'feeling good' and enhancing self-esteem. Endorphins can counterbalance tiredness in certain circumstances, allowing greater cognitive equilibrium despite associated pregnancy fatigue. The relationship between stamina (for labour) and fitness is less defined, but labour is often seen as having potential to require endurance due to time, and for women to self-manage their energy resources.

As the data offered by the antenatal focus groups was collected in either the second or third trimester, the participant experiences offered a much broader picture of pregnancy, accounting for the impact of employment and everyday living on continued participation at aquanatal classes. Specific, as well as general benefits and barriers were identified individually and shared.

#### 6.4.2.3 *Motivation and aquanatal attendance*

Participants shared a varied set of motivators for attending the classes, in the study questionnaire answers and the pre-birth focus groups. These included a number of benefits associated with being in water and an additional set of assets to their social wellbeing. Women identified positively with being in water

*"...take the weight off everything.."*

3/1

*".. that... like release of pressure.."*

4/1

*"..doing something even though you're not as active as what you were.."*

3/1

The study questionnaire data affirms that 75% of participants sought to meet other mums-to-be as a motivator to attend. In addition, 91.6% were at the time in full-time employment (plus one stay-at-home mother). As all participant women indicated a range of active living, caregiving, housework and walking involvement in their daily lives from data given in antenatal PPAQ answers, the separation of data specific to aquanatal is not possible from current study results.

*".. you get to meet people, you get a chance to socialise, ask questions, talk to each other..."*

6/2

*"..the fitness benefit and the feeling well benefit... "*

10/2

This study did not measure if these various motivations (see Figure 6-17, p206) altered throughout pregnancy especially nearer term, which would have offered additional information about fluctuations for stated reasons, or if these motivations remain similar to those ahead of the first attendance at aquanatal.

## **6.5 Conclusion and orientation for the discussion**

This case study examined women's experience of pregnancy wellbeing and peer support by attending a midwife-led aquanatal class. The results and findings (see section 6.2 – 6.4 inclusive, p178-210) suggest that pregnant women access this activity to meet other mothers-to-be and this may well be linked to their life transition to motherhood. The social community built around such provision provides insight into the extra reciprocal support to individual attendees on a variety of themes which could be associated with their experience of health communications inside and outside the group. The dynamic nature of the group membership may possibly add positively to these results.

The following discussion will take forward these results with reference to the research aims and objectives (see section 1.3, p18-19), and the literature review (see specifically chapter 2, p30-77 and chapter 3, p78-95) highlighting an explanation for the research findings.

## **Chapter 7 Discussion, Conclusions and Recommendations**

This chapter considers the research findings in relation to the literature review (see chapter 2 and chapter 3, p30-95) and the synthesis of the study results presented in the proceeding chapter, through interpretation and explanation bound by the case context (see section 1.5, p19-26). The main literature foci are briefly revisited ahead of the main debate (see section 7.2, p214-219) to offer a contextual framework to the considerations.

The case study research approach set the overall aim of exploring women's experience of involvement in attending aquanatal classes during pregnancy. The research procedures were approved to examine their perceptions of wellbeing and peer support through a set of objectives designed to question and elicit results from data collected by various methods. Adherence to the requirements of the accepted ethical framework and documentation guided the utilisation of data collection skills and diarised researcher reflections. The discussion presented here is bound by means of a series of analytical processes to explain the study outcomes.

Setting out the study aims/objectives, literature and case context into a structure for discussion, offered options to keep each elemental theme separate and later combine them, to establish comprehensive debate of the research data. This allowed the dynamic nature of the participant's experiences of wellbeing and social connectedness associated with the group context to be captured and debated over the period of membership and into the period immediately after the birth.

Following the discussion (see section 7.3, p219-237), the conclusion is presented bound by my perspective as a midwife and researcher. This seeks to establish the development of practice related to women's experience of wellbeing through attending aquanatal exercise and the impact on peer support during pregnancy that such aquatic classes may offer. The study implications, limitations and challenges are acknowledged (see section 7.6 - 7.8 inclusive, p246-253), before presenting recommendations for research and midwifery practice (see section 7.9, p253-258). A thread of reflective narratives punctuates this chapter composed of my evolutionary transition as a DProf candidate.

### 7.1.1 Reflective narrative

According to the pre-set analytical processes (see section 4.10, p139-148), I intend to let the woman's voice be the primary lead to this discussion of the data. The women's voices are offered in my discussion as quotations identified within the two key categories, together with demographic and contextual data to aid comprehensive scrutiny.

Within the review of literature I sought to consider women's experience of pregnancy wellbeing, the peer relationships built through 'attending aquanatal' and the broader social arrangements associated with pregnancy (see chapter 2 and chapter 3, p30-95). The research aim and study objectives initially hindered my consideration of a clear presentation plan of the results as these were 'professionally' driven and I felt had the potential to limit the social explanation of collected findings and results. I began to appreciate how I needed to maintain the consideration of meaning to the data, whilst offering a professional and researcher perspective by way of a holistic model, as the data analysis progressed.

Morse (2003) offered an interesting editorial on 'biasphobia' which argued that researchers must identify bias within the design, so that the data collection and analysis focuses on the less ordinary, allowing it to stand out from the 'noise' of the confusing data which lacks fit to the coded categories or theories. Understanding of these "best" categories allows scrutiny of the "weaker" or "average" ones thus reducing confusion for the novice researcher (Morse 2003, p891). This confirms the importance of linking the pre-examined and widely considered literature through informed critique and continual comparative consideration throughout the analytical processes. These strategies together with ensuring the researcher's commentary is accessible in the reporting, allows the complexity of the phenomenon to be more comprehensively debated during reporting.

*I feel completely overwhelmed by the quantity of data I have.  
Being selective about what to 'use' and what to leave out is so hard to justify. I  
feel disappointed that so much will not be seen/heard.....*

Researcher Journal: Writing up the findings/results (1)

I had a wealth of results and findings gained through data collection which may not feature comprehensively in this thesis leaving me feeling guilty as guardian of material



which will not be seen at this time. I felt tempted to seek options for inclusivity even when data links would be tenuous at best but was guided that additional data could be disseminated in other follow-up articles. The tension between my professional values and developing researcher skills was palpable and uncomfortable. Supervision allowed me to explore my dilemmas and 'bracket' these conflicts promoting focus on the discussion.

*Discussing my angst with my supervisors was actually cathartic yesterday. Although still disappointed I can see that (hopefully) I can report other data in the future. I have some doubts about how I can achieve this, but I have to move this results chapter on and get the draft finished....*

Researcher Journal: Finishing draft of Chapter 5

The disequilibrium between professional and researcher role prompted me to re-evaluate my positionality (Dwyer and Buckle 2009; Ballamingie and Johnson 2011) specifically around data analysis. Data management is essential to this part of the process, so the full data set was retained as complete and associated with all contextual information nearby. I was conscious that the reductive processes I had used needed to involve careful consideration to ensure the research objectives were met coherently. The progressive focusing nature of this was aided by the repeated consideration of insider positioning throughout the process. This was illustrated throughout the reflective class notes and reflective field notes recorded during data collection and analysis.

*How can I ensure the meaning doesn't get lost? Can my discussion really prevent a detachment between data and question focus? My moderation skills may have limited the data collected or inhibited the women especially when my curiosity led a supplementary query? .....*

Researcher Journal: During early data analysis

*..... I need to capture the detail of what the women have said very succinctly as I cannot include complete answer dialogue between them. I feel that each quote will be so brief that the dialogue between the women at the focus group will be lost to the 'cutting room floor'. I have to keep the context at the forefront and maintain my insider role as separate – so hard to describe this difference between researcher and instructor as I am both at the same time! Women's experience is foremost and my understanding secondary – surely this hinders how I can present their words? ..... Maybe that's the fundamental rule of achieving distance as a researcher?....*

Researcher Journal: Writing up the findings/results (2)

The completed sets of data from demographic and qualitative sources therefore needed to be systematically interrogated so the key areas: wellbeing through physical activity and wellbeing through social connectedness are intertwined with the quantitative data

sets. Such tasks required stringent researcher focus, taking care to bracket my prior assumptions which 'disturbed' me during the coding process (see Figure 5-1, p158 after Sustein and Chiseri-Strater 2012, p115). Leaving my professional midwifery beliefs and attitudes out of reach during later phases of coding (three to five specifically) promoted the detachment to the data but required intense effort on my part to understand the key categories from data analysis and later lead the format for a cogent discussion of the study findings.

## **7.2 Concepts of Health and Wellbeing, Peer Support and Transitioning to Motherhood Revisited**

In contemporary society our experience of personal wellbeing relates to the dynamic interplay of satisfaction with life, seeing our presence as worthwhile and the psychosocial effects of daily life challenges (ONS 2011). Wellbeing relies on the interrelation between 'being' well (essentially cognitive), 'feeling' well (subjective experience) and 'doing' well (behavioural adaption) with individuals having control of the personal emphasis on each area of wellness. For women, life satisfaction may vary during different phases of adulthood linked to variations in; health, illness and life stage(s) such as childbearing (Prenda and Lachman 2001; Diener et al. 2003; Stone et al. 2010; Dodge et al. 2012). Motivation to maintain or improve wellbeing takes account of various actions that relate our external and internal behaviours during such life phases but also on the life continuum. The use of the theory of planned behaviour (Ajzen 1988 and 1991; see Figure 2-3, p49) to continue physical activity is likely to be combined with individual motivation for leisure activity participation. Pregnancy as a significant life change may offer a motivational stimulus to women who then consider starting or re-engaging in more active daily living arrangements.

Active living was a consistent story for women attending the aquanatal class, with some indicating that the choice to attend was initially motivated by wishing to continue to be active during pregnancy. Whilst this supports Ingledew and Markland's (2008, see Figure 2-5, p51) model of participation for individuals, for the aquatic exercise group the additional impetus of social connectedness to maintain behavioural change (Prochaska and DiClemente, 1983) is required within this bio-socioecological arrangement (Sallis et al. 2006). Relationships between aquanatal members are likely to be significant to the

patterning of these lifestyle behaviours, although group dynamics may be a product of shared pregnancy experiences and instructor integration to such communications.

The concept of positive subjective wellbeing aligns to; inbuilt competence with personal resources, ability to be autonomous in life engagement, self-perception of esteem and energy for life, together with resilience to complex situations (Hone et al. 2014). One external influence on how wellbeing is experienced is associated with the environment where events occur, and the interrelation between this with and our ability to exert control in situ. For women accessing professional care during pregnancy, the setting is often determined by the service provision and local arrangements. These settings are frequently unfamiliar and unnatural for many women with added expectations of specific behaviours associated with surveillance of pregnancy by medical and specialist practitioners. Women participating in this study encountered a professional midwife in an unpredictable setting (the leisure centre) which could alter their perception of pregnancy wellbeing during their class attendance. Indeed, many indicated that they appreciated the informal contact in addressing queries that occurred between scheduled maternity care appointments. Many of these womens' initiated discussions were embedded within their personal affective experiences associated with pregnancy discomforts (such as heartburn, physical adaptations during gestation), pregnancy associated lifestyle amendments (for example posture at work) and preparing to become a mother (such as labour preparations and infant feeding). Two illustrative examples are presented here; one from a focus group participant and the second an extract from my research journal from the week 10 class:

*"...coming to the sessions here...we've had a midwife here as well, so that if there is anything that we need to know we've got that extra support, it's not just about the social side, it's we've got you [researcher identified] here...."*

11/3

*A pre-class question on Braxton Hicks Contractions by one attendee which started a wider class discussion between 3 women and myself. [Name removed] explained her experience of them feels like period type pains, with encouragement others added their experience and broader discussion ensued including identification of the pattern – none, and intensity – short and limited, and potential application to the stage of pregnancy – pp descent, and engagement progression after 26 weeks. The initial angst for [name removed] seemed to dissipate by hearing others experiences and problem solving her experience.*

*Reflective Post-script: This conversation about Braxton Hicks appeared to enable 'quieter' attendees to overcome barriers to later interaction especially during the group exercise station based class element – maybe even associated with greater cross group mixing of participants but I cannot comment on this specifically as some women stay together and others mix freely during the session.*

*Analysis memo annotation: conversations as aid to peer support [social connectedness].....*

Researcher class journal, week 10

Pregnant women gain various support from professional relationships which occur in environments suited primarily to formal contexts, and from established family or friend networks which often happen in more informal spaces. Constructive, socially effective connections with practicing midwives can be achieved by sensitive delivery of proactive individualised care whatever the venue (Stoddart 2012; Stoddart et al. 2014a; Hunter et al. 2015). Interpersonal support derived from dialogue with people experiencing similar life events can be witnessed in health and social communities across the UK and beyond. The notion of peer support is bound up in a complex fusion of: social theory, capital, habitus, reciprocity and relationships between individuals and within socially-bound communities (Bourdieu 1984; Mead et al. 2001; Gross and Pattison 2007; Maton 2010; Moore 2010; Thompson 2010). Pregnancy networking and interaction is secured by 'status homophily' and 'value homophily' (after McPherson et al. 2001) bound by network culture and location. The site for these interactions may alter the dynamics between women and the perception of benefit by those gathered in such spaces. This is echoed in my research data on use of professional support and antenatal education.

The contact with health professionals was not always positive as explained by two women:

*...“I just feel...I don't know my midwife I don't really have anything to do with her, you go in, she dips your wee and asks you 'is everything alright?' Yeah, yeah, bye' and literally in and out whereas some people get a lot more time....”*

7/1

*“...I went to [the] GP and didn't really like it so I haven't gone back but I'm lucky I haven't had to but if I had to I'd go....”*

8/2

Neither woman appeared to disengage with NHS services, although it is unclear if such experiences were due to environmental settings, the socioecological drivers to the specific appointment or personal interaction difficulties for the woman or professional. However, uptake of formal professional maternity services could be impacted by a range of dynamic or cultural barriers which may occur in certain interactions.

There appears to be a contrasting experience by attendance at class based provision (aquanatal and antenatal education) which is again set within social interactive situational practises:

*"...coming to aquanatal has been way more helpful.....more helpful than the antenatal classes as well, [be]cause the antenatal classes you didn't really get much opportunity to talk to anybody else ...it was just more about kind of learning..."*

2/1

*"...we're doing the NHS ones' on Sunday, ... ours is all on one day which is 6 hours, so I'm looking forward to that and yeah I think my husband is OK about one day..."*

16/3

The identification of inclusivity for women and partners in group gatherings appears crucial within a sociological framework whereby interaction between members is valued by women as fundamental to positive gains from attending a single or set of classes. These women can be seen to be seeking a degree of 'status homophily' and 'value homophily' (after McPherson et al. 2001) through networks built in such circumstances.

Another feature of the nature of communities for antenatal education is also the mixed gender membership where the assortment of unconscious beliefs and values ('doxa' after Deer 2010) cannot be pre-arranged leading to a 'field' (Thompson 2010) which is shaped by decidedly 'fuzzy' borders. Communicating public health content (Hunter et al. 2015) whilst translating information for individual members grounded in the national policy agenda, poses inherent difficulties within and outside the group by organisational design or perception of member(s) or facilitator (Bowden 2006a; Wadsworth 2007; Blake 2008; Sanders et al. 2016). The diverse provision is compounding the perception of applicability as is the monetary contrast between NHS and National Childbirth Trust (NCT).

*"...I'm just doing the NHS ones, I've thought about the NCT and ...then I thought well I don't think my husband would tolerate as long as the NCT [course] is. I've picked up some of the content at work and ...a big-big part of me thought I'll spend 200 pounds to make some friends. I thought that might be a bit extreme...."*

16/3

Transitioning of roles in the range of everyday social contexts poses several life influences for experience of wellbeing through life changes (Hassall 2016), especially powerful around first childbirth (see, for example Raphael-Leff 2005). Physical adaptations, financial changes through employment legislation and employee capacity,

together with psycho-social expectations of themselves and expectations by others mean life choices can appear restrictive through societal expectation (Marmot 2010; Naidoo and Wills 2016). Mixed with the demands of health and welfare contexts integral to their social community, women encounter professional surveillance of their childbearing journey and scrutiny of their health behaviours (Gross and Pattison 2007; Gross 2010; Naidoo and Wills 2016). Participants for this study shared some thoughts based on personal experience from work demands and social situations whilst pregnant, and later their perceptions in the early weeks following birth.

Women in this study offered some personal observations of coping at work including:

*"...slow[ing] down quite a lot, well I tried to occasionally when we've been short staffed, because I do the rotas...so I've always ended up doing quite a lot of overtime because it's easier...."*

16/3

*"...where it is very obvious that you're...pregnant, people don't seem to expect quite so much from you whereas at the beginning it's quite tough when it's not obvious .... but you feel [word removed]..."*

2/1

*"...it is still sort of do-able, but a lot of it I couldn't...do all of it... so you kind of feel like.... I'm not completing my role..."*

4/1

As such, their comments reflect their personal perception of how others saw them in the work environment and their commitment to 'fitting in' by the use of specific strategies at certain times.

The after-birth experience tended to echo the reality of becoming a mother during the first months and the sociological impact of negotiating and adjusting to their new role. For many, they had little experience of being at home and not working which posed cognitive (evaluation) and affective (experience) challenges set in a complex psychological (eudemonic) nature of postnatal wellbeing (after Dolan et al. 2011). Three examples are given here with one offering one option she used to ameliorate her specific reality:

*"...I just think you don't realise ....the time it will take you to recover and I think you sometimes think you can just spring back into shape and lose all the weight and it's all going to happen automatically and ...reality soon kicks in that actually it's going to take you a bit longer than you initially thought, to get yourself back in shape"*

*"The main thing is walking and going places..." "....we go to a buggy fit class um, at one of the gyms, we go there which is again quite nice to meet lots of other mums, chat to other mums and things like that, um and then I've managed to start going swimming on an evening again just once a week...."*

3/4a

*"...its things like cutting the grass and stuff as well, trying to get that done. So it's not quite as easy necessarily as you might have to stop half way through to go and sort something out [for baby name removed] and then you can carry on....."*

4/4b

*"... the first few weeks the biggest source of support was our NCT WhatsApp group because you knew whatever time of day you sent out a message somebody else was there to answer your question or yeah, just have a bit of support and reassurance so ....that's been good...."*

17/4c

These three key concepts (health and wellbeing, peer support and transition to motherhood) revisited in this section, have been viewed consistently throughout the literature and study findings, and continue to feature within the main discussion which follows. The inherent nature of peer support appears to be grounded within the social connections available through 'attending aquanatal' and to a degree reflects the resources within each pregnant woman who engages in the class. Experience of pregnancy health and wellbeing can be seen to correlate to specific symptoms and circumstances which may prompt changes to previous behaviours specifically associated with forthcoming motherhood and parenting. Assimilation of public health messages may not be consistent across or within populations despite extensive local policies to distribute this within health or social care provisions (see Sanders et al. 2016).

### **7.3 Discussion**

The two themes isolated from the qualitative data sources were 'experience of wellbeing' and 'developing peer support' (see Figure 6-1, p176; see section 6.2 and section 6.3, p178-204). Initially the debate follows each theme in relation to the study objectives, but then brings them together to explore the relationship between these topic areas. Each section of the discussion seeks to guide the reader, using a series of structured layers of quantitative and qualitative study data sources embedded into the related evidence from the literature review and some additional published discourses. The perspective of pregnancy is emphasised, although the lens of postnatal reporting is included when helpful to advance the exploration of experiences or motivations that inform wellbeing during pregnancy and the co-existence of developing social relationships with peers during the pre-birth timeframe.

During data analysis the coding strategy led from superficial to deep interrogation of underlying meanings, to gather the participants' understanding of the research phenomenon (see section 6.1, p173-178). Examining the interrelation between the sub-themes of wellbeing for medical, social, economic, spiritual or psychological status (DEFRA 2010; DoH 2010b) was viewed from the perspective of their inter-group relationships during their individual aquanatal participation. This discussion presents extracts of edited words of the women to illustrate specific parts of the debate.

### **7.3.1 Women's experience of wellbeing**

*"...being well means that I can continue to do the types  
of things that I want to do, without too much extra effort..."*

(Participant 17/Focus Group 3)

This first theme was constructed from three main sub-themes – antenatal wellbeing, participation in physical activity and postnatal wellbeing (see Figure 6-1, p176 and section 6.3, p195-204 inclusive for the qualitative findings).

Literature indicates that the interpretation of wellbeing by women is linked to their subjective and objective understanding from broader holistic health status (and co-existing welfare), specifically when personal experiences are positive (DEFRA 2010; DoH 2010b; DoH 2014; Hone et al. 2014; see section 2.4.1 for detailed discussion, p41-46). Participants in this sample expressed their cognitive and affective experiences during data collection which they used to define and balance individual subjective understanding of the phenomenon of attending aquanatal.

Primarily, each lifestyle choice women make is based in how they live and then is mediated by a range of internal and external influences guided by current and past employment, the broader socio-economic environment they inhabit, and their experience of health (Dahlgren and Whitehead 1991; Bowden 2006b). In this study, each participant's descriptions of wellbeing were embedded within the data through their individual beliefs, values and their individual social, psychological and physical experiences during pregnancy and immediately following birth.

For at least one participant her explanation is that there is a social as well as physical activity element to her experience of wellbeing:



*“...I am quite a social person I like probably the talking mix of the exercise together to be honest....”*

15/3

During one interaction in another focus group, experiences came from a more holistic explanation with wellbeing being bound by broader experiences of mental, psychological and emotional health facets tied into their physical actions:

*“...being well means that you’re happy, that you’re healthy, that you can do normal day to day things....”*

6/2

*“...if I’m anxious I don’t do anything. I don’t move I just sleep and sit on a couch and I don’t really do anything.... if I’m moving and if I’m healthy and then ....that makes me feel better and I’m less anxious so it’s quite important to me to be doing exercise and being well...”*

8/2

Wellbeing was linked by expressions of being able to keep active, being described succinctly by two other participants as:

*“....being well means that I can continue to do the types of things that I want to do, without too much extra effort and generally feeling fit and healthy at the same time...”*

17/3

*“...just being chuffed when you can walk somewhere, like going from a to b is quite a nice feeling, like the later you get into pregnancy, stop and think I can walk from the train station today, I feel quite good about that....”*

11/3

Both quotes illustrate on behalf of many of these participants that they identify with everyday functioning and lifestyle, fitting around their personal experiences setting meaning for their quality of life (QoL) (Meeberg 1993; Contanza et al. 2007). QoL occurs within a socioecological context where the subjective factors (for example wellness) combine with individual need(s) (as in leisure), tailored to opportunities of experience (such as social capital) (see Figure 2-2, p45). An appreciation of the interrelationship between QoL and health and wellbeing, cannot be explained without consideration and appreciation of the holistic nature of health and wellbeing, as experienced by individuals.

The experience of the relationship between wellbeing and engagement in physical activity during pregnancy is recognised by study participants, whilst they also identify differences to mode or the level of activity undertaken prior to pregnancy specifically (see Appendix 24, p393-394). During data analysis, the mapping of physical activities set a participant focus for active living which appeared to support the proposed activities provided by the Study and PPAQ Questionnaires, and the Focus Group themes (see

section 6.2.2, p180-189; section 6.2.3, p189-195; and section 6.4, p204-210 respectively). Despite the small sample size, the coherent interpretation of this is bound by the context of this case (the community environment and particular class membership at the time) (see section 7.3.1.1, p223-227). Occupational physical activity was limited for most as the nature of their employment was largely sedentary, which meant that leisure time for these women was when such physical activity took place (see section 6.2.3, p189-195; see also Figure 6-15, p193).

Two participants were identified as 'non-exercisers' and one as an 'excessive exerciser' principally from PPAQ data (see section 6.2.3.3, p193) and are of equal interest alongside those who were categorised as 'active living' (n=4) and 'regular exercisers' (n=2). Participation in physical activity cannot be easily aligned to 'inactive' as meaning none or minimal, or into 'more than two hours daily' as more than regular or excessive, by the framework suggested by Gaston et al. (2012) (see Appendix 25, p395). Incidental disorders of pregnancy, employment schedules, and sociological integration would all impact on intention or involvement in leisure-based activities, as well as behavioural motivation to adopt exercise participation in addition to 'normal' activities of family life.

Previous research indicates women used several criteria to assess specific physical activities. These include identified risk perception associated with the activity (previous pregnancy research: Duncombe et al., 2007; Derbyshire et al. 2008; previous pregnancy aquatic research by Cavalcante et al. 2009) and individual beliefs of positive benefits from new or established activities (previous specific pregnancy aquatic research by Liquori et al. 2003; Prevedel et al. 2003; Granath et al. 2006; Smith and Michel 2006; Baciuk et al. 2008; Vallim et al. 2011). Correlations to other health benefits such as healthy eating are not included in this study, but could be investigated further as nutrition and physical activity are often linked into weight management messages (NICE PH11, 2008b; NICE PH27 2010b), particularly around childbearing.

This quote sums up conversations from each of the antenatal focus groups, where the women each gave their impressions of the benefits:

*“... I joined quite early, I was 14 weeks when I joined and ...really enjoy [it], I joined because it was run by a midwife ...I asked who was it run by because I felt like I needed someone to ask questions from and also because I wanted to meet other women who were pregnant and I thought it would be something fun to do ...I think even though it is a workout and you don't actually realise that because you are in the water you don't actually realise that you are working out but it's quite hard, but [at the] same time you are still talking to people and ...it's quite relaxed....”*

8/2

These words echoed previous stated benefits (previous specific pregnancy aquatic research by Prevedel et al. 2003; Granath et al. 2006; Smith and Michel 2006; Baciuk et al. 2008; Vallim et al. 2011) but specifically stresses the explicit social advantages of meeting other pregnant women (echoed in Liquori et al., 2003 specifically) within a socially constructed space, enjoying the interaction during a specifically designed and safe activity.

#### 7.3.1.1 *Perinatal physical activity and gendered space*

The geography of leisure centres is such that spaces there are determined by ideas of gender, gendered identities and leisure practices (Johansson 1996; Taniguchi and Shupe 2014; Andrews 2016). Research linked to gender and exercise suggest women favour group exercise class provision with emphasis on everyday function, mobility and flexibility with a level of cardiovascular fitness built in (Keating et al. 2005; Herrmann 2015). This type of provision is likely to be provided in specifically gendered spaces. These types of exercise preferences are only partly true for the proportion of women in this study for whom running was a pre-pregnancy activity. See Appendix 24 (p393-394: before pregnancy), although the reason for this cannot be assumed nor based on specific characteristics or identified preferences. As all but one woman worked full-time, the participation in personal running arrangements could be associated with scheduling for leisure activities and/or a conscious decision to be outdoors. In addition, emotional regulation (positive wellbeing development) and prioritisation (of energy and personal goals) affect perception of barriers to engagement in leisure undertakings (Hyde et al. 2013). The rationale for choice and the impact of pre-conceptual preparations for these women is unknown.

Other women in this study chose exercise classes (aerobics, body pump, yoga or Pilates), accessed the gym (weights or cardiovascular), or engaged in brisk walking activities (see Appendix 24 p393-394: before pregnancy and first trimester). Most indicated their capacity for intensity as Borg score of 3-4 (somewhat hard) to 7-9 (very hard) at that

time. Their stated engagement during the first trimester showed many were unable to participate in the same activities and is corroborated by their comments about first trimester nausea and vomiting given in the focus groups. This echoes the research literature for early pregnancy exercise (Bennett et al. 2013; Harrison et al. 2018) and the reasons for this difference in levels of participation. Women identified 'slowing down' as being linked to first trimester tiredness or significant lack of energy, or the overwhelming influence of 'being' pregnant', driving their adjustment to specific activity, frequency or time spent on activities within the data:

*"...I did gym 3 times a week before work in the morning, so at ....6am and that kind of ended when I didn't know I was pregnant and then.. I got really bad stomach cramps ...I was exhausted so I could hardly get up for work so I couldn't get up to go [to the] gym before work so I stopped go[ing] there anymore...."*

8/2

*"... I was used to doing maybe 4-5 sets gym classes a week and being ....on the go all the time. I never ... have a nap on the weekends or anything like that so I think that like acclimatising and not having quite as much energy and accepting that you actually can't do everything that you used to do, I found quite frustrating at times but I kind of embraced it now, that took a while ..."*

17/3

Physical activity participation has been suggested as behaviour positively influenced by second and third trimesters of pregnancy (Smedley et al. 2014) as women reassess their engagement with public health advice. The impact of professional information and support is presented as bound into public health messages in the guise of improving outcomes for children's health (Marmot 2010; Hunter et al. 2015; Sanders et al. 2016). The women in this study participated in 'active' living with most identifying walking as a primary activity consistently during pregnancy and after birth (see section 6.2.3.2, p190-193; Figure 6-13, p192 and Figure 6-14, p192), although returning to pre-pregnancy levels of exercise was not achieved within the timeframe of data collection (postnatal focus group data). Whilst I did not anticipate participants would return to similar pre-pregnancy exercise levels within six months, additional follow-up of participants at one year post-birth would have allowed such information to be collected (see section 7.9.1, p253-256).

Nevertheless, some women found public scrutiny and comments about their pregnancy exercise behaviours were unhelpful:

*"...I got loads of people saying that I shouldn't have run at the beginning but again ....because I work with the public, they literally were like 'oh, you're not still running are you' and I was like, yep because as long as I felt well enough I didn't see the harm in not doing it, so I carried on...."*

7/1

Women appeared to an extent to be able to effectively deflect such comments or counter them by self-efficacy. Other participants found their immediate family offered different viewpoints where the conflict of attitudes suggested a degree of disapproval:

*"...my mum is like the opposite .... she's just sort of like 'yeah keep going as long as you can, just keep going' but like you say .. the in laws were like 'you've got to stop earlier'..."*

4/1

Assimilation or debates around such external attitudes are outside the scope of this study, but this is one area where barriers to engagement in behaviour change may be affected negatively (Prochaska and DiClemente, 1983; Ingledew and Markland, 2008; Inskip et al. 2009; Luce et al. 2016). The nature of public health messages generally for physical activity may need to be strengthened for specific populations groups such as pregnant women and new mothers, in the public domain and media campaigns. Recent publication, for instance, of the DoH infographic (DoH 2016) for physical activity in pregnancy, could aid distribution of professional advice to the wider public and national population(s).

The specific discussion of gendered space (see section 2.5 and 2.6, p56-66) is taken up again here as a theme of debate during this discussion where sociology, physiology, psychology and ecology re-emerge in combination, bound by the women's experiences. Considerations of places that are essentially familiar to individuals include our home which is principally private, and the public spaces we enter (Townsend 2000; Nash 2012a). Alongside privacy, our home offers a sense of security, a place of personal freedom, environmental control and a location where we can express ourselves without challenge (Townsend 2000). For pregnant women these facets of home become tested as the changes brought about by progressive bio-socioecological elements during the period between conception and becoming a mother. Outside the home, in public spaces, the shift for social and psychological adaption appear visibly in terms of altered body image and exhibited pregnant physical form (see section 2.7, p66-76). This new public visibility presents added personal cultural dimension into their social being as women. Nash (2012b) writes candidly that clothing choices and showing the changing body in public may be strangely uncomfortable for women as pregnancy indicates their status as a sexual being.

The chosen gendered activities (both before and during pregnancy) mentioned by participants involved attire that covered most of the women's bodies. For women the nature of appearance and functionality appears to underpin their clothing choices, especially for public presentation (Sohn and Bye 2015) or camouflage (Deighton-Smith 2014). Body image as personal capital has sociological undercurrents within self-esteem especially for later trimester 2 and trimester 3 (Gross and Pattison 2007). Availability of suitable clothing for fitness when pregnant may impact on attitudes to engaging in activities or indeed be a barrier to attending (Sohn and Bye 2015; Harrison et al. 2018). Aquatic activities attract more revealing clothing which may expose bodies to wider critical gaze of broader populations (James 2000) alongside the effects of multiple media representations of a women's ideal form and image (Skouteris et al. 2005; Duncombe et al. 2008; Luce et al. 2016) at various life stages. Participants did identify with this, specifically in the context of pool-side presence before and after the class:

*"...I'm finding that I'm just want to kind of plod through things but it's kind of OK and you don't feel ....bad about it and it's also nice to just be with other pregnant people in the pool and not kind of feel like a complete freak when you get into the [pool].....[with] everyone looking at you.."*

2/1

*"...You see all these eyes staring at you as you walk in and out...."*  
*Group laughter [Annotated memo: nervous laughter but 'in agreement' with participants 2 and 4]*

4/1

This may relate to the woman's consideration of specific activity risks versus benefits evaluated significantly on first attendance. This may influence continued participation where public exposure in leisure environments may be linked to their personal body image processing.

Body changes during pregnancy and childbirth can lead to significant psychological stress for women in their self-perception of body image (Bainbridge 2008; Powell and Hughes 2012). Several women in this study provided data that suggested they did not consider this as a significant issue for them through attending leisure activities (see Appendix 24, p393-394: first trimester activity and exercise intentions). The specific setting of aquatic provision at the leisure centre can be viewed as a unique 'field' (after Bourdieu 1984; Thompson 2010) which is also gendered space by the nature of pregnancy. Current studies into aquatic exercise have taken place in various settings

and without detailed appraisal of each centre in the published reports. Therefore, specific characteristics such as body image, cannot be associated with either 'field' or gendered space which may in turn influence habitus (Bourdieu 1984; Maton 2010) or capital (Bourdieu 1984; Moore 2010) for members of this aquanatal 'field'.

One could question if positive body image is mediated by the protective nature of a planned pregnancy strategy which may have also limited the occurrence of antenatal mental health difficulties for this participant group. The qualitative data does not reflect this aspect directly as there was only brief discussion of this in one focus group. Individual affirmative self-esteem is likely to be linked to positive body image experiences which again offer psychological protection (Deighton-Smith 2014). This was one of the reasons identified by three women for exercise participation prior to pregnancy (Figure 6-7, p185) and two women as a reason to attend aquanatal (Figure 6-8, p186). Together with the release of endorphins (Figure 6-7, p185 and Figure 6-8, p186 respectively) the psychological shielding for body image and body coverage by clothing may be more critical for certain exercise modes.

#### 7.3.1.2 *Wellbeing and perinatal public health guidance*

In the government policy document "*Making Every Contact Count*" (PHE, NHS and HEE 2015), midwives are identified as professionals who can embrace health interaction within care provision. By engaging in communications which empower women to adopt individualised public health advice, we strive to improve health outcomes for mothers and babies. In this study context situation, positive messages for active living, taking account of adjustments for physical changes associated with childbearing advancing pregnancy and early mothering, feature frequently in my research journal notes. Pre-class conversations were framed around coping with adapting at work (expectations and coping strategies) and specific physical alterations including carpal-tunnel syndrome (Researcher class journal week 9). During the circuits section of our class, smaller groups identified more personally specific queries regarding postural adaptations for working (backache), pelvic girdle discomforts or pain (mobility and function) and how their abdominal muscles could be preserved after birth (risk of diastasis recti) (Researcher class journal weeks 1-27).

As well as general pre-class and within class conversations, some women shared comments that were more person specific. One participant recalled:

*“....I remember someone talking about diabetes, and they were [perhaps gestational] diabetic and the impact it was going to have on them and ...they were talking about how things were slightly different for them and [it was] always ....interesting just hearing it [health issue] from somebody else’s perspective really...”*

6/4a

Tailoring discussion with each woman utilised aspects of my emotional intelligence skills (after Goleman, 1996) of social awareness and relationship management (interpersonal domains), in delivering communication that suited the relationship I had with each group member and the inevitable presence of other attendees.

Midwives rarely work in the leisure industry as I do as an aquanatal instructor, which presents a unique opportunity for an additional therapeutic relationship with pregnant women. Whilst this is contrary to the recommendations of ‘Better Births’ (NHSE 2015) in respect of reducing multiple different midwife contacts, there may be a level of professional continuity available in such an informal setting which could be of benefit to some pregnant women. For the women in this study this offered extra professional contact for advice and support in a non-medicalised setting and cultural context. Study participants indicated that they appreciated the availability of contact in order to answer minor queries which they felt would bother their primary carer (by a series of telephone or text messages back and forth), or to consolidate information empowering their decisions for care choices, in particular low-risk birth units, pain relief choices, and reality of labour and birthing their baby(s) (Researcher class journal weeks 23, 12 and 17 respectively). The women also engaged in reciprocal information sharing based on their own experience (either current or past) on a range of experiences of local services and topics highlighted by current media and commercial interests (Researcher class journal weeks 1-27). Much of this discussion was entirely between the women, and in such instances, I became a non-engaging bystander. Non-NHS parenting education and specific antenatal vaccination strategies often provoked questions from their peers seeking clarification of current NHS policy and professional guidance they had been given (Researcher class journal week 10).

The advantage of regular aquanatal attendance provided these participants with greater continuity for midwife contact than they experienced within their routine antenatal or



maternity care provision. Women commented that they found this reassuring especially when appointments were less frequent or contact with their own named midwife was indirect or less responsive (see examples in section 7.2, p214-219). However, this cannot be generalized as I did not explore the professional support mechanism or access to such services in full, however, it would be a recommendation for future consideration (see section 7.9.1, p253-256).

Evaluation of public health messages by midwives is offered within the literature and fits broadly with the physical adaption through pregnancy (Barakat et al. 2015; Hunter et al. 2015) and preparation for positive parenthood (Dunn-Toroosian 2003; Winson 2003; Wilkins 2006; Darvill et al. 2008; PHE 2013). Specific advice and informational support for pregnant women tends to fall between GP (symptomatic), midwife (general advice) and obstetric physiotherapist (specific musculoskeletal issue). Women might seem to infer that they may not view fitness professionals as having sufficient knowledge to offer comprehensive guidance for exercise modes or active physical engagement, which applies competently to their advancing pregnancy and some of their activity choices (Evenson et al. 2004; Duncombe et al. 2007). As the presence of midwives working in leisure spaces is rare, there is little evidence of the efficacy or potential for their professional impact on public health in these settings and this phenomenon is recommended for additional investigation (see section 7.9.1, p253-256).

Individual participants require self-incentive to seek out local leisure provision or they may rely on community knowledge to indicate suitable activities as well as web-based locality informational resources. Translating this into regular attendance is dependent upon first experience of the environment, perceptions of activity benefits, the broad culture of the group and potential for positive relationships within the group membership (Bowden 2006b; Furness et al. 2011; Sport England 2013 and 2016; Barakat et al. 2015; Swim England 2017). Motivations to access physical activity may include an activity that elicits preparation for the role of mother. In this case a socially driven leisure activity that has 'a skill for life' basis in establishing water confidence (Sport England 2013 and 2016; Evans and Allen-Collinson 2016) is then often associated with the mothering role, as mothers frequently accept dutiful responsibility and accompany pre-school-children to swimming lessons.

Study participants expressed a clear bond between the experiences of continued physical activity on their wellbeing during pregnancy. As they have exercised before, the women had identified that exercise is integral to their identity and therefore likely to be a continued investment for life:

*".. I do a Pilates class every week as well but it's one that I have been going to for about a year and a half now ... the teacher is really good at modifying everything now I'm pregnant, [and] I'm still trying to do body pump once a week. ....and every time there is at least one or two other pregnant people in that class at the time and they always seem to manage to go right to the end obviously with modifications ... I'm starting to find it a little bit more difficult, I just can't move quickly anymore but ... it's quite nice to still [go be]cause that kind of gives me a bit of a sense of normality... I'm so used to doing that before...."*

17/3

The nature of the assets built from engaging in exercise may form the basis for self-directed pursuit of existing physical activity (although adapted) and new options to adopt specific activities during childbearing. Personal drive was impacted in the first trimester by pregnancy sickness and being extremely tired, but the liminal process towards preparing for mothering their baby likely motivated them to access the aquanatal provision locally.

Some of the participant women have indicated that midwife involvement in this aquanatal class has been a positive addition to their broader experience of pregnancy wellbeing through information access and specific focus on exercise knowledge. As a professional, such interaction was grounded in a health promotion emphasis built around individual need where practical. However, as a class instructor, sometimes generic messages featured frequently, associated with class phases and focused exercises (such as pelvic floor exercises). During pregnancy, collaboration with others is pivotal to women's negotiation of the transition to becoming a mother (Le May 2009; Douglas 2010; Bennett et al. 2013). The nature of social arrangements links to the reciprocity and capacity for social capital in women's existing and newly constructed social communities during childbearing.

### 7.3.2 Women developing peer support

*“..it’s nice to have the class [be]cause there is other people to talk to...whereas otherwise you don’t have people that really know what you’re going through, and things like that...”*

(Participant 3/Focus Group 1)

This second theme was constructed from four sub-themes – peer support for pregnancy and parenthood, established support networks, health professional support and provision of antenatal education and technology related informational resources (see Figure 6.1, p176; see section 6.3, p195-204 inclusive for the qualitative findings and section 6.4, p204-210 inclusive for links between demographic and qualitative findings).

Women’s wellbeing can be seen to be secured to their experience of social connectedness especially during pregnancy. For the mother-to-be, group situations such as attending antenatal appointments or parent education classes, can offer opportunities for particular connections tied to sharing specific life experiences and a layer of social support for developing new skills and resilience through reciprocity. Social connections between individuals attending this antenatal class are built around homophily of status or value (McPherson et al. 2001) meaning a more naturally constructed social relationships can be achieved. The nature of community built networks may therefore be more accessible, open or sustainable to pregnant women rather than the potentially restrictive nature of work-based or family social networks, where hierarchy and domestic values respectively may limit psychosocial reality of their lived experiences.

#### 7.3.2.1 *Traditional social connectedness: families*

Historically traditional family relationships were the normal setting for intimate exchanges and significant role modelling. Significant reconfiguration of these structures has occurred over the past three or four decades. The biological family has become gradually eroded by differing values, differing parenting ideals and the critical political or social debates that exert influence on individual’s attitudes and behaviours (Chambers 2012). Together with the broadening ability to develop individual personal communities, women today seek social connections beyond traditional family networks, buoyed by the positive facets of being able to exert individual choice in their personal

life, providing greater fluidity and diversity in such ties and through role models (Hennekam 2016).

Complex family networks, may alter at certain life stages how women view their personal communities. During pregnancy and motherhood, the position of family relationships (ascribed) as primary social communities could be replaced through necessity or design by friends (chosen) (Pahl and Spencer 2001 in Chambers 2012). Such personal communities may offer a more combined level of connections between previous social groups that may be sustained or time defined. Acquaintances often become friends or even role models through development of friendship ties underpinned by shared knowledge, values and varied social interactions, based on common interest or shared events.

Two women described how their specific family offered general support and in addition that strong friendship ties offered elements of role modelling:

*"...I've got a friend who has got a 3 year old and 6 year old and she's like my idol, she's such a good mum, .....and I've got someone else who's had a baby in March, so I'm literally texting her going 'What pram did you get? What crib did you get? What did you do?'. Every time I see her it's .....really helpful .....but it's really nice to see it in everyday life someone I know doing it and it playing out .....so that's been really helpful, friends ....."*

16/3

*"...Mine's probably my family, huge family, ....and they all live close as well so 10—15 minute walk away from [my] parents, sisters, brothers and they've all got like 4 [children] each my brothers and sisters so ..I'm just adding one. So ...then work friends and like you say we are the same, the last ones out of a large group of friends to have [a baby] as well..."*

15/3

One participant in the same focus group presented a different view specifically in her view of support post-birth particularly where she identified other new mothers as those she perceived as supportive in mothering knowledge:

*"...Once the baby is born ... mothers ....because I haven't got a huge circle of friends that are parents, it would be nice for me to meet up with people ...that do have babies and are a similar age to me. I need to discuss things, because only if you discuss things with people who aren't pregnant or who aren't parents you are [seen as] boring. If everyone is going through the same thing as you, I sort of feel more open to discuss any issues that I might be having. I've found, well certainly from coming to the class here anyway, I sort of discuss a lot more with the women here that I don't really know that well than I would sometimes with some of my friends that aren't pregnant...."*

11/3

It appears that women assimilate acquaintances into their social communities through networking arrangements that may already exist or that occur during pregnancy. Personal meaning to such connections will be arranged to suit individuals but based

entirely on networking opportunities as well as the timing of when such occurrences arise along the continuum of transitioning to becoming a mother.

Interactions between people are guided by individuals' ability to achieve satisfying interpersonal connections within their social groups (Goleman 1996; Mead et al. 2001). These groups may be context bound through home, work and social communities associated with personal friendships (Bourdieu 1986; Thompson 2010). For individual women these connections significantly alter during the pregnancy journey due to direct and indirect contact with health professionals, parenting education provision (Bourdieu 1986; Gross and Pattison 2007; Deer 2010) and their own pursuit of related knowledge for the evolving life role (Mayer et al. 2000; Raynor and England 2010 p8-9). Becoming a mother may be one significant influence for differing social connections, especially where family ties are divided by severed kinship bonds or disassociated by distance or perceived usefulness (Chambers 2012).

#### 7.3.2.2 *Community based perinatal peer support for women*

Focused peer support (as in Centering Pregnancy®, breast feeding support groups, National Childbirth Trust (NCT) Antenatal Classes) with health professionals or specifically trained facilitator involvement, have strong health promotion or parenting skills emphasis seeking to advance child health outcomes (Small et al. 2011). Some additional non-professionally led groups have offered peer style companionship and specific resources, for example, Twins and Multiple Birth Association (TAMBA). These are primarily targeted at 'at risk' or disadvantaged or self-selective groups so some women may dismiss them as relevant to themselves. Research by Small et al. (2011) proposes that the 'befriending' and informal support offered by non-NHS groups is viewed as more accessible which may be reflected in their membership characteristics. Offering and receipt of support is less driven by stern health messages perceived as paternalistic, but by a more organically driven sharing of common purpose to the community:

*"..I have a lot of friends who have quite recently had babies and ...so I've had those to talk to, but aqua has been brilliant because ...you get to come in and especially people that are sort of due around you kind of go through it together and obviously seeing a midwife every week really does [help] because if you have that niggling little question that you know you can just ask it and not feel stupid like you're wasting anyone's time.."*

4/1

Community based support may be more successful as the location and context is less official or prescriptive, enabling less emphasis on specific groups whilst widening a support mechanism that is far more inclusive to all childbearing women. This echoes the Sure Start initiative (from 1999, which later transformed into provision of Children's Centres between 2003 and 2006) which targeted services to support families with young children, primarily in socio-economically poor areas of the UK (Lewis 2011).

For this aquanatal group, the professional advice from a midwife is available but not imposed as a requirement so that the relationships between attendees is seen as more naturally built through discussion in a safely contained and enabling non-medicalised environment. Secure to express thoughts and feelings progresses the reciprocity of social connections which are constructed in the quality of ties and breadth of connectedness between individuals. Women identified the development of inter-group connections through the data, especially post-birth when changes brought about by birth and new motherhood led to disequilibrium (Darvill et al. 2010; Raynor and England 2010; Jacinto 2013) and they recognised the importance of comfort derived from dialogue with peers at similar stages of parenting.

While social isolation is not generally identified as an issue in this data set, participant women may have undergone varying degrees of personal challenge as their individual mothering journey progressed. This includes how their personal and/or baby's health and social circumstances were impacted by maternity leave from full-time employment. For most of the participants, maternity leave would be paid for up to one year by their employer, but one woman who was self-employed returned to work after approximately 10 weeks (she was unable to attend the postnatal focus group due to this), and another was already a full-time mother caring for an elder child. Further investigation on the endurance of 'aquanatal' relationships would offer information relating to experience beyond birth (see section 7.9.2, p256-258).

Green (1998, later confirmed by an Australian study reported by Currie 2004) puts forward a hypothesis that gender identity is a critical base within leisure contexts. This is specifically relevant for gendered spaces where women may undertake self-reappraisal, balanced discussion with other women from a range of viewpoints and where open self-expression can be honestly constructed bound by 'trusting' friendships. She also states that women often reappraise relationships alongside their personal

identity within leisure contexts, whereby they are able to self-select activities outside their work culture or the watchful eye of family social expectations as partners, wives or mothers. Indeed Currie's (2004) study highlighted that women's physical, mental and social health is adversely affected by a dearth of leisure, exercise and recreation opportunities. While the development of friendships for women is seen to be different from that of men (Oakley 1997; Vigil 2007), specifically when role alterations involved development of a new role identity, it can be observed that women prefer to engage in in-depth conversations, whilst men appear to relate in a side by side interaction instead which is less intense (Vigil 2007).

The identity of 'being a mother' for women in this study appeared to evolve and was supported by a community built around leisure rather than the domestic or workplace. Such friendships are bound by a focus of interest for social connection and often extend outside the classes:

*"...I hit a realisation after we came for a catch up here, I was like all of my friends are still at work and they are just not around during the day and I spend all day every day on my own with him, which is when [participant 4] and I hooked up and there's 5 of us now and we do a lot of stuff together which, .....it just makes a big difference and like [participant 4] says there's no pressure and there's no kind of comparison or anything..."*  
2/4b

This specific participant suggested that the nature of maternity leave offered a void during the day which she managed by reviving her aquanatal class relationship with another attendee. For other women, the shared experiences have been vital to learning new skills:

*"...I catch up with [participant 17] outside of swimming and we've been texting each other questions back and forth, and pictures of things from textbooks to each other about different problems and I've even messaged my friends from work, simple ones .. 'do tights go on the inside of the vest or the outside of the vest?' ...and they genuinely make me laugh, .....they say it doesn't really matter as long as you can get them in both legs, it's fine. I text people for advice...."*  
15/4c

As a support system, leisure communities offer 'space' and 'place' for new networks to be created through their own agenda and partly created by shared experiences during participation in an activity (Green 1998; Taniguchi and Shupe 2014; Lloyd et al. 2016).

The processing and construction of friendships between women can be seen as complex in an environment where a safe space is created away from every-day housework and employee commitments. I witnessed the participants spending dedicated time talking,

sharing, exchanging ideas and information, gaining social support by way of relaxed bonding behaviours including humour to form an inclusive set of network bonds:

*“...I found that I went on the [antenatal] breast feeding course a couple of weeks before a couple of others and they asked me ‘what was that like?’, I went on it and it was like this and for myself I found it quite different again because I come from a different area, whereas you guys all go to the same hospital and bits and pieces [are different]...”*

15/4c

*A within-class conversation that I came across during the class tonight, about the visit by the Health Visitor and how women felt about this. Hearing them compare notes on the conversations they had with the HV was really interesting – especially from different community areas. Fortunately as we changed activities, one of the multigravid mothers offered her positive experience, which seemed to diffuse the sense of tension as if they began to understand that HVs are not judges of skills but another set of resources. Women’s experience today must be more embedded in media portrayals which are not always flattering to this role (sensational child safeguarding issues) as fewer home visits are made by HVs so many have no experience of their community role.*

*Post class note: It really reminded me that my professional relationship with women often seems to evolve very differently and despite the assessments and surveillance that are required, there is an inherent partnership.*

*Reflective Post-script: Ensure I facilitate some conversations about post birth experience to promote the positive public health role of the HV.*

Reflective class journal, week 19.

The use of humour I observed is non-competitive and appears to aid inclusivity through belonging. I would argue that these constructed friendships are an extension of honing nurturing behaviours ready for motherhood and may even be protective in their purposeful selecting of new social connections. The nature of power balance (Cole et al. 2004; Thorpe 2009) in groups such as this one, mean aquanatal would benefit from greater investigation, although the constantly dynamic membership is likely to be key to why conflict, domination and confrontation are rare or ameliorated by individual member characteristics (see section 7.5, p241-246; and also section 7.9.1, p253-256).

Scott (2010) reported that swimming is a self-absorbed activity where men and women react differently on poolside and in the pool, influenced by varying degrees of internal and external regulation, surveillance and the leisure centre culture. Group situations which embrace the collective nature of social sharing of class activities appeal to female rather than male participation (Taniguchi and Shupe 2014). This specific class is by nature planned to appeal to women although appropriate scheduling of such provision is vital to maximise specificity of class content and reduce the impact of conflicting leisure centre culture (Bennett et al. 2013; Harrison et al. 2018). The shared landscape



of this class positively influenced interactions with other attending women indicating active participation in connections through dialogue, regardless of prior acquaintance.

Positive experiences through social connections are based on trust and co-operative arrangements of unconscious sharing of social capital resources in transactions, or exchanges between individual members (Putman 2000; ONS 2001; Wacquant 2007; Moore 2010 after Bourdieu 2006). Integration between attendees establishes the social relationships as a contribution to their health and wellbeing through the domains of individuals; relationships and community (see socio-ecological model Figure 2-1, p38 after Sallis et al. 2006).

#### **7.4 A view through a bio-socioecological lens**

The nature of this case study research utilised the context of the aquanatal group, to aid the holistic nature of a 'Active Living' bio-socioecological model to be considered for the health behaviours of pregnant women, and the potential health promotion of the group environment (see Sallis et al. 1998). During the study the environment and the group were seen as dynamic, as were the individual participants and me as the researcher.

Whilst Bronfenbrenner's model from the 1970s, specifically located child development within the field of context for its social environment (Bronfenbrenner 1979; Bronfenbrenner and Ceci 1994) (see section 2.3, p36-40, and Figure 2-1, p38 for detail), the basic tenets of developmental psychology and socialisation continue over the lifespan, mediated by individual biopsychosocial interaction within a dynamic system of forces. The processes indicate interaction between human organisms and the environment which evolve over time, led by the function and complex reciprocity between beings (Bronfenbrenner and Ceci 1994). Sameroff (2009 from work in the same decade) added that the transactional nature of interface between child and parent brings together characteristics through various social environments, where development leads to behaviour changes which may be positive or negative and grounded in child-rearing beliefs.

Biological changes and psychological transitions to becoming a mother rely on bi-directional influences of socioeconomic status (SES – income, occupation and educational attainment), through local and broader contextual sense-making by

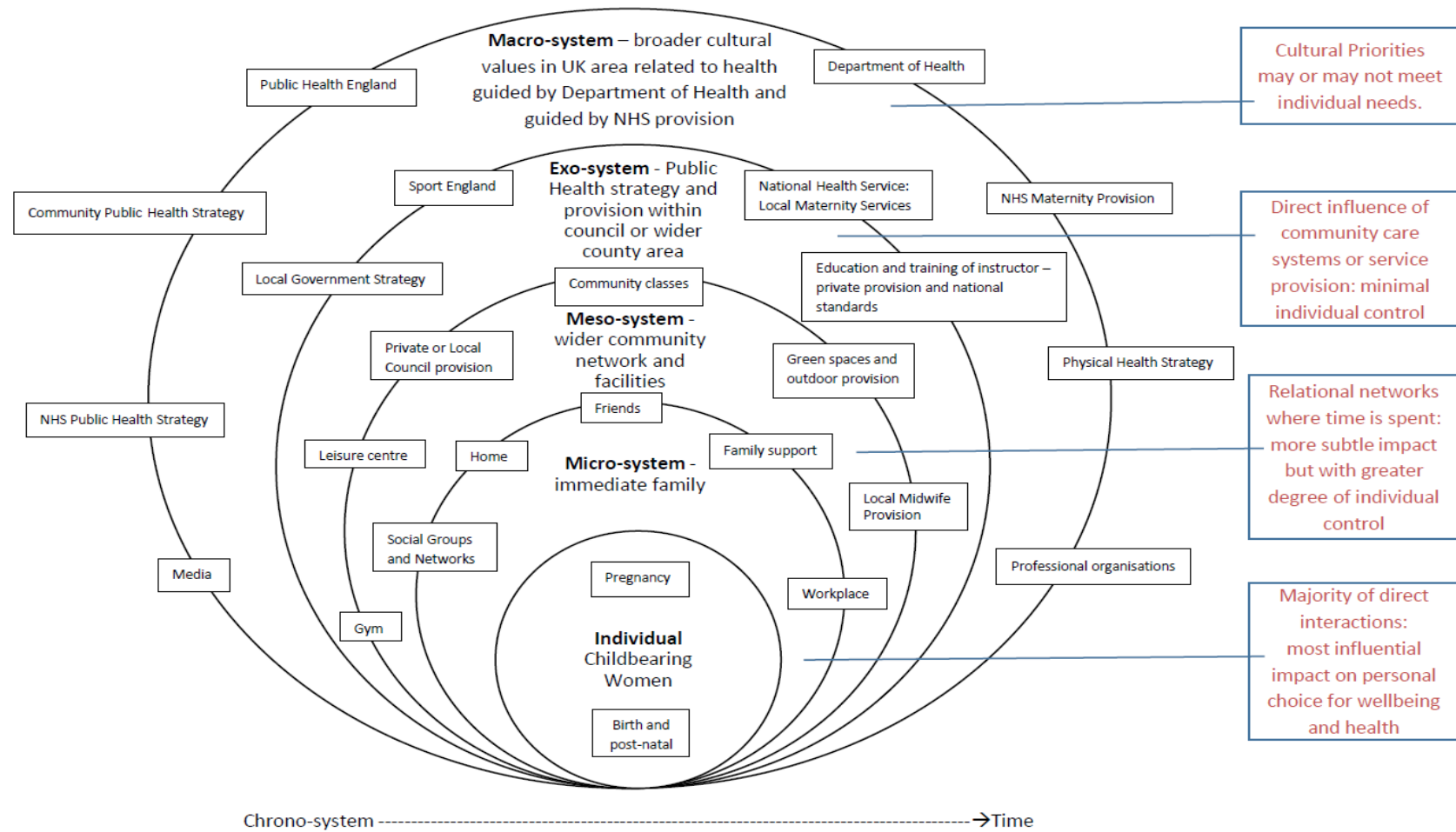
individuals of their societal role and position in communities (Naidoo and Wills 2016). Interactions between community members may be observed through their competence and performance in communication. Women will self-regulate by cognitive and behavioural adaption in preparation for their personal goal of motherhood. Previous life experiences based on existing environmental contexts and expectations through changing cultural influences will contribute to such changes.

Bronfenbrenner (2001) posed an additional theory for a bio-ecological model, whereby the continuous evolution of both individuals and groups over time and into the future are paced by characteristics and interactions from the biopsychological paradigm. Smith (2011) further identified the nature of the ecological systems being interrelated, driven by developed and developing relationships between individuals and the environment. The environmental impact may weaken or strengthen such networks, as social support may not be accessible to individuals due to the presentation or sense of positive reciprocity of relationships therein.

The nature of the aquanatal class being an established group may be pivotal to the bio-socioecological model (see section 4.4, p117-118) as the necessary components are: individuals, the physical environment, the community, the society and wider national policies. The health behaviour dimension revolves around the public health message of physical activity, and highlights the overlapping of components or systems.

To enable a consideration of the work of Bronfenbrenner (2001) and Sallis et al. (2006) to the aquanatal case context, a model was developed to illustrate the interrelation of the individual to the micro-, meso-, exo- and macro-systems and the influence of interactions to individuals from each level (Figure 7-1, p239). This offered some transparency to the impact of social and relational networks within families and communities to the experience of social engagement during pregnancy. Considerations in this area must be tempered by appreciation that women are uniquely individual in their social integration as self-determination links with psycho-social resources and motivation for engagement in external community provision. This means that although women have access to meso- exo- and macro-systems, that their engagement is personal choice.

**Figure 7-1** A proposed bio-socioecological model for the experience of Aquanatal women



Childbearing especially can be viewed as a series of dynamic transitions through biological, psychological, sociological, political, spiritual, and economic life progressions, bound up in an ecological framework of a physical environment. Most of these domain factors offer the integrative focus to the model, for women through the various levels of the related fields for health and wellbeing during pregnancy. The multilayer representation of Bronfenbrenner (1977 and 2001) and Sallis et al. (2006), offer a linked view to the layering of transitions to individuals. However, Lehman et al. (2017) offer a further detailed examination of the interrelated areas of biology, psychology and interpersonal dynamics on individual processes.

Lehman et al. (2017) propose a more linear model whereby biological, psychological and interpersonal layers intersect. This version of the model is clearly driven by a micro- and individual perspective although macro-, meso- and exo- feature as comprehensively integrated. For the individual this appears as more aesthetic and holistic where different views of similar determinants and the consequent interrelationship between these occur at various levels. This is particularly important as this study has been specifically exploring individuals and could then identify how individual characteristics effect the determinants of health, wellbeing and social cohesion.

Interpersonal adaptations may therefore occur as direct or indirect social connections with health professionals and others, based entirely on their exposure at a significant life transition. This specifically necessitates the construction of new networks which can alter existing connections through the dynamic bio-socioecological changes being progressively experienced during pregnancy.

Moving away from a biomedical focus and using a bio-socioecological model offers an opportunity to enhance the health and wellbeing of childbearing women through a holistic woman-centred approach (Leap 2009; NICE 2010d; RCM 2014). In addition, it offers practitioners options to address the health and wellbeing of individuals both within and outside existing health care systems, as the care patterns for individuals can be tailored to match the biology to the psychology and then to the sociology and the ecology. Variables in each of the holistic determinants can then be more fully

appreciated as interconnected and the significance of one determinant on each of the others is more fully understood.

Each woman will require a different level of focus, with some having more capital than others, some environments working more positively than others on the uptake or reception to such considerations. Clearly the relationship for women with professionals is fundamental to such responses and changes to behaviour or cognitive processing. One benefit from such understanding is that the more fully representation of each determinant variable can be related more effectively to underpin the development of an individual plan. The development of such practice will require thoughtfulness and determination by practitioners, especially to work in areas that are less familiar and where collaboration can positively influence such personal development, for example, between health, social and leisure providers.

Mapping consistently for determinants takes expertise and commitment. Locality provision may vary even within local authority council or NHS provisions and is often more dynamic than we know in terms of services on a day-to-day basis. Being appraised of the provision does not necessarily equate to the uptake or accessibility to communities, as action may not occur for several valid reasons including time, barriers raised by access or concessions, or individual motivations.

## **7.5 Conclusion and developing as a researching professional**

The work undertaken to investigate the experience of wellbeing for this group of pregnant women has provided insight into their perceptions of 'attending aquanatal' as one option for physical activity, and their building of networks based on social connectedness through membership of this group. A range of data has been presented to illustrate the demographic and qualitative data as they connect with the research objectives aided by the design and processes. The interpretative nature of this study can only contribute to part(s) of the bio-socioecological model. However, I have sought to embed the data collected from these women into this framework (see Figure 7-1, p239), but identify that additional work with a more diverse sample would offer broader views of the bio-socioecological model as applied to a group of aquanatal women and allow for greater generalizability.

### **7.5.1 Defining practice development**

The DProf seeks to capture the reflexivity of the researcher by the constituent of practice development as integral to the entire research process. As Unsworth (2000) purports, it consists of service or personal development in respect of a specific aspect of 'work'. Therefore, the individual's development is inclusive of their professional role as well as their research credentials. The context of development is critical to the actual journey as well as the concluding academic and professional outcome(s).

Health care is underpinned by many events that seek to progress evidence-based care suitable for the 21<sup>st</sup> century, according to the political, economic, social and cultural positioning, locally and nationally. The debates can appear as a paradox and often seem as an oxymoron where strategists, politicians, professionals and the public viewpoints are misaligned through perception, values or agenda. Change and transformation attract difference, as new versions of policy or care provision are published and almost immediately implemented (McCormack et al. 2013). Many of these require focus and practised commitment even when professionals experience role and/or scope of practice alterations.

Practice development as a theory originated in the 1970s, which has been followed by over three decades of experience for health-care, together with critical examination of the original concept and study in clinical environments (Garbett and McCormack 2004). Fundamental to this have been a clear focus on the patient/client/person in receipt of the clinical care. A number of 'initiatives and innovations' have presented ways to improve care, respond to specific issues through solutions, and primarily to enhance 'clinical effectiveness and patient outcomes' (McCormack et al. 2013, p2). Midwifery initiatives striving to embed evidenced-based care into multi-professional service provision can be seen during the 1980s (such as the 'Know your Midwife' scheme pioneered in London by Flint in 1983) (reported by Flint et al. 1989) and in the 1990s, in the 'One-to-One' midwifery continuity model (Page 1997; Page 2003; Page 2014). Implementing change to professional midwifery practice has been linked to research methodologies utilised to create the culture and context for sustained development (for example 'Action Research' reported by Choucri 2005).

One definition of practice development that resonates specifically with my path during this research journey is:

“Practice development is a continuous process of developing person-centred cultures. It is enabled by facilitators who authentically engage with individuals and teams to blend personal qualities and creative imagination with practice skills and practice wisdom. The learning that occurs brings about transformations of individual and team practices. This is sustained by embedding both processes and outcomes in corporate strategy.”

(Manley *et al.*, 2008, p9).

This presents an integral relationship between care processes, the comprehensive and extensive evaluation of these for practice, professionals, recipients of such care as well as the culture and environment where any specific development may take place. Garbett and McCormack (2004), Manley and McCormack (2004) and Manley *et al.* (2008) present developing practice as a continuum of evolutionary progression, where the driver(s) often appear remote to the setting or visionary without assumed practicality of purpose. The resultant ‘emancipatory’ change can occur for systems as well as individuals (McCormack *et al.*, 2013).

Doctorate study sets a value for development that has several facets; the area of practice that is investigated, the professional practitioner as a range of extended competencies and the nature of clinical audit activity practicalities proffered by robust and original research. Practice cannot be developed effectively without an approach that adopts a structured methodology alongside critical appraisal of the historic, current and potential ‘care’ advances that can ensue during and following the ‘investigation’. Integrated research approaches used in contemporary health and social care, offer practice development within the methods and study design.

### **7.5.2 Reflective narrative: practice development**

As a midwife, being effective and having clinical expertise for practice is vital to any professional role undertaken and as such is seen as an accomplishment; an honour gained from experience and a gift that can be shared with women. An examination of women’s experiences of care provided by midwives can be viewed as a responsibility to be embraced by each of us as part of our career path, which can also impact on the

evolution of better and responsive care provision for many areas of midwifery provision.

In examining my current role in providing an aqua-natal class, the responsibility of personal reflection on competence as a clinical midwife has allowed development of personal skills as well as professional leadership in an area of practice that could be seen as essential to contemporary promotion of health for this special population. The consideration of discourses from various sources has prompted critical review of provision, accessibility, and employment of health promotion strategies and future development of skills.

There are many themes that can be viewed for positive promotion of the midwifery skills, the development of aqua-natal provision and for enhancement of local or national public health strategies in relation to lifestyle, nutrition and physical activity. I hope to significantly use the data gained through this study to demonstrate a contribution to practice locally.

The breadth and depth of knowing myself was not apparent initially as I anticipated the strength of experience I had as a professional midwife would support my transition into a doctoral level researcher. How wrong or naive I was! Whilst the current role in academia did provide some skills of critical thinking, the elevation to expectation of direction, requirements of the research and writing strategies to accompany the synthesis at doctoral level was a significant learning task. The journey has offered considerable difficulties in progression as the part-time nature of working posed specific continuity issues for me. The setting of action learning groups based around Professional Doctorate study assisted this initially. However, the pace of individual progress was very much set around local expectations and inherent difficulties of practicalities of research design. To channel the frustration required much tenacity and self-development of professional expectations, alongside development of practice with appreciation of originality as an essential component.

The expectation of attaining a significant development for practice, arose frequently and at times dominated the effort as part of the action learning group. As fellow professionals from other health and social care disciplines advanced their journey,



mine appeared to stall on occasions. Responding to issues and discussion points or queries, presented the need to extend my breadth of viewpoint and interactions about a new range of research approaches and focused professional issues. Self-discovery about becoming a researching professional meant that I needed to manage my expectations of the nature, volume and level of study and learning in a progressively pragmatic way.

The plan for personal development as a DProf student cannot be assumed in general terms and proffered combining a range of roles throughout the path which needed careful and considered self-management.

***Multiple lenses or multiple hats?***

*Reality of being a 'double' agent as researcher and practitioner.*

*Was I a researcher today – project manager, recruiter, moderator, midwife instructor, ethicist, data analyst, change agent, topic expert?*

*Was I a midwife today – midwife instructor, professional midwife, healthcare teacher, practitioner of normality, provider of evidenced research?*

*Was I a student today – novice researcher, writer, data analyst, experiencer of life?*

*Was I an academic - colleague, tutor, facilitator, 'social worker'/advisor, resource, health professional link to placement, external examiner?*

*Me as a person – daughter, partner, sister, friend, carer, provider of pet care, medical diagnosis, human being?*

Reflecting on my identity during data collection

Disquiet around the multiple roles has continued and was very much linked to my perspective during the entire research phase and is illustrated by the reflection during data collection. The experience presented unclear boundaries to individual roles but particularly when roles ran concurrently, merged (practitioner researcher) or when roles changed without warning. The dialogue around different hats features in literature (Ryan et al. 2011), associated with the dilemmas that practitioner research poses to individuals. The focus group moderation role brought this into sharp focus as the hostess part fitted with my midwife instructor hat, which then required an abrupt amendment to researcher when the audio-recording commenced. The nature of assimilating this within the doctoral journey cannot be bolted-on, but needs to be embedded in professional expectations and personal research planning (Lee 2009) which can and do, over time, require adjustment or refinement.

## **7.6 Summary and implications of the study findings**

As a practitioner researcher the lens for this research has been viewed around the women attending aquanatal and my own professional midwifery practice in this area. From the outset I focused on the women's pregnancy experience and the meaning to their journey of transition to mothering. The research has offered insight from their perspectives on individual views of physical activity, social connectedness and the combined concepts of their altered experience of wellbeing before and during pregnancy.

The participating women appreciated the option to integrate informal social interactions with peers, alongside engaging in a safe leisure activity together with an option for midwife contact or support. Arguably this could be associated with their established exercise identity and the inbuilt drive to access activity modes correlated to their journey to motherhood. For midwives this has implications for the presentation of advice and evidence-based information around exercise and physical activity during pregnancy which can inform women's decision making and individualised care plans. A key mechanism to address delivery of health messages for childbearing women about exercise means that greater co-ordination should be inclusive between leisure and health provisions. The 'active for life' advice (Sport England 2013 and 2016) could feature more coherently in advice for pregnant women, and integrated alongside health advice for smoking cessation, weight management, enhancing mental health resilience and the population focus to reduce heart disease, reduce stroke, reduce diabetes and obesity (see section 7.9.2, p256-258). In addition to the recently published DoH infographic (2016), women would benefit from midwives being able to signpost them to a range of physical activities in their locality, graded to previous activity they have accessed (such as differing advice for 'elite' athletes and for currently inactive women who can be encouraged to take up a suitable mode of exercise at their level of ability).

While social isolation is associated with socio-economic disadvantage (PHE 2015), the nature of transition may lead to an experience of some degree of loneliness for many women. This may be more common specifically during maternity leave from

employment around the birth and for up to a year after (NCT 2008; Easter and Newburn 2014). This research study suggests that social connections established within this aquanatal provision benefited these participants transition to motherhood and endured beyond aquanatal attendance. The new range of personal communities is clearly helpful at the time and there is capacity for social connections created during this time to ameliorate some of the impact of maternity leave on accessibility of the workplace networks or even some family relationships. As parent education occurs generally in trimester 3, the early and middle pregnancy social opportunities could be pivotal to reducing the effects of isolation and transition processes of pregnancy. A recently published study by McLeish and Redshaw (2017) confirms that emotional wellbeing is improved by peer support arrangements just prior to and during early parenthood, especially where anxiety, sub-clinical depression and low self-esteem co-exist with perceived or actual reduced social support. In addition, more informal peer support via internet communities offers interactions between group members (Niela-Vilén et al. 2014) in the guise of emotional support (Byrom and Byrom 2017).

These women appear to access the aquanatal class as much for social reasons as for exercise. Attendees even from their first class, engage in conversation usually couched in identifying similarities of pregnancy experience before, during and after the class. The existence of this class in a non-medicalised and informal public environment is likely to enhance such interactions where the role of instructor midwife is more arguably 'with woman'. This is also enhanced by a class structure which seeks to minimise formality to interactions between members and instructor. Women exhibited a range of thoughts about and what they perceived as their individual requirement of support. For some participants this is not always anticipated or expected in such pregnancy provision. While some women came to rely on the class networking, others were more discerning and used a range of social contacts within their personal community. Mechanisms for women to interact with each other could be re-built into antenatal provision taking care not to frame it solely as a 'support group'. Social spaces do not need necessarily to be sited on NHS premises, or indeed be bound entirely by pregnancy. This aquanatal class offers a social space where

activity and social connection integrate more effectively than an appointment driven antenatal clinic.

Whilst women are generally health literate, the sources of evidence-based information require specificity of access to educate pregnant women coherently in a truly accessible context. Palatable public health literature and clear messages are essential to communicating knowledge on pregnancy, birth and parenting, set into personal experiences and options. Sanders et al. (2016) suggest that current practice reinforces a sense of huge quantities of information being compulsorily shared, rather than a tailored approach to individual plans of care embedded within already known relevant education and the currency of request. Midwives offer a range of options for health and maternity education to women (and their families) consistent with transition to becoming a parent and based in visual, audible and kinaesthetic provision during this journey. Our harnessing of information technology should be offered as an adjunct to literature, ensuring sources are vetted for quality assurance.

My presence as a midwife before and during the class has not been fully explored in relation to the benefits or not, women experienced by attending the aquanatal class. Initially some women were unaware of my professional status until they joined for the first time. The collective nature of the class meant private conversations needed to be negotiated but made available on request. Much dialogue between myself and attendees was nested in pregnancy discomforts and remaining active during late gestations. However, it was acknowledged that access to their named midwife could be improved. Participants shared incidents where queries made by text or phone message were unanswered for days, and even when non-urgent this lack of response was perceived as one of disengagement between appointments. Maternity services could make clear to consumers the pathway for information and advice when their named midwife works part-time, on holiday or off sick. Women may also need to be assured that contact between appointments is encouraged so that queries are dealt with in a timely way to avoid significant misuse of emergency provision when anxiety levels escalate.

## 7.7 Limitations of the research

A number of limitations of this research study need to be considered. The most important is the limit of generalizability of this case study within the wider aquatic exercise field. Pregnancy aquatics have a paucity of published studies and there is limited evidence to support its efficacy to date (see chapter 3, p78-95). Despite this, the women's experience from this study shows a valuable insight into the women's perception of the links between attending aquanatal provision and their experience of pregnancy wellbeing, set into the context of a regular weekly class. This awareness is achieved through combination of the reflective lens given by the women's focus group transcriptions and researcher records, together offering a richer level of perspective to the analysis and research findings.

The socioeconomic demographic background of the participants is established as educated to degree or professional qualification level and employed (or one stay-at-home mother). This would suggest the attendees were already motivated to participate in physical activity and able to access the centre. As the class is walk-in public access in the leisure centre, women who may be socially or economically isolated were less likely to attend. Therefore, this research is unable to evaluate the potential of midwife-led aquanatal provision to a wider group of pregnant women who may not otherwise engage in physical activity during childbearing. This would be a recommendation for future investigation (see section 7.9.1, p253-256) and may contribute to reducing inequalities for specific populations.

Another limitation is that the recruited sample of aquanatal class participants was small due to the timeframe available for data collection and the nature of the case study context for this group. It has also been noted that the study participants came from similar cultural backgrounds which indicate a limit to the diversity of sample characteristics. Despite this, each participant proffered a sense of their 'lived experience' of pregnancy, from firstly engaging in a mode of physical activity that was accessible to them and secondly by offering their views of informal contact with other pregnant women. Research processes directed through the design ensured that each woman's 'voice' was scrutinised for content, coded and categorised, and then

interwoven into the thematic data analysis framework. The membership of each focus group was limited by availability of the participants on the specific dates and to an extent the attendee participation. While focus group membership also altered between antenatal and postnatal sessions, it is unlikely that the general inter-group dynamic varied detrimentally as the women were already known to each other through aquanatal class membership.

The scope of this study is bound by the case study approach. Whilst a comparison non-aquatic exercise group of pregnant women was counselled and prepared in the pre-ethical approval phase, LREC opinion advised against this and the area of study was removed. One rationale for this recommendation was the difficulty that matching a similar case context for a second data set would have given, and the coordination of seeking corresponding participants at another site in the given time frame. However, the addition of comparison findings, especially during data analysis, would have offered broader generalizability and wider discussion of socioecological value to physical activity engagement, and attributed value of specific types of classes for individual pregnant women.

One limitation to the data collected is that a factual reporting by participants of continued and additional physical activity at structured regular intervals alongside their aquanatal class attendance was not collated. A participant diary record was proposed as part of the original research design but subsequently removed based on such a request being over-onerous to participants. The PPAQ data has captured some insight into aquanatal attendee's engagement with other activities, but lacks precision of frequency, intensity and time specifically. Such findings could have aided comparison for women's views on class content for aerobic, muscle strengthening and endurance components, or the integration of stretching exercises related to gestation and physical adaptations between activity modes. Additional investigation in this area could be a recommendation so that difference of MET values for the four themes: caregiving, housework/gardening, active living, walking as daily activity and any specific exercise engagement, could be explored in relation to specific pregnancy gestations (see section 7.9.1, p253-256).

Motivational factors for women to attend the class were given within the study questionnaire (see section 6.2.2.5, p185-186). An additional limitation of the data collected was that the ranking of identified reasons to attend aquanatal classes would have aided weighting of each motive by participant, especially when such data could be correlated against the gestation of individual participants and the timing of their first class attendance.

One unforeseen limitation is that the gathering of birthdate records was inadvertently omitted from the LREC approved study questionnaire. This came to light when the first data was processed and though unfortunate, was not viewed as vital to later analysis. This specific characteristic was not reported consistently for the studies within the methodical review of aquatic literature (chapter 3, p78-95) and directly linked to their outcome measures.

## **7.8 Challenges arising during the research**

Becoming a researching practitioner has prompted a series of personal and professional challenges, punctuating the journey from starting this study. I had anticipated the requirements to develop specific skills to achieve the doctoral level descriptors and create research expertise that was previously unfamiliar. The reality became a long and winding passage of mountainous highs and steep ravines until the final thesis came together. Three significant events occurred which had the potential to destabilise my transition from a novice researcher through the development of expertise necessary to compile this thesis with some finesse.

Ethical application and approval took an intense period of time. The completion of the relevant IRAS application and establishing the specific requirements for research documents when the application advice frequently favoured quantitative methodologies, designs and data collection modes was fraught with constant dilemmas at a time when I could not prioritise engagement. The detailed attention to gaining LREC approval appeared to conflict with the qualitative philosophy I anticipated. In addition, the NHS R&D permissions promoted another interval of time impacted on by additional delays associated with festive closures. It was only as the data collection unfolded that I fully appreciated the restrictions and precautions

necessary from the participant's point of view and indirectly to protecting myself as a novice researcher.

Two additional challenges relate specifically to skill development for proficient research practice. I investigated, deliberated and debated focus group moderation with supervisors and colleagues before devising an extensive process to support this activity. I spent considerable energy on rehearsing for my role as moderator for the focus groups (reflection-before-action) (Edwards 2017). The verbal nature of this activity meant skills needed to be honed ahead of the appointment(s) so that data was consistently requested and recorded. I was acutely aware that data gathering skills were an area where development was critical to competent research procedures.

A further dilemma was my positionality as researcher and practitioner. Research texts offered opinion and advice, but the application to my individual practice role was unknown in research. Internal debate of 'how a researcher' behaves when I was previously only known as the aquanatal midwife instructor, posed a reflexive conundrum at the time of each focus group, which featured in my reflective notes for each session. Whilst I was acutely aware that I needed to negotiate the relationship between roles, I concluded that repeated review throughout data collection would contribute to development as a researching professional. By researching this phenomenon as a case study, it was vital for my analysis that I adopted both parts of the role in full and record this in my study reporting.

As many novice researchers may identify, my data analysis skills were rudimentary at the beginning of this endeavour. Undertaking skills training became a primary initiative early in the development of research design, and was further instruction accessed following ethical approval. It was necessary to continuously develop the use of NVIVO as a data management and storage tool especially alongside the steps of thematic analysis. This did ensure that I gained more confidence in comprehensive coding as definitions were recorded at the time, capturing my research thinking in-vivo. Whilst the software aided much of the organisation and analytical stages, the full features of the package were not entirely utilised, particularly in formal reporting.



## 7.9 Recommendations

This inquiry has offered some insight into aquanatal exercise provision and accessibility for women to attend, participate and network in community settings. However, it has also identified a number of additional areas that require further investigation so professionals can better understand the impact of peer support on the experience of wellbeing for women during pregnancy.

### 7.9.1 Recommendations for Research

#### 7.9.1.1 *Replication with a diverse sample of participants*

Further work is desirable to investigate a broader diversity of participants to establish the impact of social connectedness on wellbeing through physical activity per se or specifically attending aquanatal classes. An investigation into the nature of relationships between members specifically seeking to investigate reciprocity of capital and alterations of power balance within membership associated with particular groups during pregnancy is recommended. The use of varied modes of networking (including use of social media, specific web resources/apps or face-to-face) within or in addition to maternity care should be considered within the design for this study focus, to explore the efficacy of such provision within development of future services.

#### 7.9.1.2 *Investigate the benefits of a specific aquatic exercise regime for women suffering pelvic dysfunction*

There are groups of pregnant women who are often excluded from specific physical exercise (such as those with pelvic girdle discomforts) who may benefit from a controlled aquatic set of conditioning moves that can offer mobility and postural correction through therapeutic buoyancy in water environments (see section 3.2.3 and section 3.2.4, p84-89; see section 6.5.1.2.3, p207-208). Work in this area could establish the efficacy of aquanatal provision which could reduce inactivity or postpone morbidity through restriction of pelvic movements.

7.9.1.3 *Investigate benefits of explicit exercise regimes for pregnant women with specific co-morbidities where physical activity is not contraindicated*

Exercise participation may also be discouraged for women with co-morbidities to pregnancy, for example, treated epilepsy, controlled diabetes, depression or anxiety states or obesity, each of which with individual plans and adequate professional supervision of conditions may benefit from the peer connectedness of group interactions not associated with medical illness. More ethically approved research in the experience of pregnancy wellbeing for these specific populations of women would add to the holistic plans of care for individuals to include monitored physical activities (NICE PH27 2010b; NICE CG107 2010c; NICE PH35 2011; DoH 2014; DoH 2016).

7.9.1.4 *Research efficacy of particular public health messages by professional midwives to pregnant women in a range of community settings*

Being physically active features in many health reports and policies. The debate around the importance of public health education and the opportunity to highlight health messages to women (and families) during pregnancy should remain one that health care professionals involved in maternity provision must strive to prioritise at every contact. This study has offered a snapshot of a specific group activity accessed at a time when messages may be more relevant to recipients. In this I have been able to reflect one activity mode for participants and their experience of this during pregnancy. Later follow-up to see what physical activity new mothers engage in at 1 year, 5 years and 10 years after childbirth would give much more information about behaviour change for physical activity associated with pregnancy public health messages.

7.9.1.5 *Examine the contribution of, and the effectiveness of, social connectedness for women in their transition to first motherhood*

The women in this study were seen to develop peer connections during aquanatal attendance which appear to extend beyond the group-based activity. Exploration of the durability of peer relationships between group members would offer additional knowledge of the experience of postnatal recovery and early mothering practises. An

exploration of professional support from the woman's perspective could contribute to improving social connectedness with health, leisure and social facilities and reduce psychological morbidity associated with early parenthood.

7.9.1.6 *Audit the provision and access of midwife aquatic instructor-led classes across the UK*

A natural progression of this study would be the examination of aquanatal midwife specific provision more widely in UK. This should include determining the range of communities where classes are available, and the current range of instructor education and experience is better understood in collaboration with professional midwifery and aquatic instruction. In addition, the variety of class approaches to exercise and content could be classified and an investigation into the appreciation of how group dynamics impact on participant's experience.

7.9.1.7 *Research the nature of physical activities across pregnancy in relation to active living, home and work activities, to examine links with weight management, functional mobility and gestation*

This study has identified that further examination of the detail of reported activity of the four themes (caregiving, housework/gardening, active living, walking as daily activity and specific exercise engagement [for example as in the PPAQ (see section 7.6, p246-249; and Appendix 8, p349-354)]) associated specifically with pregnancy gestation, would offer additional information to identify daily physical activity MET values. This information may suggest focus for encouraging increased physical activity as a health, wellbeing and weight management strategy.

Within this investigation, other questionnaires could be utilised such as the Clinical use Physical Activity Questionnaire for Pregnancy (CPAQpreg) piloted by Power et al. (2013), which showed correlation with the PPAQ tool for guided use by practitioners.

## **7.9.2 Recommendations for Professional practice**

### **7.9.2.1 *Development as a researching professional***

I have changed as a professional through the development of researcher skills as part of the extensive learning during the practical and theoretical stages of this project. These skills have extended my midwifery expertise of evidence-based care to women attending the aquanatal class. This group of women will benefit from my increased understanding of their motivation and perception of benefits of aquanatal, through the modification of class content to promote wellbeing through social connectedness.

I am more conscious of the ethical framework for human participation in any survey or study, and environmental conditions for maternity care provision. Maintaining reflective activities throughout has offered a unique view of research transforming aspects of my instruction during the class through the rationale for specific exercises is applied to functional daily living at home and at work.

### **7.9.2.2 *Developing professional practice***

A key priority for action will be that I expand opportunities to be involved in educational innovations that seek to promote physical activity for childbearing. Current academic provision allows me to be involved in using my expertise in undergraduate professional programmes, encouraging evidence-based individualised physical activity planning for pregnant women with midwifery and physiotherapy students. Using the findings from the study and other publications, would ensure healthcare students are given opportunities to critique varied research into exercise modes and functional physical activities which support the bio-socioecological experience of childbearing. This would enable midwives to offer clear information and advice which can be tailored to individual women during episodes of maternity care.

In addition, by my professional networking with other providers, the possible integration with leisure industry education should also be explored. This would have the advantage of collaboration potential for public health messages for adopting further physically activity into daily life to enhance health and wellbeing for all populations. A key area for initial development opportunities can be created by

dissemination from this study, to promote aquanatal access to pregnant women through education of midwives and other care and leisure professionals.

#### 7.9.2.3 *Tailoring public health messages to individuals*

The need for clearly coherent messages for physical activity during pregnancy that spans across the health, employment and leisure programmes, could aid the receipt and assimilation of the evidence-based advice for communities of women at this lifestage. Public health information prescription is an essential skill for midwives and the benefit of current knowledge of locally accessible and functional facilities for a range of health and lifestyle enhancements would be recommended for practitioner action.

Combining messages across health, occupational and leisure provision could offer greater options for individual pregnant and childbearing women, to adopt better behaviours relating to physical activity which translate comprehensively into sustained motivation for themselves and their families. Reid et al. (2017) reported work on collaborative UK guidance to support effective public health advice for pregnancy physical activity across health and leisure professional groups. Collaborative working practices for professionals (such as GPs, Midwives, Health Visitors, Leisure Instructors, Personal Trainers) including exercise prescription programmes would aid this initiative.

#### 7.9.2.4 *Developing women's social connectedness during pregnancy*

Women's experience of perinatal wellbeing is inextricably linked to their bio-socioecological context and their life experience. The nature of relationships between women and midwives may be pivotal to a healthy transition to becoming a mother and for them making sense of the biological, psychological and cultural adaptation they undergo. One recommendation for future practitioner development would be the integration of positive professional support mechanisms as identified by women, reinforcing the need for midwives to continuously actively reflect on their professional care provision.

As a method to integrate communities, networking between individuals through new connections based around shared experiences is likely to offer extra insight for both

health and services embedded in social or leisure provisions. Together with understanding of geographical and environmental factors on the development of relationships, we may be able to advance support to individuals who would not previously benefit from social connections in this way.

### **7.10 Contribution to research**

This study explored the experience of women who attended a midwife-led aquanatal class, in terms of their wellbeing through physical activity and the social connectedness gained through attending such a class. The women described how maintaining physical activity at the same time as interacting with a dynamic group of pregnant women offered:

- advantages to their antenatal knowledge that could not be gained elsewhere from peers and a midwife, as their experience of antenatal appointments were infrequent, not in a social environment, and often with a different midwife;
- a regular class provision where they could engage in suitable and safe specific pregnancy exercise opportunity which is open to active and inactive women;
- access to informal social connectedness which was time relevant to their life transition which is powerful and has potential to be enduring;
- an opportunity for regular contact with one midwife for advice if requested or for easy access to evidence-based information in a time sensitive manner.

### **7.11 Reflective narrative: the journey**

I started the DProf research journey with a small group of colleagues (Hutchings 2017). Eventually each of our journeys diverged and the peer group bonds became altered by individual needs, career progression and dissolution. The challenge of balancing the requirements of a novice researcher with other academic (and professional) responsibilities led to unremitting self-searching in extensive personal reflexive notes and a sense of isolation. This was shown in my hesitancy to begin specific phases, which

meant progress slowed before equilibrium returned and I tentatively picked up the process again, moving the study forward. The woven nature of this case study research approach reflects my practitioner reflection-in-action and reflection-on-action (after Schön 1983) on the real-time dynamic nature of the aquanatal class, particularly during research fieldwork.

I was able to adopt a 'privileged position' as an insider to the case study context but I was also very aware of a prior knowledge of the aquanatal class culture (Burnard 2016; Whalley 2016). My personal values and beliefs needed to be constantly bracketed despite an additional requirement of fluidly, needing to function as an insider during intergroup interactions but also as an 'objective' outsider whilst inhabiting my researcher stance. The complicated interrelations of this may have resulted in an imbalance associated with the instructor role I inhabited for this group, complicated by a level of capital my professional expertise brings as a resource (Knowles 2016).

In reality my reflective development as a researching professional often focused on ameliorating threats to the study in terms of internal/external validity (or legitimation as defined by Onwuegbuzie and Johnson 2006, p48), and reliability specifically during data collection and the application of the analytical framework whilst interpreting varied data. Internal factors were considered frequently during the pre-ethics design and ethics approval phase, being embedded into setting out the case context including participant characteristic variables (following consent) and later the potential for researcher observational biases as data was collected (Onwuegbuzie 2003). Participant reaction posed another dilemma in consideration of the 'Hawthorne' or 'novelty' effect of research involvement. External legitimation factors offered additional threats which included the nature of participant self-selection for aquanatal attendance, the class social-ecology of locational provision and myself as midwife-instructor and study researcher (see Appendix 26, p396). I have discussed such points within the methodology, fieldwork and results chapters of this thesis.

As the analysis and interpretation took place, I revisited the nature of observation and researcher impacts on the data. This required me to continuously combine reviewing literature alongside undertaking analytical processes causing me to question my ability to apply knowledge coherently to my findings. The inductive process of data scrutiny

and attributed explanation necessitated weaving findings from varied data collection tools in order to support or refute the completed case discussion from the participant's perspective (Onwuegbuzie and Leech 2007).

The journey has revealed a number of concepts which have enabled understanding of my own and other's social worlds. The theories of Bourdieu's 'habitus', 'field', 'capital' and 'doxa' (1984 and 1986; Thompson 2010; Moore 2010; Deer 2010 respectively) offered a lens to examine my professional life, and how the adoption of the researching professional identity has developed. In contrast I have witnessed how this group of pregnant women embraced the social nature of this aquanatal group, by choosing an option to express social capital through contact with peers. Social sharing through interaction appeared to occur in an open dialogue between women within this group. Indeed, women were seen to interact with peers external to their normal daily life circle when the opportunity arose in a contemporary safe setting.

#### **7.11.1 Research narrative: here, now and the future**

Dissemination is integral to completing this research study. During the study I presented a poster at a post-graduate conference focusing on the case study approach to examine women's motivation to attend aquanatal. Together with the IRAS publication of approved studies I was able to engage with researching professionals and researchers in discussion locally, nationally and internationally.

From this study, it appears to demonstrate that social constructs for wellbeing can contribute to the broader public health of childbearing women. The attendance at an aquanatal group may offer additional support options through informational exchange between women and regular contact with a midwife (see section 7.9.1, p253-256). These participants saw the social nature of giving and receiving support through natural networking, as helpful to their transition to motherhood and indirectly to their wellbeing. Creating impact through small 'drops' of research information is as important to transforming practice as much bigger 'splashes' which may disrupt established situational knowledge, especially within a transdisciplinary context (Flutter 2016).



My task from this point is to ensure I disseminate the research findings to the wider audience by means of midwifery publications and conference presentations. This will allow additional debate for options to combine public health strategies with professional midwifery practice development contributing to pregnancy wellbeing and social connectedness in varied environments.

## **7.12 Epilogue**

Completing this journey has presented significant personal and professional learning as well as many challenges of being a post-graduate researching professional. Various considerations of the study phases prompted some very choppy 'pool' conditions, accompanied by external and internal conditions relating to buoyancy, depth of water and stroke technique issues. The 'thinking' and 'doing' of research skills to explore a very familiar area of my practice prompted complex reflective activities which required thorough critical appraisal of my professional characteristics and philosophy. A more liberal and cogent appreciation of psychosocial aspects of contemporary practice has evolved and I have embedded this into the aquanatal class I provide, that seeks inclusivity for attendees built around their individual relational field of becoming a mother.

The significance of having data that supports the meaning and sensemaking women derive from reciprocal individual interactions with peers during life transition of becoming a mother, cannot be discarded or dismissed. Whilst women's experience of health and wellbeing may be self-regulated by their personal socialisation opportunities in communities, as a midwife I can contribute to the health messages being communicated within 'leisure' spaces where pregnant women meet (see section 7.9.2, p256-258). Social capital within a holistic and dynamic frame of maternity provision could promote stronger peer connections between women and improve networks between families and health providers. Seizing opportunities to impact positively on health is integral to being a professional and contemporary midwife.

## References

- Abel, T., 2008. Cultural capital and social inequality in health. *Journal of Epidemiology and Community Health* [online], 62 (e13), 5p. Available from: <http://dx.doi.org/10.1136/jech.2007.066159> [Accessed 1 February 2018].
- Adler, P. and Adler, P., 1994. Observational techniques. In: Denzin, N. and Lincoln, Y., eds. *Handbook of qualitative research*. Thousand Oaks, Ca: Sage, 377–392.
- Aittasalo, M., Pasanen, M., Fogelholm, M. and Ojala, K., 2010. Validity and repeatability of the short pregnancy leisure time physical activity questionnaire. *Physical Activity of Health*, 7 (1), 109-118.
- Ajzen, I., 1988. *Attitudes, personality, and behaviour*. Chicago: Dorsey Press.
- Ajzen, I., 1991. The theory of planned behaviour. *Organisational Behaviour and Human Decision Processes*, 50 (2), 179-211.
- Ajzen, I., 2006. Percieved behavioural control, self-efficacy, locus of control and the theory of planned behaviour. *Journal of Applied Social Psychology*, 32 (4), 665-683.
- Allen, R., 1991. *The Concise Oxford Dictionary*. 8<sup>th</sup> ed. London: Oxford University Press.
- American College of Obstetricians and Gynaecologists (ACOG), 2002 and reaffirmed 2009. Exercise during pregnancy and the postpartum period. ACOG Committee Opinion No 267. *Obstetrics and Gynaecology* [online], 99, 171-173. Available from: <http://www.acog.org/Resources%20And%20Publications/Committee%20Opinions/Committee%20on%20Obstetric%20Practice/Exercise%20During%20Pregnancy%20and%20the%20Postpartum%20Period.aspx> [Accessed 20 May 2013].
- American College of Sports Medicine (ACSM), 2010. *ACSM's Guidelines for exercise testing and prescription*. 10<sup>th</sup> ed. Philadelphia: Wolters Kluwer.
- Andrews, H., 2016. Gendered Space. In: Naples, N., Hoogland, R., Wickramasinghe, M. and Wong, W., eds. *The Wiley Blackwell Encyclopedia of Gender and Sexuality Studies* [online], Volume 1. Available from: <https://doi.org/10.1002/9781118663219.wbegss326> [Accessed 20 April 2018].
- Angner, E., 2011. Are subjective measures of wellbeing 'direct'? *Australian Journal of Philosophy*, 89 (1), 115-130.
- Appleby, M., 2013. The Nature of Practitioner Research: Critical distance, power and ethics. *Practitioner Research in Higher Education Journal*, 7 (1), 11-21.

Aquatic Exercise Association (AEA), 2010. *Aquatic Fitness Professional Manual*. 6<sup>th</sup> ed. Illinois: Human Kinetics.

Artel, R., O'Toole, M. and Smith, S., 2003. Guidelines of the American College of Obstetricians and Gynaecologists for exercise during pregnancy and the postpartum period. *British Journal of Sports Medicine*, 37, 6-12.

Atkinson, R., 1998. The life story interview. *Sage University Papers Series on Qualitative Research Methods*, 44. Thousand Oaks, Ca: Sage.

Aveyard, H., Payne, S. and Preston, N., 2016. *A postgraduate's guide to doing a literature review in health and social care*. Maidenhead: Open University Press.

Baciuk, E., Pereira, R., Cecatti, J., Braga, A. and Cavalcante, S., 2008. Water aerobics in pregnancy: cardiovascular response, labor and neonatal outcomes. *Reproductive Health* [online], 5 (10). Available from: <http://www.reproductive-health-journal.com/content/5/1/10> [Accessed 15 August 2017].

Baddeley, S., 1996. Antenatal exercise: a personal perspective. *Complementary Therapies in Nursing and Midwifery*, 2 (1), 3-8.

Baddeley, S., 1999. *Health-related fitness during pregnancy*. Salisbury: Quay Books.

Baddeley C. and Storrie, J., 1998. Aquanatal training course. *Practising Midwife*, 1 (2), 31.

Baecke, J., Burema, J. and Frijters, J., 1982. A short questionnaire for the measurement of habitual physical activity in epidemiological studies. *American Journal of Clinical Nutrition*, 36 (5), 936-942.

Bainbridge, J., 2008. Pregorexia: body image over baby? *British Journal of Midwifery*, 19 (9), 608.

Baines, S. and Murphy, S., 2010. *Aquatic exercise for pregnancy: a resource book for midwives and health and fitness professionals*. London: M and K Ltd.

Baker, C., 2006. *Pregnancy and Fitness*. London: A and C Black.

Ballamingie, P. and Johnson, S., 2011. The vulnerable researcher: some unanticipated challenges of doctoral fieldwork. *The Qualitative Report*, 16 (3), 711-729.

Banks, J., 1998. The lives and values of researchers: Implications for educating citizens in a multicultural society. *Educational Researcher*, 27, 4-17.

Barakat, R., Perales M., Garatachea, N., Ruiz, J. and Lucia, A., 2015. Exercise during pregnancy. A narrative review asking: what do we know? *British Journal of Sports Medicine*, 49, 1377-1383.

Barankin, B., Silver, S. and Curuthers, A., 2002. The skin in pregnancy. *Journal of American Academy of Dermatology*, 6, 236-240.

Barnett, E. and Casper, M., 2001. A definition of 'social environment'. *American Journal of Public Health*, 91 (3), 465.

Barrett, G., Shawe, J., Howden, B., Patel, D., Ojukwu, O., Pandya, P. and Stephenson, J., 2015. Why do women invest in pre-pregnancy health and care? A qualitative investigation with women attending maternity services. *BMC Pregnancy and Childbirth* [online], 15, 236. Available from: <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-015-0672-3> [Accessed 31 May 2018].

Baškarada, S., 2014. Qualitative case studies guidelines. *The Qualitative Report* [online], 19 (How to Article 24), 1-25. Available from: <http://www.nova.edu/ssss/QR/QR19/baskarada24.pdf> [Accessed 31 May 2018].

Baxter, P. and Jack, S., 2008. Qualitative Case Study Methodology: study design and implementation for novice researchers. *The Qualitative Report*, 13 (4), 544-559.

Bayrampour, H., McDonald, S., Fung, T. and Tough, S., 2014. Reliability and validity of three shortened versions of the State Anxiety Inventory scale during the perinatal period. *Journal of Psychosomatic Obstetrics and Gynaecology*, 35 (3), 101-107.

Bazeley, P., 2009. Analysing Qualitative Data: more than 'identifying themes'. *The Malaysian Journal of Qualitative Research*, 2 (2), 6-22.

Bazeley, P. and Jackson, K., 2013. *Qualitative data analysis with NVivo*. Los Angeles: Sage.

Beauchamp, T. and Childress, J., 2013. *Principles of Biomedical Ethics*. 7<sup>th</sup> ed. Oxford University Press.

Becker, B., 2009. Aquatic Therapy: Scientific Foundations and Clinical Rehabilitation Applications. *American Academy of Physical Medicine and Rehabilitation*. 1, 859-872.

Benelam, B., 2011. Physical activity in pregnancy. *Nutrition Bulletin* [online], 36 (3), 370-372. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-3010.2011.01915.x> [Accessed 20 May 2017].

Bennett, E., McEwen, C., Clarke, L., Tamminen, K. and Crocker, P., 2013. "It's all about modifying your expectations": women's experiences with physical activity during pregnancy. *Qualitative Research in Sport, Exercise and Health*, 5 (2), 267-286.

Bick, D., 2006. The importance of public health: let history speak for itself. *Midwifery*, 22 (4), 287-289.

Bick, D., 2011. Evidence based midwifery practice: take care to 'mind the gap'. *Midwifery*, 27 (5), 569-570.

Birt, L., Scott, S., Cavers, D., Campbell, C. and Walter, F., 2016. Member checking: a tool to enhance or merely a nod to validation? *Qualitative Health Research*, 26 (13), 1802-1811.

Black, D., (Chair), 1980. *The Black Report: Inequalities in Health - Report of a Research Working Group* [online], London: DHSS. Available from: <http://www.sochealth.co.uk/resources/public-health-and-wellbeing/poverty-and-inequality/the-black-report-1980/> [Accessed 8 May 2015].

Blackburn, S., 2012. *Maternal, fetal and neonatal physiology: a clinical perspective*. 4<sup>th</sup> ed. St Louis: Elsevier Saunders.

Blake, D., 2008. Midwives: all things to all women? *British Journal of Midwifery*, 16 (5), 292-294.

Bluff, R., 2005. Grounded Theory: the methodology. In: Holloway, I., ed. *Qualitative Research in Health Care*. London: Open University Press. 147-167.

Boblin, S., Ireland, S., Kirkpatrick, H. and Robertson, K., Using Stake's Qualitative Case Study Approach to Explore Implementation of Evidence-Based Practice. *Qualitative Health Research*, 23 (9), 1267-1275.

Bolitho, S. and Hatch, V., 2014. *The complete guide to aqua exercise for pregnancy and postnatal health*. (Complete Guides). London: Bloomsbury.

Bolton, G., 2010. *Reflective Practice: Writing and Professional Development*. 3<sup>rd</sup> ed. Los Angeles: Sage.

Boote, D. and Beile, P., 2005. Scholars before researchers: on the centrality of the dissertation literature review in research preparation. *Educational Researcher*, 34 (6), 3-15.

Booth, M., 2000. Assessment of physical activity: an international perspective. *Research Quarterly for Exercise and Sport*, 71, S114-S120.

Boreham, C. and Riddoch, C., 2003. Physical activity and health through the lifespan. In: McKenna, J. and Riddoch, C., eds. *Perspectives on health and exercise*. Basingstoke: Palgrave Macmillan. 11-30.

Borg, G., 1990. Psychophysical scaling with applications in physical work and perception of exertion. *Scandinavian Journal of Work and Environmental Health*, 16 (1), 55-58.

Borg, G., 1998. *Borg's perceived exertion and pain scales*. Illinois: Human Kinetics.

Borsey, A. and Hunter, B., 2012. Nursing and Midwifery: historical approaches. In: Borsey, A. and Hunter, B., eds. *Nursing and Midwifery in England since 1700*. Basingstoke: Palgrave Macmillan. 1-20.

Boscaglia, N., Skouteris, H. and Wertheim, E., 2003. Changes in body image satisfaction during pregnancy: a comparison of high exercising and low exercising women. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 43, 41-45.

Boud, D. and Tennant, M., 2006. Putting doctoral education to work: challenges to academic practice. *Higher Education Research and Development*, 25 (3), 293-306.

Bourdieu, P., 1977. *Outline of a Theory of Practice* [online]. Translation by Richard Nice. Cambridge University Press. Available from: [https://s3.amazonaws.com/academia.edu.documents/44964005/Pierre\\_Bourdieu\\_Outline\\_of\\_a\\_Theory\\_of\\_Practice\\_Cambridge\\_Studies\\_in\\_Social\\_and\\_Cultural\\_Anthropology\\_1977\\_1.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1527408953&Signature=oNbYEFroqcldv9hPS66WsX9ywoM%3D&response-content-disposition=inline%3B%20filename%3DOUTLINE\\_OF\\_A\\_THEORY\\_OF\\_PRACTICE.pdf](https://s3.amazonaws.com/academia.edu.documents/44964005/Pierre_Bourdieu_Outline_of_a_Theory_of_Practice_Cambridge_Studies_in_Social_and_Cultural_Anthropology_1977_1.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1527408953&Signature=oNbYEFroqcldv9hPS66WsX9ywoM%3D&response-content-disposition=inline%3B%20filename%3DOUTLINE_OF_A_THEORY_OF_PRACTICE.pdf) [Accessed 15 August 2017].

Bourdieu, P., 1984. *Distinction: A Social Critique of the Judgement of Taste* [online]. Translation by Richard Nice. Harvard University Press. Available from: <http://www.mit.edu/~allanmc/bourdieu1.pdf> [Accessed 15 August 2017].

Bourdieu, P., 1985. The social space and genesis of groups. *Theory and Society* [online], 14 (6), 723-744. Available from: <https://pdfs.semanticscholar.org/c507/cedcdaed9fe45d81258764891a2fca9feef6.pdf> [Accessed 15 August 2017]. Bourdieu, P., 1986. The Forms of Capital. In: Richardson, J., ed. *Handbook of Theory and Research for the Sociology of Capital* [online]. New York: Greenwood Press. 241-258. Available from: [http://home.iitk.ac.in/~amman/soc748/bourdieu\\_forms\\_of\\_capital.pdf](http://home.iitk.ac.in/~amman/soc748/bourdieu_forms_of_capital.pdf) [Accessed 15 August 2017].

Bourdieu, P., 1987. What makes a social class? On the theoretical and practical existence of groups. *Berkeley Journal of Sociology* [online], 32, 1-17. Available from: <http://voidnetwork.gr/wp-content/uploads/2016/08/What-Makes-a-Social-Class.-On-The-Theoretical-and-Practical-Existence-Of-Groups-by-Pierre-Bourdieu.pdf> [Accessed 15 August 2017].

Bourdieu, P., 1991. *Language and Symbolic Power* [online]. Translated by Gina Raymond and Matthew Adamson. Cambridge: Polity Press. Available from: <https://www.researchgate.net/.../Bourdieu+Language+and+Symbolic+Power.pdf> [Accessed 15 August 2017].

Bourdieu, P., 1998. The family spirit. *In*: Bourdieu, P., ed. *Practical Reason: on the theory of action* [online]. Cambridge: Polity Press. 64–74. Available from: <https://books.google.co.uk/books?hl=en&lr=&id=2xFbVv-EHf4C&oi=fnd&pg=PR10&dq=Bourdieu,+P.,+1998.+The+family+spirit.&ots=EWbworqnmF&sig=gXuxbJOH5l UyOYdt1xLl1vBjSY#v=onepage&q&f=false> [Accessed 15 August 2017].

Bourdieu, P., 2006. Cultural reproduction and social reproduction. *In*: Grusky, D. and Szelényi, S., eds. *Inequality: Classic Readings in Race, Class, and Gender*. Boulder, Co: Westview Press. 257–271.

Bowden, J., 2006a. Health Promotion and the midwife. *In*: Bowden J. and Manning, V., eds. *Health promotion in midwifery – principles and practice*. 2<sup>nd</sup> ed. London: Hodder Arnold. 13-24.

Bowden, J., 2006b. Attitudes, values and health behaviours. *In*: Bowden J. and Manning, V., eds. *Health promotion in midwifery – principles and practice*. 2<sup>nd</sup> ed. London: Hodder Arnold. 62-75.

Boyatzis, R., 1998. *Transforming qualitative information: thematic analysis and code development*. Thousand Oaks, Ca: Sage Publications.

Brannick, T. and Coghlan, D., 2007. In defense of being “native” – the case for insider academic research. *Organizational Research Methods*, 10 (1), 59-74.

Braun, V. and Clarke, V., 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.

Breen, L., 2007. The researcher ‘in the middle’: Negotiating the insider/outsider dichotomy. *The Australian Community Psychologist*, 19 (1), 163-174.

Brett, K., Wilson, S., Ferraro, Z., and Adamo, K., 2015. Self-report Pregnancy Physical Activity Questionnaire overestimates physical activity. *Canadian Journal of Public Health* [online], 106 (5), e297-e302. Available from: <https://pdfs.semanticscholar.org/710f/faf90d5a635b2af6fafb05704516f62b6b9e.pdf> [Accessed 17 August 2017].

British Medical Association (BMA), 2016. *Cutting away at our children’s futures: how austerity is affecting the health of children, young people and families*. London: BMA.

Bronfenbrenner, U., 1977. Toward an experimental ecology of human development. *American Psychologist* [online], 32 (7), 513–531. Available from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.458.7039&rep=rep1&type=pdf> [Accessed 15 May 2017].

Bronfenbrenner, U., 1979. *The ecology of human development: Experiments by nature and design* [online]. Harvard University Press. Available from: [https://khoerulanwarbk.files.wordpress.com/2015/08/urie\\_bronfenbrenner\\_the\\_ecology\\_of\\_human\\_developbokos-z1.pdf](https://khoerulanwarbk.files.wordpress.com/2015/08/urie_bronfenbrenner_the_ecology_of_human_developbokos-z1.pdf) [Accessed 15 May 2017].

Bronfenbrenner, U., 2001. The Bioecological Theory of Human Development. In: Smelser, N. and Baltes, P., eds., *International Encyclopaedia of the Social and Behavioural Sciences* [online]. 10, 6963-6970. Available from: [https://www.researchgate.net/publication/279434846\\_Human\\_Development\\_Bioecological\\_Theory\\_of](https://www.researchgate.net/publication/279434846_Human_Development_Bioecological_Theory_of) [Accessed 15 May 2017].

Bronfenbrenner, U., 2005. (Reprinted) The Bioecological Theory of Human Development. In: Bronfenbrenner U., ed. *Making human beings human: Bioecological perspectives on human development*. Thousand Oaks, Ca: Sage. 3-15.

Bronfenbrenner, U. and Ceci, S., 1994. Nature-nurture reconceptualized in developmental perspective: A bioecological model. *Psychological Review*, 101, 568–586.

Brown, W., Pavey, T. and Bauman, A., 2015. Comparing population attributable risks for heart disease across the adult lifespan in women. *British Journal of Sports Medicine*, 49, 1069–1076.

Bruner, J., 1991. The Narrative Construction of Reality. *Critical Inquiry*, 18 (1), 1–21.

Bryar, R. and Sinclair, M., 2011. Signposting future developments in midwifery theory, practice and research. In: Bryar, R. and Sinclair, M., eds. *Theory for midwifery practice*. 2<sup>nd</sup> ed. Basingstoke: Palgrave Macmillan. 3-15.

Burnard, P., 2016. The professional doctorate. In: Burnard, P., Dragovic, T., Flutter J. and Alderton J., eds. *Transformational Doctoral Research Practices for Professionals*. Rotterdam: Sense. 15-28.

Burns, E., Fenwick, J., Schmied, V. and Sheehan, A., 2012. Reflexivity in midwifery research: The insider/outsider debate. *Midwifery*, 28 (1), 52–60.

Butler, J., 1990. *Gender Trouble: Feminism and the Subversion of Identity* [online]. London: Routledge. Available from: [http://lauragonzalez.com/TC/BUTLER\\_gender\\_trouble.pdf](http://lauragonzalez.com/TC/BUTLER_gender_trouble.pdf) [Accessed 27 May 2018]. Original republished as Routledge Classics, 2006.

Butte, N., 2000. Carbohydrate and lipid metabolism in pregnancy: normal compared with gestational diabetes mellitus. *American Journal of Clinical Nutrition*, 71 (5), 1256s-1261s.



- Butts, C., 2008. Social network analysis: A methodological introduction. *Asian Journal of Social Psychology*, 11, 13–41.
- Byrom, S. and Byrom, A., 2017. Around the world in 80 Tweets – social media and midwifery. In: Luce, A., Hundley, V. and van Teijlingen, E., eds. *Midwifery, Childbirth and the Media*. London: Palgrave Macmillan. 129-148.
- Caldwell, K., Henshaw, L. and Taylor, G., 2005. Developing a framework for critiquing health research. *Journal of Health, Social and Environmental Issues*, 6 (1), 45-54.
- Caldwell, K., Henshaw, L. and Taylor, G., 2011. Developing a framework for critiquing health research: an early evaluation. *Nurse Education Today*, 31 (8), 1-7.
- Calman, K., 1984. Quality of life in cancer patients – an hypothesis. *Journal of Medical Ethics* [online], 10, 124-127. Available from: <https://jme.bmj.com/content/medethics/10/3/124.full.pdf> [Accessed 23 July 2018].
- Camfield, L. and Skevington, S., 2008. On subjective well-being and quality of life. *Journal of Health Psychology*, 13, 764-775.
- Carlin, A. and Alfievic, Z., 2008. Physiological changes of pregnancy and monitoring. *Best Practice and Research Clinical Obstetrics and Gynaecology*, 22 (5), 801-823.
- Carlson, H., Carlson, N., Pasternak, B. and Balderston, K., 2003. Understanding and managing the back pain of pregnancy. *Current Women's Health Reports*, 3, 65–71.
- Carlson, C., 2005. Expanding Horizons: developing a public health perspective in midwifery. In: O’Luanaigh, P. and Carlson, C., eds. *Midwifery and public health: future directions, new opportunities*. Edinburgh: Elsevier. 41-60.
- Carter, N., Bryant-Lukosius, D., DiCenso, A., Blythe, J. and Neville, A., 2014. The use of triangulation in qualitative research. *Oncology Nursing Forum*, 41 (5), 545-547.
- Carter, S., and Guittar, S., 2014. Emotion work among pregnant and birthing women. *Midwifery*, 30, 1021-1028.
- Casey, P., Coleman, L. and Houlston, C., 2013. *Peer supporters in ‘Pregnancy, Birth, and Beyond,’ and ‘Healthy Relationship Champions’: A formative evaluation*. London: Department of Education.
- Cavalcante, S., Cecatti, J., Pereira, R., Baciuk, E., Braga, A. and Silveira, C., 2009. Water aerobics II: maternal body composition and perinatal outcomes after a program for low risk pregnant women. *Reproductive Health* [online], 5:10. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2628875/pdf/1742-4755-6-1.pdf> [Accessed 15 August 2017].

Centre for Maternal and Child Enquiries (CMACE) and Royal College of Obstetricians and Gynaecologists (RCOG), 2011. *Saving Mothers Lives. Reviewing maternal deaths to make motherhood safe 2006-2008. The eighth report of the confidential enquiries into maternal death in the United Kingdom* [online]. Available from: <http://www.oa-anaes.ac.uk/content.asp?ContentID=180> [Accessed 20 May 2013].

Centre for Reviews and Dissemination (CRD), 2009. *Systematic Reviews. CRD's guidance for undertaking reviews in healthcare*. University of York: CRD.

Chambers, D., 2012. *A sociology of family life: change and diversity in intimate relations*. Cambridge: Polity.

Chang, J. and Strietman, D., 2012. Physiologic adaptations to pregnancy. *Neurologic Clinics*, 30, 781-789.

Chasan-Taber, L., Schmidt, M., Roberts, D., Hosmer, D., Markenson, G. and Freedson, P., 2004a. Development and validation of a pregnancy physical activity questionnaire. *Medicine and Science in Sports and Exercise*, 1750-1760.

Chasan-Taber, L., Schmidt, M., Roberts, D., Hosmer, D., Markenson, G. and Freedson, P., 2004b. *Pregnancy Physical Activity Questionnaire. Instructions and Calculations* [online]. Available from: [dapa-toolkit.mrc.ac.uk/pdf/pa/PPAQ\\_instructions\\_1.pdf](http://dapa-toolkit.mrc.ac.uk/pdf/pa/PPAQ_instructions_1.pdf) [Accessed 5 May 2017].

Chase, S., 2011. Narrative Inquiry: still a field in the making. In: Denzin N. and Lincoln, Y., eds. *The Sage Handbook of Qualitative Research*. 4<sup>th</sup> ed. Thousand Oaks, Ca: Sage. 421-434.

Chavez, C., 2008. Conceptualizing from the Inside: Advantages, Complications, and Demands on Insider Positionality. *The Qualitative Report*, 13 (3), 474-494.

Chou, F., Liu, L., Cooney, A., Waller, L. and Riggs, M., 2003. Psychological factors related to nausea and vomiting and fatigue in early pregnancy. *Journal of Nursing Scholarship*, 35 (2), 119-125.

Choucrist, L., 2005. Creating change: developing a midwifery action research project. *British Journal of Midwifery*, 15 (10), 629-632.

Cietak, K. and Newton, J., 1985. Serial quantitative maternal nephrosonography in pregnancy. *British Journal of Radiology*, 58, 405-413.

Cioffi, J., Schmied, V., Dahlen, H., Mills, A., Thornton, C., Duff, M., Cummings, J. and Kolt, G., 2010. Physical Activity in Pregnancy: Women's Perceptions, Practices, and Influencing Factors. *Journal of Midwifery and Women's Health*, 55 (5), 455-461.

Clapp, J., 1998. *Exercising through your pregnancy*. Champaign, Illinois: Human Kinetics.

Clarke, P. and Gross, H., 2004. Women's behaviour, beliefs and information sources about physical exercise in pregnancy. *Midwifery*, 20, 133-141.

Cluett, E., Nikodem, V., McCandlish, R. and Burns, E., 2002. *Immersion in water in pregnancy, labour and birth (Intervention review)* [online]. Available from: <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000111.pub2/epdf/standard> [Accessed 1 November 2017].

Cluett, E., 2006. Evidence-based practice. In: Cluett, E. and Bluff, R., eds. *Principles and practice of research in midwifery*. 2<sup>nd</sup> ed. Edinburgh: Ballière Tindall. 33-56.

Cluett, E. and Bluff, R., 2006. From practice to research. In: Cluett, E. and Bluff, R., eds. *Principles and Practice of research in midwifery*. 2<sup>nd</sup> ed. Edinburgh: Baillière Tindall. 13-31.

Cochrane, 2015. Cochrane Library: About Cochrane. Available from: <http://www.cochranelibrary.com/> or [www.cochrane.org](http://www.cochrane.org) [Accessed 28 August 2015].

Cohen, L. and Manion, L., 1994. *Research Methods in Education*. 4<sup>th</sup> ed. London: Routledge.

Cohen, L., Manion, L. and Morrison, K., 2000. *Research Methods in Education*. 5<sup>th</sup> ed. London: Routledge/Falmer/Taylor and Francis Group.

Cohen, L., Manion, L. and Morrison, K., 2011. *Research Methods in Education*. 7<sup>th</sup> ed. London: Routledge.

Cohen, T., Plourde, H. and Koski, K., 2013. Use of the Pregnancy Physical Activity Questionnaire (PPAQ) to identify behaviours associated with appropriate gestational weight gain during pregnancy. *Journal of Physical Activity and Health*, 10, 1000-1007.

Coldron, Y., Stokes, M., Newham, D. and Cook, K., 2008. Postpartum characteristics of rectus abdominis on ultrasound imaging. *Manual Therapy*, 13, 112-121.

Cole, C., Giardina, M. and Andrews, D., 2004. Michael Foucault: studies of power and sport. In: Guilianotti, R., ed. *Sport and modern social theorists*. Basingstoke: Palgrave Macmillan. 207-223.

Collins, M., Shattell, M. and Thomas, S., 2005. Problematic Interviewee Behaviours in Qualitative Research. *Western Journal of Nursing Research*, 27 (2), 188-199.

Conley, H., 2012. Economic crisis, austerity and gender equality: The UK case. *European Gender Equality Law Review* [online], 2, 14-19. Available from: <http://eprints.uwe.ac.uk/25963> [Accessed 12 April 2018].

Contanza, R., Fisher, B., Ali, S., Beer, C., Bond, L., Boumans, R., Danigelis, N., Dickinson, J., Elliott, C., Farley, J., Gayer, D., MacDonald Glenn, L., Hudspeth, T., Mahoney, D., McCahill, L., McIntosh, B., Reed, B., Rizvi, S., Rizzo, D., Simpatico, T. and Snapp, R., 2007. Quality of life: An approach integrating opportunities, human needs, and subjective well-being. *Ecological Economics*, 61 (2/3), 267-276.

Cresswell, J., 2006. *Qualitative Inquiry and Research Design. Choosing among five approaches*. 2<sup>nd</sup> ed. Thousand Oaks, Ca: Sage.

Critical Appraisal Skills Programme (CASP), 2017. *Systematic Review Checklist* [online]. Available from: <http://www.caspuk.net/appraising-the-evidence> [Accessed 17 August 2017].

Crossley, N., 2008. (Net)working out: social capital in a private health club. *The British Journal of Sociology*, 59 (3), 475-500.

Crossley, N., 2010. Social Class. In: Grenfell, M., ed. *Pierre Bourdieu key concepts*. Durham: Acumen. 85-97.

Crotty, M., 1998. *The foundations of social research: meaning and perspective in the research process*. London: Sage.

Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A. and Sheikh, A., 2011. The case study approach. *BMC Medical Research Methodology* [online], 11:100. Available from: <http://www.biomedcentral.com/1471-2288/11/100> [Accessed 26 April 2013].

Crozier, S., Inskip, H., Godfrey, K. and Robinson, S., 2008. Dietary patterns in pregnant women: a comparison of food frequency questionnaires and 4 day prospective diaries. *British Journal of Nutrition*, 99, 869-875.

Cummings, I., 2017. Swimming and Health Commission Report: *The Health and Wellbeing benefits of Swimming* [online]. London: Swimming and Health Commission. Available from: <http://www.swimming.org/swimengland/new-report-shows-health-benefits-swimming/> [Accessed 5 December 2017].

Currarini, S., Matheson, J. and Vega Redondo, F., 2016. *A Simple Model of Homophily in Social Networks*. Working Paper No. 16/05. Department of Economics: University of Leicester.

Currie, J., 2004. Motherhood, stress and the exercise experience: freedom or constraint? *Leisure Studies* [online], 23 (3), 225-242. Available from: <https://doi.org/10.1080/0261436042000251987> [Accessed 20 April 2018].

Dahlgren, G. and Whitehead, M., 1991. *Policies and strategies to promote social equity in health*. Stockholm: Institute for Future Studies.

- Darling, N., 2007. Ecological Systems Theory: the person in the centre of the circles. *Research in Human Development*, 4 (3/4), 203-217.
- Darra, S., 2008. Emotion work and the ethics of novice insider research. *Journal of Research in Nursing*, 13 (3), 251-261.
- Darvill, R., Skirton, H. and Farrand P., 2010. Psychological factors that impact on women's experiences of first-time motherhood: a qualitative study of the transition. *Midwifery*, 26 (3), 357-366.
- Davis, L., 2017. Biobehavioural aspects of parenting. In: Rankin, J., ed. *Physiology in childbearing with anatomy and related biosciences*. Edinburgh: Elsevier. 597-603.
- Davis-Floyd, R., 2001. The technocratic, humanistic, and holistic paradigms of childbirth. *International Journal of Gynecology and Obstetrics*, 75, S5-S23.
- Davis-Floyd, R. and Sargent, C., 1997. *Childbirth and Authoritative Knowledge: Cross-Cultural Perspectives*. University of California Press.
- Deer, C., 2010. Doxa. In: Greenfield, M., ed. *Pierre Bourdieu: Key Concepts*. Durham: Acumen. 119-130.
- DeFilippis, J., 2001. The Myth of Social Capital in Community Development. *Housing Policy Debate (Fannie Mae Foundation®)*, 12 (4), 781-806.
- Deighton-Smith, N., 2014. *Body image, health, and physical activity in pregnant women: A composite analysis*. Unpublished PhD. Leeds Metropolitan University.
- Dennis, C-L., 2003. Peer support with a health care context: a concept analysis. *International Journal of Nursing Studies*, 40, 321-332.
- Dennis, C-L., 2004. Can we identify mothers at-risk for postpartum depression in the immediate postpartum period using the Edinburgh Postnatal Depression Scale? *Journal of Affective Disorders*, 78 (2), 163-169.
- Denzin, N., 1978. *The research act: A theoretical introduction to sociological methods*. 2<sup>nd</sup> ed. New York: McGraw-Hill.
- Denzin, N., 2012. Triangulation 2.0. *Journal of Mixed Methods Research*, 6 (2), 80-88.
- Denzin, N. and Lincoln, Y., 2011. Introduction: The Discipline and Practice of Qualitative Research. In: Denzin, N. and Lincoln, Y., *SAGE Handbook of Qualitative Research*. Thousand Oaks, Ca: Sage. 1-20.

Department for Environment, Food and Rural Affairs (DEFRA), 2010. *Measuring Progress: Sustainable Development Indicators* [online]. Available from: [www.defra.gov.uk/sustainable/government/progress/documents/SDI2010\\_001.pdf](http://www.defra.gov.uk/sustainable/government/progress/documents/SDI2010_001.pdf) [Accessed 24 February 2015].

Department of Health (DoH), 2003. *Delivering the best: midwives' contribution to the NHS Plan* [online]. Available from: [http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_4128157](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4128157) [Accessed 6 April 2010].

Department of Health (DoH), 2005. *Research governance framework for health and social care* [online]. 2<sup>nd</sup> ed. London: DoH. Available from: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/139565/dh\\_4122427.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/139565/dh_4122427.pdf) [Accessed 20 May 2017].

Department of Health (DoH), 2006. *Our health, our care, our say: a new direction for community services* [online]. London: The Stationary Office. Available from: <http://www.official-documents.gov.uk/document/cm67/6737/6737.pdf> [Accessed 13 August 2013].

Department of Health (DoH), 2007. *Making it better: for mothers and babies* [online]. London: DoH. Available from: [http://webarchive.nationalarchives.gov.uk/20080814090357/dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_065053](http://webarchive.nationalarchives.gov.uk/20080814090357/dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_065053) [Accessed 20 May 2017].

Department of Health (DoH), 2008. *Research governance framework for health and social care* [online]: 2<sup>nd</sup> ed. Annex. London: DoH. Available from: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/139566/dh\\_088288.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/139566/dh_088288.pdf) [Accessed 20 May 2017].

Department of Health (DoH), 2010a. *Midwifery 2020: Programme Core Role of the Midwife Workstream - Final Report* [online]. London: DoH. Available from: [http://www.nes.scot.nhs.uk/media/1891153/core\\_role.pdf](http://www.nes.scot.nhs.uk/media/1891153/core_role.pdf) [Accessed 1 April 2017].

Department of Health (DoH), 2010b. *Our Health and Wellbeing Today*. London: DoH. Available from <https://www.gov.uk/government/publications/our-health-and-well-being-today> [Accessed 20 May 2017].

Department of Health (DoH), 2011. *Start Active, Stay Active. A report on physical activity for health from the four home country's chief medical officers* [online]. London: DoH. Available from: <https://www.gov.uk/government/publications/start-active-stay-active-a-report-on-physical-activity-from-the-four-home-countries-chief-medical-officers> [Accessed 14 August 2013].

Department of Health (DoH), 2014. *The relationship between wellbeing and health: Health Improvement Analytical Team* [online]. London: DoH. Available from: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/295474/The relationship between wellbeing and health.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/295474/The_relationship_between_wellbeing_and_health.pdf) [Accessed 20 April 2018].

Department of Health (DoH), 2016. *Physical activity for pregnant women: infographic* [online]. London: DoH. Available from: <https://www.gov.uk/government/publications/start-active-stay-active-infographics-on-physical-activity> [Accessed 20 April 2018].

Derbyshire, E., Davies, G., Costarelli, V. and Dettmar, P., 2008. Habitual patterns of physical activity during pregnancy and postnatally. *British Journal of Midwifery*, 16 (1), 20-24.

Dewey, J., 1910. *How We Think* [online]. Boston: Heath & Co. Available from: <http://archive.org/details/howwethink03dewegoog> [Accessed 11 Aug 2016].

Dey, I., 1993. *Qualitative data analysis: A user-friendly guide for social scientists*. London: Routledge Kegan Paul.

Dickson-Swift, V., James, E., Kippen, S. and Liamuttong, P., 2009. Researching sensitive topics: qualitative research as emotion work. *Qualitative Research*, 9 (1), 61–79.

Diener, E., Scollon, C. and Lucas, R., 2003. The evolving concept of subjective well-being: the multifaceted nature of happiness. *Advances in Cell Aging and Gerontology*, 15, 187–219.

Dodge, R., Daly, A., Huyton, J. and Saunders, L., 2012. The challenge of defining well-being. *International Journal of Wellbeing*, 2 (3), 222-235.

Dolan, P., Layard, R. and Metcalfe, R., 2011. *Office for National Statistics: Measuring Subjective Well-being for Public Policy* [online]. Available from: <http://www.ons.gov.uk/ons/guide-method/user-guidance/well-being/index.html> [Accessed 21 January 2014].

Donnison, J., 1988. *Midwives and medical men. A history of the struggle for the control of childbirth*. London: Historical publications.

Donovan, P., 2006a. Ethnography. In: Cluett, E. and Bluff, R., eds. *Principles and Practice of research in midwifery*. 2<sup>nd</sup> ed. Edinburgh: Baillière Tindall. 171-186.

Donovan, P., 2006b. Alternative approaches to research. In: Cluett, E. and Bluff, R., eds. *Principles and Practice of research in midwifery*. 2<sup>nd</sup> ed. Edinburgh: Baillière Tindall. 203-219.

- Douglas, H., 2010. Types of community. In: Anheier H. and Toepler, S., eds. *International Encyclopedia of Civil Society*. New York: Springer. 539-544.
- Drake, P. and Heath, L., 2011. *Practitioner research at doctoral level: developing coherent methodologies*. London: Routledge.
- Duff, E. and Dodds, R., 2012. Making services for new parents the best they can be. *Perspective (NCT Journal)*, 16, 12-13.
- Duncombe, D. W. Wertheim, E., Skouteris, H., Paxton, S. and Kelly, L., 2007. Factors related to exercise over the course of pregnancy including women's belief about the safety of exercise during pregnancy. *Midwifery*, 25 (4). 430-438.
- Duncombe, D., Wertheim, E., Skouteris, H., Paxton, S. and Kelly, L., 2008. How well do women adapt to changes in their body size and shape across the course of pregnancy? *Journal of Health Psychology*, 13 (4), 503-515.
- Dunleavy, P., 2003. *Authoring a PhD, how to plan, draft, write and finish a thesis or dissertation*. Basingstoke: Palgrave Macmillan.
- Dunn-Toroosian, V., 2003. The family. In: Squire, C., ed. *The social context of birth*. Oxford: Routledge. 57-76.
- Dwyer, S. and Buckle, J., 2009. The Space Between: On Being an Insider-Outsider in Qualitative Research. *International Journal of Qualitative methodologies*, 8 (1), 54-63.
- Easter, A. and Newburn, M., 2014. *Working it out: new parents' experiences of returning to work*. London: NCT.
- EBSCO, 2018. *Help: Searching with Boolean Operators* [online]. Available from: [https://help.ebsco.com/interfaces/EBSCO Guides/EBSCO Interfaces User Guide/Searching with Boolean Operators](https://help.ebsco.com/interfaces/EBSCO%20Guides/EBSCO%20Interfaces%20User%20Guide/Searching%20with%20Boolean%20Operators) [Accessed 17 April 2018].
- Edwards, S., 2017. Reflecting differently. New dimensions: reflection-before-action and reflection-beyond-action. *International Practice development Journal* [online]. 7 (1) 14p. Available from: <https://www.fons.org/library/journal/volume7-issue1/article2> [Accessed 17 August 2017].
- Ely, M., Vinz, R., Downing, M. and Anzul, M., 1997. *On writing qualitative research: Living by words*. London: Routledge/Falmer.
- Emerson, R., Fretz, R. and Shaw, I., 2011. *Writing ethnographic fieldnotes*. 2<sup>nd</sup> ed. University of Chicago Press.
- Enkin, M., Keirse, M., Neilson, J., Crowther, C., Duley, L., Hodnett, E. and Hofmeyr, J., 2000. *A guide to effective care in pregnancy and childbirth*. 3<sup>rd</sup> ed. Oxford University Press.



Ereaut, G. and Whiting, R., 2008. *What do we mean by 'wellbeing'? and why might it matter* [online]. Research Report DCSF-RW073. Linguistic Landscapes. Available from: <https://www.education.gov.uk/publications/eOrderingDownload/DCSF-RW073.pdf> [Accessed 20 February 2013].

Evans, A. and Allen-Collinson, J., 2016. From 'just a swimmer' to a 'swimming mother': women's embodied experiences of recreational aquatic activity with pre-school children. *Leisure Studies*, 35 (2). 141-156.

Evans, A., Allen-Collinson, J. and Williams, R., 2017. Risky bodies, risky spaces, maternal 'instincts': Swimming and motherhood. *International Review for the Sociology of Sport*, 52 (8), 972–991.

Evenson, K., Savitz, D. and Huston, S., 2004. Leisure-time physical activity among pregnant women in the US. *Paediatric and Perinatal Epidemiology*, 18, 400–407.

Evenson, K., Moos, M-K., Carrier, K. and Siega-Riz, A., 2009. Perceived barriers to physical activity among pregnant women. *Maternal and Child Health Journal*, 13 (3), 364-375.

Fereday, J. and Muir-Cochrane, E., 2006. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *International Journal of Qualitative Methods* [online], 5 (1), Available from: [http://www.ualberta.ca/~iiqm/backissues/5\\_1/pdf/fereday.pdf](http://www.ualberta.ca/~iiqm/backissues/5_1/pdf/fereday.pdf) [Accessed 2 May 2016].

Finlay, H., 2006. Public health, midwifery and government policy. In: Bowden J. and Manning, V., eds. *Health promotion in midwifery – principles and practice*. 2<sup>nd</sup> ed. London: Hodder Arnold. 1-12.

Fishbein, M. and Ajzen, I. 1975. *Belief, Attitude, Intention, and Behaviour: An Introduction to Theory and Research*. Reading, Ma: Addison-Wesley.

Fiske, A., 2000. Complementarity Theory: Why Human Social Capacities Evolved to Require Cultural Complements. *Personality and Social Psychology Review*, 4 (1), 76-94.

Flick, U., 2014. *An introduction to qualitative research*. 5<sup>th</sup> ed. Los Angeles: Sage.

Flint, C., Poulengeris, P. and Grant, A., 1989. The 'Know your Midwife' scheme – a randomised trial of continuity of care by a team of midwives. *Midwifery*, 5, 11-16.

Flutter, J., 2016. Constructing impact. In: Burnard, P., Dragovic, T., Flutter, J. and Alderton, J., eds. *Transformational Doctoral Research Practices for Professionals*. Rotterdam: Sense. 115-126.

Flyvbjerg, B., 2006. Five Misunderstandings about Case-Study Research. *Qualitative Inquiry*, 12 (2) 219-245.

Flyvbjerg, B., 2011. Case Study. In: Denzin N. and Lincoln, Y., eds. *The Sage Handbook of Qualitative Research*. 4<sup>th</sup> ed. Thousand Oaks, Ca: Sage. 301-316.

Foxcroft, K., Rowland, I., Byrne, N., McIntyre, H. and Calloway, L., 2011. Exercise in obese pregnant women: The role of social factors, lifestyle and pregnancy symptoms [online]. *BMC Pregnancy and Childbirth* [online], 11 (4). Available from: <http://www.biomedcentral.com/1471-2393/11/4> [Accessed 1 April 2018].

Foxcroft, K., Calloway, L., Byrne, N., Webster, J., 2013. Development and validation of a pregnancy symptom inventory. *BMC Pregnancy and Childbirth* [online], 13 (3). Available from: <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/1471-2393-13-3> [Accessed 1 April 2018].

Franz, N., 2011. The Unfocussed Focus Group: benefit or bane? *The Qualitative Report* [online], 16 (5), 1380-1388. Available from: <https://nsuworks.nova.edu/cgi/viewcontent.cgi?article=1304&context=tqr> [Accessed 2 May 2016].

Fraser, D., 1997. Ethical dilemmas and practical problems for the practitioner researcher. *Educational Action Research*, 5 (1), 161-171.

Furness, P., McSeveny, K., Arden, M., Garland, C., Dearden, A. and Soltani, H., 2011. Maternal obesity support services: a qualitative study of the perspectives of women and midwives. *BMC Pregnancy and Childbirth* [online], Available from: <http://www.biomedcentral.com/1471-2393/11/69> [Accessed 20 May 2013].

Furnham, A., 1986. Assertiveness through different media. *Journal of Language and Social Psychology*, 5 (1), 1-11.

Gale, N., Heath, G., Cameron, E., Rashid, S. and Redwood, S., 2013. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Medical Research Methodology* [online], 13, 117. Available from: <http://www.biomedcentral.com/1471-2288/13/117> [Accessed 1 May 2018].

Garbett, R. and McCormack, B., 2004. A concept analysis of practice development. In: McCormack, B., Manley, K. and Garbett, R., eds. *Practice Development in Nursing*. Oxford: Blackwell. 10-32.

Gaskin, I., 2002. *Spiritual Midwifery*, 4th ed. Summertown, Tennessee: Book Publishing Company.

Gaston, A., Cramp, A. and Prapavessis, H., 2012. Pregnancy—should women put up their feet or lace up their running shoes? Self-Presentation and the exercise stereotype phenomenon during pregnancy. *Journal of Sport & Exercise Psychology*, 34, 223-237.

Gaudion, A., Menka, Y., Demilew, J., Walton, C., Yiannouzis, K., Robbins, J., Schindler Rising, S. and Bick, D., 2011. Findings from a UK feasibility study of the Centering Pregnancy® model. *British Journal of Midwifery*, 19 (12), 796-802.

Gelling, L., 1999. Ethical Principles in healthcare research. *Nursing Standard*, 13 (36), 39-42.

van Gennep, A., 1909. Les rites de passage (in French). Paris: Émile Nourry. Lay Summary Review by F., Starr. 1910. *The American Journal of Sociology* [online], 15 (5), 707-709. Available from: <https://www.jstor.org/stable/pdf/2762690.pdf> [Accessed 9 July 2017].

George, A. and Bennett, A., 2005. *Case studies and theory development in the social sciences*. Cambridge: MIT Press.

Giddens, A., 1997. *Sociology*. 3<sup>rd</sup> ed. Cambridge: Polity Press.

Gilbert, E. and Harmon, J., 2003. *Manual of high risk pregnancy and delivery*. 3<sup>rd</sup> ed. St Louis: Mosby.

Gilleard, W., 2013. Trunk motion and gait characteristics of pregnant women when walking: report of a longitudinal study with a control group. *BMC Pregnancy and Childbirth* [online], 13:71. Available from: <http://www.biomedcentral.com/1471-2393/13/71> [Accessed 26 April 2013].

Gjestland, K., Bo, K., Owe, K. and Eberhard-Gran, M., 2012. Do pregnant women follow exercise guidelines? Prevalence data among 3482 women, and prediction of low-back pain, pelvic girdle pain and depression. *British Journal of Sports Medicine*, 47 (8), 515-520.

Glaser, B. and Strauss, A., 1967. *The discovery of grounded theory: strategies for qualitative research*. New York: Aldine Publishing.

Goetz, J. and LeCompte, M., 1984. *Ethnography and qualitative design in educational research*. New York: Academic Press.

Goffman, I., 1959. *The presentation of self in everyday life*. New York: Anchor/Doubleday Dell.

Goldberg, D., 1978. *Manual of the General Health Questionnaire*. Windsor, UK: National Foundation of Educational Research (NFER) Publishing.

- Goldberg, D. and Hillier, V., 1979. A scaled version of the General Health Questionnaire. *Psychological Medicine*, 9, 139-145.
- Goleman, D., 1996. *Emotional Intelligence – why it can matter more than IQ*. London: Bloomsbury.
- Gore, S., Brown, D. and Smith-West, D., 2003. The Role of Postpartum Weight Retention in Obesity Among Women: A Review of the Evidence. *Annals of Behavioural Medicine*, 26 (2), 149–159.
- Granath, A., Hellgren, M. and Gunnarsson, R., 2006. Water aerobics reduces sick leave due to low back pain during pregnancy. *Journal of Obstetric, Gynaecologic and Neonatal Nursing (JOGNN)*, 35 (4), 465-471.
- Green, E., 1998. 'Women Doing Friendship': an analysis of women's leisure as a site of identity construction, empowerment and resistance. *Leisure Studies*, 17 (3), 171-185.
- Greene, M., 2014. On the inside looking in: methodological insights and challenges in conducting qualitative insider researcher. *The Qualitative Report*, 19. 1-13.
- Grey, J., 1997. *Evidence-based healthcare: how to make health policy and management decisions*. London: Churchill Livingstone.
- Gross, H., 2010. Taking up space – pregnancy in public. *The Psychologist*, 23 (3), 202-205.
- Gross, H. and Pattison, H., 2007. *Sanctioning Pregnancy. A psychological perspective on paradoxes and culture on research*. London: Routledge.
- Haines, H., Rubertsson, C., Pallant, J. and Hildingsson, I., 2012. The influence of women's fear, attitudes and beliefs of childbirth on mode and experience of birth. *BMC Pregnancy and Childbirth* [online], 12:55. Available from: <http://www.biomedcentral.com/1471-2393/12/55> [Accessed 19 May 2017],
- Harrison, A., Taylor, N., Shields, N. and Fawley, H., 2018. Attitudes, barriers and enablers to physical activity in pregnant women: a systematic review. *Journal of Physiotherapy*, 64, 24-32.
- Hart, C., 1999. *Doing a Literature review: releasing the social science research imagination*. London: Sage Publications.
- Hassall, J., 2016. *Women's decisions to exercise in pregnancy: negotiating conflicting identities*. Unpublished PhD Thesis: Brighton.
- Hatch, V., 2008. Pre-natal aquatics. *FitPro*, October/November. 28-29.

Hegewald, M. and Crapo, R., 2011. Respiratory physiology in pregnancy. *Clinical Chest Medicine*, 32, 1-13.

Heidemann, B., and McClure, J., 2003. Changes in maternal physiology during pregnancy. *British Journal of Anaesthesia*, 3 (3), 65-68.

Henderson, K. and Gibson, H., 2013. An integrative review of women, gender, and leisure: increasing complexities. *Journal of Leisure Research*, 45 (2), 115-135.

Hennekam, S., 2016. Identity transition during pregnancy: The importance of role models. *Human Relations*, 69 (9), 1765–1790.

Herrmann, L., 2015. Women, men and exercise: A quantitative examination of gender and exercise. *The International Journal of Health, Wellness and Society*, 5 (1), 13-24.

Her Majesty's (HM) Government, 2000. *Local Government Act 2000* [online]. London: The Stationary Office. Available from: [http://www.legislation.gov.uk/ukpga/2000/22/pdfs/ukpga\\_20000022\\_en.pdf](http://www.legislation.gov.uk/ukpga/2000/22/pdfs/ukpga_20000022_en.pdf) [Accessed 12 April 2018].

Her Majesty's (HM) Government, 2010a. *Midwifery 2020 Programme: Core Role of the Midwife Workstream* [online]. *Final Report 31 March 2010*. Available from: [http://www.nes.scot.nhs.uk/media/1891153/core\\_role.pdf](http://www.nes.scot.nhs.uk/media/1891153/core_role.pdf) [Accessed 10 April 2018]. NES = NHS Education Scotland.

Her Majesty's (HM) Government, 2010b. *Healthy Lives, Healthy People: Our strategy for public health in England* [online]. London: The Stationary Office. Available from: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/216096/dh\\_127424.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/216096/dh_127424.pdf) [Accessed 13 August 2013].

Heselhurst, N., Moore, H., Rankin, J., Ells, L., Wilkinson, J. and Summerbell, C., 2011. How can maternity services be developed to effectively address maternal obesity? A qualitative study. *Midwifery*, 27 (5), 170-177.

Hewitt-Taylor, J., 2002. Insider knowledge: issues in insider research. *Nursing Standard*, 16 (46) 33-35.

Hills, A., Mokhtar, N. and Byrne, N., 2014. Assessment of physical activity and energy expenditure: an overview of objective measures. *Frontiers of Nutrition*, 1-16.

Hochschild, A., 2003. *The Managed Heart. Commercialization of human feeling*. 20<sup>th</sup> anniversary ed. Berkeley: University of California Press.

Hochschild, A., 2012. *The Managed Heart. Commercialization of human feeling. (Updated with a new preface)*. 3<sup>rd</sup> ed. Berkeley: University of California Press.

- Hodkinson, P. and Hodkinson, H., 2001. The strengths and limitations of case study research. *Presentation for Making an Impact on Policy and Practice* [online], 5-7 December at Cambridge. Available from: [LE PH PUB 05.12.01](#) [Accessed 15 August 2017].
- Hofmeyr, G., Neilson, J., Alfrivic, Z., Crowther, C., Duley, L., Gulmezoglu, M., Gyte, G. and Hodnett, E., 2008. *A Cochrane Pocketbook: Pregnancy and Childbirth*. Chichester: John Wiley and Sons Ltd.
- Holloway, I., 1997. *Basic Concepts for Qualitative Research*. London: Blackwell Science.
- Holloway, I., Brown, L. and Shipway, R., 2010. Meaning not measurement: Using ethnography to bring a deeper understanding to the participant experience of festivals and events. *International Journal of Event and Festival Management*, 1 (1), 74-85.
- Holloway, I. and Galvin, K., 2016. *Qualitative Research in Nursing and Healthcare*. 4th ed. Oxford: Wiley Blackwell.
- Holloway, I. and Wheeler, S., 2010. *Qualitative research in nursing and healthcare*. 3<sup>rd</sup> ed. Chichester: Wiley-Blackwell.
- Hone, L., Jarden, A., Schofield, G. and Duncan, S., 2014. Measuring flourishing: The impact of operational definitions on the prevalence of high levels of wellbeing. *International Journal of Wellbeing*, 4 (1), 62-90.
- ten Hoope-Bender, P., de Bernis, L., Campbell, J., Downe, S., Fauveau, V., Fogstad, H., Homer, C., Powell Kennedy, H., Matthews, Z., McFadden, A., Renfrew, M. and Van Lerberghe, W., 2014. Improvement of maternal and newborn health through midwifery (Midwifery Series). *Lancet*, 384, 1226–1235.
- Hossain, N., Byrne, B., Campbell, A., Harrison, E., McKinley B. and Shah, P., 2011. *The impact of the global economic downturn on communities and poverty in the UK*. York: Joseph Rowntree Foundation.
- House, E., 1980. *Evaluating with Validity*. Beverley Hills: Sage.
- Hunter, B., 2001. Emotion work in midwifery: a review of current knowledge. *Journal of Advanced Nursing*, 34 (4), 436-444.
- Hunter, B., 2004. Conflicting ideologies as a source of emotion work in midwifery. *Midwifery*, 20, 261–272.
- Hunter, B., 2006. The importance of reciprocity in relationships between community-based midwives and mothers', *Midwifery*, 22, 308–322.

Hunter, B., 2010. Mapping the emotional terrain of midwifery: What can we see and what lies ahead? *International Journal of Work Organisation and Emotion*, 3 (3), 253–269.

Hunter, B. and Smith, P., 2007. Emotional labour: Just another buzz word? *International Journal of Nursing Studies*, 44, 859-861.

Hunter, B., Sanders, J. and Warren, L., 2015. *Exploring the Public Health Role of Midwives and Maternity Support Workers: Final Report* [online]. Cardiff University. Available from:  
[https://www.rcm.org.uk/sites/default/files/RCM\\_report\\_%20final.pdf](https://www.rcm.org.uk/sites/default/files/RCM_report_%20final.pdf) [Accessed 17 August 2017].

Husserl, E., 1967. *Ideas: general introduction to pure phenomenology*. London: George Allen and Unwin.

Hutchings, M., 2017. Improving doctoral support through group supervision: analysing face-to-face and technology-mediated strategies for nurturing and sustaining scholarship. *Studies in Higher Education*, 42 (3), 533-550.

Hyde, A., Maher, J. and Elavsky, S., 2013. Enhancing the understanding of physical activity and wellbeing within a lifespan perspective. *International Journal of Wellbeing*, 3 (1), 98-115.

Hyett, N., Kenny, A. and Dickson-Swift, V., 2014. Methodology or method? A critical review of qualitative case study reports. *International Journal of Qualitative Studies on Health and Well-being* [online], 9 (1), Available from:  
<http://dx.doi.org/10.3402/qhw.v9.23606> [Accessed 15 August 2017].

Hytten, F., 1968. Physiological changes in early pregnancy. *Journal of Obstetrics and Gynaecology - British Commonwealth*, 75, 1193-1197.

Hytten, F., 1990. Nutritional requirements in pregnancy. *Midwifery*, 6 (3), 140-145.

Ingledeu, D. and Markland, D., 2008. The role of motives in exercise participation. *Psychology and Health*, 23 (7), 807-828.

Inglehart, R., 2002. Gender, aging and subjective well-being. *International Journal of Comparative Sociology*, 43 (3), 391-408.

Inskip, H., Crozier, S., Godfrey, K., Borland, S., Cooper, C. and Robinson, S., 2009. Women's compliance with nutrition and lifestyle recommendations before pregnancy: general population cohort study. *British Medical Journal* [online], 338:b481. Available from:  
<https://www.bmj.com/content/bmj/338/bmj.b481.full.pdf> [Accessed 1 April 2018].

International Physical Activity Questionnaires (IPAQ), no date. *The IPAQ: the English self-administration long version* [online]. Available from: [https://sites.google.com/site/theipaq/questionnaire\\_links](https://sites.google.com/site/theipaq/questionnaire_links) and from [http://www.sdp.univ.fvg.it/sites/default/files/IPAQ\\_English\\_self-admin\\_long.pdf](http://www.sdp.univ.fvg.it/sites/default/files/IPAQ_English_self-admin_long.pdf) [Accessed 22 June 2018].

International Physical Activity Questionnaires (IPAQ) Group, no date. *Home page* [online]. Available from: <https://sites.google.com/site/theipaq/> [Accessed 22 June 2018].

Jacinto, G., 2013. Birth: a rite of passage. *International Journal of Childbirth Education*, 28 (1), 11-14.

Jakes, R. and Wareham, N., 2003. Epidemiology of activity and physical health. In: McKenna, J. and Riddoch, C., eds. 2003. *Perspectives on health and exercise*. Basingstoke: Palgrave Macmillan. 33-60.

James, K., 2000. 'You can feel them looking at you': the experience of adolescent girls at swimming pools. *Journal of Leisure Research*, 32, 262-280.

Jefford, E., Fahy, K. and Sundi, D., 2011. Decision-Making Theories and their usefulness to the midwifery profession both in terms of midwifery practice and the education of midwives. *International Journal of Nursing Practice*, 17, 246–253.

Johansson, T., 1996. Gendered Spaces: The Gym Culture and the Construction of Gender. *Young*, 4 (3), 32-47.

Johns, J., 1998. A concept analysis of trust. *Journal of Advanced Nursing*, 24, 76-83.

Jolly, K., Ingram, L., Khan, K., Deeks, J., Freemantle, N. and MacArthur, C., 2012. Systematic review of peer support for breastfeeding continuation: metaregression analysis of the effect of setting, intensity and timing. *British Medical Journal* [online], 344, Available from: <http://www.bmj.com/content/344/bmj.d8287> [Accessed 21 January 2014].

Jones, C., Jensen, J., Scherr, C., Brown, N., Christy, K. and Weaver, J., 2015. The Health Belief Model as an explanatory framework in communication research: exploring parallel, serial, and moderated mediation. *Health Communication*, 30 (6), 566-76.

Kamioka, H., Tsutani, K., Okuizumi, H., Mutoh, Y., Ohta, M., Handa, S., Okada, S., Kitayuguchi, J., Kamada, M., Shiozawa, N. and Honda, T., 2010. Effectiveness of aquatic exercise and balneotherapy: a summary of systematic reviews based on randomised controlled trials of water immersion therapies. *Journal of Epidemiology*. 20 (1), 2-12.



- Kamioka, H., Tsutani, K., Mutoh, Y., Okuizum, H., Ohta, M., Handa, S., Okada, S., Kitayuguchi, J., Kamada, M., Shiozawa, N., Park, S-J., Honda, T. and Moriyama, S., 2011. A systematic review of nonrandomised controlled trials on the curative effects of aquatic exercise. *International Journal of General Medicine*, 4, 239-260.
- Kanter, R., 1977. *Men and Women of the Corporation*. New York: Basic Books, [Revised edition 1993].
- Karger, T., 1987. Focus groups are for focusing, and for little else. In: Hayes T. and Tatham C., eds. *Focus group interviews: A reader*. 2nd ed. Chicago: American Marketing Association.
- Karnieli-Miller, O., Strier, R. and Pessach, L., 2009. Power relationships in qualitative research. *Qualitative Health Research*, 19 (2), 279-289.
- Katz, V., 1996. Water exercise in pregnancy. *Seminars in Perinatology*. 20 (4). 285-291.
- Keating, X., Jianmin G., Pinero, J. and Bridges, D., 2005. "A meta-analysis of college students' physical activity behaviours". *Journal of American College Health*, 54, 116-125.
- Kickbusch, I. and Nutbeam, D., 1998. *Health Promotion Glossary* [online]. World Health Organization, Geneva. Available from: <http://www.who.int/healthpromotion/about/HPR%20Glossary%201998.pdf> [Accessed 20 May 2017].
- Kirkham, M., 2010. The maternity services context. In: Kirkham, M., ed. *The midwife-mother relationship*. Basingstoke: Palgrave Macmillan. 1-16.
- Kitzinger, S., 2008. *The New Pregnancy and Childbirth: Choices and Challenges*. 4<sup>th</sup> ed. London: Dorling Kindersley.
- Knowles, J., 2016. Professional doctorate researching and the changing 'self': a personal and professional journey. In: Burnard, P., Dragovic, T., Flutter J. and Alderton, J., eds. *Transformational Doctoral Research Practices for Professionals*. Rotterdam: Sense. 91-100.
- Krippendorff, K., 2004. *Content analysis: An introduction to its methodology*. 2<sup>nd</sup> ed. Beverly Hills, Ca: Sage.
- Lambert, C., Jomeen, J. and McSherry, W., 2010. Reflexivity: a review of the literature in the context of midwifery research. *British Journal of Midwifery*, 18 (5), 321-326.

Laney, E., Lewis Hall, M., Anderson, T. and Willingham, M., 2015. Becoming a mother: the influence of motherhood on women's identity development. *Identity*, 15 (2), 126-145.

Lawton, J., Kirkham, J., White, D., Rankin, D., Cooper, C. and Heller, S., 2015. Uncovering the emotional aspects of working on a clinical trial: a qualitative study of the experiences and views of staff involved in a type 1 diabetes trial. *BioMed Central: Trials* [online], Available from: <http://www.trialsjournal.com/content/16/1/3> [Accessed 3 September 2017].

Lazarsfeld, P. and Merton. R., 1954. Friendship as a Social Process: A Substantive and Methodological Analysis. In: Berger, M., Abel, T. and Page, C., eds. *Freedom and Control in Modern Society*. New York: Van Nostrand, 18-66.

Leap, N., 2009. Woman-centred or women-centred care: does it matter? *British Journal of Midwifery*, 17 (1), 12-16.

Ledward, A., 2011. Informed consent: ethical issues for midwife research. *Evidence Based Midwifery*, 9 (1), 23-29.

Lee, N., 2009. *Achieving your professional doctorate*. Maidenhead: Open University Press.

Lehman, B., David, D. and Gruber, J., 2017. Rethinking the biopsychosocial model of health: understanding health as a dynamic system. *Social and Personality Psychology Compass* [online], 11. e12328. Available from: <https://doi.org/10.1111/spc3.12328> [Accessed 1 April 2018].

Leisey, M., 2008. Qualitative enquiry and the IRB: protection at all costs. *Qualitative Social Work*, 7, 415-426.

Le May, A., 2009. *Communities of Practice in Health and Social Care*. Chichester: Wiley-Blackwell.

Lester, S., (2004) Conceptualizing the practitioner doctorate. *Studies in Higher Education*, 29 (6), 757-770.

Letherby, G., 2003. *Feminist Research in theory and practice*. Buckingham: Open University Press.

Lewins, A. and Silver, C., 2007. *Using software for Qualitative Data Analysis: A step by step guide*. London: Sage Publications.

Lewis, J., 2011. From Sure Start to children's centres: an analysis of policy change in English early years programmes. *Journal of Social Policy*, 40 (1), 71-88.

- Li, J., Kendall, G., Henderson, S., Downie, J., Landsborough, L. and Oddy, W., 2008. Maternal psychosocial well-being in pregnancy and breastfeeding duration. *Acta Paediatrica* [online], Available from: <http://hdl.handle.net/10072/26908> [Accessed 5 February 2018].
- Lillis, T. and North, S., 2006. Academic writing. In: Potter, S., ed. *Doing postgraduate research*. 2<sup>nd</sup> ed. London: Sage Publications.
- Lincoln, Y. and Guba, E., 1985. *Naturalistic Inquiry*, Beverly Hills, Ca: Sage.
- Lindsay, V., 2014. How was witchcraft ever a crime? *Journal of International Criminal Justice Research*. 1, 1-11.
- Liquori, A., Widener, G. and Clark, L., 2003. Effects of a 6-week prenatal water exercise program on physiological parameters and well-being in women with pregnancies in the 2<sup>nd</sup>-3<sup>rd</sup> trimesters: a pilot study. *Journal of the Section on Women's Health*, 27 (3), 11-19.
- Lloyd, K., O'Brien, W. and Riot, C., 2016. Mothers with young children: Caring for the self through the physical activity space. *Leisure Sciences* [online], 38 (2), 85-99. Available from: <https://doi.org/10.1080/01490400.2015.1076362> [Accessed 20 April 2018].
- Löbner, K., Knopff, A., Baumgareten, A., Mollenhauer, U., Marienfeld, S., Garrido-France, M., Bonifacio, E. and Zeigler, A., 2006. Predictors of Postpartum Diabetes in Women with Gestational Diabetes Mellitus. *Diabetes*, 55, 792-797.
- Lox, C. and Treasure, D., 2000. Changes in feeling states following aquatic exercise during pregnancy. *Journal of Applied Social Psychology* [online], 30 (3), 518-527. Available from: <https://doi.org/10.1111/j.1559-1816.2000.tb02494.x> [Accessed on 15 August 2017].
- Luce, A., Cash, M., Hundley, V., Cheyne, H., van Teijlingen, E. and Angell, C., 2016. "Is it realistic?" the portrayal of pregnancy and childbirth in the media. *BMC Pregnancy and Childbirth* [online], Available from: <https://doi.org/10.1186/s12884-016-0827> [Accessed 28 January 2018].
- Luck, L., Jackson, D. and Usher, K., 2006. Case study: a bridge across the paradigms. *Nursing Inquiry*, 2006. 13 (2), 103-109.
- Madriz, E., 2000. Focus groups in feminist research. In: Denzin N. and Lincoln, Y., eds. *Handbook of Qualitative Research*. 2<sup>nd</sup> ed. Thousand Oaks, Ca: Sage. 835-950.
- Malinowski, B., 1922. *Argonauts of the Western Pacific: An Account of Native Enterprise and Adventure in the Archipelagoes of Melanesian New Guinea*. London: Routledge and Sons Ltd.

Manley, K. and McCormack, B., 2004. Practice development: purpose, methodology, facilitation and evaluation. *In: McCormack, B., Manley, K. and Garbett, R., eds. Practice development in nursing.* Oxford: Blackwell. 33-50.

Manley, K., McCormack, B. and Wilson, V., 2008. Introduction. *In: Manley, K., McCormack, B. and Wilson, V., eds. Practice Development in Nursing: International Perspectives.* London: Blackwell.

Mann, S., 2005. A health-care model of emotional labour: an evaluation of the literature and development of a model. *Journal of Health Organization and Management*, 19 (4/5), 304-317.

Manning, V., 2006. Information giving in health promotion. *In: Bowden J. and Manning, V., eds. Health promotion in midwifery – principles and practice.* 2<sup>nd</sup> ed. London: Hodder Arnold. 76-88.

Marieb, E. and Hoehn, K., 2015. Pregnancy and Human Development. *In: Marieb, E. and Hoehn, K., eds. Human Anatomy and Physiology. 10<sup>th</sup> Global ed.* Harlow: Pearson. 1194-1125.

Marmot, M., (Chair), 2010. *The Marmot Review: Fair society, healthy lives: strategic review of health inequalities in England post-2010* [online]. London: Department of International Development. Available from: [www.ucl.ac.uk/marmotreview](http://www.ucl.ac.uk/marmotreview) [Accessed 8 May 2015].

Martini, F., Nath, J. and Bartholomew, E., 2011. *Fundamentals of Anatomy and Physiology.* 9<sup>th</sup> ed. New York: Pearson.

Mason, J., 2002. *Qualitative researching.* 2<sup>nd</sup> ed. London: Sage.

Maton, K., 2010. Habitus. *In: Grenfell, M., ed. Pierre Bourdieu: Key Concepts.* Durham: Acumen. 49-65.

Matthews, L., 2017. The gastrointestinal tract. *In: Rankin, J., ed. Physiology in childbearing with anatomy and related biosciences.* Edinburgh: Elsevier. 217-229.

Matthews, L. and Rankin, J., 2017. Muscle – the pelvic floor and the uterus. *In: Rankin, J., ed. Physiology in childbearing with anatomy and related biosciences.* Edinburgh: Elsevier. 263-273.

Mayer, J., Caruso, D. and Salovey, P., 2000. Emotional Intelligence meets traditional standards for intelligence. *Intelligence* [online], 27 (4), 267-298. Available from: [http://www.gruberpeplab.com/teaching/psych3131\\_spring2015/documents/13.2\\_Mayer\\_2000\\_EmotionIntelligenceMeetsStandardsForTraditionalIntelligence.pdf](http://www.gruberpeplab.com/teaching/psych3131_spring2015/documents/13.2_Mayer_2000_EmotionIntelligenceMeetsStandardsForTraditionalIntelligence.pdf) [Accessed 7 July 2017].

- Maykut, P. and Morehouse, R., 1994. *Beginning Qualitative Research: A Philosophic and Practical Guide*. London: Falmer Press.
- Mazzeschi, C., Pazzagli, C., Radi, G., Raspa, V. and Buratta, L., 2015. Antecedents of maternal parenting stress: the role of attachment style, prenatal attachment, and dyadic adjustment in first-time mothers. *Frontiers in Psychology*, 6, (1443), 9 p. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4585159/pdf/fpsyg-06-01443.pdf> [Accessed 24 July 2018].
- McCambridge, J., Kypri, K. and Elbourne, D., 2014. Research participation effects: a skeleton in the methodological cupboard. *Journal of Clinical Epidemiology*, 67, e845-e849.
- McCormack, B., Manley, K. and Titchen, A., 2013. Introduction. In: McCormack, B., Manley, K. and Titchen, A., eds. 2013. *Practice development in Nursing and Healthcare*. 2<sup>nd</sup> ed. Chichester: Wiley-Blackwell. 1-17.
- McCourt, C., 2003. Social support and childbirth. In: Squire, C., ed. *The Social Context of Birth*. Oxford: Routledge. 187-210.
- McFadyen, J. and Rankin, J., 2016. The Role of Gatekeepers in Research: Learning from Reflexivity and Reflection. *Global Science and Technology Forum (GSTF) Journal of Nursing and Health Care*, 4 (1), 82-88.
- McHaffie, H., 2000. Ethics and good practice. In: Proctor, S. and Renfrew, M. eds. *Linking Research and Practice in Midwifery. A guide to evidence-based practice*. Edinburgh: Baillière Tindall. 71-88.
- McLeish, J. and Redshaw, M., 2017. Mothers' accounts of the impact on emotional wellbeing of organised peer support in pregnancy and early parenthood: a qualitative study. *BMC Pregnancy and Childbirth* [online], 17, 28. Available from: <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-017-1220-0> [Accessed 17 August 2017].
- McNeill, J. and Nolan, A., 2011. Midwifery research by midwifery researchers: challenges and considerations. *Evidence Based Midwifery*, 9 (2), 61-65.
- McNeill, V., Foley, M., Quirk, A. and McCambridge, J., 2016. Shedding light on research participation effects in behavioural change trials: a qualitative study examining research participant experiences. *BMC Public Health* [online], Available from: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-2741-6> [Accessed on 1 August 2017].
- McPherson, M., Smith-Lovin, L. and Cook, J., 2001. Birds of a Feather: Homophily in Social Networks. *Annual Review of Sociology*, 27, 415-44.

Mead, G., 1934. *Mind, Self and Society from the standpoint of a social behaviourist*. University of Chicago Press.

Mead, S., Hilton, D. and Curtis, L., 2001. Peer support: A theoretical perspective. *Psychiatric Rehabilitation Journal*, 25 (2), 134-141.

Medical Research Council (MRC), no date. *Diet and Physical Activity (DAPA) Measurement Toolkit* [online]. Available from: <http://dapa-toolkit.mrc.ac.uk/physical-activity-assessment/methods/questionnaire/examples-and-links.php> [Accessed 19 April 2017].

Meeberg, G., 1993. Quality of Life: a concept analysis. *Journal of Advanced Nursing*, 18, 32-38.

Melzer, K., Schultz, Y., Boulvain, M. and Kayser, B., 2010. Physical activity and pregnancy. Cardiovascular adaptations, recommendations and pregnancy outcomes. *Sports Medicine*, 40 (6), 493-507.

Merriam Webster, 2018. *Dictionary* [online]. Available from: <https://www.merriam-webster.com/dictionary/society> [Accessed 31 May 2018].

Merriam, S., 2009. *Qualitative Research: a guide to design and innovation*. 3<sup>rd</sup> ed. San Francisco: Josey Bass.

Merriam, S. and Tisdell, E., 2016. *Qualitative Research: a guide to design and innovation*. 4<sup>th</sup> ed. San Francisco: Josey Bass.

Merriman, S., 1998. *Qualitative research and case study application in education*. San Francisco: Josey Bass.

Mesec, B., 1998. Uvod v kvalitativno raziskovanje v socialnem delu. Ljubljana: Visoka šola za socialno delo. English translation: *Introduction to qualitative research in social work*. Ljubljana: University College of Social Work.

Michaelson, J., Mahoney, S. and Schifferes, J., [New Economic Foundation (nef)] 2012. *Measuring Well-being. A guide for practitioners* [online]. Available from: [http://www.socialauditnetwork.org.uk/files/3013/4996/6900/Measuring\\_well-being\\_handbook\\_FINAL\\_-\\_010812.pdf](http://www.socialauditnetwork.org.uk/files/3013/4996/6900/Measuring_well-being_handbook_FINAL_-_010812.pdf) [Accessed 28 July 2013].

Miles, M., and Huberman, M., 1994. *Qualitative Data Analysis: an expanded sourcebook*. 2<sup>nd</sup> ed. Thousand Oaks: Sage.

Montaño, D. and Kasprzyk, D., 2008, Theory of reasoned action, theory of planned behaviour and the integrated behavioural model. In: Glanz, K., Rimer, B. and Viswanath, K., eds. *Health behaviour and health education. Theory, research and practice*. 4<sup>th</sup> ed. San Francisco: Josey Bass. 67-96.

- Moore, R., 2010. Capital. In: Grenfell, M., ed. *Pierre Bourdieu: Key Concepts*. Durham: Acumen. 101-118.
- Mooventhan, A. and Nivethitha, L., 2014. Scientific Evidence-Based Effects of Hydrotherapy on Various Systems of the Body. *North American Journal of Medical Science*. 6 (5). 199-209.
- Morse, J., 2003. Editorial: Biasphobia. *Qualitative Health Research*, 13 (7), 891-892.
- Mottola, M., 2016. Components of Exercise prescription and pregnancy. *Clinical Obstetrics and Gynaecology*, 59 (3), 552-558.
- Muallem, M. and Rubeiz, N., 2006. Physiological and biological skin changes in pregnancy. *Clinics in Dermatology*, 24, 80-83.
- Mutrie, N. and Wood, C., 2003. How can we get people more active? A problem waiting to be solved. In: McKenna, J. and Riddoch, C., eds. *Perspectives on health and exercise*. Basingstoke: Palgrave Macmillan. 131-152.
- Naidoo, J. and Wills, J., 2016. *Foundations of Health Promotion*. 4<sup>th</sup> ed. London: Elsevier.
- Nash, M., 2012a. Exercise. In: Nash, M., *Making 'postmodern' mothers: pregnant embodiment, baby bumps and body image*. London: Palgrave Macmillan. 168-202.
- Nash, M., 2012b. Dressing and maternity fashion. *Making 'postmodern' mothers: pregnant embodiment, baby bumps and body image*. London: Palgrave Macmillan. 84-130.
- National Audit Office (NAO), 2016. *Local Government: Overview 2015-2016* [online]. Available from: <https://www.nao.org.uk/wp-content/uploads/2016/11/Overview-Local-government.pdf> [Accessed 31 May 2018].
- National Health Service (NHS), 2000. *The NHS plan: a plan for investment, a plan for reform* [online]. London: The Stationary Office, Available from: <http://webarchive.nationalarchives.gov.uk/20130124064356/> or [http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/@ps/documents/digitalasset/dh\\_118522.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_118522.pdf) [Accessed 12 April 2018].
- National Health Service England (NHSE), 2015. *National Maternity Review: Better Births. Improving outcomes of maternity services in England: a five year forward view for maternity care* [online]. London: NHSE. Available from: <https://www.england.nhs.uk/wp-content/uploads/2016/02/national-maternity-review-report.pdf> [Accessed 4 July 2017].

National Institute of Health and Care Excellence (NICE), 2006. *CG37 Postnatal Care* [online]. Available from: <https://www.nice.org.uk/guidance/cg37> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2007. *PH6 Behaviour change: guidance* [online]. London: NICE. Available from: <https://www.nice.org.uk/Guidance/ph6> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2008a. *CG62 Antenatal care: routine care for healthy pregnant women* [online]. London: NICE. Available from: <https://www.nice.org.uk/guidance/cg62> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2008b. *PH11 Maternal and child nutrition: guidance* [online]. London: NICE. Available from: <https://www.nice.org.uk/guidance/ph11> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2008c. *PH13 Promoting physical activity in the workplace: full guidance* [online]. London: NICE. Available from: <https://www.nice.org.uk/guidance/ph13> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2010a. *PH25 Prevention of cardiovascular disease: guidance* [online]. London: NICE. Available from: <https://www.nice.org.uk/guidance/ph25> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2010b. *PH27 Weight management before, during and after pregnancy: guidance* [online]. London: NICE. Available from: <https://www.nice.org.uk/guidance/ph27> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2010c. *CG107 Hypertension in pregnancy* [online]. London: NICE. Available from: <https://www.nice.org.uk/guidance/cg107> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2010d. *CG110. Pregnancy and complex social factors: a model for service provision for pregnant women with complex social factors* [online]. Available from: <https://www.nice.org.uk/guidance/cg110> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2011. *PH35 Preventing type 2 diabetes - population and community interventions: guidance* [online]. London: NICE. Available from: <https://www.nice.org.uk/guidance/ph35> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2012a. *PH41 Walking and cycling: guidance* [online]. London: NICE. Available from: <https://www.nice.org.uk/guidance/ph41> [Accessed 20 May 2017].



National Institute of Health and Care Excellence (NICE), 2012b. *PH42 Obesity - working with local communities: guidance* [online]. London: NICE. Available from: <https://www.nice.org.uk/guidance/ph42> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2012c. *QS22 Quality standard for antenatal care* [online]. London: NICE. Available from: <https://www.nice.org.uk/guidance/qs22> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2012d. *Descriptions of services for pregnant women with complex social factors* [online] (Implementation tools). Available from: <https://www.nice.org.uk/guidance/cg110/resources/service-descriptions-pdf-136153837> [Accessed 31 May 2018].

National Institute of Health and Care Excellence (NICE), 2014a. *CG190. Intrapartum care for healthy women and babies* [online]. Available from: <https://www.nice.org.uk/guidance/cg190> [Accessed 20 May 2017].

National Institute of Health and Care Excellence (NICE), 2014b. *CG189. Obesity: identification, assessment and management* [online]. Available from: <https://www.nice.org.uk/guidance/cg189> [Accessed 21 January 2018].

National Perinatal Epidemiology Unit (NPEU), 2015. *Maternal health and wellbeing in the perinatal period* [online]. Available from: <https://www.npeu.ox.ac.uk/research/maternal-health-and-wellbeing-in-the-perinatal-period-212> [Accessed on 13 July 2017].

New Economics Foundation (NEF), 2014. *Wellbeing in four policy areas: Report by the All-Party Parliamentary Group on Wellbeing Economics and the New Economic Foundation* [online]. London: New Economics Foundation. Available from: [https://b3cdn.net/nefoundation/ccdf9782b6d8700f7c\\_lcm6i2ed7.pdf](https://b3cdn.net/nefoundation/ccdf9782b6d8700f7c_lcm6i2ed7.pdf) [Accessed 17 August 2017]

Niela-Vilén, H., Axelin, A., Salanterä, S. and Melender, H-L., 2014. Internet-based peer support for parents: a systematic integrative review. *International Journal of Nursing Studies*, 51 (11), 1524-1537.

Noble, H. and Smith, J., 2014. Qualitative data analysis: a practical example. *Evidence Based Nursing*, 17 (1), 2-3.

Northouse, P., 2007. *Leadership theory and practice*. 4<sup>th</sup> ed. London: Sage.

Nursing and Midwifery Council (NMC), 2012. *Midwives Rules and Standards*. London: NMC.

Nursing and Midwifery Council (NMC), 2015. *The Code for Nurses and Midwives* [online]. London: NMC. Available from: <https://www.nmc.org.uk/standards/code/> [Accessed 17 May 2017].

Oakley, A., 1974. *Sociology of Housework*. New York: Pantheon Books.

Oakley, A., 1997. Forward. In: Hey, V., 1997. *The company she keeps: an ethnography of girls' friendships*. Buckingham: Open University Press.

Oakley, A., Hickey, D., Rajan, L. and Rigby, A., 1996. Social support in pregnancy – does it have long term effects? *Journal of Reproduction and Infant Psychology*, 14, 7-22.

Office for National Statistics [ONS] (Socio-Economic Inequalities Branch of the Social Analysis and Reporting Division), 2001. *Social Capital, a review of the literature* [online]. Compiled by Rosalyn Harper. Available from: <http://www.ons.gov.uk/ons/guide-method/user-guidance/social-capital-guide/the-social-capital-project/index.html> [Accessed 14 August 2013].

Office for National Statistics (ONS), 2011. *Developing a Framework for Understanding and Measuring National Well-being* [online]. Compiled by Alison Spence, Matthew Powell and Abbie Self. Available from: <http://www.ons.gov.uk/ons/guide-method/user-guidance/well-being/publications/developing-a-framework-for-understanding-and-measuring-national-well-being.pdf> [Accessed 16 April 2017].

Oleson, V., 2011. Feminist qualitative research in the millenniums first decade: developments, challenges, prospects. In: Denzin N. and Lincoln, Y., eds. *The Sage Handbook of Qualitative Research*. 4<sup>th</sup> ed. Thousand Oaks, Ca: Sage. 129-146.

Onwuegbuzie, A., 2003. Expanding the framework of internal and external validity in quantitative research. *Research in the Schools*, 10 (1), 71-90.

Onwuegbuzie, A. and Johnson, R., 2006. The validity issue in mixed research. *Research in the Schools*, 13 (1), 48-63.

Onwuegbuzie, A. and Leech, N., 2007. Validity and qualitative research: An oxymoron? *Quality & Quantity: International Journal of Methodology*, 41, 233–249.

Organisation for Economic Co-operation and Development (OECD), 2015. *OECD Better Life Index* [online]. Available from: <http://www.oecdbetterlifeindex.org> [Accessed 5 March 2015].

Organisation for Economic Co-operation and Development (OECD), 2017. *OECD Better Life Index* [online]. Available from: [www.oecdbetterlifeindex.org/](http://www.oecdbetterlifeindex.org/) [Accessed 9 July 2017].

- Ormston, R., Spencer, L., Barnard, M. and Snape, D., 2014. The foundations of qualitative research. In: Ritchie, J., Lewis, J., McNaughton Nicholls, C. and Ormston, R., eds. *Qualitative Research Practice. A guide for social science students and researchers*. Los Angeles: Sage. 1-25.
- Orne, M., 1962. On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implications. *American Psychologist*, 17 (11), 776-783.
- Ortlipp, M., 2008. Keeping and Using Reflective Journals in the Qualitative Research Process. *The Qualitative Report* [online], 13 (4), 695-705. Available from: <http://nsuworks.nova.edu/tqr/vol13/iss4/8> [Accessed 15 July 2017].
- Page, L., 1997. Evidence-based practice in midwifery: a virtual revolution? *Journal of Clinical Effectiveness*, 2 (1), 10-13.
- Page, L., 2003. One-to-one Midwifery: restoring the “with woman” relationship in midwifery. *Journal of Midwifery and Women’s Health*, 48 (2), 119-125.
- Page, L., 2014. Margie Polden Memorial Lecture: the normalisation of childbirth in modern maternity care. *Journal of the Associated of Chartered Physiotherapists in Women’s Health*, 114, 5-9.
- Pahl, R. and Spencer, L., 2001. *Rethinking Friendship: personal communities and social cohesion* [online]. ESRC report. Available from: <http://www.esrc.ac.uk/my-esrc/grants/R000237836/outputs/Read/8b1b0360-c040-4cc0-b3ad-62d4f33a99c2>. [Accessed from <http://researchcatalogue.esrc.ac.uk/search/search-page.aspx?q=friendship&tab=grants> [Accessed Nov 1998; 15 August 2017].
- Parker, K. and Smith, S., 2003. Aquatic-aerobic exercise as a means of stress reduction during pregnancy. *The Journal of Perinatal Education* [online], 12 (1), 6-17. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1595134/> [Accessed 15 August 2017].
- Parlett, M. and Hamilton D., 1972. *Occasional paper 9 – Evaluation as illumination: A new approach to the study of innovatory programs*. Edinburgh: Centre for Research in the Educational Sciences, University of Edinburgh.
- Parratt, J. and Fahy, K., 2011, 'A feminist critique of foundational nursing research and theory on transition to motherhood'. *Midwifery*, 27 (4), 445-451.
- Patrick, H., 2017. Minor disorders of pregnancy. In: Rankin, J., ed. *Physiology in childbearing with anatomy and related biosciences*. Edinburgh: Elsevier. 317-322.
- Patton, M., 1999. Enhancing quality and credibility of qualitative analysis. *Health Services Review*, 34 (5), 1189-1208.

- Peräkylä, A. and Ruusuvioli, J., 2011. Analysing text and talk. *In: Denzin, N. and Lincoln, Y., eds. Collecting and Interpreting Qualitative Materials*. 4<sup>th</sup> ed. Los Angeles: Sage. 277-307.
- Plummer, K., 2001. *Documents of Life 2: An Invitation to a Critical Humanism*. Volume 2. London: Sage. 120-121.
- Polit, D. and Beck, C., 2004. *Nursing Research: principles and methods*. Philadelphia: Lippincott Williams and Wilkins.
- PPAQ Protocol and MET values. no date [online]. Available from: [http://dapa-toolkit.mrc.ac.uk/documents/en/PPA/PPAQ\\_instructions\\_1.pdf](http://dapa-toolkit.mrc.ac.uk/documents/en/PPA/PPAQ_instructions_1.pdf) [Accessed 19 April 2017]
- PPAQ Questionnaire. no date [online]. Available from: [http://dapa-toolkit.mrc.ac.uk/documents/en/Pre/Pregnancy\\_Physical\\_Activity.pdf](http://dapa-toolkit.mrc.ac.uk/documents/en/Pre/Pregnancy_Physical_Activity.pdf) [Accessed 19 April 2017]
- Potter, S., 2006. Undertaking a Literature Review. *In: Potter. S., ed. Doing Postgraduate Research*. 2<sup>nd</sup> ed. London: Sage. 152-179.
- Poudevigne, M. and O'Connor, P., 2006. A review of physical activity patterns in pregnant women and their relationship to psychological health. *Sports Medicine*, 36 (1), 19-38.
- Powell, J. and Hughes, C., 2012. Antenatal interventions that support obese pregnant women. *British Journal of Midwifery*, 20 (5), 325-331.
- Power, J., Evans, G. and Tsintzas, K., 2013. Pilot validation of the clinical use physical activity questionnaire for pregnancy (CPAQpreg). *British Journal of Sports Medicine*, 47 (17), A1133-A1134.
- Prenda, K. and Lachman, M., 2001. Planning for the future: a life management strategy for increasing control and life satisfaction in adulthood. *Psychology and Aging*, 16 (2), 206-216.
- Prevedel, T., Calderon, I., De Conti, M., Consonni, E. and Rudge, M., 2003. Maternal and perinatal implications of hydrotherapy in pregnancy. *Revista Brasileira de Ginecologia e Obstetricia* [online], 25 (1). Available from: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0100-72032003000100008](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0100-72032003000100008) [Accessed 15 August 2017] Translated from Portuguese by Microsoft Translator.
- Prochaska, J. and DiClemente, C., 1983. Stages and processes of self-change of smoking: towards and integrative model of change. *Journal of Consulting and Clinical Psychology*, 51 (3), 390-395.

Public Health England (PHE), 2013. *Nursing and Midwifery Contribution to Public Health: Improving health and wellbeing*. London: PHE.

Public Health England (PHE), 2015. *Local action on health inequalities: Reducing social isolation across the lifecourse*. Practice Resource. London: PHE/ University College London (UCL) Institute of Health Equity (IHE).

Public Health England (PHE), 2016. *Strategic plan for the next four years: better outcomes by 2020* [online]. Available from: <https://www.gov.uk/government/publications/public-health-england-strategic-plan> [Accessed 8 August 2017].

Public Health England (PHE) and NHS and Health Education England (HEE), 2016. *Making Every Contact Count (MECC): Consensus statement* [online]. London: PHE/NHS. Available from: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/515949/Making\\_Every\\_Contact\\_Count\\_Consensus\\_Statement.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/515949/Making_Every_Contact_Count_Consensus_Statement.pdf) [Accessed 8 August 2017].

Putman, R., 2000. *Bowling Alone: the Collapse and Revival of American Community*. New York: Simon and Schuster.

QRS International, 2016. *NVivo: The #1 Software for Qualitative Data Analysis* [online]. Available from: <http://www.qsrinternational.com/product> [Accessed 3 May 2016].

Qualitative Data Analysis (QDA) Training, 2013a. *Day 1 - Introduction to NVivo: Setting up your Qualitative Database*. Dublin: QDA Training.

Qualitative Data Analysis (QDA) Training, 2013b. *Day 2 - NVivo Underway: Analysing your Data*. Dublin: QDA Training.

Quality Assurance Agency (QAA), 2011. *Doctoral Degree Characteristics*. Gloucester: Quality Assurance Agency for Higher Education.

Quality Assurance Agency (QAA), 2015. *Characteristics Statement: Doctoral Degree*. Gloucester: Quality Assurance Agency for Higher Education.

Ragin, C., 2010a. Cases of 'what is a case?' In: Ragin C. and Becker, H., eds. *What is a case? Exploring the foundations of social inquiry*. 11<sup>th</sup> ed. Cambridge University Press. 1-17.

Ragin, C., 2010b. 'Casing' and the process of social inquiry. In: Ragin C. and Becker, H., eds. *What is a case? Exploring the foundations of social inquiry*. 11<sup>th</sup> ed. Cambridge University Press. 217-226.

Rankin, J., 2002. *Effects of Antenatal Exercise on Psychological Well-being, Pregnancy and Birth Outcome*. London: Whurr Ltd.

Rankin, J., 2017a. The haematological system – physiology of the blood. In: Rankin, J., ed. *Physiology in childbearing with anatomy and related biosciences*. Edinburgh: Elsevier. 155-166.

Rankin, J., 2017b. Renal tract. In: Rankin, J., ed. *Physiology in childbearing with anatomy and related biosciences*. Edinburgh: Elsevier. 195-206.

Raphael-Leff, J., 2005. *Psychological processes of childbearing*. 4<sup>th</sup> ed. London: Anna Freud Centre.

Raynor, M. and England, C., 2010. *Psychology for midwives: pregnancy, childbirth and puerperium*. Berkshire: McGraw Hill/Open University Press.

Reay, D., 2004. Gendering Bourdieu's concepts of capitals? Emotional capital, women and social class. *Sociological Review*, 52 (s2), 57-74.

Redshaw, M., 2012. *Presentation – Wellbeing in reproductive health* [online]. NPEU, Oxford. 17-18<sup>th</sup> September. Available from: <http://www.iccs.org.uk/wp-content/docs/VNN%20docs/MR%20-%20Wellbeing%20in%20Reproductive%20Health.pdf> [Accessed 20 May 2013].

Reed, R., Barnes, M. and Rowe, J., 2016. Women's Experience of Birth: Childbirth as a Rite of Passage. *International Journal of Childbirth*, 6 (1), 45-56.

Rees, C., 2003. *Introduction to Research for Midwives*. 2<sup>nd</sup> ed. Edinburgh: Elsevier Ltd.

Rees, C., 2011. *Introduction to Research for Midwives*. 3<sup>rd</sup> ed. London: Churchill Livingstone.

Reid, H., Smith, R., Calderwood, C. and Foster, C., 2017. Physical activity and pregnancy: time for guidance in the UK. *British Journal of Sports Medicine*, 51 (21), 1511.

Reiners, J., 2012. Understanding the differences between Husserl's (descriptive) and Heidegger's (interpretative) phenomenological research. *Journal of Nursing Care* [online], 1 (5) 119, Available from: <http://dx.doi.org/10.4172/2167-1168.1000119> [Accessed 30 April 2-18].

Richards, L., 2005. *Handling Qualitative Data – A Practical Guide*. London: Sage.

Riddoch, C. and McKenna, J., 2003. Perspectives on health and exercise: an introduction. In: McKenna, J. and Riddoch, C., eds. *Perspectives on health and exercise*. Basingstoke: Palgrave Macmillan. 1-7.

Riley, R. and Weiss, M., 2015. A qualitative thematic review: emotional labour in healthcare settings. *Journal of Advanced Nursing*, 72 (1), 6-17.

Ritchie, C., 2012. Rating of perceived exertion (RPE). Commentary. *Journal of Physiotherapy*, 58, 62.

Robinson, O., 2014. Sampling in Interview-Based Qualitative Research: A Theoretical and Practical Guide. *Qualitative Research in Psychology*, 11 (1), 25-41.

Robson, S., Hunter, S., Boys, R. and Dunlop, W., 1989. Serial study of factors influencing changes in cardiac output during human pregnancy. *American Journal of Physiology*, 256 (4), 1060-1065.

Rogers, C., 1969. *Freedom to Learn: A View of What Education Might Become*. Columbus, Oh: Charles Merrill.

Rosenstock, I., 1974. Historical Origins of the Health Belief Model. *Health Education Monographs*, 2 (4), 328-335.

Royal College of Midwives (RCM), 2012. *Maternal Emotional Wellbeing and Infant Development: A Good Practice Guide for Midwives* [online]. London: RCM. Available from: [https://www.rcm.org.uk/sites/default/files/Emotional%20Wellbeing\\_Guide\\_WEB.pdf](https://www.rcm.org.uk/sites/default/files/Emotional%20Wellbeing_Guide_WEB.pdf) [Accessed 5 February 2018].

Royal College of Midwives (RCM), 2014. *High quality midwifery care* [online]. London: RCM. Available from: <https://www.rcm.org.uk/sites/default/files/High%20Quality%20Midwifery%20Care%20Final.pdf> [Accessed 3 September 2015].

Royal College of Obstetricians and Gynaecologists (RCOG), 2006. *Statement No 4: Exercise in pregnancy*. London: RCOG.

Royal College of Obstetricians and Gynaecologists (RCOG), 2013. *Patterns of maternity care in English NHS hospitals 2011/12*. London: RCOG.

Royal College of Obstetricians and Gynaecologists (RCOG), 2015. *What we do* [online]. Available from: [www.rcog.org.uk/en/about-us/what-we-do](http://www.rcog.org.uk/en/about-us/what-we-do) [Accessed 3 September 2015].

Rubery, J. and Rafferty, A., 2013. Women and recession revisited. *Work, employment and society*, 27 (3), 414-432.

Ryan, G. and Bernard, H., 2003. Techniques to Identify Themes. *Field Methods*, 15 (1), 85-109.

Ryan, K., Brown, S., Wilkins, C., Taylor, A., Arnold, R., Angell, C. and van Teijlingen, E., 2011. Which hat am I wearing today? Practising midwives doing research. *Evidence Based Midwifery* [online], Available from: <https://www.rcm.org.uk/learning-and-career/learning-and-research/ebm-articles/which-hat-am-i-wearing-today-practising> [Accessed 16 May 2016].

Ryan, M., 2011. Improving reflective writing in higher education: a social semiotic perspective. *Teaching in higher education*, 16 (1), 99-111.

Saldaña, J., 2016. *The coding manual for qualitative researchers*. 3<sup>rd</sup> ed. London: Sage.

Sallis, J., Cervero, R., Ascher, W., Henderson, K., Kraft, M. and Kerr, J., 2006. An ecological approach to creating active living communities. *Annual Review of Public Health*, 27, 297-322.

Sameroff, A., 2009. The transactional model. In: Sameroff, A., ed. *The transactional model of development: How children and contexts shape each other*. Washington: American Psychological Association. 3-21. Available from: <http://dx.doi.org/10.1037/11877-001> [Accessed 2 April 2018].

Sandall, J., 2014. *The contribution of continuity of midwifery care to high quality maternity care*. Report for the Royal College of Midwives. London: RCM.

Sandall, J., Soltani, H., Gates, S., Shennan, A. and Devane, D., 2016. *Midwife-led continuity models versus other models of care for childbearing*, Cochrane Database of Systematic Reviews 2016, Issue 4. Art. No.: CD004667.

Sandelowski, M., 2011. "Casing" the Research Case Study. *Research in Nursing and Health*, 34. 153–159.

Sanders, J., Hunter, B. and Warren, L., 2016. A wall of information? Exploring the public health component of maternity care in England. *Midwifery*, 34, 253-260.

Sanders, K., Odell, J. and Webster, J., 2013. Learning to be a Practice Developer. In: McCormack, B., Manley, K. and Titchen, A., eds. 2013. *Practice development in Nursing and Healthcare*. 2<sup>nd</sup> ed. Chichester: Wiley-Blackwell. 18-44.

Santos, P., Abreu, S., Moreira, C., Lopes, D., Santos, R., Alves, O., Silva, P., Montenegro, N. and Mota, J., 2014. Impact of compliance with different guidelines on physical activity during pregnancy and perceived barriers to leisure physical activity. *Journal of Sports Sciences* [online], 32 (14), 1398-1408. Available from: <http://dx.doi.org/10.1080/02640414.2014.893369> [Accessed 17 August 2017].

von Scheve, C., 2012. Emotion regulation and emotion work: Two sides of the same coin? *Frontiers in Psychology*, 3 (496), 1-10.



Schindler Rising, S., 1998. CenteringPregnancy®: an interdisciplinary model of empowerment. *Journal of Nurse-Midwifery*, 43 (1), 46-54.

Schindler Rising, S., Powell Kennedy, H. and Klima, C., 2004. Redesigning prenatal care through Centering Pregnancy®. *Journal of Midwifery and Women's Health*, 49, 398-404.

Schmidt, M., Freedson, P., Pekow, P., Roberts, D., Sternfeld, B. and Chasen-Taber, L., 2006. Validation of the Kaiser Physical Activity Survey in pregnant women. *Medicine and Science in Sports and Exercise*, 38 (1), 42-50.

Schön, D., 1983. *The Reflective Practitioner: How professionals think in action*. London: Temple Smith.

Schön, D. 1991. *The Reflective Practitioner*. Aldershot: Ashgate.

Scott, D., Brown, A., Lunt, I. and Thorne, L., 2004. *Professional doctorates: integrating professional and academic knowledge*. Maidenhead: Society for Research in Higher Education/ Open University Press.

Scott, S., 2010. How to look good (nearly) naked: the performative regulation of the swimmer's body. *Body and Society*, 16, 143-168.

Seefat-van Teeffelen, A., Nieuwenhuijze, M. and Korstjens, I., 2011. Women want proactive psychosocial support from midwives during transition to motherhood: a qualitative study. *Midwifery*, 27 (1), e122-127.

Self, A., 2014. *Measuring National Well-being: Insights across society, the economy, and the environment* [online]. 2014. London: Office for National Statistics. Available from: [http://webarchive.nationalarchives.gov.uk/20160106231158/http://www.ons.gov.uk/ons/dcp171766\\_371427.pdf](http://webarchive.nationalarchives.gov.uk/20160106231158/http://www.ons.gov.uk/ons/dcp171766_371427.pdf) [Accessed 17 August 2017].

Shynlova, O., Tsui, P., Jaffer, S. and Lye, S., 2009. Integration of endocrine and mechanical signals in the regulation of myometrial functions during pregnancy and labour. *European Journal of Obstetrics and Gynaecology and Reproductive Biology*, 144S, S2-S10.

Silverman, D., 2006. *Interpreting Qualitative Data*. 3<sup>rd</sup> ed. London: Sage.

Simons, H., 2009. *Case study research in practice*. London: Sage.

Sinkovics, R. and Alfoldi, E., 2012. Progressive focusing and trustworthiness in qualitative research: The enabling role of computer-assisted qualitative data analysis software (CAQDAS). *Management International Review*, 52 (6), 817-845.

- Skouteris, H., Carr, R., Wertheim, E., Paxton, S. and Duncombe, D., 2005. A prospective study of factors that lead to body dissatisfaction during pregnancy. *Body Image*, 2, 347–361.
- Small, R., Taft, A. and Brown, S., 2011. The power of social connection and support in improving health: lessons from social support interventions with childbearing women. *BMC Public Health* [online], 11 (Supplement: 5) S4. Available from: <http://www.biomedcentral.com/1471-2458/11/S5/S4> [Accessed 28 January 2018].
- Smedley, J., Jancey, J., Dhaliwal, S., Zhao, Y., Monteiro, S. and Howat, P., 2014. Women's reported health behaviours before and during pregnancy: A retrospective study. *Health Education Journal*, 73 (1), 28-40.
- Smith, S. and Michel, Y., 2006. A pilot study of the effects of aquatic exercise on the discomforts of pregnancy. *Journal of Obstetric, Gynaecologic and Neonatal Nursing* (JOGNN), 35 (3), 315-323.
- Smith, L., 2011. Applying the Bioecological Theory of Human Development to learning: Enhancing student engagement in online learning [online]. In: Skalicky, J., Adam, A., Abbott, D. and Kregor, G., eds. *Proceedings of the 10th Teaching Matters Annual Conference. Sharing practice*, Hobart: Centre for the Advancement of Learning and Teaching, University of Tasmania. Available from: <https://www.researchgate.net/publication/274640186> Applying the Bioecological Theory of Human Development to learning Enhancing student engagement in online learning [Accessed 24 July 2018].
- Smithson, J., 2008. Focus Groups. In: Alasuutari, P., Bickman L. and Brannen J., eds. *The Sage Handbook of Social Research Methods*. London: Sage. 357-370.
- Snape, D., Meads, C., Bagnall, A-M., Tregaskis, O. and Mansfield, L., 2017. *What Works Wellbeing: A guide to our evidence review methods* [online]. Revised edition. Available from: <https://whatworkswellbeing.org/product/a-guide-to-our-evidence-review-methods/> [Accessed 17 August 2017].
- Sohn, M. and Bye, E., 2015. Pregnancy and Body Image: Analysis of Clothing Functions of Maternity Wear. *Clothing and Textiles Research Journal*, 33 (1), 64-78.
- Soltani, H. and Fair, F., 2017. Nutrition and metabolism during pregnancy. In: Rankin, J., ed. *Physiology in childbearing with anatomy and related biosciences*. Edinburgh: Elsevier. 239-248.
- Spencer, L., Ritchie, J., Ormston, R., O'Connor, W. and Barnard, M., 2014a. Analysis: Principles and Processes. In: Ritchie, J., Lewis, J., McNaughton Nicholls, C. and Ormston R., eds. *Qualitative Research Practice. A guide for social science students and researchers*. 2<sup>nd</sup> ed. Los Angeles: Sage. 269-293.

Spencer, L., Ritchie, J., O'Connor, W., Morrell, G. and Ormston, R., 2014b. Analysis in Practice. In: Ritchie, J., Lewis, J., McNaughton Nicholls, C. and Ormston R., eds. *Qualitative Research Practice. A guide for social science students and researchers*. 2<sup>nd</sup> ed. Los Angeles: Sage.

Spielberger, C., Gorsuch, R., Lushene, R., Vagg, P. and Jacobs, G., 1983. *Manual for the State-Trait Anxiety Inventory*. Palo Alto, Ca: Consulting Psychologists Press.

Sport England, 2013. *Active People Survey 6* [online]. London: Sport England. Available from: <http://www.sportengland.org/research/about-our-research/> [Accessed 14 August 2013].

Sport England, 2016. *Sport England: towards an active nation strategy 2016–2021*. London: Sport England.

Squire, C., 2003. Women and Society. In: Squire C., ed. *The Social Context of Birth*. Oxford: Radcliffe Medical Press. 1-20.

Stake, R., 1981. Interview with Robert E. Stake. *Educational Evaluation and Policy Analysis*, 3 (3), 91-94.

Stake, R., 1995. *The art of case study research*. Thousand Oaks, Ca: Sage.

Stake, R., 2000. Case Studies. In: Denzin N. and Lincoln Y., eds. *Handbook of Qualitative Research*. 2<sup>nd</sup> ed. Thousand Oaks, Ca: Sage. 134-164.

Stake, R., 2005. Qualitative Case Studies. In: Denzin N. and Lincoln Y., eds. *The Sage Handbook of Qualitative Research*. 3<sup>rd</sup> ed. Thousand Oaks, Ca: Sage.

Stake, R., 2008. Qualitative Case Studies. In: Denzin N. and Lincoln Y., eds. *Strategies of Qualitative Inquiry*. 3<sup>rd</sup> ed. Thousand Oaks, Ca: Sage. 119-150.

Stansfield, R. and Lee, N., 2009. Developing a professional toolkit: leading research in professional practice. In: Lee N., ed. *Achieving your professional doctorate*. Maidenhead: Open University Press. 107-132.

Starman, A., 2013. The case study as a type of qualitative research. *Journal of Contemporary Educational Studies*, 1, 28-43.

Starr, F., 1910. Review: Les Rites de Passage. *The American Journal of Sociology*, 15 (5), 707-709.

Stemler, S., 2001. An overview of content analysis. *Practical assessment, research and evaluation* [online], 7 (17), 6p. Accessed from: <http://pareonline.net/getvn.asp?v=7&n=17> [Accessed 11 April 2016].

- Stewart, C. and Cash, W., 2011. *Interviewing: Principles and Practices*. 13<sup>th</sup> ed. New York: McGraw-Hill Education.
- Stewart, D., Shamdasani, P. and Rook, D., 2007, *Focus groups theory and practice*. 2<sup>nd</sup> ed. Thousand Oaks, Ca: Sage.
- Stewart, D. and Shamdasani, P., 2015. *Focus groups: theory and practice*. 3<sup>rd</sup> ed. Los Angeles: Sage.
- Stevenson, A. and Waite, M., 2011. *Concise Oxford English Dictionary*. 12<sup>th</sup> ed. Oxford University Press.
- Stoddart, K., 2006. *A grounded theory study of patient/nurse interaction in a community practice setting*. University of Stirling: Unpublished PhD: University of Stirling.
- Stoddart, K., 2012. Social meanings and understandings in patient nurse interaction in the community practice setting: a grounded theory study. *BMC Nursing* [online], 11 (14), p10. Available from: <http://www.biomedcentral.com/1472-6955/11/14> [Accessed on 7 March 2017].
- Stoddart, K. and Bugge, C., 2012. Uncovering the features of negotiation in developing the patient–nurse relationship. *British Journal of Community Nursing* [online], Vol 17, No 2 77-84. Available from: <https://doi.org/10.12968/bjcn.2012.17.2.77> [Accessed on 16 March 2017].
- Stoddart, K., Ciccu-Moore, R., Grant, F., Niven, B-A., Paterson, H. and Wallace, A., 2014a. Care and comfort rounds: improving standards. *Nursing Management* [online], 20 (9) 18-23. Available from: <https://journals.rcni.com/doi/abs/10.7748/nm2014.02.20.9.18.e1140> [Accessed on 7 March 2017].
- Stoddart, K., Bugge, C., Shepherd, A. and Farquharson, B., 2014b. The new clinical leadership role of senior charge nurses: a mixed methods study of their views and experience. *Journal of Nursing Management*, 22, 49-59.
- Stone, A., Schwartz, J., Broderick, G. and Deaton, A., 2010. A snapshot of the age distribution of psychological well-being in the United States. *Proceedings of the National Academy of Sciences*, 107 (22), 9985-9990.
- Stouffer, S., 1941. 'Notes on the case-study and the unique case.' *Sociometry*, 4, 349–357.
- Streubert, H. and Carpenter, D., 1999. *Qualitative research in nursing: advancing the humanistic imperative*. 2<sup>nd</sup> ed. Philadelphia: Lippincott.
- Sustein, B. and Chiseri-Strater, E., 2012. *Fieldworking: Reading and writing research*. 4<sup>th</sup> ed. Boston: Bedford/St. Martin's.

Swanborn, P., 2010. *Case Study Research – what, why and how?* Los Angeles: Sage.

Swim England, 2017. *Swim England response to the Health and Wellbeing benefits of Swimming Report* [online]. London: Swim England. Available from: <http://www.swimming.org/swimengland/new-report-shows-health-benefits-swimming/> [Accessed 5 December 2017].

Symon, A., 2003. A review of mothers' prenatal and postnatal quality of life. *Health and Quality of Life Outcomes*, 1, 38, 8p. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC212189/pdf/1477-7525-1-38.pdf> [Accessed 24 July 2018].

Symon, A. and Dobb, B., 2011. Maternal quality of life assessment: the feasibility of antenatal-postnatal follow-up using the Mother Generated Index. *Journal of Reproductive and Infant Psychology*, 29 (2), 183-194.

Symon, A., MacKay, A. and Ruta, D., 2003. Postnatal quality of life: a pilot study using the Mother-Generated Index. *Journal of Advanced Nursing*, 42 (1), 21-29.

Tan, E., K. and Tan, E. L., 2013. Alterations in physiology and anatomy during Pregnancy. *Best Practice and Research Clinical Obstetrics and Gynaecology*, 27 (6), 791-802.

Taniguchi, H. and Shupe, F., 2014. Gender and family status differences in leisure-time sports/fitness participation. *International Review for the Sociology of Sport*, 49 (1), 65–84.

Taylor, C. and Hicks, S., 2009. The practitioner-researcher: a critical and reflexive approach to professional practice. In: Lee, N., ed. *Achieving your professional doctorate. A handbook*. Berkshire: Open University Press. 50-84.

Tellis, W., 1997. Application of a Case Study Methodology. *The Qualitative Report* [online], 3 (3), 21p. Available from: <http://www.nova.edu/ssss/QR/QR3-3/tellis2.html> [Accessed 26 April 2013].

Tesch-Römer, C., Motel-Klingebiel, A. and Tomasik, M., 2008. Gender differences in subjective well-being: comparing societies with respect to gender equality. *Social Indicators Research*, 85, 329-349.

Theodosius, C., 2006. Recovering emotion from emotion management. *Sociology*, 40 (5), 893-910.

Thomas, G., 2011. *How to do your Case Study. A guide for students and researchers*. Los Angeles: Sage.

- Thomas, G., 2015. *How to do your Case Study. A guide for students and researchers*. 2<sup>nd</sup> ed. Los Angeles: Sage.
- Thomas, G. and Myers, K., 2015. *The Anatomy of the Case Study*. Los Angeles: Sage.
- Thompson, P., 2010. Field. In: Grenfell M., ed. *Pierre Bourdieu: Key Concepts*. Durham: Acumen. 66-80.
- Thorpe, H., 2009. Bourdieu, feminism and female physical culture: gender reflexivity and the habitus-field complex. *Sociology of Sport Journal*, 26, 491-516.
- Thurlaway, K. and Upton, D., 2009. *The psychology of lifestyle: promoting healthy behaviour*. London: Routledge.
- Townsend, P., 2000. "Gendered Space? An Exploration of the Gendered Meaning and Experience of 'Home' in Contemporary British Society." *FORUM: eJournal for Postgraduate Studies in Architecture, Planning and Landscape*, 3 (1), 40–46.
- van Tubergen, A. and van der Linden, S., 2002. A brief history of spa therapy. *Annals of Rheumatic Disease*. 61, 273-275.
- Tuckett, A., 2005. Applying thematic analysis theory to practice: A researcher's experience. *Contemporary Nurse*, 19 (1/2), 75-87.
- Tufford, L. and Newman, P., 2010. Bracketing in Qualitative Research. *Qualitative Social Work*, 11 (1), 80–96.
- Turner, V., 1977. Variations on a theme of liminality. In: Moore S. and Myerhoff B., eds. *Secular ritual*. Amsterdam: Van Gorcum. 36-52.
- Unluer, S., 2012. Being an insider researcher while conducting case study research. *The Qualitative Report*, 17 (58), 1-14.
- Unsworth, J., 2000. Practice Development: a concept analysis. *Journal of Nursing Management*, 8 (6), 317-326.
- Utter, A., Robertson, R., Green, J., Suminski, R., McAnulty, S. and Nieman, D., 2004. Validation of the Adult OMNI Scale of perceived exertion for walking/running exercise. *Medicine and Science in Sports and Exercise*, 36, 1776–1780.
- Vallim, AS., Osis, M., Cecatti, J., Baciuk, E., Silveira, C. and Cavalcante, S., 2011. Water exercises and quality of life during pregnancy. *Reproductive Health* [online], Available from: <https://doi.org/10.1186/1742-4755-8-14> [Accessed 15 August 2017].
- Vélez-Agosto, N., Soto-Crespo, J., Vizcarrondo-Oppenhimer, M., Vega-Molina, S. and Garcia Coll, C., 2017. Bronfenbrenner's bioecological theory revision: moving culture from macro into the micro. *Perspectives of Psychological Science*, 12 (5), 900-910.

- Verschuren, P., 2003. Case study as a research strategy: some ambiguities and opportunities. *International Journal of Social Research Methodology*, 6 (2), 121-139.
- Vigil, J., 2007. Asymmetries in the friendship preferences and social styles of men and women. *Human Nature*, 18, 143-161.
- Vincent, C. and Ball, S., 2007. 'Making up' the middle-class child: Families, activities and class dispositions. *Sociology*. 41 (6), 1061-1077.
- Vleeming, A., Albert, H., Ostgaard, H. and Stuge, B., 2008. European guidelines for the diagnosis and treatment of pelvic girdle pain. *European Spine Journal*, 17, 794–819.
- Wacquant, L., 2007. Pierre Bourdieu. In: Stones, R., ed. *Key Contemporary Thinkers*. 2<sup>nd</sup> ed. Basingstoke: Palgrave Macmillan.
- Wadsworth, P., 2007. The benefits of exercise in pregnancy. *The Journal for Nurse Practitioners*, 333-338.
- Wagstaff, P., 2006. Surveys. In: Cluett, E. and Bluff, R., eds. *Principles and Practice of research in midwifery*. 2<sup>nd</sup> ed. Edinburgh: Baillière Tindall. 57-78.
- Waldron, S., 2010. *Office for National Statistics: Measuring Subjective Wellbeing in the UK - Working Paper* [online]. Available from: <http://www.ons.gov.uk/ons/guide-method/user-guidance/well-being/index.html> [Accessed 13 January 2014].
- Walker, S., Sechrist, K. and Pender, N., 1987. The Health-Promoting Lifestyle Profile: Development and Psychometric Characteristics. *Nursing Research* [online], 36, 76-81. Available from: <http://dx.doi.org/10.1097/00006199-198703000-00002> [Accessed 17 April 2018].
- Walker, S., Sechrist, K. and Pender, N., 1995. *Health Promotion Model - Instruments to Measure Health Promoting Lifestyle: Health-Promoting Lifestyle Profile [HPLP II] (Adult Version* [online]). Available from: <https://deepblue.lib.umich.edu/handle/2027.42/85349> [Accessed 17 April 2018].
- Wattis, L., Standing, K. and Yerkes, M., 2013. Mothers and work–life balance: exploring the contradictions and complexities involved in work–family negotiation. *Community, Work and Family*, 16 (1), 1-19.
- Webb, C., 1992. The use of first person in academic writing: objectivity, language and gatekeeping. *Journal of Advanced Nursing*, 17, 747-752.
- Webster, S., Lewis, J., and Brown, A., 2014. Ethical considerations in qualitative research. In: Ritchie, J., Lewis, J., Nicholls McNaughton, C. and Ormston R., eds. *Qualitative research in practice: a guide for social science students and researchers*. London: Sage. 77–110.

Wellington, J. and Sikes, P., 2006. A doctorate in a tight compartment: why do students choose a professional doctorate and what impact does it have on their personal and professional lives? *Studies in Higher Education*, 31 (6), 723-734.

Wendling, G., 2008. *Understanding Change through the Rites Of Passages Framework* [online]. Unpublished PhD: Fielding Graduate University. Available from: <http://artandstory.typepad.com/files/understadning-rites-of-passages.pdf> [Accessed 20 May 2017].

Whalley, D., 2016. Moving from practitioner to researching professional: shifts of identity. In: Burnard, P., Dragovic, T., Flutter J. and Alderton J., eds. *Transformational Doctoral Research Practices for Professionals*. Rotterdam: Sense. 101-111.

White, S., 2009. *Analyzing Wellbeing: A Framework for Development Practice* [online]. Working Paper. University of Bath/Wellbeing in Developing Countries Research Group. Available from: <http://opus.bath.ac.uk/13944/> [Accessed 21 December 2017].

White, S., Ryan, R. and Camfield, L., 2012. *Does wellbeing travel? : debating universalism and cultural difference in understandings of wellbeing* [online]. Conference paper. Bath. Available from: <https://www.gov.uk/dfid-research-outputs/does-wellbeing-travel-debating-universalism-and-cultural-difference-in-understandings-of-wellbeing> [Accessed 17 August 2017].

Whitehead, M., 1992. The Health Divide. In: Townsend, P., Whitehead, M. and Davidson N., eds. *Inequalities in Health*. London: Penguin.

Wiggins, M., Oakley, A., Roberts, I., Turner, H., Rajan, L., Austerberry, H., Mujica, R. and Mugford, M., 2004. The social support and family health study: a randomised controlled trial and economic evaluation of two alternative forms of postnatal support for mothers living in disadvantaged inner-city areas. *Health Technology Assessment Monograph*, 8 (32), 1-120.

Wilkins, C., 2006. A qualitative study exploring the support needs of first-time mothers on their journey towards intuitive parenting. *Midwifery*, 22, 169-180.

Wilmore, M., Rodger, D., Humphreys, S., Clifton, V., Dalton, J., Flabouris, M. and Skuse, A., 2015. How midwives tailor health information used in antenatal care. *Midwifery*, 31, 74–79.

Winson, N., 2003. Transition to motherhood. In: Squire C., ed. *The Social Context of Birth*. Abingdon: Radcliffe Medical Press.

Wolfe, L. and Weissgerber, T., 2003. Clinical physiology of exercise in pregnancy: a literature review. *Journal of Obstetrics and Gynaecology of Canada*, 25 (6), 473-481.



Woodside, A., 2010. *Case Study Research: theory, methods, practice*. Bingley, Yorkshire: Emerald.

World Health Organisation (WHO), 2009. *Track 2: Health literacy and health behaviour* [online]. 7<sup>th</sup> Global conference on health promotion: track themes. Available from:

[www.who.int/healthpromotion/conferences/7gchp/track2/en/index.html](http://www.who.int/healthpromotion/conferences/7gchp/track2/en/index.html) [Accessed 7 September 2015].

Wu, W., Meijer, O., Uegaki, K., Mens, J., van Dieën, J., Wuisman, P., and Ostgaard, H., 2004. Pregnancy-related pelvic girdle pain (PPP), I: terminology, clinical presentation, and prevalence. *European Spine Journal*. 13, 575–89.

Yanamandra, N. and Chandraharan, E., 2012. Anatomical and physiological changes in pregnancy and their implications in clinical practice. Chapter 1. 1-8. *In*: Chandraharan, E. and Arulkumaran, S., eds. *Obstetric and Intrapartum Emergencies*. Cambridge University Press.

Yearley, C., 1997. Motherhood as a rite of passage: an anthropological perspective. *In*: Alexander, J., Levy V. and Roth C., eds. *Midwifery Practice: Core Topics 2*. London: Palgrave. 23-37.

Yin, R., 1993. *Applications of case study research*. Newbury Park, Ca: Sage.

Yin, R., 2003. *Applications of case study research*. 2<sup>nd</sup> ed. Newbury Park, Ca: Sage

## **Appendices**

## **Appendix 1:      Brief Summary of Anatomical and Physiological Changes during Pregnancy**

Physiological changes occur progressively during pregnancy to ensure fetal development is sustained, protected, and for maternal preparedness for childbirth (Hyttén 1968; Carlin and Alfirevic 2008; Martini et al. 2011). These changes for all body systems are complex, beginning at conception and are generally seamless to protect and maintain normal function during the childbearing continuum. While healthy women should encounter no significant difficulties with these adaptations, older women, the co-existence of medical disorders and those with 'multiple gestations' may find the changes more physically demanding.

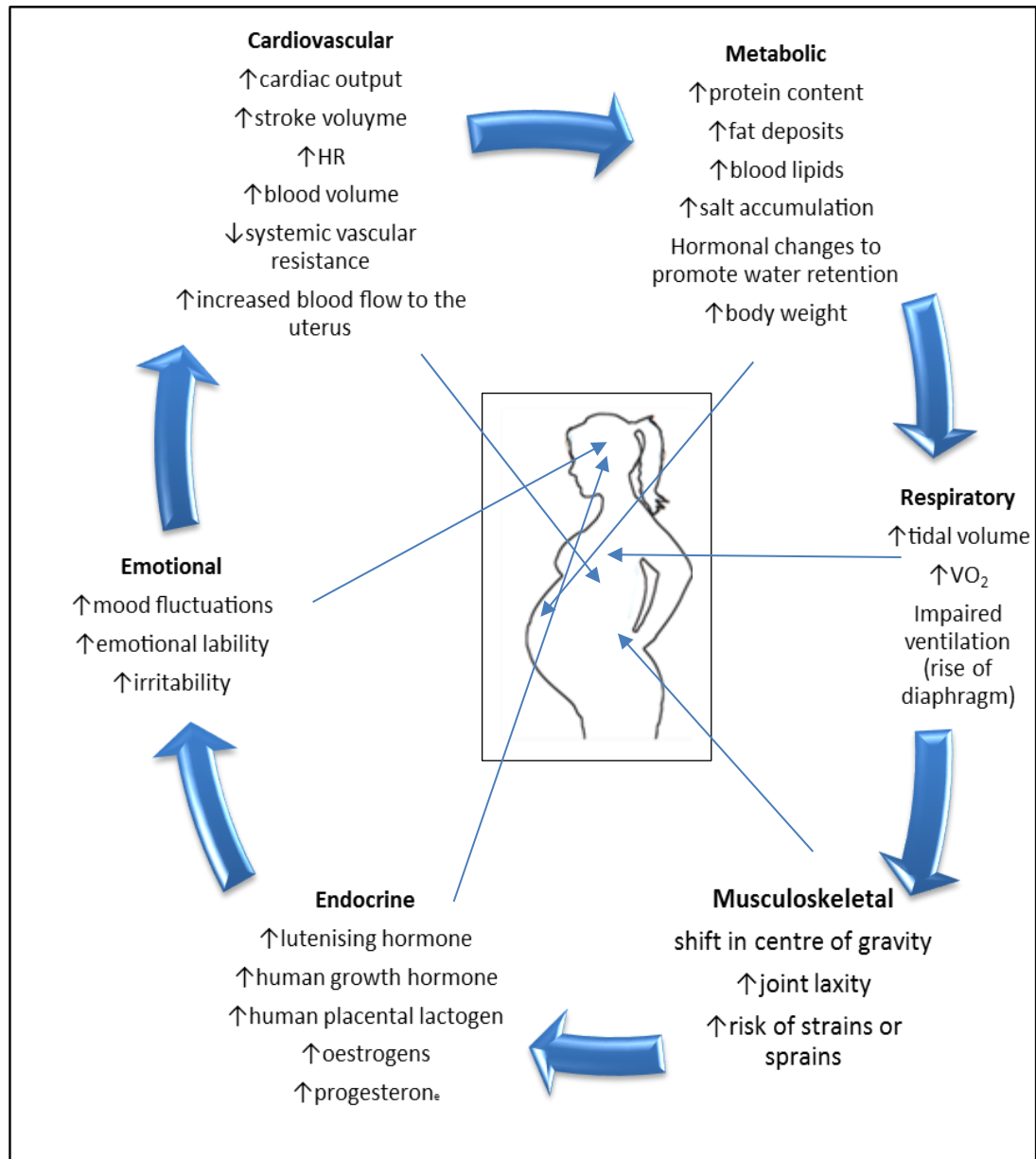
The greatest physical changes occur firstly within the cardiovascular and secondly the haematological systems. Other systems that are altered to meet the physical changes are the respiratory tract, renal system, gastrointestinal tract and endocrine system – thyroid, pancreas, and pituitary glands significantly (Carlin and Alfirevic 2008; Yanamandra and Chandharan 2012; Barakat et al. 2015) (see Figure A-1, p312). There are added effects of these physiological and anatomical changes in relation to the musculoskeletal system which leads to postural adaptations and alterations to mobility and body movements.

### Cardiovascular

The heart and blood vessels distribute oxygen and nutrients within the blood to all body cells, transporting carbon dioxide and various waste products from them. During pregnancy extra oxygen and nutrition support the maternal organs which nurture the developing fetus and adapted physiological changes (Carlin and Alfirevic 2008; Marieb and Hoehn 2015). The cardiovascular system is also integral to the regulation of body temperature and homeostatic fluid, electrolyte and acid-base balance. White blood cells or leukocytes contribute to protection and immunity from infections, while platelets are an essential part of blood clotting to prevent excess blood loss from injury or haemorrhage at the time of birth (Heidemann and McClure 2003; Carlin and Alfirevic 2008; Blackburn 2012).

During pregnancy, the heart moves upwards and to the left as the diaphragm is raised by up to 4cm at full-term (Hegewald and Crapo 2011). Cardiac muscle walls remain of similar thickness, but the volume is increased by 12% due to increased ventricular filling and the consequential enlarged atrial size as blood volume changes occur (Robson et al. 1989; Gilbert and Harmon 2003).

**Figure A-1 Main adaptations to physiology during pregnancy**



(Adapted from Barakat et al. 2015, p1378).

The main cardiovascular changes are: increased heart rate, reduced systemic vascular resistance, and lowered systolic and diastolic blood pressure until the 24<sup>th</sup> week of gestation, followed by a gradual return to normal of both pressures by the expected date of delivery (Carlin and Alfievic 2008; Chang and Streitman 2012). Cardiac output rises during the first 12-14 weeks to reach a level of 30-50% above 'non-pregnant' by 28 weeks. Stroke volume also increases by around 30% by 20 weeks of pregnancy (Carlin and Alfievic 2008; Hegewald and Crapo 2011; Blackburn 2012; Yanamandra and Chandharan 2012).

### Haematology

Increased blood volume, raised erythrocyte numbers and increased coagulability of the blood are specifically altered to cope with the burden of the placental demands and those of fetal development (Carlin and Alfievic 2008). The blood volume increase is contributed to by up to 50% rise in plasma volume and 20% rise in red cell volume which points to an overall haemodilution of cells or potential decreased oxygen carrying capacity of blood during pregnancy (Gilbert and Harmon 2003; Chang and Streitman 2012). The stated 'physiological anaemia of pregnancy' may lower the viscosity within the maternal blood to allow improved gaseous exchange with the fetal circulation, and be entirely normal (Gilbert and Harmon 2003; Rankin 2017a).

Platelet numbers do not alter significantly, but fibrinogen concentrations increase in the final weeks of pregnancy which, if present with venous stasis in the pelvic area increases the risk of hypercoagulability. The fibrinogen levels are likely to be part of the mechanism to control bleeding following the delivery of the placenta and membranes following birth (Gilbert and Harmon 2003; Heidemann and McClure 2003).

The distribution of circulating blood is non-standard but while the hepatic and cerebral system is similar to pre-pregnancy, the renal flow of blood is raised by 40%, as is the flow to the uterus due to increased demands on those organs (Gilbert and Harmon 2003; Tan and Tan 2013).

### Respiratory

During pregnancy women adopt thoracic breathing as the diaphragm moves up 4cm and the lower ribs flare, increasing the sub-costal angle and the thoracic circumference up to 6cm (Gilbert and Harmon 2003; Hegewald and Crapo 2011). Progesterone is responsible for a 40% increase in tidal volume and a 25% reduction in residual volume of the lungs. As a compensatory measure, hyperventilation within the alveoli occurs which meets the extra 20% oxygen consumption requirements to support fetal and maternal growth and support the basal metabolic rate (Gilbert and Harmon 2003). As excess carbon dioxide is exhaled, the arterial oxygen tension increases while the arterial CO<sub>2</sub> reduces. This indicates a compensatory condition of respiratory alkalosis during pregnancy and is significant in high risk cases for whom respiratory acidosis may develop rapidly (Gilbert and Harmon 2003; Hegewald and Crapo 2011; Chang and Streitman 2012).

### Renal

Kidney length during pregnancy alters by approximately 1cm (Cietak and Newton 1985). The increased overall blood volume and cardiac output means that the kidneys filter at least 50% more blood through the glomerular system before the second trimester (Carlin and Alfievic 2008; Tan and Tan 2013). To support the function, the

kidneys demonstrate progesterone changes to the 'pelves, calyces and ureters' which are seen to enlarge, and simulated hydronephrosis by ureteric compression around the maternal pelvis especially in later pregnancy due to uterine growth, and a degree of urinary stasis (Heidemann and McClure 2003; Carlin and Alfirovic 2008). The glomerular filtration increases and re-absorption may be reduced for specific substances (protein, glucose) which alters the results of renal tests taken during pregnancy for these. In addition, sodium and water are retained in greater quantities to normalise blood pressure levels during the perinatal period and thought to be associated with resistance to angiotensin hormone within the renin-angiotensin-aldosterone mechanism (Carlin and Alfirovic 2008; Tan and Tan 2013; Rankin 2017b).

### Gastrointestinal

Abdominal organs are displaced gradually as the gravid pregnancy advances within the cavity. The hormonal action of progesterone on smooth muscle tissue produces reduced tone to the intestinal tract causing reduced motility, and the increased incidence of heartburn, indigestion, bloating and constipation (Carlin and Alfirovic 2008; Yanamandra and Chandraharan 2012).

Nausea (a frequent symptom between 4-12 weeks gestation) and vomiting (occurring less often overall but for some lasts all day and throughout pregnancy) are inconvenient symptoms which are experienced by two out of every three pregnant women (Patrick 2017). Specific reaction to elevated serum chorionic gonadotrophic hormone as well as raised oestrogen and progesterone or in combination with such increased levels, may offer a physiological basis for such symptoms. Additionally, emotional elements could add to the presence of symptoms (Chou et al. 2003) or indeed be supportive of positive adaption steering mothers-to-be away from nutrients that may be 'toxic' during fetal organ development (Patrick 2017).

### Skin changes

Dematological alterations based on elevated serum oestrogen and increased melanocyte production, are linked to hyperpigmentation for a lot of women during pregnancy (Muallem and Rubeiz 2006). Women experience noticeably deeper pigmentation of areolar tissue, nipples and external genitalia which occur frequently especially if their original complexion is darker. In addition the linea nigra occurs for the duration of pregnancy extending along the abdominal mid-line from the symphysis pubis tracing the linea alba between the rectus abdominus muscles.

Of greater significance to many is the more visible darkening of freckles affecting the face and to chloasma ('mask of pregnancy') specifically of the cheeks, chin and temple area of the forehead where melanocytes are stimulated to increased pigmentation, especially in conditions of higher UV light (Barankin et al. 2002). Hyperpigmentation

does tend to recede following the birth, but can persist causing variable psychological cosmetic distress.

### Metabolic

The body undertakes a variety of bio-chemical reactions within cells during digestion which are initiated by enzymes converting nutrients into other substances by anabolic or catabolic processes, releasing energy and digestive nutrients into the blood for distribution (Butte 2000; Barakat et al. 2015; Soltani and Fair 2017). During pregnancy there are demands for energy and increased nutrition to support tissue and fetal growth as well as fetal development (Hyttén 1968 and 1990). Typical weight gain is 11-15 kilograms for western women with variations in fat deposits, water retention and fetal growth (Clapp 1998; Soltani and Fair 2017). Hormonal influence is from oestrogen, progesterone, the placental hormone, human placental lactogen and altered glucose metabolism from insulin antagonism, plus adjusted lipid and protein metabolism. Hyperinsulinaemia occurs which leads to a diabetogenic state where the placental hormones, together with cortisol, prolactin and glucagon promote insulin resistance as a significant metabolic change (Gilbert and Harmon 2003; Yanamandra and Chandrahara, 2012).

### Musculoskeletal issues

Musculoskeletal changes result from weight gain associated with the physiological and anatomical changes that pregnancy brings (Artel et al. 2003). Typically women develop increasing lumbar lordosis and kyphosis, contributed to by postural changes and weight gain which may be linked to impaired balance in several areas of the body associated with altered centre of gravity. The inter-relation of tissue growth and deposits of adipose tissue at various sites in the body, alongside altered tensions in the broad and round ligaments supporting the uterus, often leads to discomforts which result in adoption of poor postures and unbalanced joint loading (Baker 2006). Changes to hormonal levels of oestrogen, which promotes growth, progesterone, which relaxes smooth muscle tissue, and relaxin which primarily leads to laxity of fibrous tissue and ligaments especially of the pelvis, all may contribute to incidences of back pain, joint instability and pelvic girdle pain (Barakat et al. 2015).

During pregnancy weight-bearing exercise, and increased forces affecting the joints, specifically hips and knee, may lead to potential damage especially where there is already instability or disease. The reported incidence of low back pain is up to 50% of women during pregnancy (Carlson et al. 2003; Gjestland et al. 2012) while pelvic girdle pain is experienced by 20-45% (Wu et al. 2004; Vleeming et al. 2008; Gjestland et al. 2012) which may reduce further engagement in physical activity and impact on feelings of wellbeing during pregnancy. Research evidence of this area is limited and the guidance appears to recommend that professionals caution women when discussing potential for falls, sprains and injury (Artel et al. 2003). This information may add to

the barriers to regular physical activity during pregnancy due to fears associated with participation rather than the health benefits during pregnancy and beyond (Clarke and Goss 2004; Duncombe et al. 2007).

### Postural changes

Throughout pregnancy, the maternal posture alters specifically in skeletal areas of the spine and there is notable increased cervical, thoracic and lumbar curvature to the spine in advanced gestation (Barakat et al. 2015). In order to achieve an upright stature women often hyperextend at the knees, and alter the attitude of the foot pronation during the gait cycle, as a wider base is essential for balance and weight redistribution during movement. Gilleard (2013) has recently reported a study of gait features and trunk activity for pregnant women during walking movement which indicated that length of stride diminishes, step width is increased and walking speed remains unchanged as pregnancy advances and is maintained for eight weeks after birth. Her work examined the sagittal, coronal and transverse motions for three trunk segments – the thoracic, thoracolumbar and pelvic areas, showing that there is a reduction in the range of motion for the pelvic and thoracolumbar in the transverse plane, while after birth the sagittal plane demonstrates a larger range of motion in the thoracic area but reduced in the pelvic area (Gilleard 2013). These results support the musculoskeletal issues related to altered shape and weight gain during pregnancy.

The uterus is composed of smooth muscle fibres which divide and increase in size during pregnancy to accommodate the growing fetus and placenta. These processes are governed by oestrogen which aids hyperplasia and stimulation of myometrial proteins. This facilitates stretching and hypertrophy of muscle fibres, leading to initial increase to uterine wall thickness, which gradually thins towards the final weeks of gestation (Shynlova et al. 2009; Matthews and Rankin 2017). Initially a pelvic organ, the uterus extends into the abdominal cavity after twelve weeks gestation, assuming a right oblique tilt and more anterior position as pregnancy advances, due to the proximity of the descending colon and other abdominal organs or tissues respectively (Matthews 2017). The hormone progesterone maintains quiescence of myometrial muscle due to reduction in conduction of nerve impulses until labour is triggered (Shynlova et al. 2009).

The abdominal muscles are made up of four separate groups – rectus abdominis, external and internal obliques and the transverses abdominis (Baker 2006; Martini et al. 2011). The muscle functions are inherent with trunk stability, forward flexion, lateral flexion and lateral rotation and also support the spine and internal organs. The rectus abdominis muscle is in two parts, which are anterior and run vertically from the sternum to the public bones. These muscles are linked by the linea alba along the midline, which is seen to separate for most women during pregnancy from the



umbilicus in an upward direction by approximately 2cms (diastasis recti). During pregnancy the abdominal muscles are stretched progressively and may lead to poor posture if weak or over stretched, incorrect pelvic tilt, and increased incidence of lower back pain (Baker 2006; Coldron et al. 2008; AEA 2010).

Once the uterus becomes an abdominal organ from 4<sup>th</sup> month of gestation, there is more likelihood of supine hypotension when women lie on their back, as the weight of the gravid uterus on the vena cava may cause compression and reduce blood flow for mother and fetus (ACOG 2009; Yanamandra and Chandrabaran 2012). Within the environment of water, the buoyancy limits the vena caval compression in modified supine postures although maternal comfort should be assured in such positions and monitored for reaction (Cluett et al. 2002; Smith and Michel 2006; AEA, 2010).

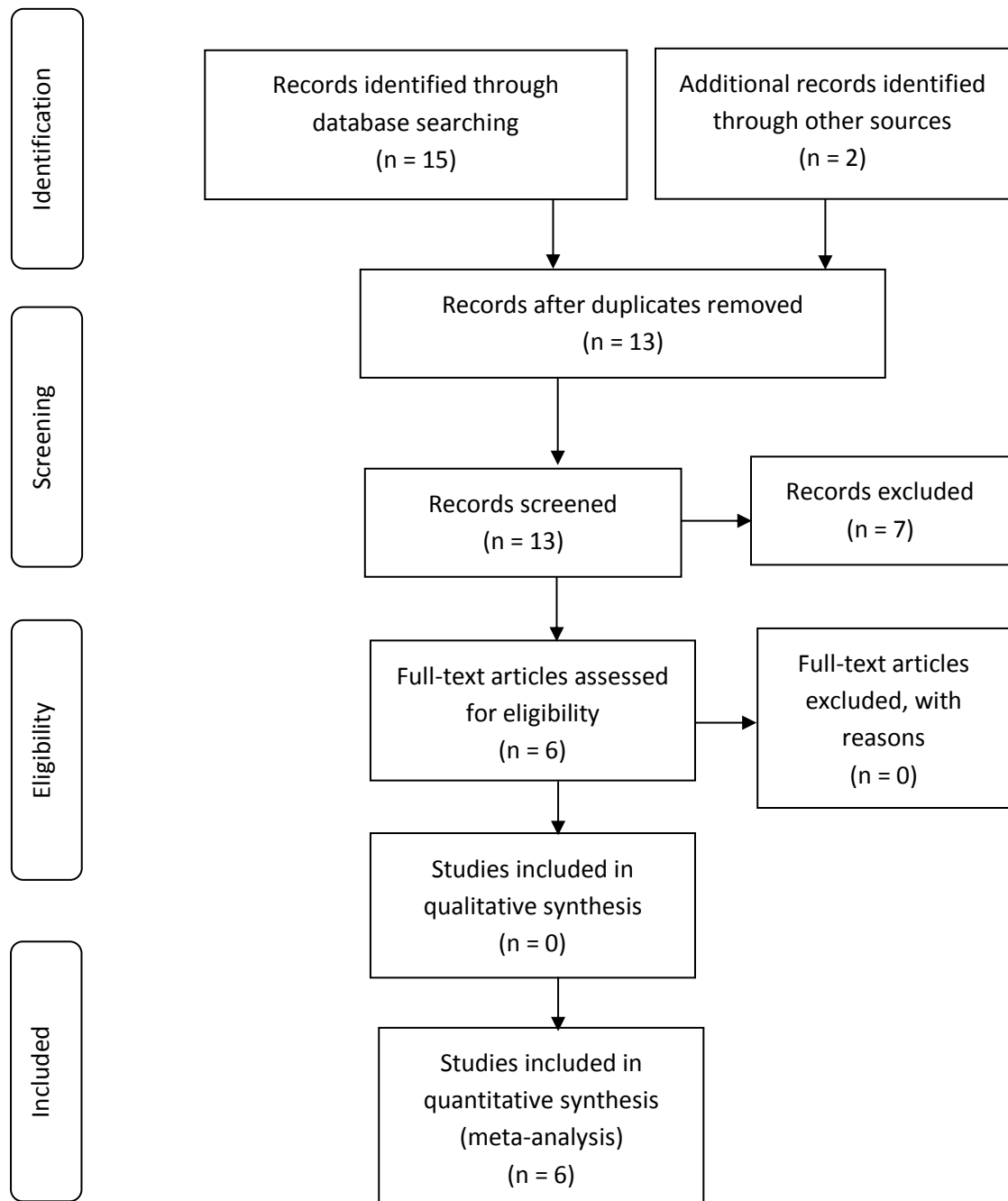
## Appendix 2: Studies of leisure-time exercise beliefs and behaviours during pregnancy 2000–onwards.

AUTHOR(s) YEAR (PUB)	COUNTRY	STUDY DESIGN STUDY YEAR	SAMPLE	DATA COLLECTION TOOL DATA COLLECTION TIMING	PA MEASURE	FINDINGS	COMMENTS
<b>QUANTITATIVE</b>							
Symons Downs and Hausenblas  <b>2004</b>	USA	Women's exercise beliefs and behaviours during pregnancy and postpartum.  Retrospective cohort study	74 post- partum women within 1 year of birth.	Self-report (Godin and Shephard 1985) 7-day recall  Pre-pregnancy Pregnancy Postpartum	Open-ended questions: Behavioural beliefs of advantage of exercise; Normative beliefs to seek influences by others; Control beliefs obstructing exercise through physical or other restrictions.	Exercise decreased during pregnancy. Strenuous pre-pregnancy higher than pregnancy. Moderate – pre-pregnancy higher than pregnancy. Mild (light) – pre-pregnancy higher than pregnancy. Salient behavioural beliefs: - improves mood (33.8%); increases energy/stamina (29.7%); assists with staying fit (21.6%); controls weight (18.9%). Normative (influences) beliefs: - husband or fiancé (26.5%); children (17.6%); other family (14.9%); friends (12.2%). Control (obstructing) beliefs: - physical limitations/nausea (56.8%); tiredness and fatigue (27.0%); time limits (25.7%); gaining weight (13.5%).	Women's exercise behaviours for pre- pregnancy, during pregnancy and post-pregnancy align with 1) exercised more before pregnancy; 2) Women believe that pregnancy exercise improves mood, but physical symptoms limit participation; 3) belief that postnatal exercise aid weight control, but lack of time was a barrier; 4) husband/partner or family, exert strongly influence for pregnancy and postnatal exercise behaviours. Understanding these beliefs can aid intervention design by professionals.

AUTHOR(s) YEAR (PUB)	COUNTRY	STUDY DESIGN STUDY YEAR	SAMPLE	DATA COLLECTION TOOL DATA COLLECTION TIMING	PA MEASURE	FINDINGS	COMMENTS
Symons Downs and Hausenblas  <b>2007</b>	USA	Pregnant women's third trimester exercise behaviours, body mass index, and pregnancy outcomes.  Prospective cohort study	62 pregnant women, 3 <sup>rd</sup> trimester	Self-report  Single assessment of 3 <sup>rd</sup> trimester exercise at 6 weeks postpartum	Non-standard exercise: number of times engaging in exercise per week – moderate or vigorous over course of 3 <sup>rd</sup> trimester.  <i>Changes in exercise not measured.</i>	Correlations of beliefs with behaviours. Behavioural beliefs: - improve overall mood ( $r=0.29$ , $p<.05$ ); increase energy/stamina ( $r=0.36$ , $p<.001$ ); assist in labour/delivery ( $r=0.41$ , $p<.001$ ); keep fit ( $r=0.32$ , $p<.05$ ); keep weight in check ( $r=0.26$ , $p<.05$ ); provide stress relief ( $r=0.32$ , $p<.05$ ). Normative beliefs: - husband/partner/fiancé ( $r=0.44$ , $p<.001$ ); children ( $r=0.43$ , $p<.001$ ); other family ( $r=0.10$ , $p<.001$ ); doctor ( $r=0.44$ , $p<.001$ ); nurse ( $r=0.46$ , $p<.001$ ). Predictors of exercise behaviour: -intention ( $R^2=.24$ , $p<.001$ ). Exercising vs non-exercising pregnant women: - intention ( $F(8,43)=16.55$ , $p=.00$ ); attitude ( $F(8,43)=11.76$ , $p=.01$ ); subjective norm ( $F(8,43)=20.59$ , $p=.00$ ); perceived behavioural control ( $F(8,43)=14.53$ , $p=.00$ ); behavioural beliefs ( $F(8,43)=11.44$ , $p=.01$ ); normative beliefs ( $F(8,43)=23.15$ , $p=.00$ ).	Results imply exercise behaviour can be predicted by stated intention which may in turn be associated with subjective norms (perceived social pressure to engage). Comparison between third trimester exercisers and non-exercisers revealed postnatal BMI was lower, and birthweights were higher and babies longer. Suggest theory of planned behaviour can aid understanding of exercise engagement for late pregnancy.
Duncombe Wertheim Skouteris Paxton Kelly  <b>2009</b>	AUSTRALIA	Factors related to exercise over the course of pregnancy including women's beliefs about the safety of exercise during pregnancy.  Prospective questionnaire study	158 pregnant women recruited via advertisements, obs/gynae waiting room flyers, flyers at exercise classes, and word of mouth.	Retrospective pre-pregnancy data then Questionnaires at 16–23 weeks pregnancy (T1), 24–31 weeks pregnancy (T2), and 32–38 weeks pregnancy (T3).  Record of a one week exercise diary – intensity and time prior to each questionnaire.	Exercise Safety Beliefs Questionnaire: Beliefs about safety of low to medium exercise; high intensity exercise; gentle exercise; and weight bearing exercise; Physical symptoms; Reasons for exercise or not.	The amount and intensity of exercise decreased over the course of pregnancy, with main reasons for not exercising including feeling tired or unwell, being too busy, and, particularly in late pregnancy, exercise being uncomfortable. Some women also reported safety concerns. Safety concerns predicted amount and/or intensity of exercise. Women who rated gentle and low to medium exercise as unsafe reported engaging in less intense and fewer minutes of exercise. Researchers propose information and discussion about ways to exercise safely, enjoyably, and comfortably should be offered to pregnant women by health professionals in early pregnancy, when safety beliefs may impact on women's exercise patterns across pregnancy, and throughout pregnancy since the most appropriate forms of exercise may need to be modified over time.	Stated concerns (physical symptoms, barriers or limiters to engagement) were predictors of time and intensity of activities accessed.  Most women had clear beliefs about what forms of exercise were safe or not safe during pregnancy.  Healthcare professionals need to provide safety information and discuss impact of subjective beliefs in early pregnancy, so exercise patterning can be individualised and modified as gestation advances.

AUTHOR(s) YEAR (PUB)	COUNTRY	STUDY DESIGN STUDY YEAR	SAMPLE	DATA COLLECTION TOOL DATA COLLECTION TIMING	PA MEASURE	FINDINGS	COMMENTS
Clara-Santos Abreu Moreira Lopes Santos Alves Silva Montenegro and Mota  <b>2016</b>	PORTUGAL  Outpatient clinic at São João Hospital in Porto	Impact of compliance with different guidelines on physical activity during pregnancy, and perceived barriers to leisure physical activity.	133 pregnant women at two points during pregnancy.	Socio-demographic characteristics, lifestyle factors and barriers to leisure PA were assessed via questionnaire.  Baseline: 10th and 12th weeks and 20th and 22nd weeks	PA was assessed by accelerometry during the T1 and T2.	A large proportion of women (ranging from 32% to 96%) did not reach the levels of PA recommended by the guidelines. There were no significant differences between T1 and T2 with regard to compliance with PA recommendations. A decrease in PA levels from T1 to T2 was noted for all recommendations. No associations were found between participants' characteristics and adherence to the recommendations in T1 and T2. No significant differences were found in barriers to leisure PA between T1 and T2. The most commonly reported barriers to leisure PA were intrapersonal, not health related. These results indicate that there were no differences between trimesters regarding compliance of PA recommendations, and perceived barriers were similar in both trimesters.	Sociological framework used (McLeroy et al. 1988; Sallis et al. 2008) to define barriers – time, work/social conflict, concerns about fetus, low motivation, dislike of activity, medical diagnosis, pregnancy symptoms, access and economic. Baseline results: Mean participant age was 30.4 years; all had completed mandatory education (41.7%) with remainder completing secondary (31.1%) and Higher Education (27.3%); 73.5% were married or co-habiting; 75.8% were employed; 57.9% primigravida and 42.1% multigravida; 58.6% normal weight and 39.9% overweight/obese. Sample limited by city dwellers, not rural areas where there are likely to be reduced facilities.

### Appendix 3: PRISMA Flow Diagram



Moher, D., Liberati, A., Tetzlaff, J., Altman, D., 2009. **Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement**. PLoS Med 6 (7). Accessed from: <http://www.prisma-statement.org/> [Accessed on 12 June 2017]

#### **Appendix 4: Studies of aquatic exercise during pregnancy 2000-onwards.**

[illegible]













AUTHOR(s) YEAR (PUB)	COUNTRY SETTING	TITLE STUDY DESIGN STUDY YEAR	SAMPLE	DATA COLLECTION TOOL DATA COLLECTION TIMING	INTERVENTION/ PA MEASURE	RESULTS/ FINDINGS	CONCLUSION and COMMENTS
<b>SYSTEMATIC REVIEWS –with studies in English Language</b>							
Kamioka Tsutani Mutoh Okuizum Ohta Handa Okata Kitayuguchi Kamada Shiozawa Park Honda and Moriyama  <b>2011</b>	Systematic Review – JAPAN, KOREAN and ENGLISH studies – 21 included	A systematic review of non-randomised controlled trials on the curative effects of aquatic exercise.  <u>Systematic review</u>  Included discomforts of pregnancy (Smith and Michel study 2006) and positive effect on pregnancy health behaviours and co- incidental social connectedness. Liquori, Widner and Clark (2003) (pilot) study.					Insufficient evidence on aquatic exercise due to methodological issues and quality of reporting (see review) or heterogeneity of RCTs.
Parker and Smith  <b>2003</b>	USA	Aquatic-aerobic exercise as a means of stress reduction during pregnancy.  <u>Systematic review</u>  Lox and Treasure (2000) study which proceeds reporting of their own Quasi-experimental pilot study.					Highlight issues of self-report of exercise activity. Suggest direct observation of participant's activity level as experimental study.

## Appendix 5: Study Questionnaire

### WELLBEING DURING PREGNANCY



University Hospital Southampton   
NHS Foundation Trust

Centre Number: 001

Study Number: IRAS project 139478

Participant Identification Number for this trial: \_\_\_\_\_

**Title of Project:** An exploration of women's experiences of wellbeing and peer support during pregnancy, through attendance at midwife-led aquanatal exercise classes.

**Name of Researcher:** Liz Davey

**Thank you for taking the time to complete this questionnaire**  
**Please use the back page for comments or additional information**  
**All information will be treated in confidence**  
**Please return to Liz Davey in the envelope provided.**

### Initial Questionnaire

Today's Date: \_\_\_\_\_

#### About you:

What ethnic group are you?

- |                                       |                          |
|---------------------------------------|--------------------------|
| White British                         | <input type="checkbox"/> |
| Mixed/multiple ethnic group           | <input type="checkbox"/> |
| Asian/Asian British                   | <input type="checkbox"/> |
| Black/African/Caribbean/Black British | <input type="checkbox"/> |
| Other ethnic group                    | <input type="checkbox"/> |
| Prefer not to say                     | <input type="checkbox"/> |

Where do you live: Postcode \_\_\_\_\_

Distance to leisure centre \_\_\_\_\_ miles or \_\_\_\_\_ km

- |                    |  |                          |
|--------------------|--|--------------------------|
| Level of education | Degree level or higher qualification (or equivalent) | <input type="checkbox"/> |
|                    | Higher educational qualification below degree level  | <input type="checkbox"/> |
|                    | A levels or higher                                   | <input type="checkbox"/> |
|                    | ONC/National Level BTech or BTEC                     | <input type="checkbox"/> |
|                    | O level or GCSE equivalent                           | <input type="checkbox"/> |
|                    | Other  | <input type="checkbox"/> |
|                    | No formal qualifications                             | <input type="checkbox"/> |

Married ☐ single ☐ living with partner ☐

other ☐ Please state \_\_\_\_\_

Aquanatal participants (13 October 2015; V4)

# WELLBEING DURING PREGNANCY

Caring for other dependant(s): Family member ☐  
 Other dependants ☐  
 Their relationship to you \_\_\_\_\_

Work:

Unemployed ☐ Employed ☐ Studying ☐ Stay-at-home mum ☐

Job title: \_\_\_\_\_ Full-time ☐ or Part-time ☐

## This pregnancy:

Height: \_\_\_\_ft \_\_\_\_in or \_\_\_\_cms

Body weight (at confirmation of pregnancy or given date) \_\_\_\_ st \_\_\_\_ lbs or \_\_\_\_ kgs

Date your baby is due: \_\_\_\_\_

Number of Children: First baby ☐ Second baby ☐ More than 2 children ☐

Age(s) of children \_\_\_\_\_

Existing medical disorders Yes ☐ No ☐

Please state what disorder and any current treatment \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Early pregnancy discomforts (tick all that apply):

Nausea	<input type="checkbox"/>	Vomiting	<input type="checkbox"/>
Food cravings	<input type="checkbox"/>	Food aversions	<input type="checkbox"/>
Fatigue	<input type="checkbox"/>	Poor sleep	<input type="checkbox"/>
Heartburn	<input type="checkbox"/>	Skin pigmentation	<input type="checkbox"/>
Breast tenderness	<input type="checkbox"/>	Swelling (ankles/fingers)	<input type="checkbox"/>
Low back pain/ache	<input type="checkbox"/>	Varicous veins	<input type="checkbox"/>
Urinary frequency (no infection)	<input type="checkbox"/>	Constipation	<input type="checkbox"/>
Other	<input type="checkbox"/>	Please state	_____

**Physical Activity:**Did you exercise **before** you became pregnant?Yes ☐ No ☐

Why did you exercise? (please tick all that apply):

- |  |                          |
|--|--------------------------|
| To meet other people                                   | <input type="checkbox"/> |
| To maintain or improve fitness,                        | <input type="checkbox"/> |
| To improve digestion                                   | <input type="checkbox"/> |
| To improve sleep patterns                              | <input type="checkbox"/> |
| To reduce aches and pains                              | <input type="checkbox"/> |
| To use resistant exercises in water to aid muscle tone | <input type="checkbox"/> |
| To improve or maintain abdominal tone                  | <input type="checkbox"/> |
| To increased stamina                                   | <input type="checkbox"/> |
| To releases endorphins, our "feel good" hormones       | <input type="checkbox"/> |
| To improve posture and reduce back strain              | <input type="checkbox"/> |
| For a feeling of well-being                            | <input type="checkbox"/> |
| To improve self esteem                                 | <input type="checkbox"/> |
| For fun  | <input type="checkbox"/> |
| Other reason – please specify _____                    |                          |

# WELLBEING DURING PREGNANCY

Please use the following scale to highlight your physical activity levels:

Exertion	Borg RPE number (0-10)	Example
None	0	Reading a book, watching TV
Very, very slight	0.5	Minimal movement
Very slight	1	Tying shoes
Very light	2	Easy activity eg folding clothes
Fairly light	3	Supermarket shopping – not enough to breath more rapidly
Somewhat hard	4	Brisk walking, moderate effort, faster heart rate, but not out of breath
Hard	5-6	Activities that take vigorous effort, faster heart rate and breathing
Very hard	7-9	Highest level of sustainable activity
Very, very hard	10	Burst of activity that cannot be maintained for long

(Borg Rate of Perceived Exertion (RPE) attributes numbers 0-10 to specific levels of physical exertion from: Borg G., 1982. Psychophysical bases of perceived exertion. *Medicine and Science in Sport and Exercise*. 14:377-381).

Exercise routines during the 3 months **prior** to pregnancy – What type of exercise did you do, how hard did you exercise and for how long each time?

Type of activity	Intensity of activity (RPE figure)	How much time do you spend: (tick all that apply)						
		None	½ - 1 hour per day	More than 1 hour per day	Less than an hour per week	1-2 hours per week	2-4 hours per day	More than 4 hours per week
<i>Example : Walking</i>	4							✓
Strolling								
Walking (brisk)								
Jogging								
Running								
Cycling								
Swimming								
Gym - weights								
Gym - cardiovascular								
Aerobic classes								
Yoga								
Pilates								
Aquatic classes eg Aquasize,								
Dancing								
Ball games eg:Tennis								
Horse-riding								
Other Please specify								



# WELLBEING DURING PREGNANCY

Did you exercise **during the first three months** of pregnancy?

Yes ☐ No ☐

If your answer is yes, why did you start or continue to exercise during this time?

(please tick all that apply):

- To meet other mums-to-be ☐
- To maintain fitness, despite pregnancy ☐
- To improve digestion ☐
- To improve sleep patterns ☐
- To reduce pregnancy discomforts ☐
- To use resistant exercises in water to aid muscle tone ☐
- To improve or maintain abdominal tone ☐
- To increased stamina for labour ☐
- To releases endorphins, our “feel good” hormones ☐
- To improve posture and reduce back strain ☐
- For a feeling of well-being ☐
- To improve self esteem ☐
- For fun ☐
- Other reason – please specify \_\_\_\_\_

Using the same Borg scale (p4), please indicate for exercise routines **during the first 3 months** of pregnancy – What type of exercise did you do, how hard did you exercise and for how long each time?

Type of activity	Intensity of activity (RPE figure)	How much time do you spend: (tick all that apply)						
		None	½ - 1 hour per day	More than 1 hour per day	Less than an hour per week	1-2 hours per week	2-4 hours per day	More than 4 hours per week
<i>Example : Walking</i>	4					✓		
Strolling								
Walking (brisk)								
Jogging								
Running								
Cycling								
Swimming								
Gym - weights								
Gym - cardiovascular								
Aerobic classes								
Yoga								
Pilates								
Aquatic classes eg Aquasize, Aquanatal								
Dancing								
Ball games eg: Tennis								
Horse-riding								
Other								
Please specify								

**Exercise:**

What exercise routine do you intend to continue for the remainder of your pregnancy:

Type of exercise	How often per day	How often per week	What intensity (Please use 0-10 scale from p3)

**Aquanatal:**

Why did you attend the aquanatal exercise classes? (please tick all that apply):

- To meet other mums-to-be ☐
- To maintain fitness, despite pregnancy ☐
- To improve digestion ☐
- To improve sleep patterns ☐
- To reduce pregnancy discomforts ☐
- To use resistant exercises in water to aid muscle tone ☐
- To improve or maintain abdominal tone ☐
- To increase stamina for labour ☐
- To releases endorphins, our "feel good" hormones ☐
- To improve posture and reduce back strain ☐
- For a feeling of well-being ☐
- To improve self esteem ☐
- To have contact with a midwife for advice about pregnancy ☐
- For fun ☐
- Other reason – please specify \_\_\_\_\_

**Support:**

Do you intend to attend birth preparation (sometimes called parenthood education) sessions?

Yes ☐ No ☐

Will you go to: NHS ☐ Private e.g. NCT ☐  
 Specialist e.g. Yoga ☐ Pilates ☐ Hypnobirthing ☐ Other \_\_\_\_\_

Sources of additional support you plan to use (please specify):

	Phone	Face-to-face	Scheduled appointment
Midwife (between appointments)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> (Extra appointment)
Out of Hours Midwifery Services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
GP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Obstetrician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Out of Hours Services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Please state _____			
Alternative Practitioner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e.g. Homeopathy, Reflexology, Chiropractor			
Please state _____			
Specialist – Medical	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Specialist – Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Please state _____			
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Please state _____			

Have you looked at pregnancy related websites? Yes ☐ No ☐

Please state which ones:

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Do you use social media? Yes ☐ No ☐

Please state which ones eg Facebook, Twitter, LinkedIn, YouTube, Wiki, Flickr, Blogs (ie Tumblr or others)  
 Bebo, myspace.com, etc :

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WELLBEING DURING PREGNANCY

Please comment on the importance to you of meeting friends or colleagues:

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**Thank you for taking the time to complete this questionnaire**  
**Please use the back page for comments or additional information**

**Please use this page for comments or additional information.**

**All information will be treated in confidence.**  
**Please return to Liz Davey in the envelope provided.**

## Appendix 6: Studies using pregnancy activity questionnaires during pregnancy.

AUTHOR(s) YEAR (PUB)	COUNTRY SETTING	STUDY DESIGN STUDY YEAR	SAMPLE	DATA COLLECTION TOOL DATA COLLECTION TIMING	PA MEASURE	RESULTS/(FINDINGS)	CONCLUSIONS and COMMENTS
<b>Pregnancy Physical Activity Questionnaire or PPAQ – used in English Language</b>							
Chasen-Taber Schmidt Roberts Hosmer Markenson and Freedson  <b>2004a</b>	USA  Western Massach- usetts within a tertiary care facility.	Development and validation of a pregnancy physical activity questionnaire (PPAQ).	235 ethnically diverse women – 58% white, 28% hispanic, 14% black.  1T =10% 2T=34% 3T=56%	PPAQ development. Three 24h physical activity recalls – type, duration and frequency.  Relative contribution of each activity to between persons variance in energy expenditure was used to establish a list of activities.	Validation by 54 pregnant women, pre-PPAQ and then MTI Actigraph for 7d and repeat PPAQ.  Used MET values measured for pregnant women where available – ie walking and light-moderate intensity household tasks.	ICC used to measure reproducibility of PPAQ =0.78 for total activity, 0.82 for moderate activity, 0.81 for vigorous activity (range 0.83- sport/exercise to 0.93 for occupational activity. SCC between PPAQ and three points of actigraph classification points ranged between 0.087 and 0.43 for total activity, 0.25 to 0.34 for vigorous activity, 0.20 to 0.49 for moderate activity and -0.08 to 0.22 for light activity. Correlations higher for sport/exercise and occupational activities compared.	<b>PPAQ</b> is suggested as a reliable and reasonable accurate measure of broad range of physical activities in pregnancy.  However better correlation for sport/exercise and occupational activities rather than household/caregiving activity would be advised as more helpful to contemporary populations.



AUTHOR(s) YEAR (PUB)	COUNTRY SETTING	STUDY DESIGN STUDY YEAR	SAMPLE	DATA COLLECTION TOOL DATA COLLECTION TIMING	PA MEASURE	RESULTS/(FINDINGS)	CONCLUSIONS and COMMENTS																				
OTHER QUESTIONNAIRES – used in English Language																											
Derbyshire Davies Costarelli and Dettmar       <b>2008</b>	UK	Habitual patterns of physical activity during pregnancy and postnatally.   <b>Prospective cohort study</b>	94 recruited  3 London Trusts	International Physical Activity Questionnaire ( <b>IPAQ</b> ) after Craig et al., 1993;  MET scoring from Ainsworth et al., 1993. 70 completed at 13 weeks; 58 at 25 weeks, 59 completed at 35 weeks gestation and 54 completed at 6 week postpartum	Metabolic equivalent score (MET) applied to activity categories of IPAQ.  Energy expenditure calculated for leisure, work, and activity in the home and finally total per 24 hours.  Baseline if not 24 hours was used as 1.5 MET Sub divisions (five) of socio-economic class was were used to group participants.	SPSS (two-way ANOVA and Bonferroni tests). First trimester – leisure highest activity as mean value of 1.9 kcal/kg per day; 2nd trimester – work expenditure was greatest as mean value 3.2 kcal/kg per day; 3rd trimester – household activities were highest as mean value 5.2 kcal/kg per day; and after birth as mean value 5.0 kcal/kg per day (lactating 4.5 and non-lactating 6.7). Intensity                      Mins per day <table><tr><td></td><td>VA</td><td>MA</td><td>LA</td></tr><tr><td>T1</td><td>29.8</td><td>63.0</td><td>71.8</td></tr><tr><td>T2</td><td>27.4</td><td>71.1</td><td>65.0</td></tr><tr><td>T3</td><td>18.5</td><td>79.6</td><td>41.0</td></tr><tr><td>P</td><td>11.5</td><td>68.0</td><td>65.0</td></tr></table>		VA	MA	LA	T1	29.8	63.0	71.8	T2	27.4	71.1	65.0	T3	18.5	79.6	41.0	P	11.5	68.0	65.0	Women participate in higher level of vigorous activity in early pregnancy compared to postnatal.  Proximity of leisure facilities may predict type and quality of physical activity (Hammer et al., 2000).Sustainability of PA not related to socio-economic grouping of participants.  MET values not pregnancy specific as detailed elsewhere and thus probably unsuited to trimester 2 and 3 measurements.
	VA	MA	LA																								
T1	29.8	63.0	71.8																								
T2	27.4	71.1	65.0																								
T3	18.5	79.6	41.0																								
P	11.5	68.0	65.0																								
Harrison Thompson Tweede and Lombard       <b>2011</b>	AUSTRALIA	Measuring physical activity during pregnancy.   Subset of <b>RCT</b>   March <b>2009</b> and March <b>2010</b>	(48) 30 completed the study	Between 26 and 28 week gestation. <b>IPAQ</b> Pedometer (Yamax brand) and Accelerometer (Actigraph brand) worn for 5-7 days under ‘free living conditions’.  <b>IPAQ</b> and pedometer estimates were compared with accelerometer data	Non specific	18 excluded – failure to wear, incomplete data.  Accelerometer = pedometer for estimation of daily steps (p=0.69, p<0.01) and good absolute agreement with low system error (mean difference: 505 ±1498 steps/day).  Accelerometer and <b>IPAQ</b> for MET equivalents did not correlate well.	Pedometer in this setting offered reliable comparative estimate of physical activity to accelerometer.  However non-compliance was 39% likely to be significant. Subjective IPAQ less accurate in this instance.  Recommend activity measures should in future include clear objective measures.																				









## Appendix 7: Pregnancy Physical Activity Questionnaire (PPAQ)

WELLBEING DURING PREGNANCY	
 	<b>University Hospital Southampton</b>  NHS Foundation Trust Centre Number: 001 Study Number: IRAS project 139478 Participant Identification Number for this trial: _____

**Title of Project:** An exploration of women's experiences of wellbeing through attendance at aquanatal exercise, and the impact of peer support during pregnancy

**Name of Researcher:** Liz Davey

### Pregnancy Physical Activity Questionnaire

It is very important you tell us about yourself honestly. There are no right or wrong answers. We just want to know about the things you are doing during this 3 month period of your pregnancy.

1. Today's date:   /   /
2. What was the first day of your last period?   /   /
3. When is your baby due?   /   /

<i><b>During this 3 months, when you are NOT at work, how much time do you usually spend:</b></i>	
4. Preparing meals (cook, set tables, wash dishes) <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	5. Dressing, bathing, feeding children while you are sitting <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day
6. Dressing, bathing, feeding children <u>while you are standing</u> <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day	7. Playing with children while you are <u>sitting or standing</u> <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day

PPAQ (V1)

Adapted from: MRC Pregnancy Physical Activity Data Collection Questionnaires. [Last Accessed 25 April 2014]. Acknowledgement to Chasen-Taber, L., et al, 2004, Development and Validation of a Pregnancy Physical Activity Questionnaire. Medicine and Science in Sports and Exercise. p1750-1760.

## WELLBEING DURING PREGNANCY

<input type="checkbox"/> 3 or more hours per day 8. Playing with children while you are <u>walking or running</u> <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	<input type="checkbox"/> 3 or more hours per day 9. Carrying children <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day
10. Taking care of an older adult <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	11. Sitting and using a computer or writing, while <u>not</u> at work <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day
12. Watching TV or a DVD <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	13. Sitting and reading, talking, or on the phone, while <u>not</u> at work <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day
14. Playing with pets <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	15. Light cleaning (make beds, laundry, iron, put things away) <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day

PPAQ (V1)

Adapted from: MRC Pregnancy Physical Activity Data Collection Questionnaires. [Last Accessed 25 April 2014]. Acknowledgement to Chasen-Taber, L., et al, 2004, Development and Validation of a Pregnancy Physical Activity Questionnaire. Medicine and Science in Sports and Exercise. p1750-1760.

## WELLBEING DURING PREGNANCY

16. Shopping (for food, clothes, or other items) <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	17. Heavier cleaning (vacuum, mop, sweep, wash windows) <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day
18. Mowing lawn while on a riding mower <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	19. Mowing lawn using a walking mower, raking, gardening <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day
<b>Going Places...</b>	
20. Walking <u>slowly</u> to go places (such as to the bus, work, visiting) NOT for fun or exercises <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	21. Walking <u>quickly</u> to go places (such as to the bus, work, visiting) NOT for fun or exercises <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day
22. Driving or riding in a car, train or bus <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	

PPAQ (V1)

Adapted from: MRC Pregnancy Physical Activity Data Collection Questionnaires. [Last Accessed 25 April 2014]. Acknowledgement to Chasen-Taber, L., et al, 2004, Development and Validation of a Pregnancy Physical Activity Questionnaire. Medicine and Science in Sports and Exercise. p1750-1760.

## WELLBEING DURING PREGNANCY

<b>For Fun or Exercise...</b>	
23. Walking <u>slowly</u> for fun or exercise <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	24. Walking <u>more quickly</u> for fun or exercise <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day
25. Walking <u>quickly up hills</u> for fun or exercise <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	
<b>During the past 3 months, how much time have you spent:</b>	
26. Jogging <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	27. Prenatal exercise class <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day
28. Swimming <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	29. Dancing <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day

PPAQ (V1)

Adapted from: MRC Pregnancy Physical Activity Data Collection Questionnaires. [Last Accessed 25 April 2014]. Acknowledgement to Chasen-Taber, L., et al, 2004, Development and Validation of a Pregnancy Physical Activity Questionnaire. Medicine and Science in Sports and Exercise. p1750-1760.

<b>Doing other things for fun or exercise? Please tell us what they are</b>	
30. Name of Activity _____ <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	31. Name of Activity _____ <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day
<p>Please fill out the next section if you work for wages, as a volunteer, or if you are a student. If you are a homemaker, out of work, or unable to work, you do not need to complete this last section.</p> <p style="text-align: center;"><b>At Work...</b></p> <p style="text-align: center;">During this 3 months, how much time do you usually spend:</p>	
32. Sitting at work or in class <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	33. Standing or slowly walking at work while carrying things (heavier than a 4 litre milk carton) <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day
34. Standing or <u>slowly</u> walking at work <u>not</u> carrying anything <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day	35. Walking <u>quickly</u> at work while <u>carrying</u> things (heavier than a 4 litre milk carton) <input type="checkbox"/> None <input type="checkbox"/> Less than ½ hour per day <input type="checkbox"/> ½ to almost 1 hour per day <input type="checkbox"/> 1 to almost 2 hours per day <input type="checkbox"/> 2 to almost 3 hours per day <input type="checkbox"/> 3 or more hours per day

PPAQ (V1)

Adapted from: MRC Pregnancy Physical Activity Data Collection Questionnaires. [Last Accessed 25 April 2014]. Acknowledgement to Chasen-Taber, L., et al, 2004, Development and Validation of a Pregnancy Physical Activity Questionnaire. Medicine and Science in Sports and Exercise. p1750-1760.

# WELLBEING DURING PREGNANCY

<p>36. Walking <u>quickly</u> at work <u>not</u> carrying anything</p> <p><input type="checkbox"/> None</p> <p><input type="checkbox"/> Less than ½ hour per day</p> <p><input type="checkbox"/> ½ to almost 1 hour per day</p> <p><input type="checkbox"/> 1 to almost 2 hours per day</p> <p><input type="checkbox"/> 2 to almost 3 hours per day</p> <p><input type="checkbox"/> 3 or more hours per day</p>	
<i>Thank You</i>	

**Thank you for taking the time to complete this questionnaire**  
**Please use the this page for comments or additional information**

All information will be treated in confidence  
 Please return to Liz Davey in the envelope provided, at the focus group meeting.

PPAQ (V1)

Adapted from: MRC Pregnancy Physical Activity Data Collection Questionnaires. [Last Accessed 25 April 2014]. Acknowledgement to Chasen-Taber , L., et al, 2004, Development and Validation of a Pregnancy Physical Activity Questionnaire. Medicine and Science in Sports and Exercise. p1750-1760.



## Appendix 8: Table of PPAQ MET values for PPAQ questions 4-36.

During this 3 months, when you are NOT at work, how much time do you usually spend:	Average weekly energy expenditure (MET ·h:week <sup>-1</sup> )				
4. Preparing meals (cook, set tables, wash dishes)	Values x7	MET 2.5	5. Dressing, bathing, feeding children while you are sitting	Values x7	MET 2.0
None	0	0	None	0	0
Less than ½ hour per day	0.25	4.375	Less than ½ hour per day	0.25	3.5
½ to almost 1 hour per day	0.75	13.125	½ to almost 1 hour per day	0.75	10.5
1 to almost 2 hours per day	1.5	26.25	1 to almost 2 hours per day	1.5	21
2 to almost 3 hours per day	2.5	43.75	2 to almost 3 hours per day	2.5	35
3 or more hours per day	3	52.5	3 or more hours per day	3	42
6. Dressing, bathing, feeding children while you are standing	Values x7	MET 3.0	7. Playing with children while you are sitting or standing	Values x7	MET 2.7
None	0	0	None	0	0
Less than ½ hour per day	0.25	5.25	Less than ½ hour per day	0.25	4.725
½ to almost 1 hour per day	0.75	15.75	½ to almost 1 hour per day	0.75	14.175
1 to almost 2 hours per day	1.5	31.5	1 to almost 2 hours per day	1.5	28.35
2 to almost 3 hours per day	2.5	52.5	2 to almost 3 hours per day	2.5	47.25
3 or more hours per day	3	63	3 or more hours per day	3	56.7
8. Playing with children while you are walking or running	Values x7	MET 4.0	9. Carrying children	Values x7	MET 3.0
None	0	0	None	0	0
Less than ½ hour per day	0.25	7	Less than ½ hour per day	0.25	5.25
½ to almost 1 hour per day	0.75	21	½ to almost 1 hour per day	0.75	15.75
1 to almost 2 hours per day	1.5	42	1 to almost 2 hours per day	1.5	31.5

2 to almost 3 hours per day	2.5	70	2 to almost 3 hours per day	2.5	52.5
3 or more hours per day	3	84	3 or more hours per day	3	63
10. Taking care of an older adult	Values x7	MET 4.0	11. Sitting and using a computer or writing, while not at work	Values x7	MET 1.8
None	0	0	None	0	0
Less than ½ hour per day	0.25	7	Less than ½ hour per day	0.25	3.15
½ to almost 1 hour per day	0.75	21	½ to almost 1 hour per day	0.75	9.45
1 to almost 2 hours per day	1.5	42	1 to almost 2 hours per day	1.5	18.9
2 to almost 3 hours per day	2.5	70	2 to almost 3 hours per day	2.5	31.5
3 or more hours per day	3	84	3 or more hours per day	3	37.8
12. Watching TV or a DVD	Values x7	MET 1.0	13. Sitting and reading, talking, or on the phone, while not at work	Values x7	MET 1.1
None	0	0	None	0	0
Less than ½ hour per day	0.25	1.75	Less than ½ hour per day	0.25	1.925
½ to almost 1 hour per day	1.25	8.75	½ to almost 1 hour per day	1.25	9.625
1 to almost 2 hours per day	3	21	1 to almost 2 hours per day	3	23.1
2 to almost 3 hours per day	5	35	2 to almost 3 hours per day	5	38.5
3 or more hours per day	6	42	3 or more hours per day	6	46.2
14. Playing with pets	Values x7	MET 3.2	15. Light cleaning (make beds, laundry, iron, put things away)	Values x7	MET 2.3
None	0	0	None	0	0
Less than ½ hour per day	0.25	5.6	Less than ½ hour per day	0.25	4.025
½ to almost 1 hour per day	0.75	16.8	½ to almost 1 hour per day	0.75	12.075
1 to almost 2 hours per day	1.5	33.6	1 to almost 2 hours per day	1.5	24.15
2 to almost 3 hours per day	2.5	56	2 to almost 3 hours per day	2.5	40.25
3 or more hours per day	3	67.2	3 or more hours per day	3	48.3
16. Shopping (for food, clothes, or other items)	Values x7	MET 2.3	17. Heavier cleaning (vacuum, mop, sweep, wash windows)	Values x7	MET 2.8

None	0	0	None	0	0
Less than ½ hour per day	0.25	4.025	Less than ½ hour per day	0.25	4.9
½ to almost 1 hour per day	0.75	12.075	½ to almost 1 hour per day	0.75	14.7
1 to almost 2 hours per day	1.5	24.15	1 to almost 2 hours per day	1.5	29.4
2 to almost 3 hours per day	2.5	40.25	2 to almost 3 hours per day	2.5	49
3 or more hours per day	3	48.3	3 or more hours per day	3	58.8
18. Mowing lawn while on a riding mower	Values x7	MET 2.8	19. Mowing lawn using a walking mower, raking, gardening	Values x7	MET 4.4
None	0	0	None	0	0
Less than ½ hour per day	0.25	4.9	Less than ½ hour per day	0.25	7.7
½ to almost 1 hour per day	0.75	14.7	½ to almost 1 hour per day	0.75	23.1
1 to almost 2 hours per day	1.5	29.4	1 to almost 2 hours per day	1.5	46.2
2 to almost 3 hours per day	2.5	49	2 to almost 3 hours per day	2.5	77
3 or more hours per day	3	58.8	3 or more hours per day	3	92.4
<b>Going Places...</b>					
20. Walking slowly to go places (such as to the bus, work, visiting) NOT for fun or exercises	Values x7	MET 2.5	21. Walking quickly to go places (such as to the bus, work, visiting) NOT for fun or exercises	Values x7	MET 4.0
None	0	0	None	0	0
Less than ½ hour per day	0.25	4.375	Less than ½ hour per day	0.25	7
½ to almost 1 hour per day	0.75	13.125	½ to almost 1 hour per day	0.75	21
1 to almost 2 hours per day	1.5	26.25	1 to almost 2 hours per day	1.5	42
2 to almost 3 hours per day	2.5	43.75	2 to almost 3 hours per day	2.5	70
3 or more hours per day	3	52.5	3 or more hours per day	3	84
22. Driving or riding in a car, train or bus	Values x7	MET 1.5			
None	0	0			
Less than ½ hour per day	0.25	2.625			
½ to almost 1 hour per day	0.75	7.875			

1 to almost 2 hours per day	1.5	15.75			
2 to almost 3 hours per day	2.5	26.25			
3 or more hours per day	3	31.5			
<b>For Fun or Exercise...</b>					
23. Walking slowly for fun or exercise	Values x7	MET 3.2	24. Walking more quickly for fun or exercise	Values x7	MET 4.6
None	0	0	None	0	0
Less than ½ hour per day	0.25	5.6	Less than ½ hour per day	0.25	8.05
½ to almost 1 hour per day	0.75	16.8	½ to almost 1 hour per day	0.75	24.15
1 to almost 2 hours per day	1.5	33.6	1 to almost 2 hours per day	1.5	48.3
2 to almost 3 hours per day	2.5	56	2 to almost 3 hours per day	2.5	80.5
3 or more hours per day	3	67.2	3 or more hours per day	3	96.6
25. Walking quickly up hills for fun or exercise	Values x7	MET 6.5			
None	0	0			
Less than ½ hour per day	0.25	11.375			
½ to almost 1 hour per day	0.75	34.125			
1 to almost 2 hours per day	1.5	68.25			
2 to almost 3 hours per day	2.5	113.75			
3 or more hours per day	3	136.5			
<b>During the past 3 months, how much time have you spent:</b>					
26. Jogging	Values x7	MET 7.0	27. Prenatal exercise class	Values x7	MET 3.5
None	0	0	None	0	0
Less than ½ hour per day	0.25	12.25	Less than ½ hour per day	0.25	6.125
½ to almost 1 hour per day	0.75	36.75	½ to almost 1 hour per day	0.75	18.375
1 to almost 2 hours per day	1.5	73.5	1 to almost 2 hours per day	1.5	36.75
2 to almost 3 hours per day	2.5	122.5	2 to almost 3 hours per day	2.5	61.25

3 or more hours per day	3	147	3 or more hours per day	3	73.5
28. Swimming	Values x7	MET 6.0	29. Dancing	Values x7	MET 4.5
None	0	0	None	0	0
Less than ½ hour per day	0.25	10.5	Less than ½ hour per day	0.25	7.875
½ to almost 1 hour per day	0.75	31.5	½ to almost 1 hour per day	0.75	23.625
1 to almost 2 hours per day	1.5	63	1 to almost 2 hours per day	1.5	47.25
2 to almost 3 hours per day	2.5	105	2 to almost 3 hours per day	2.5	78.75
3 or more hours per day	3	126	3 or more hours per day	3	94.5
<b>Doing other things for fun or exercise? Please tell us what they are</b>	Values x7	MET CHECK		Values x7	MET CHECK
30. Name of Activity _____			31. Name of Activity _____		
None	0		None	0	
Less than ½ hour per day	0.25		Less than ½ hour per day	0.25	
½ to almost 1 hour per day	0.75		½ to almost 1 hour per day	0.75	
1 to almost 2 hours per day	1.5		1 to almost 2 hours per day	1.5	
2 to almost 3 hours per day	2.5		2 to almost 3 hours per day	2.5	
3 or more hours per day	3		3 or more hours per day	3	
<b>Please fill out the next section if you work for wages, as a volunteer, or if you are a student. If you are a homemaker, out of work, or unable to work, you do not need to complete this last section.</b>					
<b>At Work...</b>					
During this 3 months, how much time do you usually spend:					
32. Sitting at work or in class	Values x7	MET 1.6	33. Standing or slowly walking at work while carrying things (heavier than a 4 litre milk carton)	Values x7	MET 3.0
None	0	0	None	0	0

Less than ½ hour per day	0.25	2.8	Less than ½ hour per day	0.25	5.25
½ to almost 1 hour per day	1.25	14	½ to almost 1 hour per day	1.25	26.25
1 to almost 2 hours per day	3	33.6	1 to almost 2 hours per day	3	63
2 to almost 3 hours per day	5	56	2 to almost 3 hours per day	5	105
3 or more hours per day	6	67.2	3 or more hours per day	6	126
34. Standing or slowly walking at work not carrying anything	Values x7	MET 2.2	35. Walking quickly at work while carrying things (heavier than a 4 litre milk carton)	Values x7	MET 4.0
None	0	0	None	0	0
Less than ½ hour per day	0.25	3.85	Less than ½ hour per day	0.25	7
½ to almost 1 hour per day	1.25	19.25	½ to almost 1 hour per day	1.25	35
1 to almost 2 hours per day	3	46.2	1 to almost 2 hours per day	3	84
2 to almost 3 hours per day	5	77	2 to almost 3 hours per day	5	140
3 or more hours per day	6	92.4	3 or more hours per day	6	168
36. Walking quickly at work not carrying anything	Values x7	MET 3.3			
None	0	0			
Less than ½ hour per day	0.25	5.775			
½ to almost 1 hour per day	1.25	28.875			
1 to almost 2 hours per day	3	69.3			
2 to almost 3 hours per day	5	115.5			
3 or more hours per day	6	138.6			

(After Chasen-Taber et al. 2004b)

## Appendix 9: NHS Research Ethics Committee Permission



### Health Research Authority

South Central - Hampshire B Research Ethics Committee

Level 3 Block B  
Whitefriars  
Lewins Mead  
Bristol  
BS1 2NT

Telephone: 0117 342 1384

05 January 2016

Miss Elizabeth C Davey  
Senior Lecturer in Midwifery

Dear Miss Davey

**Study title:** An exploration of women's experiences of wellbeing and peer support during pregnancy, through attendance at midwife-led aquanatal exercise classes.  
**REC reference:** 15/SC/0486  
**Protocol number:** N/A  
**IRAS project ID:** 139478

Thank you for your letter of 04/01/2016. I can confirm the REC has received the documents listed below and that these comply with the approval conditions detailed in our letter dated 16 November 2015.

#### Documents received

The documents received were as follows:

Document	Version	Date
Letters of invitation to participant [Letter Aqua attendees]	Version 5	17 November 2015
Other [REC review 16-11-15]	Version 1	16 November 2015
Participant information sheet (PIS) [PIS Aqua attendees]	Version 5	17 November 2015

A Research Ethics Committee established by the Health Research Authority

## Approved documents

The final list of approved documentation for the study is therefore as follows:

Document	Version	Date
Covering letter on headed paper [Covering letter]	Version 3	19 October 2015
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [BU Liability Insurance]		20 July 2015
Interview schedules or topic guides for participants [Semi-structured Interview Guide]	Version 3	25 June 2015
Letter from sponsor [BU Sponsorship Letter]	Version 1	22 January 2015
Letters of invitation to participant [Letter Aqua attendees]	Version 5	17 November 2015
Non-validated questionnaire [Initial Questionnaire Aqua attendees]	Version 4	13 October 2015
Other [SusanWayCV]	Version 1	01 December 2014
Other [NIHR GCP Certificate]	Version 1	12 January 2015
Other [Permission letter - VL]	Version 1	22 January 2015
Other [REC review 29-4-15]	Version 1	08 May 2015
Other [Professional Indemnity Insurance]	Version 2	20 July 2015
Other [REC review 30-09-15]	Version 1	09 October 2015
Other [REC review 16-11-15]	Version 1	16 November 2015
Participant consent form [Consent Form]	Version 4	13 October 2015
Participant information sheet (PIS) [PIS Aqua attendees]	Version 5	17 November 2015
REC Application Form [REC_Form_21072015]		21 July 2015
Research protocol or project proposal [Research Proposal]	Version 5	21 October 2015
Summary CV for Chief Investigator (CI) [EDaveyCV]	Version 1	
Summary CV for supervisor (student research) [LAFengeCV]	Version 1	28 November 2014
Validated questionnaire [PPAQ]	Version 2	22 May 2015

You should ensure that the sponsor has a copy of the final documentation for the study. It is the sponsor's responsibility to ensure that the documentation is made available to R&D offices at all participating sites.

15/SC/0486	Please quote this number on all correspondence
------------	--

Yours sincerely



**Mrs Siobhan Bawn**  
REC Manager

E-mail: [nrescommittee.southcentral-hampshireb@nhs.net](mailto:nrescommittee.southcentral-hampshireb@nhs.net)

Copy to: Ms Julie Northam  
Ms Sharon Atwill



## Appendix 10: Research and Development Permissions

### University Hospital Southampton NHS Foundation Trust



Please reply to: Research and Development  
SGH - Level E, Laboratory & Pathology  
Block, SCBR - MP 138  
Southampton University Hospitals NHS

Telephone: 023 8120 5078  
Fax: 023 8120 8678  
E-mail: sharon.davies-dear@uhs.nhs.uk

Miss Elizabeth C Davey  
Bournemouth University, School of Health and Social Care

07 January 2016

Dear Miss Davey

**ID: RHM O&G0231    An exploration of women's experiences of wellbeing through attendance at aquanatal exercise, and the impact of peer support pregnancy**

#### EudraCT:

Thank you for submitting all the required documentation for Trust R&D approval. I write to inform you that your study has full UHS R&D approval. Please find attached the Conditions of Trust R&D approval which you are obliged to adhere to.

Please note that according to the 70 day benchmark you should aim to recruit your first patient by 1 March 2016.

You are required to keep copies of all your essential documents relating to this study. Please download a copy of the relevant Investigator Site File template from the R&D website:  
<http://www.uhs.nhs.uk/Research/For-investigators/Sitefile.aspx>.

Your project is subject to R&D monitoring and you will be contacted by our office to arrange this.

Please note: A condition of approval is that any changes need to be timeously notified to the R&D office. This includes providing copies of:

- . All NRES substantial amendments and favourable opinions;
- . All Serious Adverse Events (SAEs);
- . NRES Annual Progress Reports;
- . Annual MHRA Safety Reports;
- . NRES End of Study Declaration;
- . Notifications of significant breaches of GCP or protocol

Please quote the above RHM No. On any correspondence with our office.

Should you, or any of your team, require training in any of the policies and procedures required to ensure compliance with the conditions of approval, please refer to the R&D Training website <http://www.uhs.nhs.uk/Research/For-investigators/Mandatory-training-governance-and-safety-management/Mandatory-training-governance-and-safety-management.aspx> for an up-to-date calendar of training events.

Yours sincerely

Sharon Davies-Dear

**Research Governance Officer**

Research Department  
Rm 32, The Lyford Unit, F floor  
Basingstoke and North Hampshire Hospital  
Aldermaston Road  
Basingstoke  
Hampshire  
RG24 9NA  
Tel : 01256 312783  
Fax: 01256 312770

[research.team@hhft.nhs.uk](mailto:research.team@hhft.nhs.uk)

28<sup>th</sup> January 2016

Miss Elizabeth Davey  
Bournemouth University  
Faculty of Health and Social Sciences

Dear Miss Davey

Re: **Final HHFT Research Department Approval Confirmation**

Title: **Aquanatal exercise classes - An exploration of women's experiences of wellbeing and peer support during pregnancy, through attendance at midwife-led aquanatal exercise classes.**

R & D Ref. No: **2015-STU-09**

Ethics Ref. No: **15/SC/0486**

Thank you for completing the R&D Approval procedure for the above study. This letter confirms that this research proposal has approval to commence at Hampshire Hospitals NHS Foundation Trust.

The conditions of this trust approval require you as Student Investigator to ensure the following:

- You have returned a signed '**Student Investigator Agreement**' outlining your responsibilities in the conduct of this research study before you commence.
- You and your research staff are required to be aware of and adhere to responsibilities, as detailed in the protocol and Clinical Trial Agreement, as well as comply in full with ICH / Good Clinical Practice, UK Law, DH Research Governance Framework (2005), Data Protection Act (1998), Freedom of Information Act (2000) and current EU Legislation – please see the references listed below.
- All serious adverse events should be reported to the Sponsor in accordance with the protocol and copied to R&D within 7 days of becoming aware of the event. The Trust Incident Reporting System should also be used if applicable.
- All recruitment to this study must be recorded on E-DGE, a web-based Clinical Research Management System. Please contact R&D for registration details.
- All research team members involved in the study have attended Good Clinical Practice (GCP) training within the last 2 years.

Please note that this Trust approval only applies to the versions of documents listed below. Any changes to the protocol can only be initiated following further approval from the Ethics Committee via a protocol amendment. The Research Department must also be notified of any changes to the study or the documents below.

Document Versions at Approval		
Document	Version	Date
REC Favourable Opinion		05 Jan 2016
REC Favourable Opinion with conditions		16 Nov 2015
Covering letter on headed paper [Covering letter]	3.0	19 Oct 2015
Evidence of sponsor insurance or indemnity (Non NHS Sponsors only) [BU Liability Insurance]	1.0	01 Aug 2014
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [BU Liability insurance]		20 Jul 2015
Interview schedules or topic guides for participants [ Semi-structured interview Guide]	3.0	25 Jun 2015
Letter from sponsor [BU Sponsorship letter]	1.0	22 Jan 2015
Letter of Invitation to participant [Letter Aqua attendees]	5.0	17 Nov 2015
Non-validated questionnaire [Initial Questionnaire Aqua attendees]	4.0	13 Oct 2015
Other [Susan Way CV]	1.0	01 Dec 2014
Other [NIHR GCP Certificate]	1.0	12 Jan 2015
Other [Permission Letter – VL]	1.0	22 Jan 2015
Other [REC review 29-4-15]	1.0	08 May 2015
Other [Professional Indemnity Insurance]	2.0	20 Jul 2015
Other [REC review 30-09-15]	1.0	09 Oct 2015
Other [REC review 16-11-15]	1.0	16 Nov 2015
Participant Consent form [Consent Form]	4.0	13 Oct 2015
Participant information sheet (PIS) [PIS Aqua attendees]	4.0	13 Oct 2015
REC Application Form [REC Form 21072015]		21 Jul 2015
Research protocol or Project proposal [Research proposal]	5.0	21 Oct 2015
Summary CV for Chief Investigator (CI) [Elizabeth Davey CV]	1.0	
Summary CV for supervisor (student research) [LAFengeCV]	1.0	28 Nov 2014
Validated questionnaire [PPAQ]	2.0	22 May 2015

I am enclosing two Student Investigator Agreements which detail your responsibilities and would be grateful if you would return one signed Student Investigator Agreement to the research office at the above address as soon as possible and before commencing the study. The 2<sup>nd</sup> copy should be kept with your Trust Approval letter in your Investigator Site File.

This approval is subject to full ethical for the study to commence within Hampshire Hospitals NHS Foundation Trust.

Please contact the research team at the address above if you require further information.

On behalf of the Trust I wish you every success with the study.

Yours sincerely,



Dr John K Ramage  
Director of Research and Development

#### **References**

Research governance framework for health and social care 2<sup>nd</sup> edition 2005  
[www.dh.gov.uk/assetRoot/04/12/24/27/04122427.pdf](http://www.dh.gov.uk/assetRoot/04/12/24/27/04122427.pdf)

For Clinical Trial Regulations:-  
Medicines & Healthcare products Regulatory Authority – [www.mhra.gov.uk/index.htm](http://www.mhra.gov.uk/index.htm)

Data Protection Act - [www.opsi.gov.uk/Acts/Acts1998/ukpga\\_19980029\\_en\\_1](http://www.opsi.gov.uk/Acts/Acts1998/ukpga_19980029_en_1)

Freedom of Information Act - [http://www.opsi.gov.uk/Acts/acts2000/ukpga\\_20000036\\_en\\_1](http://www.opsi.gov.uk/Acts/acts2000/ukpga_20000036_en_1)

Mental Capacity Act - [www.opsi.gov.uk/acts/acts2005/ukpga\\_20050009\\_en\\_1](http://www.opsi.gov.uk/acts/acts2005/ukpga_20050009_en_1)

Human Tissue Act:- [www.hta.gov.uk/](http://www.hta.gov.uk/)

## Appendix 11: Field Notes Template for Weekly Class

Date	
Activity	
Number of Participants	
Length of observation	
<p>Summary description of group events e.g. participation, discussion threads including specific words, phrases, summaries of conversations, and insider language, keeping focus, specific difficulties for participants, facilitator issues, and environment issues including sensory impressions: sights, sounds, textures, smells, taste etc.</p>	
<p>Observation Narrative</p> <p>Wellbeing</p> <p>(Peer) support</p> <p>Physical activity</p> <p>Attending Aquanatal</p>	
<p>Questions raised from group discussion</p>	
<p>Things to follow up before next group</p>	
<p>Discussion with supervisors</p>	

## Appendix 12: Sponsorship



22<sup>nd</sup> January 2015

To: IRAS

Project Title: An exploration of women's experiences of wellbeing through attendance at aquanatal exercise, and the impact of peer support during pregnancy


As Project Sponsor I agree to ensure:

- The research proposal respects the dignity, rights, safety and well-being of participants and the relationship with care professionals
- The research proposal is worthwhile and of high scientific quality
- Arrangements proposed for the work are consistent with the Department of Health Research Governance Framework (RGF)
- We will endeavour to ensure that organisations and individuals involved in the research have or will all agree the division of responsibilities between them
- There will be a clear written agreement identifying the organisation responsible for the ongoing management and monitoring of the project.

Name: Professor B Gail Thomas

Role: Dean of Health and Social Sciences

Organisation: Bournemouth University

Signature...  ..... Date 21.1.2015

Yours sincerely,

BOURNEMOUTH UNIVERSITY

## Appendix 13: Gatekeeper Permission



Valley Leisure Limited  
West Street  
Andover  
Hants  
SP10 1QP  
01264 347100  
[www.valleyleisure.com](http://www.valleyleisure.com)

Ms L Davey

22<sup>nd</sup> January 2015

Dear Ms Davey,

Thank you for your letter and supporting information in relation to your Professional Doctorate.

Valley Leisure would be delighted to support your research and I can confirm our permission for you to carry out the research as outlined.

I would be grateful if you could share any of the results of your research with us.

Yours sincerely,

  
Kevin Paterson  
Chief Executive  
01264 347111  
[kpateron@valleyleisure.com](mailto:kpateron@valleyleisure.com)

Registered address: Wilsons (Company Secretaries) Ltd, Alexandra House, St Johns Street, Salisbury, Wiltshire, SP1 2SB.  
Co. Registration No. 2188010 Registered in England and Wales. Registered as a Charity No. 800760.

## Appendix 14: Invitation Letter

WELLBEING DURING PREGNANCY

University Hospital Southampton   
NHS Foundation Trust



### Study title:

An exploration of women's experience of wellbeing and peer support during pregnancy, through attendance at midwife-led aquanatal exercise classes.

### Invitation Letter

Dear Mother-to-be,

You are being invited to take part in an educational research project. Before you decide if you want to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

### What is the purpose of the project?

During pregnancy women may attend various forms of physical activity. This study seeks to discover why women attend aquanatal classes and what this activity means to the experience of being well and healthy during pregnancy. Women attending the aquanatal class at Romsey Rapids Sports Complex (Leisure Centre) during 2016 are being invited to take part in this study.

Should you decide to take part, this invitation letter gives some detail about the study and is for you to keep. If you decide to take part you can still withdraw at any time without it affecting your continued attendance at aquanatal or your maternity care. You do not have to give a reason if you decline to take part or wish to withdraw.

### What would taking part involve?

On your first attendance at the Leisure Centre you will be asked to complete a short health questionnaire before starting the aquanatal class. At each class you attend, you will be asked if there are any changes to your health or pregnancy since your previous attendance.

As part of the study you will be asked to complete a short questionnaire about you, your pregnancy, any medical history and recent participation in physical activities. You will then be asked to participate in three focus groups of no more than six participants at the Leisure Centre at three monthly intervals, with other women at a similar stage of pregnancy. The focus groups will be tape-recorded and last 30-60 minutes. The questions will ask about your experience of being part of the aquanatal group. The information you provide will give an insight into why women decide to come to aquanatal classes and what women see are the benefits from attending.

The researcher will ask if your named midwife can be contacted prior to each focus group and at approximately one month after the birth to ask about your health and any adverse events. The final postnatal focus group will be arranged for approximately three months after your baby's birth and held at the Leisure Centre.



**Will I be recorded, and how will the recorded media be used?**

There will be audio recordings of the group which will only be used for reporting this study. No other use will be made of them without your written permission, and only the researcher and research supervisors will be able to access the original recordings during the study.

**What are the possible benefits of taking part?**

Whilst there are no immediate benefits for you participating in the project, it is hoped that this work will provide information on the specific nature of social and professional support through attending an activity based group during pregnancy. This information may then be used to inform future service provision within community settings. The results of the research may not benefit you personally but may help to improve care for pregnant women in the future.

**What are the possible disadvantages and risks of taking part?**

There are no specific risks and we cannot see any disadvantages to taking part in this research. Focus groups will be conducted in a confidential space. Focus groups will be led by the researcher who is a practising midwife. Women who may require additional support will be directed to their midwife, GP or Health Visitor.

**Will my taking part in this project be kept confidential? What will happen to the results of the research project?**

All the information that is collected about you during the course of the research will be kept strictly confidential. You will not be able to be identified in any reports or publications as information will be anonymised. A summary of the findings will be made available to women who take part. The final report will be submitted for a research award by the researcher taking account of confidentiality of all women who participate.

**Who is organising/funding the research?**

The research is being conducted as part of a professional doctorate programme at Bournemouth University, but is not otherwise funded. The study has been reviewed by two experienced researchers within the University and will continue to be scrutinised by two research supervisors throughout.

**Who will I contact if I have any concerns or complaints?**

This study is being supervised by senior researchers at the university. Details of the researcher and research supervisor, the research sponsor representative and the Leisure Centre site representative can be found at the end of this information.

Concerns or complaints should be made in writing to the research sponsor (Julie Northam).

**You will be provided a copy of this information sheet and a copy of the consent form signed by you.**

**I would like to thank you for taking the time to read this information and considering participating in this study. If you are interested in participating in this research study, then please complete the attached Reply Slip and return it to Liz Davey in the envelope provided.**

Participant Information (17 Nov 2015 V5)

**Contacts for further information:**

**Researcher:** Liz Davey, Senior Lecturer in Midwifery, Bournemouth University  
Tel: 01202 961545 or E-mail: [ldavey@bournemouth.ac.uk](mailto:ldavey@bournemouth.ac.uk)

**Supervisor:** Dr Susan Way, Lead Midwife for Education, Bournemouth University.  
Tel: 01202 961821 or E-mail: [sueway@bournemouth.ac.uk](mailto:sueway@bournemouth.ac.uk)

**Leisure Centre Representative:** Liz Murray, Community Participation Manager, Valley Leisure Ltd, Romsey  
Rapids Sports Complex, Southampton Rd, Romsey, Hampshire.  
Tel: 01264 347113 or E-mail: [lmurray@valleyleisure.com](mailto:lmurray@valleyleisure.com)

**Contact if you have concerns or complaints about the research:**

**Research Sponsor:** Julie Northam  
Head of Research and Knowledge Exchange Bournemouth University, Bournemouth, Dorset.  
Tel: 01202 961208 or E-mail: [jnortham@bournemouth.ac.uk](mailto:jnortham@bournemouth.ac.uk)

---

✂ Cut/Tear Here

Reply form:

**Researcher:** Liz Davey, Senior Lecturer in Midwifery, Bournemouth University. Tel: 01202 961545 or  
E-mail: [ldavey@bournemouth.ac.uk](mailto:ldavey@bournemouth.ac.uk)

**Study title**

An exploration of women's experience of wellbeing and peer support during pregnancy, through attendance at midwife-led aquanatal exercise classes.

I am/am not (please indicate your choice) interested in discussing the research study in more detail.

Signed..... Date.....

Contact preference: Phone.....

E-mail.....


Postal address.....

.....

.....

Please place in the envelope provided and return to Liz Davey. Thank you.

## Appendix 15: Participant Information Sheet

<b>WELLBEING DURING PREGNANCY</b>	
<b>University Hospital Southampton</b>  <small>NHS Foundation Trust</small>	
 	<b>Study title:</b> An exploration of women's experience of wellbeing and peer support during pregnancy, through attendance at midwife-led aquanatal exercise classes.

### Participant Information Sheet

**Dear Mother-to-be,**

You are being invited to take part in an educational research project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

#### What is the purpose of the project?

During pregnancy women may attend various forms of physical activity. This study seeks to discover why women attend aquanatal classes and what this activity means to the experience of being well and healthy during pregnancy. Women attending the aquanatal class at Romsey Rapids Sports Complex (Leisure Centre) during 2016 are being invited to take part in this study.

Should you decide to take part, this information sheet gives some detail about the study and is for you to keep. If you decide to take part you can still withdraw at any time without it affecting your continued attendance at aquanatal or your maternity care. You do not have to give a reason if you decline to take part or wish to withdraw.

#### What would taking part involve?

On your first attendance at the Leisure Centre you will be asked to complete a short health questionnaire before starting the aquanatal class. At each class you attend, you will be asked if there are any changes to your health or pregnancy since your previous attendance.

As part of the study you will be asked to complete a short questionnaire about you, your pregnancy, any medical history and recent participation in physical activities. You will then be asked to participate in three focus groups of no more than six participants at the Leisure Centre at three monthly intervals, with other women at a similar stage of pregnancy. Each focus group will be tape-recorded and last 30-60 minutes. The questions will ask about your experience of being part of the aquanatal group. The information you provide will give an insight into why women decide to come to aquanatal classes and what women see are the benefits from attending.

The researcher will ask if your named midwife may be contacted prior to each focus group and at approximately one month after your due date to ask about your health and any adverse events. You will then be contacted by phone or e-mail to invite you to one further focus group approximately three months after your baby's birth to be held at the Leisure Centre.

Refreshments will be available during the focus groups.

**Will I be recorded, and how will the recorded media be used?**

The audio recordings of your focus group will only be used for reporting this study. No other use will be made of them without your written permission, and only the researcher and research supervisors will be able to access the original recordings during the study.

**What are the possible benefits of taking part?**

Whilst there are no immediate benefits for you participating in the project, it is hoped that this work will provide information on the specific nature of social and professional support through attending an activity based group during pregnancy. This information may then be used to inform future service provision within community settings. The results of the research may not benefit you personally but may help to improve care for pregnant women in the future.

**Do I have to take part?**

You can choose to take part in the study or not. If you choose not to take part, your attendance at the aquanatal class and your maternity care will not be affected.

**What are the possible disadvantages and risks of taking part?**

There are no specific risks and we cannot see any disadvantages to taking part in this research. Focus groups will be conducted in a confidential space. Focus groups will be led by the researcher who is a practicing midwife. Women who may require additional support will be directed to their midwife, GP or Health Visitor.

**Will my taking part in this project be kept confidential? What will happen to the results of the research project?**

All the information that is collected about you during the course of the research will be kept strictly confidential. You will not be able to be identified in any reports or publications as information will be anonymised. A summary of the findings will be made available to women who take part. The final report will be submitted for a research award by the researcher taking account of confidentiality of all women who participate.

**Who is organising/funding the research?**

The research is being conducted as part of a professional doctorate programme at Bournemouth University, but is not otherwise funded. The study has been reviewed by two experienced researchers within the University and will continue to be scrutinised by two research supervisors throughout.

**Who will I contact if I have any concerns or complaints?**

This study is being supervised by senior researchers at the university. Details of the researcher and research supervisor, the research sponsor representative and the Leisure Centre site representative can be found at the end of this information. Concerns or complaints should be made in writing to the research sponsor (Julie Northam). **You will be provided a copy of this information sheet and a copy of the consent form signed by you. I would like to thank you for taking the time to read this information and considering participating in this study.**

**Contacts for further information:**

**Researcher:** Liz Davey, Senior Lecturer in Midwifery, Bournemouth University  
Tel: 01202 961545 or E-mail: [ldavey@bournemouth.ac.uk](mailto:ldavey@bournemouth.ac.uk)

**Supervisor:** Dr Susan Way, Lead Midwife for Education, Bournemouth University.  
Tel: 01202 961821 or E-mail: [sueway@bournemouth.ac.uk](mailto:sueway@bournemouth.ac.uk)

**Leisure Centre Representative:** Liz Murray, Community Participation Manager, Valley Leisure Ltd, Romsey  
Rapids Sports Complex, Southampton Rd, Romsey, Hampshire.  
Tel: 01264 347113 or E-mail: [lmurray@valleyleisure.com](mailto:lmurray@valleyleisure.com)

**Contact if you have concerns or complaints about the research:**

**Research Sponsor:** Julie Northam  
Head of Research and Knowledge Exchange Bournemouth University, Bournemouth, Dorset.  
Tel: 01202 961208 or E-mail: [jnortham@bournemouth.ac.uk](mailto:jnortham@bournemouth.ac.uk)

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## Appendix 16: Consent



University Hospital Southampton   
NHS Foundation Trust

Centre Number: 001

Study Number: IRAS project 139478

Participant Identification Number for this trial: \_\_\_\_\_

### CONSENT FORM

**Title of Project:** An exploration of women's experiences of wellbeing and peer support during pregnancy, through attendance at midwife-led aquanatal exercise classes.

**Name of Researcher:** Liz Davey

Please initial box

1. I confirm that I have read the information sheet dated..... (version.....) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected. ☐
3. I understand that all the focus groups will be audio-recorded. Only the researcher, research supervisors and transcriber will have access to the original recordings during the study. Recordings will be erased/destroyed at the end of the study. ☐
4. I understand that I will be required to respect the confidentiality of all other participants in the focus groups at all times. ☐
5. I understand that the report of the information collected can be accessed by UK NHS bodies for audit purposes. ☐
6. I understand that the information collected about me will be used to support this educational research project, and may be shared anonymously with supervisors during this research and within the research report. All personal and contact details will be destroyed within three months of the study ending. ☐
7. I agree to take part in the above study. ☐

\_\_\_\_\_  
Name of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name of Person  
taking consent

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

When completed: 1 for participant; 1 for researcher site file; 1 (original) to be kept in medical notes. Elizabeth (Liz) Davey (13 Oct 2015; V4)

## Appendix 17: Semi-structured focus group topics

### Overview of the focus groups

*Each participant to choose a pseudonym to aid transcription and maintain anonymity.*

*Restate research focus and confidentiality of discussion in relation to research.*

*Reiterate consent for study for each participant.*

Opening:

Hello and welcome, my name is \_\_\_\_\_, and I will be conducting the focus group with you today.

During the focus group, I would like to discuss the following topics:

- what being well and healthy during this pregnancy means to you,
- what kind of support you require or would like to have during pregnancy,
- the physical activities you are using during this pregnancy and what these physical activities means to your being fit and/or healthy,
- and your experience of attending aquanatal classes.

With these topics in mind:

Can you describe what being well means for you .....

Tell me about any sources of support you have consulted about your pregnancy....

Describe for me your experience of physical activity during this pregnancy...

Tell me about your reasons for continued attendance at the aquanatal class....

Closing:

Thank you for coming and speaking to me today about your experience of wellbeing, physical activity and support during this pregnancy.

Focus Group Questions - Focus Group leader use only.

Main Questions	Additional Questions	Clarification Seeking Questions
<b>Sense of wellbeing</b>		
<p>Can you describe what being well means for you .....</p> <p>Can you describe what being healthy means for you .....</p> <p>Can you describe what being content with life means for you .....</p>	<ul style="list-style-type: none"> <li>• In your opinion, have you noticed any changes in your sense of wellness since pregnancy was confirmed...</li> <li>• Can you explain these changes to your sense of wellness and health...</li> <li>• Have you changed any aspect of your day-to-day life or work to alter your sense of health and wellness...</li> </ul>	<p>Can you expand on this...</p> <p>Can you tell me anything else...</p> <p>Can you give me an example...</p>
<b>Thoughts on (peer) support</b>		
<p>Tell me about any additional sources of support you have consulted about your pregnancy....</p> <p>Tell me about any additional sources of support you would like to have access to during your pregnancy...</p>	<ul style="list-style-type: none"> <li>• Tell me about your experience of these particular support sources during pregnancy...</li> <li>• In your opinion, how and why is/are these support sources significant to you...</li> <li>• Tell me about any contact with another mother-to-be/member of the group other than during antenatal clinical/the aquanatal class....</li> <li>• In your experience has support from other women had an impact on your sense of wellness or health...</li> </ul>	<p>Can you expand on this..</p> <p>Can you tell me anything else...</p> <p>Can you give me an example...</p>
<b>Perception of physical activity during pregnancy</b>		
<p>Describe for me your experience of physical activity during this pregnancy...</p>	<ul style="list-style-type: none"> <li>• Tell me how you may have changed your physical activity type or frequency of activity during this pregnancy...</li> <li>• In your experience has anyone commented on the physical activities you do/have done...</li> <li>• In your opinion have others influenced your thoughts and type of</li> </ul>	<p>Can you expand on this..</p> <p>Can you tell me anything else...</p> <p>Can you give me an example...</p>



	physical activity during this pregnancy...	
Can you tell me about any other exercise classes you currently attend.....	<ul style="list-style-type: none"> <li>• Can you tell me about your experience of general (open-to-all) exercise classes that you have attended during this pregnancy.....</li> <li>• Tell me about your experience of attending activity classes for pregnant women e.g. yoga/pilates/active birth.....</li> </ul>	<p>Can you expand on this..</p> <p>Can you tell me anything else...</p> <p>Can you give me an example...</p>
Tell me about your experience of attending the Leisure Centre during this pregnancy.....	<ul style="list-style-type: none"> <li>• Tell me of your experience about any facilities you have used in the Leisure Centre whilst pregnant.....</li> <li>• Can you tell me about the experience of taking part in physical activities on your feelings of pregnancy health or being well.....</li> </ul>	<p>Can you expand on this..</p> <p>Can you tell me anything else...</p> <p>Can you give me an example...</p>
Tell me about your intentions regarding exercise and/or physical activity after the birth.....	<ul style="list-style-type: none"> <li>• Can you tell me about what physical activities you intend to continue once the baby is born.....</li> </ul>	
<b>Attending aquanatal</b>		
Tell me about your reasons for continued attendance at the aquanatal class....	<ul style="list-style-type: none"> <li>• Tell me about any benefits to your health or feeling of wellness you experience by attending aquanatal exercise...</li> <li>• Tell me about your experience of attending the aquanatal class during pregnancy...</li> <li>• In your experience has attending the aquanatal class affected your sense of pregnancy health ....</li> <li>• In your experience has attending the aquanatal class affected your experience of meeting with other mothers-to-be...</li> <li>• Tell me about your experience of meeting with other mothers-to-be at the aquanatal classes....</li> </ul>	<p>Can you expand on this..</p> <p>Can you tell me anything else...</p> <p>Can you give me an example...</p>

	<ul style="list-style-type: none"> <li>• Tell me about how meeting with other mothers-to-be has made any change to your health or feeling of wellness during this pregnancy.....</li> </ul>	
Tell me about your experience of attending the aquanatal class.....	<ul style="list-style-type: none"> <li>• In your experience what are the benefits to your feelings of being well during pregnancy immediately after the aquanatal class....</li> <li>• Can you explain the how these benefits affect your likelihood (or not) to attend other physical activity classes during the remainder of this pregnancy....</li> </ul>	<p>Can you expand on this..</p> <p>Can you tell me anything else...</p> <p>Can you give me an example...</p>
Considering your feelings about health during pregnancy, what other activities would you consider attending if classes or facilities are/were available.....	<ul style="list-style-type: none"> <li>• Tell me about other physical activities you would attend if they were available to pregnant women.....</li> </ul>	<p>Can you expand on this..</p> <p>Can you tell me anything else...</p> <p>Can you give me an example...</p>

## **Appendix 18: Unedited Reflection on Focus Group 3**

Tuesday

Arriving at the leisure centre, the weather was warm and dry although cloudy. One participant was on the bridge so she entered the meeting room with me and offered to help setting up the seats and tables.

We arranged the room and switched on the air conditioning to cool the air. We sat and waited for others to arrive chatting generally about pregnancy events and leaving work.

When two others arrived we waited a little more before having a mug of tea/coffee and slicing up the cake. When 6pm arrived we decided to start the focus group and after a brief introductory explanation of the study I started the tape recorder.

The first question met a nervous start for answers, however the participants soon started to share their thoughts about wellbeing. I added in a second linked question about wellbeing and work and we continued the answers. Our fourth participant (name removed) arrived, so we stopped and allowed her to sit and I re-iterated our current theme. The traffic had been the hold up close to the centre which had meant a 25 minute delay and doubled her travel time.

Despite a 'shaky' re-engagement to the questions, the group continued and gave their thoughts. Our fourth attendee joined in tentatively and then started to add her answers. I wondered if I should have restarted/stopped the tape/offered tea or coffee at that point. As the others had already waited I continued the group mentally noting a conversation required for participant four once we had completed the 'questions'. I felt guilty as a hostess that we had started before she arrived, but also as a researcher that I had a responsibility to the others to guide the remainder of the focus group in a timely way. I was uncomfortable and found it impacted on my 'active listening' for a few minutes.

I was using the 'dialogue' of semi-structured approach from FG1 which today felt stilted as the responses presented different thoughts or order of thinking. This challenged me again to really listen to their conversation so I could make the appropriate links in the exploratory additional queries – reflecting their terminology or phrases appropriately. Due to the hiatus afforded by the fourth arrival, I found this specifically difficult and this is something to bear in mind as I prepare for this reflection and listening to the audio file.

The progression through the four 'topics' continued with very similar detail within the responses to previous groups suggesting women viewed the importance of the peer

support to be as valuable to their experience of pregnancy wellbeing. There seemed to be little impact of others on their participation of physical activity which appears to be grounded in their personal value/belief of activity. Some participants had engaged in other activities, others not which is very similar to the other two groups. I did feel that whilst one participant in this group worked in health care and have physical activity within her employment role, others in the group were more sedentary at work which led them to be more active outside the work environment. Personality characteristics may moderate such activities or family/locality in relation to the mode utilised.

This group seemed a bit longer (and is on the audio timeline) which may have been due to the exploratory questions or as a result of the hiatus. Either way I need to consider the impact of time on the responses and my moderation skills during this focus group.

Once we had reached the end of the 'topics' I enquired about additional comments and this was then the importance of the midwife instructor was raised and confirmed by others.

The tape recording stopped I thanked everyone again and offered tea to participant four and cake. The three others left as two had other commitments that evening. This was different to the other groups, but I feel that providing the hostess aspect was highly important.

I did tidy up a bit, but sat and chatted generally whilst (Jemma) drank tea and ate cake. She apologised several times and I tried to assure her than everyone was fine and not her fault or a problem.

#### Thoughts:

It is interesting how group attendees confide their anxieties to me as Jemma did at this time.

Maybe I appear to have time or is the environment more protective – do they confide in me as I am not their primary midwife but still a professional who can offer support/advice/information.

Is the peer support of this group part of the protective mechanism for those who have experienced anxieties previously either as expressed anxiety or personally perceived anxiety symptoms? Mental health is not a strong feature in my pre-activity health questions, but often something that arises out of conversation or indirectly from declared medication information.

If this the gendered space of such activities outside the home? Women together which influences their perception of safe disclosure.

Is the leisure setting rather than healthcare environment import to this observation?

Is this about a 'safe' environment issue? Away from patriarchal situations of healthcare settings?

Is the ambient noise of the centre an additional element to 'confidentiality' through muffled conversation but still viewed as 'open' to a professional who is mildly detached from their care plan?

Are discussion that relate to health only, those that I am included with? What constitutes their experience of health or wellbeing in such contacts? In addition can I ask if they ask similar questions of their named primary midwife?

Do they consider that I may not be interested or can contribute to discussion on 'travel systems' 'car seats' and similar things – does my professional role inhibit aspects of what they discuss in front of me or with me? Am I a woman or a midwife in this group – is my role pivotal or unimportant in respect of health, activity or other?

## Appendix 19: Antenatal and Postnatal Transcription

### Antenatal (FG2)

Moderator:

So, first question .....Can you describe what being well means to each one of you?

Group laughter

S06:

I'm [Name] this is my second pregnancy, and I think, I think being well just means that you're happy, that you're healthy, that um you can do normal day to day things, um and obviously this is my second pregnancy, it's being able to spend time with my daughter, um I gave up work after .. having her um to become a full time mum, um but um yeah I think that just being well just, yeah it's not just physical, it's the mental as well, I think that's really quite key that it is about the mental wellbeing too, um that um you feel happy and healthy.

Question

Wellness seen as combined physical/mental/spiritual

S10:

Um I'm [Name], um this is first pregnancy and I'm still I'm just about 20 weeks so first half. Um, being well a similar response trying to think of a slightly different answer for you, but just generally in my mind um I thought I could do a lot more than I actually can and it's taken a little while psychologically to get to grips with that so the first 3 months were just feeling horrendously sick and I couldn't do any exercise and it wasn't because I was concerned about my figure or how I looked it was purely just for feeling well in my eyes and then when that passed it's been really nice to be able to do a bit of exercise and now feel better than I potentially did in the first 3 months. Um, yeah and I guess I'd not thought about it but the psychological element of it is was what I was suffering with I guess and that I wasn't able to do exercise in the start and it was hurting that side of things, physically I was probably fine; you know I wasn't...yeah.

Thoughtful response

Holistic: physical and mental elements

Vomiting=not well

Body image?

Unable to exercise linked to not feeling well

S08:

My name is [Name] and this my first pregnancy and I'm 21 weeks tomorrow and I think for me mainly I struggle with anxiety and depression that kind of stuff so to me being well is that I'm actually not anxious and that's one of the main things for me I think, also the physical stuff but mainly my mental health I think.

Psychological impact of not exercising on wellbeing rather than physical

Psychological symptoms of wellbeing

Moderator:

So where does um wellness fit into that ...

Psychological symptoms of not experiencing wellbeing

S08:

I guess um if I'm anxious I don't do anything. I don't move I just sleep and sit on a couch and I don't really do anything so if I'm mentally well then I'm able to do stuff and then I, when I, are able to do stuff then that reduces the anxiety, if I'm moving and if I'm healthy and then I'm that makes me feel better and I'm less anxious so it's quite important to me to be like doing exercise and being well so it doesn't it keeps away the anxiety and keeps away the depression and that so I think that's quite important.

Links between anxiety and health and wellbeing

'Exercise' linked to wellbeing by all three participants

Moderator:

So ..... There have been some changes over time that you've experienced with feeling well...? ... Where does well fit with healthy?

S10:

I think it fits hand in hand for me, it does as an active person, healthy comes with active and um well comes with health in my opinion.

Personal definition of wellbeing associated with health and being active

S06: Living as they want Wellness and happiness

It's *the ability to kind of get out there and kind of live life really and to do things that you, that you want to do and get enjoyment out of it um be happy out of it, um I think that's kind of, yeah I think say I think it's nice, before I did, before I became pregnant again I did some exercise so from a physical perspective again it's nice just to do something, and also a bit of time for me as well, um, keeping hold of that I think is quite key as well, but um and then having, being able to find something I was able to do whilst I was pregnant and um to be safe doing that, um is also quite key um and also just from a practical point of view, the time of day, it's a good time of day to do it, um there are other sessions, a couple that I know of are during the day it's not practical because I was either work for or I have a little one, so um I think that kind of perhaps ties in with that.* Physical activity as personal time Safe activity Importance of timing for activity

## Postnatal (FG4b)

Moderator: Question

OK ....what you think being well means to you since you've had your babies.....?

S04: Impact of food choices and time

*Trying to eat a healthy diet which isn't that easy sometimes.*

S02: Changes not seen as 'good'

*I think the bar has definitely lowered since um....*

S04: Effort of task suggested Wellness now being described as primarily 'practical' eg: time, specific food/drink etc Quality standards versus reality

*Yeah. Trying to eat healthily and I think cos sometimes you just pick up a biscuit*

W01: Impact of new motherhood on looking after self

*Remembering to eat sometimes and remembering to drink as well particularly If you are like breastfeeding, making sure you are drinking enough otherwise your body kind of prioritises them over yourself.*

S04: Know the importance and the consequences Wishing to participate in activity to feel 'fitness' return

*Getting the fitness side back for me as well. For me at the very end it did drop quite a bit, just because of like I wasn't working as much, I had quite an active job so that did have quite an effect on me so getting back to doing a lot of walking and doing some exercise classes again is quite good for me, I've started doing that and Um it makes you feel a bit better about yourself.*

Moderator: Personal experience of pre and post birth 'exercise' as individual or as with peers

So when did you start that? Add-on query to find out when they re-started exercise after the birth

S04: What exercise and when Reason for specific exercise choice

*Um, I started doing Pilates about 8 weeks after he was born just because I really struggled with my back and I thought that would help and it really did help my back and posture and things. I think just having an hour away from him as well was horrible but I actually quite enjoyed it because I got out to socialise with other people which was nice, um and then I've started doing a boogie bounce class instead of that one. So I'm trampolining ....* The second activity!

*Well it's like little trampettes so yeah it's good fun* Bittersweet experience of leaving baby but gaining social contact Explanation of activity

..... [edited content: comments removed about trampolines after childbirth for this extract]

Moderator:

Anything .....in terms of physical activities?

SO2:

Effort of task suggested in current situation

Impact of new motherhood on looking after self

Um, I'm not doing a huge amount at the moment, um, which I don't like because I don't like not feeling fit but just finding the time to kind of to fit it in is a bit of a challenge but um, I mean some of the baby classes, I've been doing swimming lessons once a week and then they are quite....

Effort of participating acknowledged

Not seeing this as activity for herself

...physically exerting, because you are having to pick them up all the time and lift them out of the water and stuff so that is helping. Um, but yeah I would like to be doing more exercise, definitely, it's just finding the time.

Key perceived barrier to activity for self

Would prefer to do exercise for self?

.....

Question

Moderator:

...OK, so what about peer support....

Helpfulness of peer support acknowledged

SO4:

Focus of peer support via infant

I suppose all the, like the sort of baby groups that we go to they are brilliant and helpful. They do sort of help at lot, don't they?

Collaborative view sought

SO2:

Yeah.

Importance of peer collaboration on 'realistic' personal

SO4:

But, um, and again everyone is so different there is no pressure to get back to your old self, like ASAP or anything so that's good. Um, I know that when I did do Pilates, I started you have to take it easy, so even outside of the pregnancy world people are very aware of you not being in your peak physical condition.

Acknowledgement of real physical condition after birth and during early motherhood.

Moderator:

Do you meet up with ... other mum's?

Identifying the 'ideal' peer support

Peer support mechanism

WO1:

Yeah, yeah I was very lucky because my best friend she had her baby 3 weeks before (baby name removed), she was actually due a week after me but she had her little one early so I've got a close friend that I speak to, if I don't see her daily, I speak to her on the phone daily so we are almost going through exactly the same milestones at the same time, and then obviously doing various baby groups so I've made friends from going to the baby groups, coffee mornings and going to activity, [name removed] activity barn and things, and let the babies do their thing whilst we have a cup of tea. And then I've got quite a few friends with babies who are slightly older, work colleagues and such like.

Setting and nature of peer support

Added peer support

So actually I've kind of got those as well, and they've been through it now and they are still a resource.

Impact of new motherhood

Um and there's lots of different groups around, at the beginning like breastfeeding support groups that are invaluable. Nobody ever tells you how hard certain things are, like those first 8 weeks at home, nobody ever tells you how hard they are going to be, so actually having the resources around and knowing other people who have been through it, they can kind of answer trivial questions.

Scale of value attached to certain groups

Peer support mechanism



SO2:

Impact of new motherhood

Yeah, I think that you don't really, I hit a realisation which was quite, actually after we came for a catch up here, I was like all of my friends are still at work and they are just not around during the day and I spend all day every day on my own with him, which is when SO4 and I hooked up and there's 5 of us now and we do a lot of stuff together which is, it just makes a big difference and like SO4 says there's no pressure and there's no kind of comparison or anything.

Using aquanatal peers as a resource after birth

Collaboration of knowledge, not competition

Well obviously we compare 'what's he doing?' and it's interesting to see how they are all developing differently but no kind of competition which is nice. I do find that different baby groups tend to be quite different in terms of how welcoming and how friendly they are. We went to one which none of the others that we know do on Wednesdays and it's just much less friendly than some of the other ones that I have been to, so I think you do have to kind of find the right ones to go to, ones that are not too cliquey or whatever.

Experience of different groups and peer support: Finding the right one

SO4:

Yeah you definitely need the groups.

Experience of different groups and peer support: Finding the right one

WO1:

I think some of the groups, I've done some different groups and some of them, I just found them to be very much like a teacher at a class and like baby sensory I really enjoyed because it's really laid back and you do it, but if some mum's are chatting she just keeps going, whereas the other woman was more like a teacher and she wanted us all to be quiet.

SO4:

Importance of 'fun' element to a class/group

Yeah, which isn't fun.

Going to a group for other reason than peer support?

SO2:

That's what it's like at the one I go to on a Wednesday, you get told off for chatting and it's not chatting time.

...

## **Appendix 20: Extract from Overall Coding Category: Participation in Physical Activity**

### Reference 1

....even now I'm starting to struggle and I don't like it....

### Reference 2

....So just to keep going a few more weeks.....

### Reference 3

.... hope I can keep going like you two...

### Reference 4

....it is a bit difficult when, when you are used to being, I guess, I guess 'cause you are kind of comparing to how it was before...

### Reference 5

.....Not being able to do things is quite frustrating...

### Reference 6

....I wouldn't say that necessarily meant that you felt like you weren't well..... just not as fit and healthy as perhaps you were before...

### Reference 7

....I find it takes just a little bit longer to do certain things but you can still get them done...

### Reference 8

.....just takes a bit more time....

### Reference 9

....Just that is it the things you just expect like out of breath.....

### Reference 12

.....it's like the swelling, like the swollen feet I've noticed that one ... especially ... at the end, like now sort of nearing the end.

### Reference 13

.....I'm like you know I'm going to have to like sit down because your feet kind of stop you from...

### Reference 14

.....I'm like I've never had cankles before in my life.

Reference 17

...the same with the swollen feet, that's .... a bit distressing...

Reference 18

.....I don't really do a lot apart from come to this now.

References 19-20

..... I did run 'til I was about twenty.....I think I was twenty five, twenty six weeks that and I do really miss not coming running and that's the reason I joined the swimming just so I feel like I'm doing something.

Reference 21

.....'cause kind of only did swimming before.

Reference 22

.....then obviously that first trimester when you're just feeling rubbish that all kind of went by the wayside.

Reference 23

....so it was nice that I kind of did this again.

Reference 24

....then I started up with the swimming again and that's quite nice really and as I say it is nice to be in the water and things like that.

Reference 25

.....I do find swimming is quite a nice one that you can carrying on doing as well.

Reference 26

...I normally I run um a lot so having to stop was ... a bit rubbish and I haven't done it at all since I've been pregnant because of, because the same as um (I um) I felt so crap in my first trimester that I was like 'oh I can't do it' and then I just couldn't face going back to it 'cause you know if you have a big break and then it's going to be too hard I can't cope.

Reference 27

....coming here and swimming.

Reference 28

....I was doing swimming on two other nights as well as coming here.

Reference 29

....the last month or so I haven't done anything other than the aqua natal which um is all I've kind of felt that I can do realistically.

Reference 30

.....I've got a dog so I walk him a lot.....

Reference 31

.....I used to walk a ridiculous amount so that was kind of quite a good fitness and walk the dog when I get home.

Reference 32

.....I started doing the aqua right at the beginning of my pregnancy so I sort of tried to keep that going.

References 33-34

..... I do try and still get out with the dog in the forest everyday just sort of pootle about, not fast but I still sort of wander about.

Reference 35

.....It's slowing down isn't it?

Reference 36

.....You just can't go as fast.

Reference 37

.....It's like when I used to be swimming I used to be in the middle lane and now in like the really slow lane...laughter....floating along.

Reference 38

.....I've been swimming a couple of times but I think sometimes you just get, like you sit down and think I really can't be bothered....[laughter]

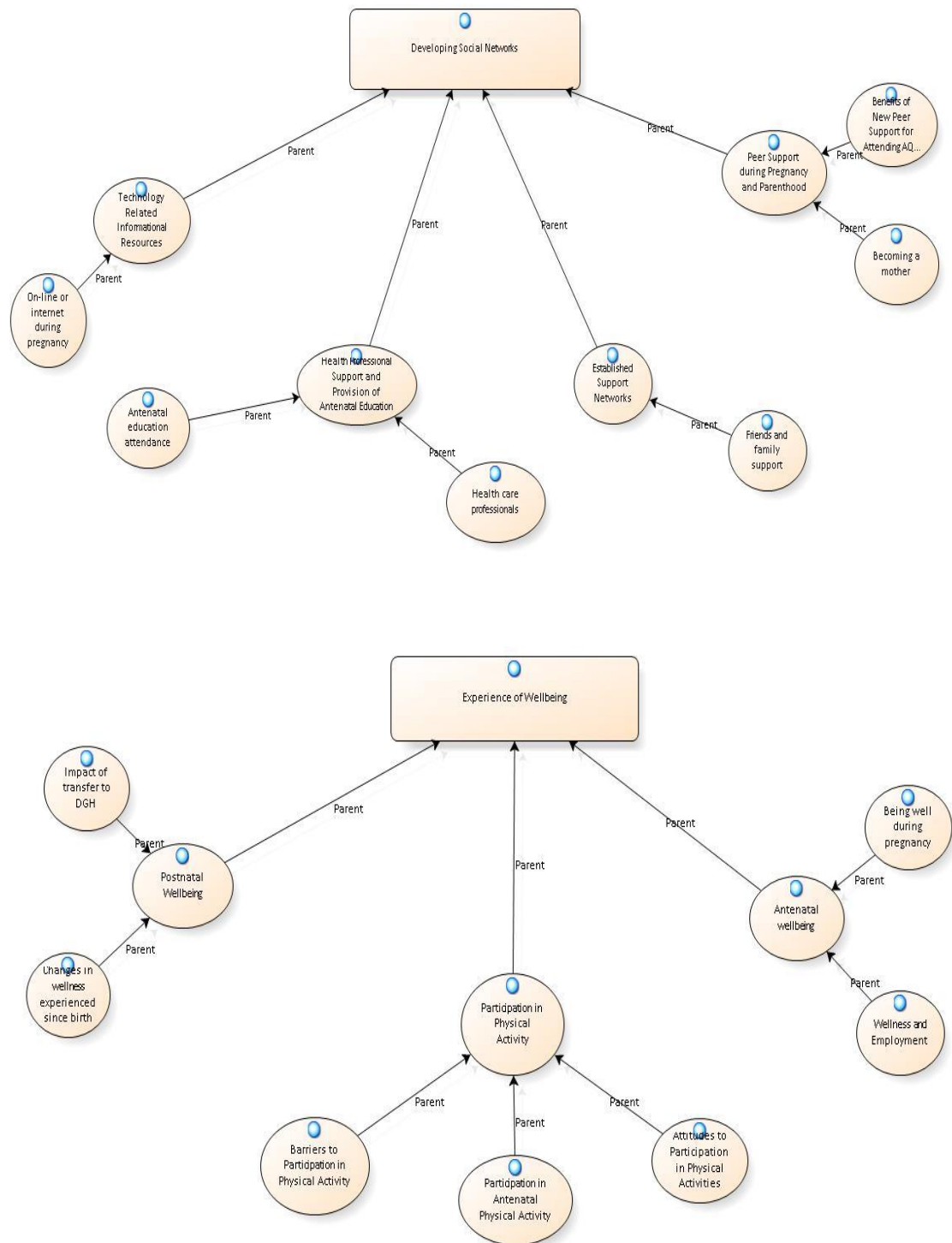
Reference 39

.... trying to keep fit.

Reference 40

..I got loads of people saying that I shouldn't have run at the beginning but again that because I work with the public, they literally were like 'oh, you're not still running are you' and I was like, yep because I didn't, as long as I felt well enough I didn't see the harm in, in not doing it, so I carried on.....

## Appendix 21: NVIVO models



## Appendix 22: Tree nodes for 'Experience of Wellbeing'

Name	Description				
Experience of Wellbeing	Aggregated node where experience of wellbeing associated with antenatal or postnatal is offered including affect of physical activity participation				
	Name	Description			
	Antenatal wellbeing	Perceptions and experiences of wellbeing during pregnancy			
		Name	Description		
		Being well during pregnancy	Participants description of 'well' during this current pregnancy		
			Name	Description	
			Able to keep active	Importance to wellbeing of staying active	
			Able to keep moving	Mobility as important to wellbeing experience	
			Active lifestyle	Engaging in active lifestyles as contributing to wellbeing experiences	
			Being healthy	'Health' as a contributor to experience of wellbeing - not always defined	
			Doing things you enjoy	Enjoyment as a contributing characteristic of wellness	
			Expectations altered	Perception of how expectations of wellness alter during pregnancy	
			Feeling well	Perception of generally feeling well as it contributes to the experience of wellbeing	
			Mental health as well as physical	Perception of how mental and psychological symptoms may impact negatively on wellbeing during pregnancy	

		Name	Description		
		Wellness and Employment	Experience of wellness whilst at work and perceptions of what contributed to that experience - positive and negative		
			Name	Description	
			Capacity to work	Reporting of alteration of completing/continuing the job role whilst pregnant	
			Coping with the job	Reporting of experience specific to job role and work expectations	
			Early pregnancy issues	Impact of early pregnancy discomforts on being at or doing work activities.	
			Support at work	Experience of supportive work culture (or not) whilst expecting a baby.	
	Name	Description			
	Participation in Physical Activity	Experiences of physical activity participation during childbearing			
		Name	Description		
		Attitudes to Participation in Physical Activities	Perceptions and reported attitudes of self and others to participating in physical activities outside the home		
			Name	Description	
			Comparing self and others	Perceptions of self as compared to others during pregnancy - links tentatively to body image and capacity to engage meaningfully in activities	
			Motivation for returning to Physical Activity	Perceptions of what motivates the re-engagement with physical activity outside the home	
		Name	Description		
		Barriers to Participation in Physical Activity	Inhibitory factors for engagement in physical activities		
			Name	Description	

			Frustration with activity level or feeling fit or healthy	Explaining their experiences of how pregnancy has altered their engagement with personal activities or family/community activities	
				Name	Description
				Slowing down	Perceptions of how advancing pregnancy has led to reduced engagement in physical activity and reduced ability to participate in previous activities
			Name	Description	
			Liimitations of Early Motherhood	Experience of participation as significantly curtailed during the first weeks of being a mother	
		Name	Description		
		Participation in Antenatal Physical Activity	Discussing their experiences of physical activity during pregnancy		
			Name	Description	
			Activity outside the home	Experiences of outdoor or community based physical activities	
			Pregnancy physical activity engagement	Experiences of specific pregnancy physical activities - yoga, pilates, and other	
				Name	Description
				AQUANATAL as physical activity or fitness participation	Perception of AQUANATAL as participation in a fitness activity during pregnancy
				Attending other fitness classes	Experiences of both pregnancy specific or general population fitness classes during this pregnancy
				Comments on participating in physical activities or fitness provision during pregnancy	Description of participation in physical activity provision during pregnancy
				Pelvic floor	Perceptions of specific exercise focus during this pregnancy
				Pre-pregnancy fitness or exercise participation	Discussion about pre-conception/pregnancy exercise



					participation - individual activities and class based activities
	Name	Description			
	Postnatal Wellbeing	Discussion on the experience of postnatal wellbeing			
		Name	Description		
		Changes in wellness experienced since birth	Impact and perception of how wellness has altered since the birth of their baby		
			Name	Description	
			Recovery time to feeling of wellness	Discussing the reality of recovery on their perception and experience of wellness after the birth of their baby	
		Name	Description		
		Impact of transfer to District General Hospital (main maternity unit)	Experience of birth complications and 'emergency' procedures on feeling of wellness/wellbeing - at time of birth and during early postnatal period		

## Appendix 23: Tree nodes for ‘Developing Peer Support (or Social Networks)’

Name	Description				
Developing Peer Support (or Social Networks)	Aggregated node where the experience of support is primarily peer in origin				
	Name	Description			
	Established Support Networks	Family, close friends who offer pregnancy information and support. Both positive and negative experiences noted			
		Name	Description		
		Friends and family support	Support experiences provided by family and/or friends		
			Name	Description	
			Family	Support from family members	
			Peer support - friends	Experience of support and information from friends, work colleagues or close acquaintances	
	Name	Description			
	Health Professional Support and Provision of Antenatal Education	Experience of NHS provision, contact and establishing a relationship with the hcp. Also antenatal education provision both NHS and private (NCT) whereby they compare information and support opportunities during discussion			
		Name	Description		
		Antenatal education attendance	Intended sources of antenatal education either NHS and/or Private Provider(s)		
		Health care professionals	Experience with midwives, GP or Obstetric Team either positive or negative		

	Name	Description			
	Peer Support during Pregnancy and Parenthood	The journey of peer support			
		Name	Description		
		Becoming a mother	Perceptions of the experience of the journey to becoming a mother and the skills and informational requirements		
			Name	Description	
			Preparing to be a mother	Thinking and building towards mothering: Getting ready to be a mother	
				Name	Description
				Thinking forward to postnatal support	All data here relates to woman's perspective during pregnancy focus group discussion.
			Name	Description	
			Reality of Motherhood	Experience of the reality after the birth - wellness, routine, mothering, nutrition, exhaustion/tiredness	
				Name	Description
				Changes in wellness experienced since birth	Experiences of being well since the birth including impacting factors eg time, access, tiredness
				Lack of Routine	Thoughts about the establishment of a routine or finding there isn't one.
				New Motherhood and Nourishment	Experiences of Diet, Nutrition and Nourishment
				Tiredness or Exhaustion	Experiences of physical or mental tiredness. Also Crosses into a WELLBEING FACTOR during postnatal wellness.

		Name	Description		
		Benefits of New Peer Support for Attending AQUANATAL	Perceived and verbalised benefits of attending AQUANATAL group		
			Name	Description	
			AQUANATAL as support and physical activity	Perceptions and experiences of support gained by access to AQUANATAL as physical activity	
			AQUANATAL Facebook Group Link or Access	Use of Group Page either antenatally or postnatally	
			AQUANATAL midwife	Perceptions of midwife-led instructor for AQUANATAL	
	Name	Description			
	Technology Related Informational Resources	On-line and other experience of information relating to pregnancy and/or AQUANATAL			
		Name	Description		
		On-line or internet during pregnancy	Experience or not of on-line information - both positive and negative		

## Appendix 24: Study Questionnaire Data

Exercise type, intensity and time findings – before pregnancy; first trimester and exercise plans for the remainder of pregnancy.

BEFORE PREGNANCY												
			INTENSITY (Borg score)					TIME				
			Very light (B: 2) Easy activity eg folding clothes	Fairly light (B: 3) Supermarket shopping – not enough to breath more rapidly	Somewhat hard (B:4) Brisk walking, moderate effort, faster heart rate, but not out of breath	Hard (B: 5-6) Activities that take vigorous effort, faster heart rate and breathing	Very hard (B: 7-9) Highest level of sustainable activity	1/2 -1 per day	less than an hour per week	1-2 hours per week	2-4 hours per day	more than 4 hours per week
Exercise Types	Strolling	2	4	1			1		3	1	2	
	Walking (brisk)			3	1		1	3	3	1	2	
	Jogging				2	1			2		1	
	Running				2			1	1			
	Cycling					1			1			
	Swimming			2	3			2	2			
	Gym - weights			1	1	1			2			
	Gym - cardiovascular			1	2	1			2			
	Aerobic classes				1	2		1	2			
	Yoga			3			1		2			
	Pilates		2						1			
	Aquatic classes eg Aquasize,											
	Dancing											
	Ball games eg:Tennis					1			1			
	Horse-riding											
	Other: Snowboarding						1				1	
	Other: Bowls	1							1			
	Other: Body Pump				1			1				

FIRST TRIMESTER												
			INTENSITY (Borg Score)				TIME					
			Very light (B: 2) Easy activity eg folding clothes	Fairly light (B: 3) Supermarket shopping – not enough to breath more rapidly	Somewhat hard (B:4) Brisk walking, moderate effort, faster heart rate, but not out of breath	Hard (B: 5-6) Activities that take vigorous effort, faster heart rate and breathing	1/2 - 1 per day	more than 1hr per day	less than an hour per week	1-2 hours per week	2-4 hours per day	more than 4 hours per week
Exercise Types	Strolling	2	3		1	1	2			2	2	
	Walking (brisk)			5	1	1		1	2	1	2	
	Jogging				1			1			1	
	Running										1	
	Cycling		1					1			1	
	Swimming			1					1			
	Gym - weights											
	Gym - cardiovascular			1					1			
	Aerobic classes				1				1			
	Yoga			1					1			
	Pilates											
	Aquatic classes eg Aquanatal			1					1			
	Dancing											
	Ball games eg:Tennis											
	Horse-riding											
	Other: Bowls	1							1			

EXERCISE INTENTIONS												
			INTENSITY (Borg Score)					Time				
			Very slight (B: 1) Tying shoes	Very light (B: 2) Easy activity eg folding clothes	Fairly light (B: 3) Supermarket shopping – not enough to breath more rapidly	Somewhat hard (B:4) Brisk walking, moderate effort, faster heart rate, but not out of breath	Hard (B: 5-6) Activities that take vigorous effort, faster heart rate and breathing	30 mins per day	1 - 2 hours per day	once or twice a week	2-5 times per week	5-7 times per week
Exercise Types	Strolling			1					1			
	Walking (brisk)			1	2	2		1	4			
	Jogging											
	Running											
	Cycling											
	Swimming				1	1	1			2	1	
	Gym - weights											
	Gym - cardiovascular											
	Aerobic classes											
	Yoga				2				2	1		1
	Pilates		1		2					2	1	
	Aquatic classes eg Aquanatal (n=10), Aquatherapy (n=1)				4	5 + 1			9 + 1			
	Dancing											
	Ball games eg Tennis											
	Horse-riding											
	Other: Body pump						1			1		

(See section 4.9.3, p130-131; see also Appendix 5, p329-336 where Borg scoring is presented in detail)

## Appendix 25: Descriptions for types of exercisers

Regular Exerciser	<p>Jennifer is 27 years old, and 25 weeks into her first pregnancy. She is of average height and weight. She has brown eyes and straight dark hair that is cut to her shoulders. She and her partner Rob both work outside the home. In her spare time, she listens to music, reads, watches TV, or gets together with her friends.</p> <p><i>Jennifer exercises regularly, working out at the gym or at a community venue 3 or 4 days each week. Her exercise programme consists of jogging, fitness classes and some weight training.</i></p>
Active Living	<p>Jennifer is 27 years old, and 25 weeks into her first pregnancy. She is of average height and weight. She has brown eyes and straight dark hair that is cut to her shoulders. She and her partner Rob both work outside the home. In her spare time, she listens to music, reads, watches TV, or gets together with her friends.</p> <p><i>Jennifer lives 3 km away from her job and either walks to work (45 mins) or rides her bike (20 mins) or uses transport due to distance or timing. She never takes the elevator; she always climbs the stairs. Her work involves some physical activity.</i></p>
Excessive Exerciser	<p>Jennifer is 27 years old, and 25 weeks into her first pregnancy. She is of average height and weight. She has brown eyes and straight dark hair that is cut to her shoulders. She and her partner Rob both work outside the home. In her spare time, she listens to music, reads, watches TV, or gets together with her friends.</p> <p><i>Jennifer exercises every day for two hours or more, rain or shine. Even when she is feeling sick or injured, she works out jogging, attending fitness classes and weight training. Jennifer gets upset if for some reason she is unable to exercise.</i></p>
Non- Exerciser	<p>Jennifer is 27 years old, and 25 weeks into her first pregnancy. She is of average height and weight. She has brown eyes and straight dark hair that is cut to her shoulders. She and her partner Rob both work outside the home. In her spare time, she listens to music, reads, watches TV, or gets together with her friends.</p> <p><i>Jennifer is physically inactive and does not participate in exercise activities such as jogging, fitness classes or weight training.</i></p>
Other - control	<p>Jennifer is 27 years old, and 25 weeks into her first pregnancy. She is of average height and weight. She has brown eyes and straight dark hair that is cut to her shoulders. She and her partner Rob both work outside the home. In her spare time, she listens to music, reads, watches TV, or gets together with her friends.</p> <p><i>Jennifer is physically inactive and does not participate in exercise activities due to medical, physical or social reasons</i></p>

(Adapted from Gaston, Cramp and Prapavessis 2012, p229)

## Appendix 26: PGR Conference poster



### Using a case study approach to explore pregnant women's motivation to attend aquanatal classes

Elizabeth Davey, Senior Lecturer in Midwifery,  
Professional Doctorate Candidate

A case study is "...an in-depth study of a single individual or location" (Rees, 2003, p236).



This aquanatal class is a **unique** community-based group connected to the midwife researcher who is the group instructor. The group has dynamic membership where participants self-select to attend the class.

The focus is to explore their motivation to attend the class. In case studies the **context** is integrated with the data collected. The description of the background and environment of the group is linked to the group member's perspective and are examined using **multiple data** collection tools.

Using data from **questionnaires, focus groups** and **researcher field notes** will examine women's perspective of wellbeing, networking and peer support during pregnancy which will be validated through an **analytical framework** using a type of non-deductive inference labelled abductive reasoning (Pierce, 1903) to explain the study findings. These findings may not be generalizable as the participants and/or setting may not be viewed as representative outside the current case context.



Case study and **practitioner research**  
The site is outside NHS healthcare environment. The researcher hopes to determine if this setting is seen by the women to be beneficial to health messages, and in this adjusts the relationship and potential for health communication between individuals and a midwife during low-risk pregnancy.



The case study allows for research of the phenomena, the professional to research themselves through **reflection in- and on-action** whilst developing professional and research skills for practice-based research including specialist skills for aqua instruction.

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## Abbreviations used within the text

ACOG	American College of Obstetricians and Gynaecologists
BMA	British Medical Association
CEO	Chief Executive Officer
CMACE	Centre for Maternal and Child Enquiries (Saving Mother's Lives/Why Children Die)
DoH	Department of Health
FPH	Faculty of Public Health
GP	General Practitioner
HEE	Health Education England
HRA	Health Research Authority
NAO	National Audit Office
NCT	National Childbirth Trust
NHS	National Health Service
NHSE	NHS England
NICE	National Institute of Health and Care Excellence PH = Public Health; CG = Clinical Guideline; QS = Quality Standard
NIHR	National Institute for Health Research
NMC	Nursing and Midwifery Council
NPEU	National Perinatal Epidemiology Unit
ONS	Office for National Statistics
PHE	Public Health England
QAA	Quality Assurance Agency
QoL	Quality of Life
RCM	Royal College of Midwives
R&D	Research & Development
RCOG	Royal College of Obstetricians and Gynaecologists
SES	Socioeconomic status
WHO	World Health Organisation

## Glossary

Aquanatal	exercises during pregnancy in water of active and passive moves that link together to maintain muscle strength and mobility, moderated to account for physical adaptations and limitations due to changes during pregnancy and post birth (Baddiley 1999).
Booking Visit	a detailed collecting of medical, obstetric, physical, psychological and social information by the midwife usually around 10 weeks gestation. Advice and information about pregnancy issues, screening, public health and place of birth (amongst many other health topics) are offered at that time (see NICE CG62, 2008a).
Borg RPE	(or Borg Rate of Perceived Exertion) is a way of measuring physical activity intensity level based on how hard the body is working (Borg 1990). Exertion rating is considered to be a good estimate of the actual heart rate during exercise using a factor of 10 for the 6-20 scale [for example: a RPE of 12; then $12 \times 10 = 120$ or a heart rate of approximately 120 beats per minute]. Borg also developed the Borg CR (category-ratio) 10 scale (Borg 1998).
Case study	a single case (or group of cases) selected to explore in depth a specific issue within a defined context (Thomas 2011).
Community of interest	is described as a network of people who share the same interest, knowledge, and understanding for any given subject area. It may be a 'live' community of individuals who meet to discuss and exchange information, or a virtual community that meets, discusses, and exchanges information via the Internet or messaging tools.
Community of practice	is defined as 'a group that coheres through sustained mutual engagement on an indigenous enterprise, creating a common repertoire' (Wenger 1998). The relationship and understanding between group members is defined by the 'work', the setting and collective management structure.
Culture	the beliefs, way of life, art, and customs that are shared and accepted by people in a particular society.
FITT Principle	(or formula) is a way of monitoring an exercise program. The acronym outlines the key components of an effective program. F, I, T, T, stand for: Frequency, Intensity, Time and Type (Artel et al. 2003; Mottola 2016).

Gestation of pregnancy	the period of gestation calculated from the date of the first day of the last menstrual period and is normally 40 weeks in duration.
Health Literacy	is “defined as the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health” (WHO 2009). See <a href="http://www.who.int/healthpromotion/conferences/7gchp/track2/en/">http://www.who.int/healthpromotion/conferences/7gchp/track2/en/</a>
Lifestyle	a self-determined pattern of actions and behaviours partly directed by cultural background, personal beliefs and life control factors (Veal 1993).
Multigravida	a woman who has been pregnant more than once.
Paradox	an apparently self-contradictory statement whose underlying meaning is revealed only by careful scrutiny (See Allen, 1991, p862). Its purpose is to arrest attention and provoke fresh thought, as in the statement “Less is more.” (from Robert Browning poem "Andrea del Sarto" (The Faultless Painter), published in 1855). In poetry, paradox functions as a device encompassing the tensions of error and truth simultaneously, not necessarily by startling juxtapositions but by subtle and continuous qualifications of the ordinary meanings of words. When a paradox is compressed into two words, as in “living death,” it is called an oxymoron (See Allen, 1991, p852).
Peer Support	involves people sharing knowledge, experience or practical help with each other.
Physical activity	is any bodily ‘exercise’ that enhances or maintains physical fitness and overall health and wellness.
Primigravida	a woman pregnant for the first time.
Public health	the science and art of promoting and protecting health and wellbeing, preventing ill-health and prolonging life through the organised efforts of society (Faculty of Public Health 2017).
Quality of life	“the extent to which hopes and ambition are matched by experience” (Calman 1984, p125).

Reflective narrative	a tool for learning through practice.
Social capital	the “network of social connections that exist between people, and their shared values and norms of behaviour, which enable and encourage mutually advantageous social cooperation” (Collins English Dictionary 2012). See <a href="https://www.collinsdictionary.com/dictionary/english/social-capital">https://www.collinsdictionary.com/dictionary/english/social-capital</a>
Trimester	normal pregnancy lasts 40 weeks, divided into three trimesters lasting around 13 weeks each.
Wellbeing	“a state of being well, healthy, contented etc” (Allen 1991, p1393).

## Glossary of NVIVO Terminology

Attributes	An attribute is a property of a node, case or document. It is equivalent to a variable in quantitative analysis. An attribute (e.g. ethnicity) may have several values (e.g. Malay, Chinese, Indian, etc.). Any particular node, case or document may be assigned one value for each attribute. Similarities within or differences between groups can be identified using attributes. Attribute Explorer displays a table of all attributes assigned to a document, node or set.
CAQDAS	Computer Aided Qualitative Data Analysis. The CAQDAS programme assists data management and supports coding processes. The qualitative analysis process. NVIVO is one of the CAQDAS programmes; others include NUDIST, ATLAS-ti, AQUAD, ETHNOGRAPH and MAXQDA.
Code	A term that represents an idea, theme, theory, dimension, characteristic, etc., of the data.
Coder	A tool used to code a passage of text in a document under a particular node. The coder can be accessed from the Document or Node Browser.
Coding	The action of identifying a passage of text in a document that exemplifies ideas or concepts and connecting it to a node that represents that idea or concept. Multiple codes can be assigned to the same segment of text in a document.
Coding stripes	Coloured vertical lines displayed at the right hand pane of a Document; each is named with title of the node at which the text is coded.
DataLinks	A tool for linking the information in a document or node to the information outside the project, or between project documents. DocLinks, NodeLinks and DataBite Links are all forms of DataLink.
Document	A document in an NVIVO project is an editable rich text or plain text file. It may be a transcription of project data or it may be a summary of such data or memos, notes or passages written by the researcher. The text in a document can be coded, may be given values of document attributes and may be linked (via DataLinks) to other related documents, annotations, or external computer files. The Document Explorer shows the list of all project documents.

Memo	A document containing the researcher's commentary flagged (linked) on any text in a Document or Node. Any files (text, audio or video, or picture data) can be linked via MemoLink.
Model	NVIVO models are made up of symbols, usually representing items in the project, which are joined by lines or arrows, designed to represent the relationship between key elements in a field of study. Models are constructed in the Modeller.
Node	Relevant passages in the project's documents are coded at nodes. A Node represents a code, theme, or idea about the data in a project. Nodes can be kept as Free Nodes (without organisation) or may be organised hierarchically in Trees (of categories and subcategories). Free nodes are freestanding and are not associated to themes or concepts. Early on in the project, tentative ideas may be stored in the Free Nodes area. Free nodes can be kept in a simple list and can be moved to a logical place in the Tree Node when higher levels of categories are discovered. Nodes can be given values of attributes according to the features of what they represent, and can be grouped in sets. Nodes can be organised (created, edited) in Node Explorer (a window listing all the project nodes and node sets). The Node Browser displays the node's coding and allows the researcher to change the coding.
Project	Collection of all the files, documents, codes, nodes, attributes, etc. associated with a research project. The Project pad is a window in NVIVO when a project is open which gives access to all the main functions of the programme.
Sets	Sets in NVIVO hold shortcuts to any nodes or documents, as a way of holding those items together without actually combining them. Sets are used primarily as a way of indicating items that in some way are related conceptually or theoretically. It provides different ways of sorting and managing data.
Tree Node	Nodes organised hierarchically into trees to catalogue categories and subcategories.

(Source(s): QDA Training 2013a; QDA Training 2013b; Bazeley and Jackson 2013; QRS International 2016).

## Glossary of Research Terms

Good Clinical Practice (GCP)	GCP is an international ethical and scientific quality standard for designing, recording and reporting studies. The aim of GCP is to ensure the rights, safety and wellbeing of study participants are protected and research data is high quality
HRA Approval	The process for the NHS in England that brings together the assessment of governance and legal compliance. Undertaken by dedicated HRA staff with the independent REC opinion provided through the UK Health Departments Research Ethics Service.
Integrated Research Application System (IRAS)	A single, web-based system for completing applications for the permissions and approvals required for health and social care research in the UK. The various applications can be printed or submitted for this single system (includes REC, R&D, MHRA, GTAC, NIGB, ARSAC).
National Research Ethics Service (NRES)	An umbrella organisation responsible for all REC across the UK (replaced COREC in 2007).
Research Ethics Committee (REC)	A group authorised by NRES to review study documents for research taking place in the NHS or social services. Some REC specialise in Clinical Trials, or topics such as research in children, MCA. All Research in NHS Trusts/Social Services must have been reviewed by a UK REC. See <a href="http://www.nres.npsa.nhs.uk/">http://www.nres.npsa.nhs.uk/</a> for detail.
Research Passport	A system for HEI employed researchers/postgraduate students who need to undertake their research within NHS organisations, which provides evidence of the pre-engagement checks undertaken on that person in line with NHS Employment Check Standards (among them CRB and occupational health checks).
Site	The NHS organisation in which study activities and assessment are performed or the location(s) where trial-related activities are actually conducted. Each site/NHS Trust needs to give R&D approval.

(Source NRES (UK) from <http://www.nres.npsa.nhs.uk/>).