Prevalence and patterns of anxiety
in patients undergoing gynaecological surgery

Sandra Allen

Eloise Carr

Richard Barrett

Katrina Brockbank

Christina Cox

Nigel North

Acknowledgements

Contents

List of Tables and Figures

Figures

Abstract

It is well documented that hospitalisation for surgery is associated with increased anxiety (Dodds 1993). Raised anxiety levels have important clinical significance since they adversely impact upon intra- and post-operative outcomes such as pain (Munafo & Stevenson 2001). Despite various advances and initiatives, local research (Carr 2000) indicates that surgical anxiety and post-operative pain continue to be problematic for patients. This study investigates the prevalence and pattern of anxiety in surgical patients, and factors affecting these experiences.

The study utilised a multiple method design with a purposive sample of 80 surgical patients. Anxiety was assessed at six time points over 72 hours and pain was measured post-operatively. After discharge, semi-structured taped telephone interviews were conducted. The quantitative data was analysed using a combination of appropriate parametric and non-parametric statistics. The qualitative data was analysed for themes.

Trait anxiety (p<0.0001), major surgery (p=0.002) and pain prior to admission (p=0.006) were associated with increased state anxiety. Elevated levels of pre-operative anxiety were associated with increased levels of post-operative pain (p=0.011). In the qualitative analysis, causes of anxiety included 'organisation and delivery of care' and 'becoming a patient'. Themes identified under alleviation of anxiety included 'people' and 'being prepared'.

- Anxiety levels may be raised before admission to hospital. This has important clinical, ethical and research implications.
- Patients at particular risk of high levels of anxiety may be identified and interventions targeted to this vulnerable group.
- Delivery and service of care should consider patient views and experiences and be redesigned to better meet their needs.
- Nursing care needs to be 'engaged'. This is the key ingredient in the provision of psychological support for patients.

Executive Summary

Background

It is well documented that hospitalisation for surgery is associated with increased anxiety (Dodds 1993). Raised anxiety has important clinical implications since it has been shown to adversely impact upon anaesthetic requirements (Maranets & Kain 1999), postoperative pain (Thomas et al. 1995) and recovery (Boeke et al. 1991a). Local research (Carr 2000) has shown that post-operative pain and anxiety continue to be problematic for patients after surgery.

Despite a wealth of research on anxiety[1] there appear to be few studies that explore the trajectory of anxiety before and after surgery. Study design issues limit the applicability of the research that has been conducted (Chapman & Cox 1977, Johnston 1980). The investigation of the course of anxiety may be seen as important not only to enhance understanding of the patient experience, but also for the successful implementation of anxiety management interventions.

Methodology

The study had four objectives:

- To identify the prevalence of anxiety in a pre-operative population and in the immediate post-operative period;
- To identify the pattern of anxiety pre-operatively and post-operatively and how this may vary over time;
- To identify what events/situations may contribute to an elevation or decrease in anxiety levels in the immediate pre- and post-operative periods;
- To record the post-operative pain scores and identify any correlation with raised anxiety levels.

The study utilised a mixed method approach, combining quantitative and qualitative approaches. The sample consisted of 80 patients undergoing planned gynaecology surgery. Anxiety was assessed using the State Trait Anxiety Inventory (STAI) (Spielberger et al. 1970). Trait anxiety was measured at the time of recruitment. State anxiety was then assessed at six time points during the immediate pre- and post-operative periods. Post-operative pain was also measured using a visual analogue scale.

---

[1] Two distinct categories of anxiety, trait and state, have been identified. Trait anxiety refers to relatively stable individual differences in anxiety proneness whereas state anxiety is a transitory emotional state (Spielberger et al. 1970).

For the qualitative approach, taped semi-structured telephone interviews were conducted approximately a week after discharge in order to gain a better understanding of the patient experience.

Findings

Quantitative findings

- In general, state anxiety rose steadily from the night before surgery to the point of leaving the ward to go to theatre. Anxiety then increased sharply prior to anaesthetic but a dramatic decrease was observed at day one post-operatively. Little variation in anxiety levels was seen between day one and day two post-operatively.

- Approximately 50% of patients experienced high state anxiety on the morning of surgery.

- Patients with higher levels of trait anxiety were more likely to experience higher levels of anxiety throughout the admission period ($p<0.0001$).

- Those patients having major surgery ($p=0.002$) or reporting pain prior to admission ($p=0.006$) were also more likely to experience higher levels of state anxiety.

- Elevated levels of pre- ($p=0.011$) and post-operative ($p<0.0001$) anxiety were associated with increased levels of post-operative pain.

Qualitative findings

From the analysis of the qualitative data, four themes were identified under a major theme of 'causes of anxiety':
- Not knowing;
- Organisation and delivery of care;
- Becoming a patient;
- Concerns over others.

Three themes were identified under a major theme of 'alleviation of anxiety':
- People;
- Being prepared;
- Good pain management.

Conclusion and Clinical Implications

- This study found higher rates of anxiety than previously reported in surgical patients (Kindler et al. 2000, Nelson et al. 1998).

- Anxiety levels appear raised before admission to hospital. This has important clinical and research implications.

- It may be possible to identify a specific patient group that is at particular risk of high levels of anxiety using variables such as trait anxiety, degree of surgery and pain prior to admission. Interventions designed to reduce anxiety could be targeted to this vulnerable group.

- Patient experiences can inform the delivery of services to meet their health needs better.

- Social support derived from fellow in-patients was an important contributory factor in the amelioration of anxiety.

- Nursing care needs to be 'engaged' and should provide individualised care that acknowledges the emotional, physical, spiritual and environmental dimensions of a patient.

Introduction

It is well documented that hospitalisation for surgery is associated with increased anxiety (Johnston 1980, Norris & Baird 1967, Ramsey 1972, Welsh 2000). Anxiety may be considered to be an emotional response to a perceived threat or danger (Spielberger & Rickman 1990). Hospitalisation alone presents many such threats to most patients since it is related to new stressful experiences, the psychological effects of which may be amplified by poor health (Wilson-Barnett 1981). However, hospitalisation for surgery or other invasive procedures is particularly acknowledged as an anxiety provoking event since it is accompanied by a wide range of additional fears (Dodds 1993, Welsh 2000), including an alteration in body image, having an anaesthetic, postoperative pain and dependence (Wilson-Barnett 1981).

Raised anxiety has important clinical implications since it has been demonstrated to adversely impact upon anaesthetic requirements, post-operative pain and post-operative recovery. Several studies (Goldman et al. 1988, Maranets & Kain 1999, Markland & Hardy 1993, Williams et al. 1975), as well as reported clinical experience (Maranets & Kain 1999), suggest that the anxious patient requires increased doses of anaesthetic agents in order to establish and maintain an anaesthetised state. Numerous studies have demonstrated a positive correlation between anxiety and pain with those less anxious patients experiencing less pain (de Groot et al. 1997, Thomas et al. 1995). It has also been shown that the anxious patient tends to require a longer post-operative hospital stay (Boeke et al. 1991a). Additionally, raised anxiety can result in behavioural and cognitive sequelae that can also have far-reaching effects on recovery (Kiecolt-Glaser et al. 1998, Wilson-Barnett & Batehup 1988).

The quality and amount of information currently given to patients has changed greatly since the first research suggested that it could reduce anxiety and yet local research has found that patients still continue to experience anxiety associated with being in hospital (Carr 2000). Uncertainty still exists, though, regarding the magnitude of the problem, with varied anxiety prevalence figures reported (Maranets & Kain 1999). National and local research has shown that post-operative pain also continues to be problematic for patients. On a national level, it was found that 61% of patients suffered pain and of these 33% were in pain all or most of the time (Bruster et al. 1994). On a local level, it has been found that 68% of patients surveyed experienced significant pain in the early postoperative period (Carr 2000). Again, this is despite various advances in the management of acute pain, such as acute pain management

teams, increased education on pain management, epidurals, patient controlled analgesia and new drugs.

Informational interventions designed to minimise anxiety may have limited use in clinical practice where cost and time are major factors (O'Halloran & Altmaier 1995). Such interventions may also increase distress for patients who have an avoidance coping style for dealing with a threat such as surgery (Munafo 1998). There appear to be few contemporary studies that have sought the patients' perspective on the most effective methods for reducing anxiety as well as the situations which amplify that anxiety. The identification and understanding of anxiety as experienced by surgical patients is vital given that assisting patients in coping with anxiety is recognised as one of the nurse's most important responsibilities (Swindale 1989). Previous research has suggested that nurses do not accurately perceive anxiety and stress in surgical patients (Biley 1989, Teasdale et al. 2000).

In general, there has been a wealth of research conducted on anxiety in surgical patients. However, surprisingly little research has been conducted on the natural course of such anxiety. Study design issues (see Literature Review) limit the applicability of the research that has been conducted. Johnston (1980) suggests that most research is based instead on an 'intuitive hypothesis'. The investigation of the course of anxiety may be seen as important not only to enhance understanding of the patient experience, but also for the successful implementation of anxiety management interventions. Furthermore, few studies have sought to identify the events and situations that contribute to the most anxious times.

Anxiety is a subjective experience and its occurrence in surgical patients is a current problem with important clinical implications. This study explores the magnitude of the problem, the natural course of anxiety, together with the patients' perspective on the events and situations that both exacerbate and ameliorate surgical anxiety.

Literature Review

Introduction

This review presents a critical overview of the relevant literature related to anxiety in surgical patients. Anxiety as a psychological concept is briefly reviewed before exploring the evidence that promotes the clinical significance of anxiety in relation to intra- and post-operative outcomes. Finally, the research regarding the prevalence and pattern of anxiety, the patient variables affecting anxiety levels, together with previous investigations of the patient's anxiety experience are critically reviewed.

Anxiety

Anxiety is a widely used psychological concept that, at first glance, seems to be understood by everybody on the basis of personal experiences. However, anxiety has many meanings (Edelmann 1992), and these are reflected in the many different definitions of anxiety in the scientific literature:

> Anxiety is a personality characteristic of responding to certain situations with a stress syndrome of responses. Anxiety states are then a function of the situations that evoke them and the individual personality that is prone to stress (Simpson 1980 cited by Edelmann 1992 p1).

> An unpleasant emotional state or reaction that can be distinguished from others, such as anger or grief, by a unique combination of experimental qualities and physiological changes (Spielberger & Rickman 1990 p69).

> Anxiety is a state of mood or emotions of which an excess is unpleasant; it is concerned with uncertainty and is directed towards the future rather than the past (Tyrer 1999 p5).

In general it is apparent that anxiety concerns a subjective reaction consisting of feelings of tension, apprehension, nervousness, and worry, and activation of the autonomic nervous system (Spielberger & Rickman 1990). This reaction may be as a result of a perceived danger that may lead to physical harm or arise from social-evaluative situations that pose threats to self-esteem or psychological well-being (Spielberger & Rickman 1990).

The anxiety response has been described as expressing itself through at least three different systems, reinforcing anxiety as a multidimensional emotion (Edelmann 1992). Lang (1968, 1971 cited by Edelmann 1992) promoted this three system theory and proposed that anxiety responses consist largely of independent components of motor behaviour, linguistic expressions and physiological states. This three system theory has received support (Rachman & Hodgson 1974 cited by Dodds 1993) but has also received criticism, mainly regarding the lack of a consistent definition of the linguistic expression component of anxiety (Kozak & Miller 1982 cited by Dodds 1993).

Fear and stress

An important differentiation to make is between anxiety and fear and anxiety and stress. Fear and stress are both words closely associated with anxiety. Fear is generally seen as a type of anxiety specifically associated with an object or setting, an external threat, whereas most forms of anxiety refer to internal threats or are unfocused (Tyrer 1999). Stress generally refers to external forces or pressures acting on an individual (Spielberger & Rickman 1990). Anxiety is thus an individual's subjective response to those external forces and pressures (Boore 1978 cited by Dodds 1993).

State and trait anxiety

Anxiety research has lead to the creation of two distinct categories of anxiety: state and trait. Cattell and Scheier (1963 cited by Spielberger & Rickman 1990) and Spielberger (1966 cited by Edelmann 1992) created the impetus for the creation of such a distinction. State anxiety is conceptualised as a:

> …transitory emotional state or condition of the human organism that is characterized (sic) by subjective, consciously perceived feelings of tension and apprehension, and heightened autonomic nervous system activity (Spielberger et al. 1970 p3).

Spielberger et al. (1970) proposed that state anxiety varies in intensity and fluctuates over time as a function of the perceived danger. In contrast, trait anxiety refers to:

> …relatively stable individual differences in anxiety proneness, that is, to differences between people in the tendency to respond to situations perceived as threatening with elevation in A-State intensity (Spielberger et al. 1970 p3).

Spielberger et al. (1970) suggest that individuals who are high in trait will exhibit state elevations more frequently than low trait individuals since they tend to react to a wider range of situations as dangerous or

threatening. Furthermore, high trait individuals are also more likely to respond with elevated state in situations where there is a perceived threat to self-esteem (Spielberger et al. 1970). However, the state trait distinction has received criticism, most notably for its arbitrary nature and its lack of recognition of the environmental factors that influence anxiety. Edelmann (1992) and Spielberger and Rickman (1990) provide a review of such criticism.

Anxiety and Surgical Outcomes

Patients differ in their recovery from, and their response to, surgery. Such variability is also apparent within comparable procedures (Munafo & Stevenson 2001). The cause of such differences is unclear and thus has led to suggestions that psychological factors, such as anxiety, may be associated with surgical recovery (Munafo & Stevenson 2001). The existence and identification of such associations has obvious clinical importance. The intra- and post-operative outcome variables that have most frequently been associated with anxiety are anaesthetic requirements, post-operative pain and surgical recovery. The literature pertaining to these possible associations is explored below.

Anaesthetic requirements

Maranets and Kain (1999) suggest, through clinical experience, that the anxious patient requires larger doses of anaesthetics to establish and maintain an anaesthetised state. The highly anxious patient may be at greater risk during surgery due to this need for larger doses of anaesthetic agents (Johnston 1980). Such larger doses may also have negative implications for post-operative recovery (Markland & Hardy 1993). However, there has been relatively little research conducted regarding the influence that anxiety exerts on such intra-operative variables. Studies investigating the possible association between anxiety and anaesthetic requirements include Goldman et al. (1988), Maranets and Kain (1999), Markland and Hardy (1993) and Williams et al. (1975).

Williams et al. (1975) examined the effect of a pre-operative interview on anxiety (assessed physiologically) as well as on the ease of anaesthetic induction. In this study it was found that highly anxious patients required a greater amount of anaesthetic agents to induce anaesthesia compared with less anxious patients. This study has received criticism for its lack of use of validated measures to assess anxiety and because it did not control for potential confounding variables (Maranets & Kain 1999). Goldman et al. (1988) investigated whether larger doses of anaesthetic agents were required in anxious patients. The study sample consisted of 52 gynaecology day case patients and hypnosis was the intervention chosen to reduce state anxiety. It was found that the patients who had

received the hypnosis were significantly less anxious and required less of the drug used to induce and maintain anaesthesia. However, this study has also been criticised for its use of an unvalidated anxiety measurement scale as well as the use of hypnosis as an intervention, due to the potential difficulties associated with its practical application in a clinical setting (Markland & Hardy 1993).

Markland and Hardy (1993) examined state anxiety, relaxation techniques and anaesthesia requirements in 21 patients undergoing day case surgery. This study divided the patients into three groups: relaxation group (listened to a tape-recorded relaxation session), attention-control group (listened to a tape-recorded short story) and no treatment control group. Both the relaxation group and the attention-control group required significantly less time to induce anaesthesia and small doses of the anaesthetic agents. An obvious limitation to this study is the small sample size. The study also did not appear to control for potential confounding variables. The most recent study was conducted by Maranets and Kain (1999) who investigated whether trait or state anxiety was associated with anaesthetic requirements in 57 gynaecology patients. State anxiety was not found to influence the quantity of anaesthetic agent required to induce or maintain an anaesthetised state. However, trait anxiety was found to be an independent predictor of anaesthetic requirements. The design of this study addressed many of the weaknesses of previous research. Additionally, this study also controlled for anaesthetic depth during surgical procedure, a practice that was not performed in previous studies.

Overall, the published research, as well as reported clinical experience, indicates that anxiety is associated with increased anaesthesia requirements. The validity of earlier studies has been questioned (Maranets & Kain 1999) and uncertainty exists regarding the anxiety component (state or trait) which is exerting an influence on anaesthetic requirements. An important question concerns the clinical significance of such results. Although this is not obvious from previous research, an indication of the clinical significance is provided by Macario et al. (1999) who reported that pre-operative anxiety was considered one of the five most important clinical anaesthesia outcomes to avoid, as judged by a panel of expert anaesthetists.

Post-operative pain

Perhaps one of the most widely researched relationships with anxiety is post-operative pain. In particular, whether anxiety states pre-operatively are predictive of a patient's perception of post-operative pain and analgesia use. The existence of such relationships has important clinical implications for the education of patients in pain reduction strategies as

well as informing post-operative analgesia policies. For the purposes of this literature review, eight studies are presented that specifically investigate anxiety and post-operative pain (Boeke et al. 1991b, Johnston & Carpenter 1980, Kain et al. 2000, Nelson et al. 1998, Oberle et al. 1990, Perry et al. 1994, Scott et al. 1983, Taenzer et al. 1986).

In reviewing the literature, three distinct associations between anxiety and post-operative pain were identified. Firstly, that a patient's trait anxiety is related to post-operative pain. This was investigated by Kain et al. (2000), Nelson et al. (1998), Perry et al. (1994), Scott et al. (1983) and Taenzer et al. (1986). Of these five studies, two found a significant association between trait anxiety and post-operative pain (Perry et al. 1994, Taenzer et al. 1986). Taenzer et al. (1986), in a study of 40 gallbladder patients, found that trait anxiety was positively correlated to post-operative pain (r=0.35, p<0.01), as measured by a visual analogue scale, as well as analgesic intake (r=0.28, p<0.05).

The second association identified in the literature concerns a possible relationship between pre-operative state anxiety and post-operative pain. Boeke et al. (1991b), Johnston and Carpenter (1980), Kain et al. (2000), Oberle et al. (1990), Perry et al. (1994), Scott et al. (1983) and Taenzer et al. (1986) investigated this potential relationship. Of these seven studies, four found a significant association between pre-operative state anxiety and post-operative pain (Boeke et al. 1991b, Kain et al. 2000, Perry et al. 1994, Scott et al. 1983). The correlation coefficients reported by these studies ranged from 0.20 (p<0.05) (Boeke et al. 1991b) to 0.35 (p<0.01) (Kain et al. 2000). In the study conducted by Perry et al. (1994), using a sample of 94 gynaecology patients, it was found through multiple regression analysis that pre-operative state anxiety was a significant predictor of post-operative pain.

The final association identified in the literature relates to a potential relationship between post-operative state anxiety and post-operative pain. This was investigated by Boeke et al. (1991b), Nelson et al. (1998), Oberle et al. (1990) and Scott et al. (1983). All four of these studies demonstrated a significant association between post-operative state anxiety and post-operative pain. The correlation coefficient reported by these studies range from 0.30 (p<0.001) (Boeke et al. 1991b) to 0.56 (p<0.05) (Oberle et al. 1990). Also, Scott et al. (1983) found, in a sample of 48 gallbladder patients, that post-operative state anxiety was also correlated with the number of analgesics requested (r=0.33, p<0.01).

A degree of inconsistency is apparent in the literature regarding the relationship between trait anxiety, pre-operative state anxiety and post-

operative pain. There are several factors that may account for such contradictory findings: gender, surgical procedure, anaesthetic techniques, pain assessment technique, sample size and length of time prior to surgery that trait anxiety was assessed. Additionally, the pain management practices of nursing and medical staff would be varied across the studies. A further point to consider when interpreting such findings is the interaction occurring between trait anxiety and pre-operative state anxiety. It has been suggested that trait anxiety exerts no direct effects on post-operative pain, rather its effects are mediated through the effects of trait anxiety on pre-operative state anxiety (Kain et al. 2000). In contrast, a consistent relationship has been demonstrated between post-operative state anxiety and post-operative pain. This may not be surprising when it is considered that anxiety evokes a similar physiological response from the body as acute pain (Walding 1991).

Recovery

It has been suggested that the transient suppression of the immune system that accompanies psychological stress, such as anxiety, may result in an increased risk of post-operative complications and delayed surgical recovery (Boeke et al. 1991a). Feelings of well being may also impact upon recovery (Boeke et al. 1991b). This has economic as well as clinical implications. For the purpose of this review, seven studies are presented that examine the relationship between anxiety and an indicator of surgical recovery (Boeke et al. 1991a, Boeke et al. 1991b, Boeke et al. 1992, de Groot et al. 1996, Holden-Lund 1988, Johnston & Carpenter 1980, Wallace 1984a). Post-operative length of stay was the indicator of recovery used by Boeke et al. (1991a), Boeke et al. (1991b) and Boeke et al. (1992). All of the studies were conducted with gallbladder patients, and pre- as well as post-operative state anxiety was assessed. No associations were identified between pre-operative state anxiety and length of stay (Boeke et al. 1992). Boeke et al. (1991a) and Boeke et al. (1991b) both identified relationships between post-operative state anxiety and length of stay. Indeed, Boeke et al. (1991a) identified a particularly anxious subgroup of the sample that stayed in hospital an average of three days longer post-operatively. These studies controlled for the potential confounding influence of medical status variables. However, the studies are similar and as such it is not entirely clear from the articles if the samples used were drawn from one single data set.

In the study conducted by de Groot et al. (1996) the outcome measure used to assess recovery was the Symptom Checklist 90 (Arrindell & Ettema 1986 cited by de Groot et al. 1996). The sample consisted of 126 patients undergoing lumbar surgery. After controlling for age, sex and medical variables, state anxiety was found to be positively associated with physical complaints, with a beta coefficient of 0.27 (p<0.01) being

reported. Johnston and Carpenter (1980) also used a self-report tool to assess recovery (Wolfer-Davies scale, Wolfer & Davies 1970 cited by Johnston & Carpenter 1980). This study consisted of a sample of 73 patients undergoing major gynaecological surgery. No significant associations were identified between anxiety and recovery.

Finally, Holden-Lund (1988) and Wallace (1984a) examined the effects that interventions designed to minimise anxiety had on recovery. Holden-Lund (1988) investigated the effects of relaxation with guided imagery on anxiety and surgical wound healing. Urinary cortisol levels were also measured in order to obtain a physiological correlate of recovery. This sample consisted of 27 gallbladder patients. The group that received the guided imagery intervention had significantly lower urinary cortisol levels on day one post-operatively, as well as less evidence of erythema at the surgical wound site compared with the control group. However, the results of this study should be interpreted cautiously due to the small sample size and the use of an unvalidated tool to assess the surgical wounds. Wallace (1984a) tested the use of a preparatory booklet in a sample of 80 gynaecology patients. Patients who received the booklet experienced a better recovery in comparison with the control group on a number of measures, including post-discharge vigour scores and a faster return to normal activities.

In reviews of the studies that have investigated the relationship between anxiety and surgical outcomes, it has been the studies relating to anxiety and recovery that have produced the most uncertainty (Munafo & Stevenson 2001) due to the degree of inconsistency observed. A great deal of this inconsistency arises from the varied measures used to define surgical recovery. Post-operative recovery is multidimensional and the choice of outcome is crucial for establishing a relation between pre- and post-operative states (Johnston 1986). Additionally, it is important to define the concept of recovery; whether recovery refers to recovery from the illness or recovery from the procedure (Johnston 1986).

Prevalence of Anxiety in Surgical Populations

In reviewing the literature pertaining to anxiety in surgical populations, few instances were identified where the incidence or prevalence of anxiety was explicitly investigated. This is generally surprising given the amount of research conducted on anxiety and the resources allocated to its alleviation. In some studies, the sample is divided into grades of anxiety (low, moderate, high), but such division is generally performed on an arbitrary basis in order to facilitate further analyses (for example, Auerbach 1973, Caumo et al. 2001, Williams et al. 1975). Thus, such

studies do not provide reliable prevalence data. Furthermore, other studies that aimed to report the incidence of anxiety (for example, McCrone et al. 2001) fail to do so.

Norris and Baird (1967) conducted one of the earliest studies on the incidence of anxiety. Clinically trained observers assessed 500 patients for the presence of pre-operative anxiety based on the answers to a series of questions and stated physical signs. Of the total sample, 60% were found to be anxious pre-operatively. Ramsey (1972) also used a clinical assessment to determine the presence of pre-operative anxiety in a sample of 382 patients. Two hundred and seventy-nine (73%) of these patients were classified as anxious. Neither study considered post-operative anxiety.

More recently, the prevalence of anxiety has been reported by some studies adjunct to the primary study aims. Kindler et al. (2000) and Moerman et al. (1996) both reported pre-operative prevalence figures for mixed surgical populations, which were 25% (n=486) and 32% (n=200) respectively. In a sample of 89 gynaecological patients, Thornton et al. (1997) assessed anxiety using the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith 1983 cited by Thornton et al. 1997), and reported the prevalence of clinically significant pre-operative anxiety as 54%. In the same study, Thornton et al. (1997) also reported that the prevalence of clinically significant anxiety two months post-operatively was 24%. In contrast, Nelson et al. (1998), in a study of 98 cardiac patients, reported the prevalence of anxiety as 5% on day two post-operatively.

Two points arise from this brief review. Firstly, as mentioned above, the prevalence of surgical anxiety is a research area that has not received much attention. This may, in part, be due to the practical issues involved in defining anxiety and an anxious patient (see Limitations); secondly, that reported figures for the prevalence of anxiety are varied and inconsistent across studies. This may be the result of factors such as type of surgical procedure, time when anxiety was assessed, sex, age, and anxiety measurement tool used. Again, the definition used to classify anxiety would also affect the prevalence figures.

Pattern of Anxiety in Surgical Populations

The above discussion relating to anxiety and surgical outcomes gives an indication of the importance of anxiety in surgical patients. Given this, it is surprising to note that little work has been conducted on the natural course of anxiety in surgical patients. Johnston (1980) suggests that

most studies are instead based on an 'intuitive hypothesis'. The investigation of the course of anxiety may be seen as vital not only to enhance understanding of the patient experience, but also for the successful implementation of anxiety management interventions. As a result of an extensive literature search, six studies were identified which sought to identify the pattern of anxiety (Chapman & Cox 1977, Duits et al. 1998, Johnston 1980, McCrone et al. 2001, Spielberger et al. 1973, Wallace 1984a). All of the studies used the State Trait Anxiety Inventory (Spielberger et al. 1970) to assess state anxiety.

One of the earliest studies was conducted by Spielberger et al. (1973). The sample consisted of 26 male patients undergoing general surgery. This study attempted only a basic investigation into the course of anxiety, as anxiety was only assessed at two time points, pre- (18-24 hours before) and post- (median 7 days) surgery. A marked decline in anxiety was observed from the pre- (mean score 41.15) to the post- (mean score 31.12) surgery time point. Chapman and Cox (1977) built upon these findings in a study of 67 mixed sex, abdominal surgery patients. These patients were divided into three groups: general surgery (n=44), kidney donors (n=11) and kidney recipients (n=12). Anxiety was measured on admission to hospital and post-operatively on days one and three. In the general surgery patients, anxiety was found to rise from its lowest level at pre-surgery (mean score 39.9) to a peak on day one post-operatively (mean score 41) and subsequently declined slightly on day three (mean score 40.6). Overall, these results suggest little variation in anxiety over the immediate pre- and post-operative periods. In the kidney donor and recipient groups, the same pattern was observed but to a more marked degree which may reflect the different concerns of these patient groups compared to the general surgery population.

Johnston (1980) conducted the most widely known work on the pattern of anxiety. This paper reports the results of four separate studies. In order to keep the current review succinct, only the results of the second and third study will be discussed. These studies bear most relevance to the current study. In Johnston's (1980) second study, 21 patients undergoing gynaecological surgery were investigated. Anxiety was assessed daily from four days before surgery to four days after surgery, excluding the day of surgery. The highest mean level of anxiety was observed two days before surgery. No significant changes in anxiety were observed from one day before to four days after surgery.

In the third study, 72 patients undergoing gynaecological surgery were recruited. This time anxiety was assessed four days before surgery to fourteen days after surgery, again excluding the day of surgery. The

highest level of mean anxiety was observed the day before surgery. Mean anxiety then fell slightly two days post-surgery and then declined sharply at day six and then day fourteen post-operatively. This suggests little difference in the immediate pre- and post-surgery anxiety levels and that anxiety does not significantly lower until approximately a week after surgery. The two main points that these studies raise is that anxiety appears to be elevated prior to admission and that there is no simple reduction in anxiety from before to after surgery.

The study by Wallace (1984a) assessed the pattern of anxiety as part of an evaluation of the effectiveness of a booklet in the reduction of surgical stress. Anxiety was measured at five time points in 80 gynaecology patients: out-patients (six to eight weeks before surgery), morning of surgery, evening of surgery, one week post-surgery and six weeks post-surgery. In the group that received routine care (n=26), anxiety rose slightly from out-patients to the morning of surgery where anxiety peaked (mean score 38). From the morning of surgery, anxiety was observed to decline in a linear fashion to one week post-surgery (mean score 31.4). Little variation in the mean anxiety scores is again noted.

More recently, Duits et al. (1998) and McCrone et al. (2001) have attempted to describe the course of anxiety in coronary artery bypass graft patients. Duits et al. (1998), in a study of 217 mixed sex patients, assessed anxiety at four time points: 14 days before surgery, one day before surgery, seven days after surgery and six months after surgery. Anxiety was highest 14 days pre-operatively (female mean score 52), declined slightly the day before surgery (female mean score 48.8) and then declined sharply seven days post-operatively (female mean score 37.2). Little difference was observed between the mean scores at seven days and six months after surgery (female mean score 38.4), suggesting that anxiety levels returned to a 'normal' level approximately a week post-operatively. McCrone et al. (2001) in a study of 31 mixed sex patients, assessed anxiety at six time points, pre-operatively (not defined), two to three days post-operatively and two, four, eight and twelve weeks post-operatively. Total sample anxiety was highest pre-operatively, declined steadily through the fourth post-operative week, and then increased slightly at 12 weeks.

The pattern of anxiety has been demonstrated to be varied across the studies reviewed, with a great deal of this variation probably accounted for by the type of surgical procedure investigated. However, from these studies, two points may be drawn. Firstly, that anxiety appears elevated prior to admission but that it is not clear how early this elevation occurs. Secondly, that little variation had been observed in anxiety levels during

the immediate pre- and post-operative periods. This would be in contrast to the 'intuitive hypotheses' and it may be that the times chosen by the studies to assess anxiety are masking any activity occurring in anxiety levels at these times. Indeed, only one of the studies reviewed (Wallace 1984a) actually measures anxiety on the day of surgery (morning of surgery). In order to gain a clearer picture of the pattern of anxiety during the immediate pre- and post-operative periods, these key time periods in the patient experience need to be examined in more detail. Furthermore, the key studies surrounding the pattern of anxiety are over 20 years old. Since then nursing and surgical practices, patterns of hospitalisation as well as patients' knowledge and expectations have changed enormously. These are factors that would impact greatly upon the pattern of anxiety.

Patient Variables Associated with Anxiety in Surgical Populations

Patients differ in the amount of anxiety experienced before surgery (Kincey 1995). Despite the obvious clinical value in being able to predict those patients who may be more likely to experience a higher level of anxiety, there is little published work where the primary focus is the identification of the factors which may predispose patients to such higher anxiety levels. The relevant literature appears to concentrate more on a discussion of the identification and treatment of anxiety, or present relevant anecdotal findings in addition to primary study aims. Instead, it has been suggested that within the healthcare setting the identification of high-risk anxiety groups is based more on assumptions regarding risk factors (Domar et al. 1989). However, some studies provide evidence that some factors can predispose patients to higher levels of pre-operative anxiety (Badner et al. 1990, Caumo et al. 2001, Domar et al. 1989, Kindler et al. 2000, Mackenzie 1989).

The two risk factors most frequently quoted within the literature are sex and age. In relation to sex, it is proposed that female patients tend to experience higher levels of anxiety. This is a relatively consistent finding with support provided by Badner et al. (1990), Caumo et al. (2001), Domar et al. (1989), Kindler et al. (2000) and Mackenzie (1989). It has been suggested that the type of surgery may account for this finding (Kindler et al. 2000). Often women undergoing gynaecological surgery are compared with men undergoing abdominal surgery and therefore the meaning of the surgery may have affected anxiety levels rather than just gender (Kindler et al. 2000). However, this association has persisted within multivariate analyses where such potential confounders are controlled for (Kindler et al. 2000), although another possible bias to

consider is that females may have a tendency to admit or report higher levels of anxiety. All of the studies mentioned here used self-report measures of anxiety, therefore the strength of this bias cannot be commented on.

Age is another frequently reported risk factor. It is proposed that younger patients tend to experience higher levels of anxiety. This finding is not as consistently reported as the association between anxiety and sex, with Badner et al. (1990), Caumo et al. (2001) and Domar et al. (1989) reporting no significant association. Older patients typically would be expected to have more experience of hospital admissions, surgery and general anaesthesia and thus it may be these factors and not age alone that account for the lower anxiety levels in older patients. However, Kindler et al. (2000) did find a significant association between anxiety and age after adjusting for previous anaesthesia experience.

Beyond age and sex, the anxiety risk factors most frequently investigated appear to be: level of education, previous experience of anaesthesia/surgery, degree of surgery, and type of surgery. Uncertainty seems to exist regarding the association between level of education and anxiety. Caumo et al. (2001) found that patients with more years in education were more anxious pre-operatively. However, this is contradicted by the studies conducted by Domar et al. (1989) and Kindler et al. (2000) where no association and a reverse association were identified respectively.

Patients with previous experience of anaesthesia/surgery may be expected to have lower anxiety levels (Badner et al. 1990, Caumo et al. 2001, Kindler et al. 2000, Mackenzie 1989). The degree of surgery to be performed was found by Caumo et al. (2001) to be an independent risk factor for high pre-operative anxiety. However, Domar et al. (1989) found no significant association between degree of surgery and anxiety. Finally, Kindler et al. (2000) and Mackenzie (1989) both investigated the relationship between type of surgery and anxiety. Kindler et al. (2000) found that anxiety was highest in male patients undergoing otorhinolaryngological surgery and in female patients undergoing thoracic surgery. Mackenzie (1989) found that oral surgery was associated with the highest anxiety scores. In general, it is suggested that surgery associated with mutilation is related to higher levels of anxiety (Domar et al. 1989, Kindler et al. 2000).

Patient's Experience of Surgical Anxiety

As part of the current literature review, research was also sought which attempted a qualitative inquiry into surgical anxiety from the patients' perspective. Two pieces of research were identified (Grieve 2002, Wiens 1998). Grieve (2002) asked 150 day surgery patients, in the course of normal conversation and through open questioning, to describe how they felt about their impending surgery. The predominant fear identified was the anaesthesia since it resulted in a total loss of control. Patients also reported feeling uncomfortable with the thought of their body being manipulated whilst they were under the effects of the anaesthetic. This lead Grieve (2002) to the conceptualisation of a central feature, the experience of disempowerment, which compounded patient anxiety. This represented a process during the pre-operative period where the patient gradually loses personal identity and control. Thus, as the patient's control diminishes, a proportional increase in the anxiety experienced by the patient occurs. This study conducted by Grieve (2002), although providing valuable insight into the patient experience, has limitations since its findings represent reflection on clinical practice and the informal involvement of patients. Additionally, the study only considered the immediate pre-operative period as experienced by patients undergoing day surgery.

The aim of the study conducted by Wiens (1998) was to investigate and describe the nature of pre-operative anxiety in women. The study utilised a phenomenological hermeneutical perspective and involved 14 women. From the analysis of data obtained from semi-structured interviews as well as field notes, seven categories were constructed which described what the women talked about pre-operatively. These categories were direct verbalisation, valuing connections, threats to self, death experiences, diversion or social discourse, coping, and unresolved relationship issues. Essentially, the findings illustrated the complexity of pre-operative anxiety. However, again only the immediate pre-operative period was considered, the sample size was relatively small and the data analysis was a secondary analysis. Additionally, the study was conducted in the United States; therefore the generalisability of the findings to United Kingdom populations is debatable.

Other studies have attempted to describe the nature of pre-operative anxiety but may not be considered essentially qualitative in nature. Two examples of such studies are those conducted by Johnston (1987) and Bodley et al. (1974). Johnston (1987) used a 'thoughts' questionnaire to assess worries in 135 gynaecology patients prior to surgery. The two main worries identified were whether the surgery would be successful

and how long it would take to return to normal post-operatively. Bodley et al. (1974) used a Kelly Repertory Grid to investigate 28 patients pre-operatively in order to discover the nature of pre-operative anxiety. Bodley et al. (1974) found that, in addition to worries concerning the operation and the anaesthetic, patients were also concerned about leaving the home and family and such concerns were heightened if there was a lack of communication and contact with hospital staff.

Summary

Essentially, anxiety concerns a subjective reaction consisting of feelings of tension, apprehension, nervousness and worry related to the future. Two distinct categories of anxiety have emerged from psychological research: state and trait. State anxiety refers to a transitory emotional state whereas trait anxiety refers to relatively stable individual differences in anxiety proneness (Spielberger et al. 1970).

The clinical importance of anxiety related to hospitalisation and surgery is evident through the negative effects it exerts on anaesthetic requirements, post-operative pain and recovery. In particular, the association between post-operative state anxiety and post-operative pain has been well demonstrated within the literature. However, uncertainty is apparent regarding the influence of trait and pre-operative state anxiety on post-operative pain. Clinical importance established through research has been reinforced by reported clinical experience (Macario et al. 1999, Maranets & Kain 1999).

The prevalence of surgical anxiety is infrequently investigated and reported rates are highly varied ranging from 25% (Kindler et al. 2000) to 73% (Ramsey 1972) pre-operatively and from 5% (Nelson et al. 1998) to 24% (Thornton et al. 2000) post-operatively. Such variation may be accounted for, in part, by the definition used to classify patients as anxious. There have also been few studies that examine the pattern of surgical anxiety. Instead, it has been suggested that research is based more on an 'intuitive hypotheses' (Johnston 1980). Studies exploring the pattern of anxiety have produced diverse findings, which may in part be accounted for by differences in patient characteristics such as sex, age and type of surgery. It is evident that such studies have not measured anxiety in the immediate pre- and post-operative periods, yet it is likely that patients experience differing levels of anxiety in these key phases. Additionally, such work (Johnston 1980) is dated and its current applicability debatable.

Anxiety is still problematic for surgical patients (Carr 2000) despite the introduction of measures designed to minimise it. Very few studies have been conducted to obtain the patient's perspective on the experience of anxiety and the events and situations that aggravate and ameliorate it. Since anxiety is a subjective experience, and healthcare professionals have been shown to inaccurately perceive and understand such anxiety (Biley 1989), insight into such experiences may be considered invaluable not only for the success of anxiety management interventions, but also for the further development of patient care.

Methodology

Study Objectives

- To identify the prevalence of anxiety in a pre-operative population and in the immediate post-operative period;
- To identify the pattern of anxiety pre-operatively and post-operatively and how this may vary over time;
- To identify what events/situations may contribute to an elevation or decrease in anxiety levels in the immediate pre-and post-operative periods;
- To record the post-operative pain scores and identify any correlations with raised anxiety levels.

Overall Study Design

There has been a growing emphasis on combining quantitative and qualitative paradigms, particularly in nursing research where the researcher will often attempt to describe and conceptualise the multifaceted complexity of an individual's response to illness or healthcare situations (Shih 1998). The combination of methodologies is a process often referred to as triangulation (Barbour 1999, Begley 1996, Coyle & Williams 2000, Shih 1998). Triangulation has been defined as 'the combination of two or more theories, data sources, methods, or investigators in one study of a single phenomenon' (Shih 1998 p632). This definition addresses four types of triangulation, but triangulation may also be applied to the analysis of data (Begley 1996).

There are two purposes behind the use of triangulation: confirmation and completeness. Confirmation refers to the validation of the findings of one method against the findings of another (Coyle & Williams 2000). Relating the findings from different methodologies represents an attempt to counteract the threats to validity posed by each approach (Shih 1998). Completeness attempts to obtain a more accurate and complete picture of a social experience or phenomenon (Coyle & Williams 2000). Begley (1996) provides a discussion of the advantages and disadvantages of triangulation but essentially its main strengths lie in these two goals: confirmation and completeness of data.

For the purposes of this study, an across-methods triangulation was used, which enabled the use of quantitative and qualitative methodologies. This mixed methods framework was deemed essential since the study had a dual purpose; to investigate the epidemiology of

anxiety as well as gain an insight into the patients' anxiety experience. The use of mixed methods also enabled the generation of research questions for further investigation. The aim of this triangulation was to obtain a more complete and holistic understanding of anxiety as experienced by surgical patients (completeness of data).

Sample

A purposive sample of women undergoing planned gynaecological surgery was used. The inclusion criteria were that all patients were in the age range 16-85 years, and were having planned gynaecological surgery. Patients were excluded from the study if they suffered cognitive dementia or confusion, or were unable to understand the questionnaire.

The sample size was based on calculating an 'effect size' of 0.3. The effect is specified as a standardised outcome, where 0 is no effect, 0.10 small, 0.30 medium and 0.50 large. Cohen (1977) notes that correlations in many sociological studies are generally less than 0.50. It was determined that a sample size of n=85 would be sufficient to detect a correlation coefficient 0.3 with 80% power and a type 1 error rate of 0.05. It was envisaged that approximately 105 patients would need to be recruited to the study, factoring in attrition, in order to achieve a sample size of 85. Few studies state how they arrived at their sample size but one study, using similar measures with post-operative hysterectomy patients, calculated that a sample size of 70 patients with 80% power and a type 1 error rate of 0.05 was adequate (Choinere et al. 1998).

Data Collection Tools

State Trait Anxiety Inventory (STAI)

Anxiety levels were measured using the State Trait Anxiety Inventory (STAI), developed by Spielberger et al. (1970). The STAI is a self-administered questionnaire that consists of two forms; one to measure trait anxiety and one to measure state anxiety.

To recap, trait anxiety refers to 'relatively stable individual differences in anxiety proneness' (Spielberger et al. 1970 p.3) whereas state anxiety is 'conceptualized (sic) as a transitory emotional state or condition' (Spielberger et al. 1970 p.3).

A copy of the forms used to measure trait and state anxiety can be seen in Appendix A. Each of the forms consists of 20 statements. The responses for each of the statements are formatted on a four point Likert scale. The form for trait anxiety requires the subject to respond to each statement in accordance with how they generally feel. The form for state

anxiety requires the subject to respond to each statement in accordance with how they feel at that particular point in time. The possible scores for each form range from a minimum of 20 (low anxiety) to a maximum of 80 (high anxiety). Normative data for the STAI is provided by Spielberger et al. (1970). In a population of female undergraduates, the mean trait and state scores reported are 38.25 and 35.12 respectively (Spielberger et al. 1970). In a population of male general medical surgical patients, the mean trait and state scores reported are 41.91 and 42.38 respectively (Spielberger et al. 1970). Spielberger et al. (1970) do not provide normative data for female general medical surgical patients.

Validity and reliability

In assessing the concurrent validity of the trait component of the STAI, Spielberger et al. (1970) correlated the trait form with widely used measures of trait anxiety and reported correlation coefficients ranging from 0.73 to 0.85. The construct validity of the state component of the STAI was also demonstrated by Spielberger et al. (1970) through contrasted groups. Spielberger et al. (1970) report reliability data, by test-retest correlation, ranging from 0.73 to 0.86 for the trait form and 0.16 to 0.54 for the state form. The low correlation for test-retest reliability for the state form is expected since the form is designed to measure situational factors. Taking this into account, Spielberger et al. (1970) also report alpha coefficients as a measure of reliability for the state form, and these reliability coefficients ranged from 0.83 to 0.92.

Visual analogue scale

A visual analogue scale (VAS) was used to measure pain on days one and two post-operatively. The VAS consisted of a 10cm horizontal line with verbal anchors at either end (no pain and worst pain imaginable) (Appendix B). Patients were asked to provide a pain measurement by placing a mark on the line at the point that best described their current pain on movement. The VAS score is determined by measuring in centimetres from the left of the line to the point marked by the patient.

The VAS is among the most common measures of pain intensity and is considered easy to administer and score (McGuire 1992). An advantage of the VAS is in the provision of interval level data that allows for the use of parametric statistics (Dalton & McNaull 1998). However, the VAS has been criticised for the difficulty it presents in conceptualising a sensory phenomenon in a straight line continuum (McGuire 1992). Since such an assessment is highly subjective it has been suggested that the VAS is of most value when looking at change within individuals over time rather than across groups at a particular point in time (Crichton 2001). Many researchers have demonstrated the validity and reliability of the VAS across a variety of patient groups. McGuire (1992) provides a discussion

of such research. Overall, the VAS is considered a reliable, sensitive and valid method of assessing the intensity of acute pain (Dalton & McNaull 1998, McGuire 1992).

Semi-structured telephone interviews

In order to gain a further insight into the patients' anxiety experience, taped semi-structured telephone interviews were conducted. A copy of the interview schedule used can be seen in Appendix C. This method of data collection was chosen since its format provides a structure and focus to the interview, whilst also containing a flexibility which allows for probing of more complex and sensitive issues (Barriball & While 1994). Therefore, this method of data collection is well suited to the exploration of the perceptions and opinions of participants (Barriball & While 1994). This was deemed an important feature for the current study due to the subjective nature of anxiety.

Telephone interviews were used for several reasons: data can be gathered quickly and relatively easily, the interviews could be arranged for a mutually convenient time, it was not feasible for the researcher to travel to each patient's home, and many people feel comfortable with the relative anonymity of the telephone (Burnard 1994). Additionally, previous research has reported that interviews conducted with patients in hospital may produce a poorer quality of data due to response inhibitions created by the environment (Carr & Worth 2001). Overall, there is good support in the literature for the use of the telephone as a method of data collection (Barriball et al. 1996, Burnard 1994, Carr & Worth 2001). These interviews were taped as this permitted an identical replication of the interview, which facilitated analysis as well as reduced the possibility of error (Barriball & While 1994).

Validity and reliability

Semi-structured interviews have been criticised for the challenge they pose in obtaining a valid and reliable research process (Brink 1989 cited by Barriball & While 1994). However, it may be seen as a researcher's ethical duty to ensure validity and reliability if the research results are to affect care and service delivery (Smith 1992).

One concern is grounded in the acknowledgement that nearly all words can be interpreted differently (Barriball & While 1994). Barriball & While (1994) suggest that the researcher needs to maintain an awareness of this and thus use the flexibility inherent in the semi-structured interview and use probes in order to validate responses. However, it has been noted that such validation may be at the cost of reliability (Wilson 1996 cited by Carr & Worth 2001). In contrast, Barriball and While (1994) consider the use of probes within semi-structured interviews as an

invaluable tool for ensuring the reliability of the data. Nonetheless, the ability to explore the patient's personal experience was particularly important in the study since anxiety is a subjective experience.

Another concern relating to the validity and reliability of interview data is the risk of socially desirable answers. This is where a participant gives what they perceive as a preferred socially desirable response regardless of whether it is true or not (Brink 1989 cited by Barriball & While 1994). A sense of rapport as well as similarities in age, sex, ethnicity and education can all reduce the risk of socially desirable answers (Barriball & While 1994). As a result of the data collection procedure (see below), the researcher was able to build and develop a rapport with the patients prior to the interviews. The researcher was also the same sex as the patients. It was also felt that the use of the telephone to interview (relative anonymity) as well as the fact that the researcher was not employed by the hospital would further reduce the risk of socially desirable responses.

Finally, the use of audio tapes also helps to ensure the validity of interview data (Barriball & While 1994).

Ethics

Ethical approval for the study was obtained from the Local Research and Ethics Committee (LREC). Permission was also sought from the consultant surgeons whose patients would be involved. The study was also discussed with the nurse in charge of the ward concerned and access to the patients was granted.

During recruitment (see below) each patient was given a brief verbal overview of the project. If the patient then expressed an interest in taking part, they were given an information sheet to read (Appendix D) and were provided with an opportunity to ask any questions. Formal written consent was then obtained by means of an informed consent form (Appendix E). At this time the researcher reiterated the patients' right to cease participation in the study at any time and assured the patients of the confidentiality of all information obtained during the study period. Each patient was provided with a copy of the consent form. Additionally, the patient's general practitioner (GP) was informed about their participation in the study. Each GP was sent a letter (Appendix F), attached to the medical discharge note, and provided with a contact name and telephone number should they have any concerns about the patient participating in the study.

Even though the patient was informed of the telephone interview when they consented to take part in the study, it is important to recognise that

during the time between written consent and the interview, the patient's views may change (Carr & Worth 2001). Therefore, when the patients were contacted by telephone, the researcher reaffirmed that the interview could still go ahead.

Pilot Study

Prior to the main study, a pilot was conducted. The pilot study had three main aims. Firstly, to test the proposed procedure for data collection. Secondly, to refine and develop the interview schedule as well as practice and enhance interviewing techniques. Finally, to gather information about the field in order to inform and direct the study. The pilot study consisted of 15 patients and was conducted over a period of two months (Oct 2000-Nov 2000). At the end of the pilot study it was concluded that no alterations were required to the quantitative arm of the study and only minor alterations were made to the qualitative arm with regards to the interview schedule.

Steering Group

For the purposes of the study, a steering group was formed to direct the study and provide assistance in the event of problems arising. The steering group consisted of six members (Appendix G) and steering group meetings were held on a quarterly basis.

Setting and Recruitment

The study was based at a District General Hospital in the south of England. The study was conducted on a gynaecology surgical ward. The ward consisted of 13 beds (three bays of four beds and one side room).

At the hospital, gynaecology patients are invited to attend a pre-admission clinic approximately one week before their planned admission date. During this visit the patient is shown around the ward, is introduced to the nursing and medical staff, receives written and verbal information, is given the opportunity to ask questions, and undergoes a medical consultation and examination.

Patients were invited to participate in the study during the pre-admission clinic. Patients were approached while they were waiting to see the doctor. The researcher introduced herself and gave the patient a brief overview of the project before inviting them to participate. If patients expressed an interest in taking part, they were given an information sheet (Appendix D) to read through and were provided with an opportunity to ask any questions before giving their consent to take part in the study.

Data Collection Procedure

Trait anxiety was assessed at the pre-admission clinic, using the trait component of the STAI, once the patients had consented to take part in the study. The researcher emphasised that responses should reflect how the patients generally felt.

State anxiety was measured at six time points during the study period using the state component of the STAI. Four of these time points were pre-operative: 6pm the night before surgery, 8am or on waking the morning of surgery, before leaving the ward for theatre, and in the holding area prior to the anaesthetic. The remaining two time points were: 8am day one post-operative and 8am day two post-operative.

The STAI was self administered by the patients pre-operatively. They were given these questionnaires to take away with them at the pre-admission clinic. The researcher emphasised that responses should reflect how the patients felt at the time the questionnaire was completed. The researcher visited the patients on the ward in order to complete the post-operative questionnaires, after which the patients were also asked to provide a pain score using the VAS.

Information in addition to basic demographics was also collected: type of surgery, history of previous surgery, if the surgery was related to a possible malignancy, whether the patient had received night sedation the night before the surgery, whether the patient had received pre-medication, and if the patient suffered from pain prior to admission. Information was obtained either from the patients directly or the medical records.

Approximately one week after discharge, the patients were telephoned at home in order to conduct the semi-structured interview. These interviews were taped. Three attempts were made to call each patient. Originally it was intended that every patient would be called. However, after a period of time it was observed that no new data was being obtained from the interviews. Therefore, as a result of this observation, as well as time constraints, interviewing ceased six months after the start of the data collection period (October 2001).

Study Modifications

As mentioned above, the original recruitment target of the study was to consent 105 patients to the study with a final sample size, allowing for attrition, of 85 patients. Several months into the study it became apparent that this aim would not be attainable. This was due to time constraints

and a lower number of patients attending clinic than anticipated. This presented problems in relation to the quantitative analysis. Therefore, after comprehensive discussion within the steering group, the decision was made to adhere to the original study timeframe and supplement the quantitative study data with the data obtained during the pilot study (n=15). The threat to validity by inclusion of the pilot data was considered minimal since no changes had been made to the methodology and only a short time had passed from the pilot to the main study. This resulted in a final sample size, for the quantitative arm, of 80 patients.

Data Analysis

Quantitative data

The quantitative data was managed in a database constructed in Microsoft Access. The data was analysed using a combination of the Statistical Package for the Social Sciences (SPSS) version 10 and Minitab version 12. Prior to the statistical analysis, the data was screened for missing values and outliers. Such occurrences were followed up, checked and amended if required. The data was explored using descriptive statistics and normality was assessed. In the instances where the data was not normally distributed, appropriate non-parametric statistics were used.

Prevalence of anxiety
The prevalence of anxiety was assessed using external and internal reference values. Internal reference values were used in addition to externally set values due to the variability observed in the literature regarding the accepted value to use when defining 'high' anxiety (see Limitations). This problem was compounded by the nature of the patients in the current study i.e. gynaecological surgical patients. The use of internally set values also allowed a superficial assessment of the externally set value.

The external reference value selected to explore the prevalence of anxiety in the sample was a State Trait Anxiety Inventory (STAI) score of 45. The selection of this value was based on previous published research and the STAI manual (Duits et al. 1998, Kindler et al. 2000, Spielberger et al. 1970). Therefore, a score greater than or equal to 45 would classify the patient as being a 'high' anxiety patient. Such classification labelling follows that adopted by other studies (Auerbach 1973, Kindler et al. 2000, Nelson et al. 1998, Spielberger et al. 1973, Teasdale et al. 2000).

Two internal reference values were selected as a comparison with the external reference value. Due to the skewed distribution of the anxiety scores, percentiles (50th and 75th) were the summary measures used to

define 'high' anxiety patients. The 50th and 75th percentiles were calculated separately for trait and state anxiety. Composite percentiles were calculated for the state scores. Thus, the state percentiles encompass the data for all six time points at which state anxiety was measured.

For the 50th percentile, the cut-off point to classify 'high' trait anxiety was a STAI score of 40, so that patients with a trait score equal to or above 40 were classified as 'high' anxiety patients. The 50th percentile cut-off point to classify 'high' state anxiety was also a STAI score of 40, so that patients with a state score equal to or above 40 were classified as 'high' anxiety patients.

For the 75th percentile, the cut-off point to classify 'high' trait anxiety was a STAI score of 49, so that patients with a trait score equal to or above 49 were classified as 'high' anxiety patients. The 75th percentile cut-off point to classify 'high' state anxiety was a STAI score of 51, so patients with a state score equal to or above 51 were classified as 'high' anxiety patients.

Pattern of anxiety

The pattern of anxiety was assessed visually through the use of tilted line plots, median plots and box plots. Mann-Whitney tests were also performed in order to assess statistically the changes in anxiety levels between key time points. A linear regression was also performed using the pre-operative state anxiety data. Linear regression gives an estimate that describes the change in the dependent variable (state anxiety) that accompanies a change in the independent variable (time to surgery) (Kirkwood 1988).

Patient characteristics associated with anxiety

Univariate analysis

Analyses were performed in order to identify any associations between anxiety and patient characteristics (potential risk factors). Initially this was performed on a univariate basis in order to gain a basic view of the activity in the data. In this analysis a composite measure of the state anxiety profile was used rather than applying separate analyses at each time point. This summary measure was obtained by calculating the area under the curve (AUC) for each patient's state anxiety profile. Matthews et al. (1990) and Senn et al. (2000) suggest the use of the AUC to summarise data from repeated measures.

The calculation of the AUC depends on complete data. Therefore, where data was missing for one or two of the assessed time points, an

estimation of the missing value(s) was calculated by means of linear interpolation. Any patient who had more than two time points missing were excluded from this analysis. This resulted in three patients being excluded. The AUC variable was tested for normality, and no evidence of significant non-normality was detected using the Anderson-Darling test statistic ($p=0.712$) or through visual plots of the variable. Thus for the categorical variables, t-tests were performed. For the continuous variables, Spearman's rank correlation was used as the patient characteristic variables (trait anxiety and age) were not normally distributed.

Multivariate analysis

A multivariate analysis was performed to explore the risk of 'high' anxiety associated with the patient characteristics. The multivariate analysis also explored the factors that may predict the likelihood of a patient falling into the 'high' anxiety group. Logistic regression analysis was the chosen method, as it allowed an estimation of the risk associated with an explanatory variable after adjustment for the presence/absence of all other variables in the equation (Everitt 1994). Logistic regression is also more flexible than other regression techniques as the predictor variables do not have to be normally distributed, linearly related, or of equal variance within each group (Tabachnick & Fidell 1996).

For the purposes of facilitating a logistic regression model fit, the AUC variable was dichotomised around the 50th percentile. Patients with an AUC value equal to or greater than the 50th percentile were considered to fall into the 'high' anxiety group. All of the possible risk factors under investigation were entered into the model. Variables were then excluded from the model by means of backwards stepwise elimination, using the change in scaled deviance as the inclusion/exclusion criterion. Tabachnick and Fidell (1996) consider the stepwise approach as best suited for screening and hypothesis generating purposes. This procedure was then repeated but with the AUC variable dichotomised around the 75th percentile. Patients with an AUC value equal to or greater than the 75th percentile were considered to fall into the 'high' anxiety group.

Associations between anxiety and post-operative pain

Correlation statistics were used to investigate the associations between post-operative pain and anxiety. Correlation provides a measure of association that indicates the degree to which two variables have a linear relationship (Last 1995). The correlation coefficient can vary between +1 and -1, where +1 indicates a perfect positive linear association and -1 indicates a perfect negative linear association (Last 1995). For the purposes of this analysis, a composite measure of the pre-operative state

anxiety scores was used. This measure was obtained by calculating the area under the curve (AUC) for each patient's pre-operative state anxiety profile. Trait anxiety and the post-operative time points were considered individually. Because the post-operative pain scores were not normally distributed, Spearman's rank correlation was used.

Qualitative data

Data from the semi-structured telephone interviews were transcribed the same or next day in order to preserve detail and minimise error, thus leading to a richer transcription. Microsoft Word was used for the purposes of transcription. Each transcript was reviewed line by line and each incident and fact was noted and conceptualised by means of a code. The coding process was ongoing throughout the interview period. Miles and Huberman (1994) consider such practice essential since it drives ongoing data collection and aids the re-shaping of perspective. Since the analysis was an ongoing process, the codes were revised when they appeared inappropriate or overly abstract (Miles & Huberman 1994). For an example of a coded interview extract, see Appendix H.

The next level of the analysis involved the identification of patterns and recurrences within the coded data, also known as 'pattern coding' (Miles & Huberman 1994). Miles and Huberman (1994) note the important functions of pattern coding which include the reduction of large amounts of data into a smaller number of analytic units, and providing assistance to the researcher in constructing a cognitive map for understanding local incidents and interactions.

Through a process of analytical thinking and questioning, the codes were grouped together into a smaller number of constructs if they were found to pertain to the same aspect of the phenomena. These constructs were labelled categories. Again, this was an ongoing process throughout the interview period and essentially enabled the identification of emergent themes. Final themes were identified through further analytical thinking and questioning. Throughout the whole analysis process, the data was frequently linked back to the original research questions.

Rigour

Scientific rigour is associated with research, with qualitative research being criticised for its lack of rigour (Davies & Dodd 2002, Morse 1999). To address this question of rigour, many researchers have attempted to apply quantitative criteria to qualitative studies; the most noted concepts are those of validity and reliability (Koch & Harrington 1998, Whittemore et al. 2001). However, these quantitative terms have different philosophical underpinnings, and as such, cannot be applied (Cutcliffe & McKenna 1999 cited by Slevin & Sines 1999-2000, Holloway & Wheeler

1996). Therefore, whilst quantitative research seeks validity and reliability, qualitative research seeks rigour.

Terminology that is applied to qualitative research comes under the broad umbrella of rigour, sometimes known as trustworthiness. These terms include transferability, dependability, confirmability and credibility that can also be known as authenticity (Holloway & Wheeler 1996). The overall aims of these methods are for the study to represent reality, transferability and their use as evaluation criteria (Koch & Harrington 1998, Slevin & Sines 1999-2000).

To safeguard authenticity in this study, there was an exploration of inter-rater reliability. This study involved semi-structured interviewing and, as interviews are a social activity, it can be more than the subject reporting their experiences to the interviewer. Inter-rater reliability challenges possible research subjectivity to achieve objective research outcomes (Davies & Dodd 2002). Consequently, a co-researcher, who is an experienced nurse now working in practice education, coded and interpreted the data to confirm the meanings seen in the data, to represent the reality of the participants.

Inter-rater reliability has real strength within semi-structured studies, since questions are consistently asked in the same way. Within unstructured interviews, however, it can be the whole experience that generates codes, which can create different perspectives for different co-researchers. Taking inter-rater reliability forward and applying it to this semi-structured study, what percentage of transcripts should be re-analysed? Despite extensive literature searches (Denzin & Lincoln 2000, Morse et al. 2001) and talking to colleagues, no actual percentage is given, rather the concept and process are described. Consequently, it was decided to take a pragmatic approach and to randomly re-analyse every seventh transcript. This resulted in six transcripts being checked for authenticity by identifying main themes that emerged. The co-researcher was blind to the researcher's ideas, and upon meeting, such topics were shared with the discovery of mutually agreed themes.

Summary

The study had four objectives:
- To identify the prevalence of anxiety in a pre-operative population and in the immediate post-operative period;
- To identify the pattern of anxiety pre-operatively and post-operatively and how this may vary over time;

- To identify what events/situations may contribute to an elevation or decrease in anxiety levels in the immediate pre-and post-operative periods;
- To record the post-operative pain scores and identify any correlation with raised anxiety levels.

The study utilised a mixed methods approach, combining quantitative and qualitative methodologies. The sample consisted of 80 patients undergoing planned gynaecology surgery. Patients were recruited from the pre-admission clinics. Anxiety was assessed using the State Trait Anxiety Inventory (STAI) (Spielberger et al. 1970). Trait anxiety was measured at the time of recruitment. State anxiety was assessed at six time points; 6pm the night before surgery, 8am or on waking the morning of surgery, before leaving the ward to go to theatre, prior to the anaesthetic, 8am day one post-operatively and 8am day two post-operatively. During the post-operative questionnaire, pain was measured using a visual analogue scale. Taped semi-structured telephone interviews were conducted approximately a week after discharge to gain a better understanding of the patient experience.

Descriptive statistics were used to assess the prevalence of anxiety. The pattern of anxiety was assessed through visual plots of the data. Associations between patient characteristics and anxiety were explored using parametric statistics and a summary measure of the state anxiety profiles. A logistic regression analysis was conducted to explore the risk of 'high' anxiety associated with patient characteristics. Correlation statistics were used to compare anxiety levels and pain scores. The semi-structured interviews were transcribed and analysed for themes.

Quantitative Findings

Introduction

One hundred and twelve patients were asked to participate in the study; 94 patients (83.9%) consented to take part, 11 (9.8%) declined and 7 (6.3%) were found to be not appropriate. These patients were not appropriate to include in the study because they either did not understand the questionnaires or were having the surgery performed as a day case. Of the 94 patients who consented, 80 were considered to have enough data points to be included in the final analysis. The remaining 14 patients were withdrawn from the study for one of the following reasons: surgery postponed or cancelled, incomplete data, or transferred to general surgeons.

In the report of the quantitative analysis, the following key applies:

Trait Score = Pre-admission clinic trait anxiety score.

S1 = State anxiety score at 6pm the evening before surgery.

S2 = State anxiety score at 8am/on waking morning of surgery.

S3 = State anxiety score before leaving the ward to go to theatre.

S4 = State anxiety score in the holding area pre-anaesthetic.

S5 = State anxiety score day one post-operatively.

S6 = State anxiety score day two post-operatively.

Pain1 = Pain score day one post-operatively.

Pain2 = Pain score day two post-operatively.

Findings

Sample characteristics

All of the patients were female. The mean age was 52.1 years (SD 13.96) and range 16-82 years, suggesting a younger than anticipated study population. The majority of the women were married (55, 68.8%). The most common surgical procedure was total abdominal hysterectomy (28, 35%) followed by vaginal hysterectomy (15, 18.7%) (Appendix I). 86.3% (n=69) of the sample had had previous surgery. The median trait score for the sample was 40.5 with an interquartile range of 32-48.75. These values were slightly higher than expected. The mean post-operative length of stay was 3.8 days (SD 2.13) with a range of 1-16 days. Patient characteristics appear in Table 1.

Table 1: Characteristics of the sample (n=80).

Patient Characteristic	Study Population
Sex	
Female	80 (100%)
Age	
16-39	16 (20%)
40-49	19 (23.8%)
50-59	18 (22.5%)
60-69	18 (22.5%)
70+	9 (11.3%)
Marital Status	
Single	12 (15%)
Married	55 (68.8%)
Widowed	5 (6.2%)
Divorced/separated	8 (10%)
Trait Score	
Median	40.5
Interquartile range	32-48.75
Classification of surgery *	
Major	40 (50%)
Minor	40 (50%)
Previous surgery	
Yes	69 (86.3%)
Night sedation (n=54)**	
Yes	11 (20.4%)
Pre-medication	
Yes	13 (16.2%)
Surgery for query cancer	
Yes	11 (13.8%)
Pre-admission pain	
Yes	22 (27.5%)
Post-operative length of stay (days)	
Mean $\pm$ SD	3.8 $\pm$ 2.13
Range	1-16

* - Classification of surgical procedures appears in Appendix I.

** - Night sedation refers only to patients admitted the night before surgery.

Prevalence of anxiety

External reference value

Table 2 summarises the prevalence of anxiety in the sample using an external reference value of STAI ≥ 45. At the pre-admission clinic, nearly half of the patients (41.3%) were 'high'[2] anxiety cases. Pre-operatively, the greatest prevalence of 'high' anxiety was seen at the pre-anaesthetic time point, where 67% of the sample were 'high' anxiety cases. Post-operatively, the prevalence of 'high' anxiety decreased considerably. On day one and two post-operatively, 20% and 19% of the sample respectively had high levels of anxiety.

---

[2] Patients classified as a 'high' anxiety patient if scored above a defined reference value on the STAI. Such classification labelling ('high' anxiety patient) follows that adopted by other studies (Auerbach 1973, Kindler et al. 2000, Nelson et al. 1998, Spielberger et al. 1973 & Teasdale et al. 2000).

Table 2: Prevalence of anxiety in the sample using an external reference value (STAI score $\geq$ 45) (n=80).

	N (valid)	Frequency $\geq$ 45	%
Trait	80	33	41.3
S1	78	35	44.9
S2	74	39	52.7
S3	56	29	51.8
S4	21	14	66.7
S5	75	15	20
S6	74	14	18.9

Internal Reference Values

Using the 50th percentile (STAI state and trait $\geq$ 40) as the cut-off value, half (51.3%) of the patients at the pre-admission clinic were 'high' anxiety cases. This figure rose to 59% the evening before surgery. Again, the greatest prevalence of 'high' anxiety patients was seen at the pre-anaesthetic time point (71.4%). Post-operatively, the prevalence of 'high' anxiety patients dropped to 40% on day one and 32% on day two (Table 3).

Using the 75th percentile as the cut-off value (STAI trait $\geq$ 49), a quarter of the patients at the pre-admission clinic were 'high' anxiety cases, and 37% of the patients were classified as 'high' anxiety cases (STAI state $\geq$ 51) before leaving the ward to go to theatre. However, the prevalence of 'high' anxiety patients rose sharply to 62% prior to the anaesthetic. Post-operatively, the prevalence of 'high' anxiety patients dropped to 13% on day one and 8% on day two (Table 3).

Table 3: Prevalence of anxiety in the sample using internal reference values (50th and 75th percentiles) (n=80).

	N (valid)	$\geq$50th Percentile		$\geq$75th Percentile	
		Frequency	%	Frequency	%
Trait	80	41	51.3	20	25
S1	78	46	59	26	33.3
S2	74	48	64.9	26	35.1
S3	56	36	64.3	21	37.5
S4	21	15	71.4	13	61.9
S5	75	30	40	10	13.3
S6	74	24	32.4	6	8.1

Comparison of external and internal reference values

Figure 1 shows the prevalence of 'high' anxiety in the sample using each of the reference values discussed above. The external reference value of

a STAI score equal to or greater than 45 produces a prevalence curve of 'high' anxiety which follows the same pattern as that produced by the 50th and 75th percentiles. Namely, a slow rise in prevalence from pre-admission clinic to leaving the ward to go to theatre, followed by a peak in prevalence prior to the anaesthetic, and then a sharp decline post-operatively. Additionally, the external reference prevalence curve falls between those produced by the 50th and 75th percentiles.

It can also be observed from Figure 1, as well as the data in Tables 2 and 3, that the prevalence of 'high' state anxiety in the sample, considering the characteristics of the patients, is perhaps lower than expected. However, the prevalence of 'high' trait anxiety was slightly higher than expected, with nearly half of the sample (41.3%) classified as 'high' anxiety patients (STAI $\geq$ 45).

Figure 1: Prevalence of 'high' anxiety in the sample using external (ERV) and internal reference values (IRV) (n=80).
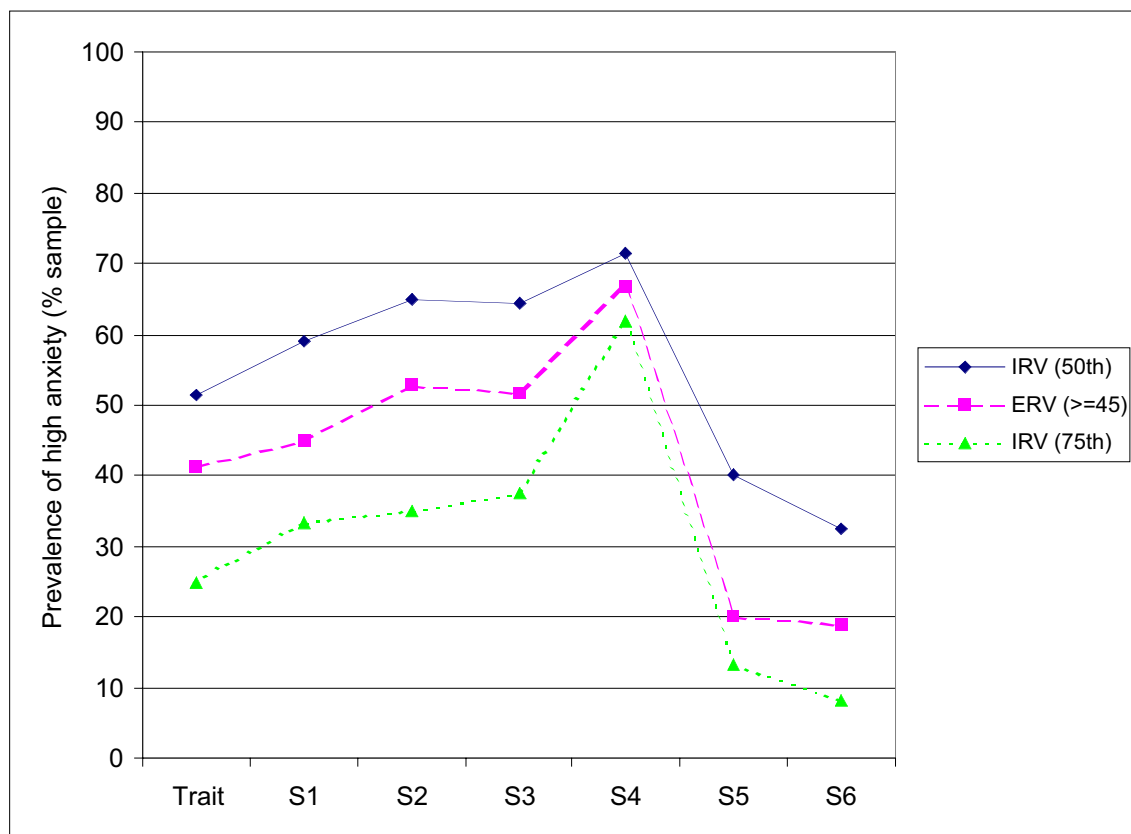
Pattern of anxiety

The between individual variation in anxiety levels over the study period was extensive. In order to convey this variability, the anxiety profile for each of the patients in the sample (n=80) is displayed in a tilted line plot in Figure 2. However, despite this variability, a general pattern can be seen to emerge from Figure 2, which is a rise in anxiety to the pre-anaesthetic time point followed by a decline in anxiety levels post-operatively.

Figure 2: Anxiety profiles of the sample population during the study period (n=80).
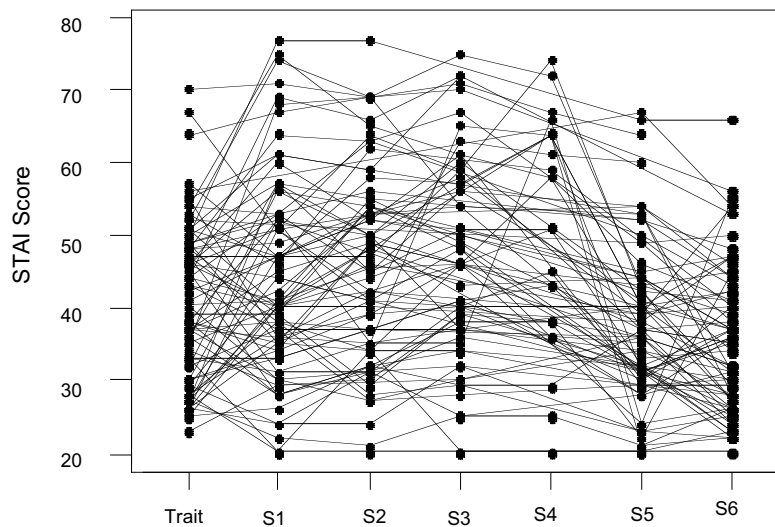
Summary statistics allow a clearer presentation of this pattern (Table 4, Figures 3 and 4). Pre-operatively, there was little observed difference between the median pre-admission clinic anxiety trait score (median=40.5) and the state anxiety score the night before surgery (median=41). This may suggest that the impending surgery impacts upon anxiety levels at an earlier pre-operative time point than is covered by the study.

Median anxiety was then seen to rise slowly from the night before surgery (median=41) to the point of leaving the ward to go down to theatre (median=46). Subsequently, anxiety levels rose sharply at the pre-anaesthetic time point where anxiety peaked (median=58). Indeed, the point just prior to the anaesthetic was found to be the most anxious time for the patients in the study.

Table 4: Descriptive statistics for anxiety at each assessed time point (n=80).

	N (valid)	Min	25th percentile	Median	75th percentile	Max
Trait	80	23	32	40.5	48.75	70
S1	78	20	34.75	41	52.25	77
S2	74	20	34.75	45.5	54	77
S3	56	20	36.25	46	57.75	75
S4	21	20	38	58	64	74
S5	75	20	31	37	43	67
S6	74	20	27	35	42	66

Figure 3: Summary statistics for the anxiety profiles displayed as boxplots (n=80).
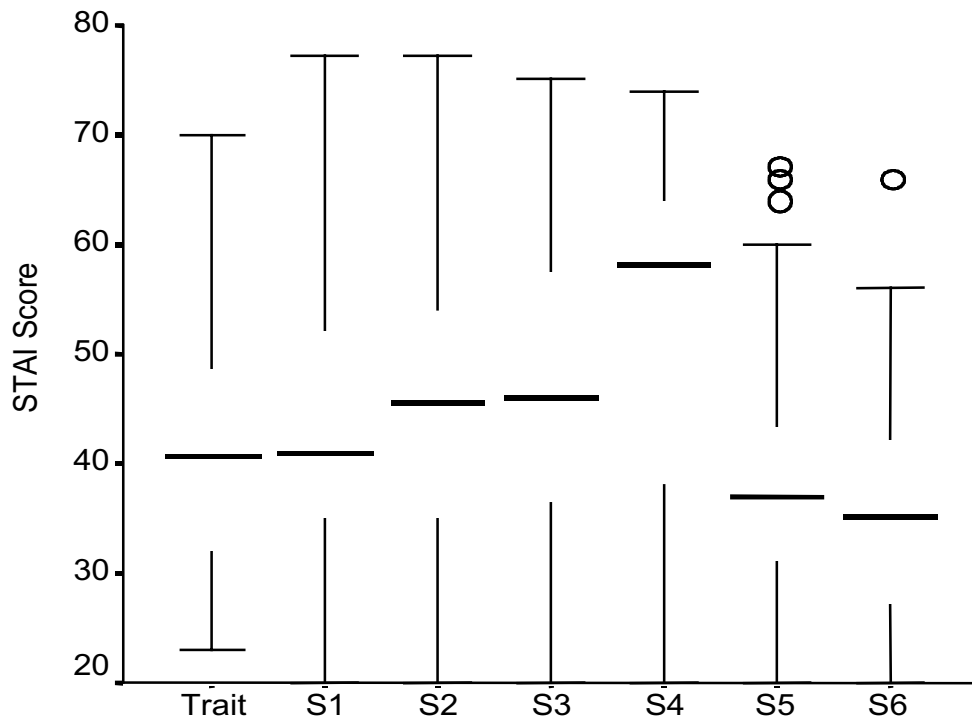
Figure 4: Median anxiety curve (n=80).
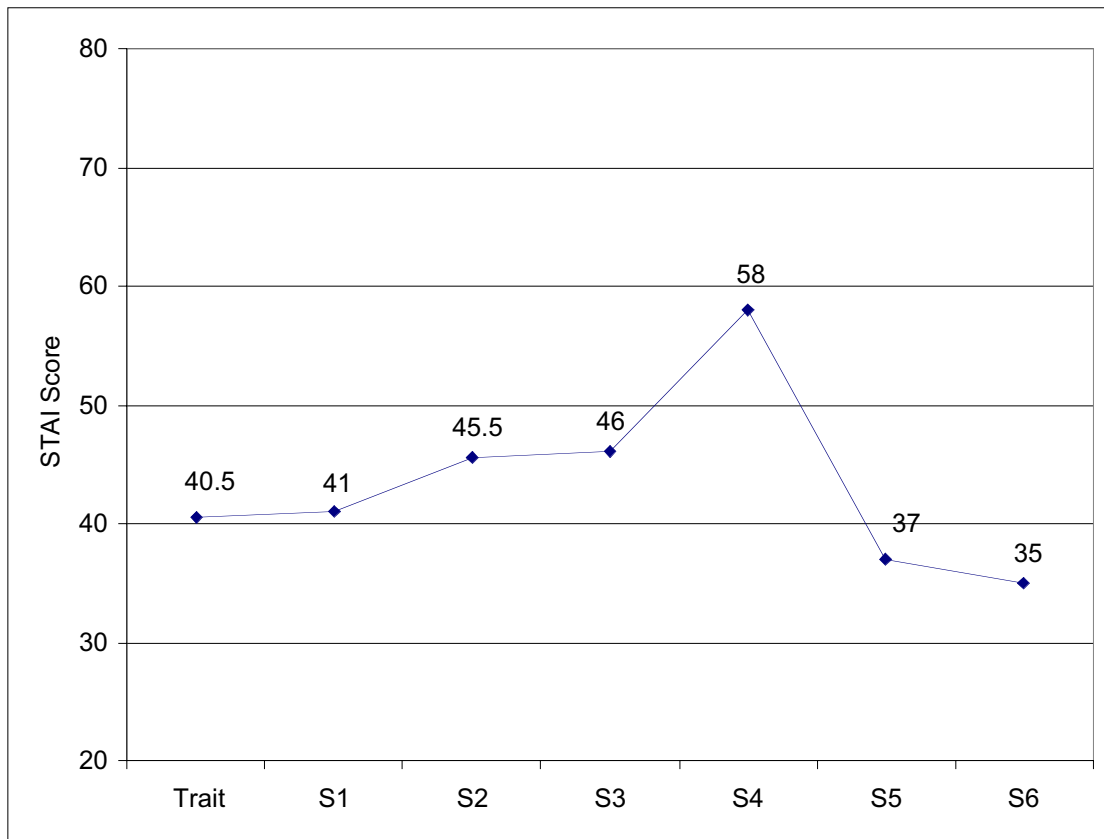
The median anxiety prior to the anaesthetic was significantly higher than the median anxiety the evening before surgery (p<0.0001, see Table 5). This observed rise in anxiety levels as a function of proximity to surgery was found to be statistically significant, although proximity to surgery in isolation explained little of the observed variation in anxiety levels (r^2=4.1%, p<0.0001).

Table 5: Summary of Mann Whitney test between the median anxiety scores at time points S1-S4 and S4-S5 (n=80).

	Median	Difference between medians	95% CI	p value
S1	41	17	(1 , 17)	0.034
S4	58			
S4	58	21	(8 , 24)	<0.0001
S5	37			

Post-operatively, there was a sharp decline in anxiety from the pre-anaesthetic time point (median=58) to day one post-operatively (median=37). This decrease in the median values of anxiety between these two time points was statistically significant (p=0.03, see Table 5). On day two post-operatively, median anxiety dropped slightly further (median=35) to its lowest level throughout the entire study period (including trait anxiety score).

Associations between anxiety & patient characteristics (univariate analysis)

Table 6 summarises the results of the Spearman's correlation and t-tests which explore the associations between the patient characteristics and anxiety levels.

The univariate analysis found a statistically significant association between the summary measure of state anxiety (AUC) (see Methodology, Data Analysis) and the following variables: trait anxiety score, major surgery and previous pain. Pre-medication was found to be of borderline statistical significance (p=0.065).

There was a clear positive correlation between the patients' pre-admission trait anxiety score and the state anxiety profile (r=0.587, p<0.001). This indicates that those patients with higher levels of anxiety proneness are more likely to experience higher levels of anxiety throughout the admission period.

Patients who were admitted for major surgery (see Appendix I) were more anxious during the course of the study period than those patients who were admitted for minor surgery (p=0.002). In addition, patients who reported suffering from pain prior to hospital admission were significantly more anxious during the admission period than those patients who did not report pain (p=0.006).

Table 6: Summary of Spearman's correlation and t-tests for the patient characteristics and the summary state anxiety measure (AUC) (n=77).

	r	p value			
Age	-0.164	>0.1			
Trait score	0.587	<0.0001			
	N	Mean (AUC)	Diff in means	95% CI	p value
Major surgery					
Yes	39	229.8	37.7	(14.8 , 60.6)	0.002
No	38	192.1			
Previous surgery					
No	66	213.1	2.2	(-21.7 , 26.1)	>0.1
Yes	11	210.9			
Pre medication					
Yes	12	245.0	40.3	(-3 , 83.5)	0.065
No	64	204.7			
Night sedation*					
Yes	10	217.2	1.3	(-39 , 41.7)	>0.1
No	42	215.9			
Surgery for query cancer					
Yes	11	223.5	14.3	(-25 , 53.8)	>0.1
No	66	209.2			
Previous pain					
Yes	20	242.1	43.2	(13 , 73.4)	0.006
No	42	198.9			

* Note: Night sedation only applies to those patients who were admitted the day before surgery.

Associations between anxiety & patient characteristics (multivariate analysis)

A multivariate analysis, using logistic regression, was performed to explore the risk of 'high' anxiety associated with the patient characteristics. This multivariate analysis also explored the factors that may predict the likelihood of a patient falling into the 'high' anxiety group. In order to preserve some of the detail with the state AUC variable, two logistic regression models were constructed.

Logistic regression model using 50th percentile

For the purposes of facilitating a logistic regression model fit, the AUC variable was dichotomised around the 50th percentile. Patients with an AUC value greater than or equal to the 50th percentile were considered to fall into the 'high' anxiety group. Following backwards stepwise elimination, the final regression model contained the risk variables 'trait score' and 'major surgery', and the statistics associated with this model are presented in Table 7.

Table 7: Logistic regression model using AUC as the response variable ($\geq 50^{th}$ percentile = 'high' anxiety) (n=77).

Explanatory	Coef (β)	SD	Z	P value	Odds Ratio	95% CI	
						Lower	Upper
Constant	-5.91	1.48	-3.99	<0.0001			
Trait	0.124	0.03	3.72	<0.0001	1.13	1.06	1.21
Major surg.	1.884	0.60	3.16	0.002	6.58	2.04	21.17

P value for the model <0.001.

Logistic regression revealed that patients with a higher trait score and those having major surgery were significantly more likely to fall into the 'high' anxiety group (AUC $\geq 50^{th}$ percentile). Patients with a higher trait score were 1.13 (p<0.0001, 95%CI (1.06,1.21)) times more likely to experience high levels of anxiety during the admission period. Patients who were having major surgery were 6.58 (p=0.002, 95%CI (2.04,21.17)) times more likely to experience high levels of anxiety during the admission period. Within the model, no significant first-order interaction effects or residual pathologies were detected. The reduced model equation correctly classified 83.7% of the sample to their original 'high'/'low' anxiety groups (based on the AUC 50th percentile).

Logistic regression model using the 75th percentile

For the purposes of facilitating a logistic regression model fit, the AUC variable was dichotomised around the 75th percentile. Patients with an AUC value greater than or equal to the 75th percentile fell into the 'high' anxiety group. Following backwards stepwise elimination, the final regression model contained the risk variables 'trait score' and 'previous pain'. The statistics associated with this model are presented in Table 8.

Table 8: Logistic regression model using AUC as the response variable ($\geq 75^{th}$ percentile = 'high' anxiety) (n=77).

Explanatory	Coef (β)	SD	Z	P value	Odds Ratio	95% CI	
						Lower	Upper
Constant	-8.57	2.18	-3.93	<0.0001			
Trait	0.154	0.04	3.51	<0.0001	1.17	1.07	1.27
Prev pain	1.581	0.76	2.08	0.038	4.86	1.09	21.63

P value for the model <0.001.

Logistic regression revealed that patients with a higher trait score and those who reported pain prior to admission were significantly more likely to fall into the 'high' anxiety group (AUC $\geq 75^{th}$ percentile). Patients with a higher trait score were 1.17 (p<0.0001, 95%CI (1.07,1.27)) times more likely to experience high levels of anxiety during the admission period.

Patients who reported pain prior to admission were 4.86 (p=0.038, 95%CI (1.09,21.63)) times more likely to experience high levels of anxiety during the admission period.

Within the model, no significant first-order interaction effects or residual pathologies were detected. The reduced model equation correctly classified 86.7% of the sample to their original 'high'/'low' anxiety groups (based on the AUC 75th percentile).

Correlation between anxiety levels and post-operative pain

Pain was measured on day one and day two post-operatively. Pain scores were measured using a visual analogue scale (0-10cms) and represent the patient's level of pain on movement. The mean pain score on day one post-operatively was 3.21 (SD 2.17) and the mean pain score on day two post-operatively was 2.52 (SD 2.23).

Summary statistics for the post-operative pain scores are displayed in Figure 5. The median pain score on day one was 3.4 with an interquartile range of 0.9-4.52. The median pain score on day two was 2.1 with an interquartile range of 0.52-3.77. Thus, it appears from this data that post-operative pain was moderately well managed.

Figure 5: Summary statistics for pain on days one (n=74) and two (n=76) post-operatively.
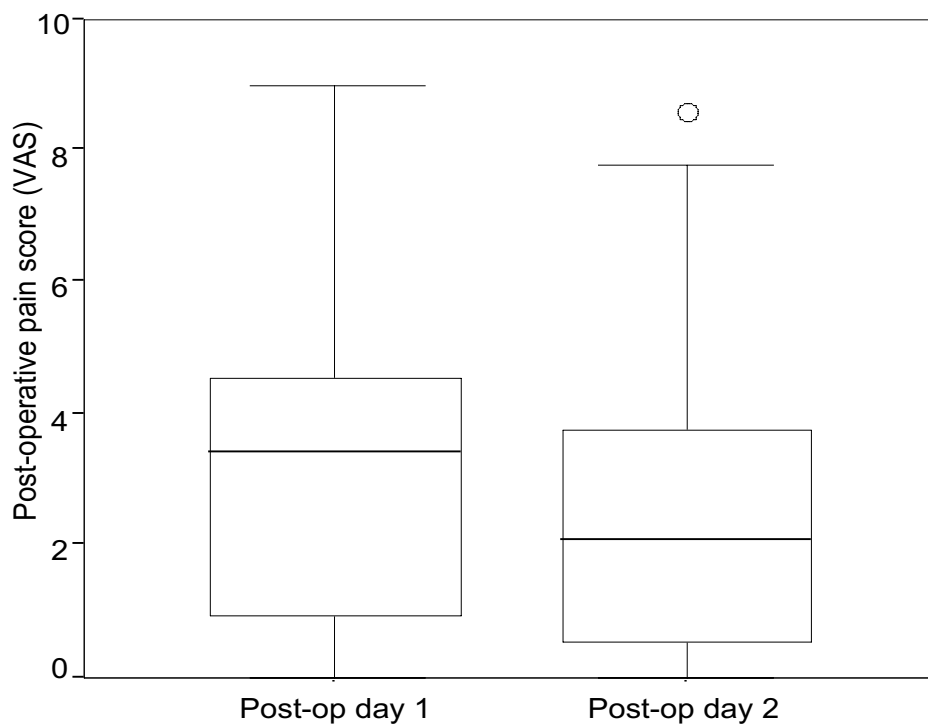
Table 9 (below) summarises the results of the Spearman's correlation between pain on days one and two post-operatively and anxiety levels during the study period.

On day one post-operatively, pain was significantly correlated with pre-operative state anxiety (p=0.031). This suggests that those patients who were more anxious pre-operatively experienced a higher level of post-operative pain on day one. Pain on day one was also significantly correlated with post-operative state anxiety on day one (p=0.001) and day two (p=0.012). This indicates that those patients who experienced higher levels of pain on day one post-operatively encountered higher levels of anxiety on days one and two. Although statistically significant, these positive correlations were not marked. The most marked effect was with anxiety at day one post-operatively (r=0.382). No statistically significant association was identified between trait anxiety and pain on day one post-operatively.

On day two post-operatively, pain was significantly correlated with pre-operative state anxiety (p=0.011). Again, this suggests that those patients who were more anxious pre-operatively experienced a higher level of post-operative pain on day two. Pain on day two was also significantly correlated with post-operative state anxiety on day one (p=0.002) and day two (p<0.0001). This indicates that patients with a higher level of anxiety on days one and two post-operatively experienced a higher level of pain on day two. Again, although statistically significant, these positive correlations pre-operatively and at day one post-operatively were not marked. However, a more marked positive correlation was found with anxiety at day two post-operatively (r=0.515). No statistically significant association was identified between trait anxiety and pain on day two post-operatively.

Table 9: Summary of Spearman's correlation of trait and state anxiety with post-operative pain.

	Trait Score	Pre-op State (AUC)	Post-op State	
			Day 1	Day 2
Pain Day 1 Post-op (n=74)	r = 0.011 p > 0.1	r = 0.254 p = 0.031	r = 0.382 p = 0.001	r = 0.298 p = 0.012
Pain Day 2 Post-op (n=76)	r = 0.193 p = 0.095	r = 0.295 p = 0.011	r = 0.362 p = 0.002	r = 0.515 p<0.0001

Additional analysis generated from the qualitative analysis

The findings of the qualitative study generated three additional research questions which were possible to test in the quantitative data.

Question 1: Do patients who are admitted to the ward the day before surgery experience more anxiety than those patients who are admitted on the day of surgery?

This question was tested using the summary measure of the patients' state anxiety profile (AUC). Although the mean state anxiety AUC was higher for patients who were admitted the day before surgery (216.1) compared to the mean for those admitted on the day of surgery (201), this trend was not statistically significant (Table 10).

Table 10: Summary of t-test between summary measure of state anxiety profile (AUC) and admission day before surgery (n=77).

	N	Mean (AUC)	Diff in means	95% CI	p value
Admitted day before					
Yes	52	216.1	15.1	(-10.2 , 40)	>0.1
No	25	201.0			

Question 2: Do patients who have had the surgery of interest cancelled previously experience more anxiety once admitted than those patients who did not have the surgery of interest previously cancelled?

This question was tested using the summary measure of the patients' state anxiety profile (AUC). No statistically significant associations were found between anxiety and previous surgical cancellations (Table 11).

Table 11: Summary of t-test between summary measure of state anxiety profile (AUC) and previous surgical cancellations (n=77).

	N	Mean (AUC)	Diff in means	95% CI	p value
Previous cancellations					
Yes	5	200.9	-11	(-43.9 , 66)	>0.1
No	72	211.9			

Question 3: Does the time of day that the surgery occurs have any impact on the patients' anxiety levels?

This question was tested using the summary measure of the patients' state anxiety profile (AUC). To answer this question the sample was split

into two groups: patients admitted the day before surgery and patients admitted the day of surgery. No statistically significant associations were found between anxiety and time of surgery in either group (Table 12).

Table 12: Summary of Spearman's correlation between summary measure of state anxiety profile (AUC) and time of surgery (n=77).

	r	p value
Admitted day before surgery	0.094	>0.1
Admitted day of surgery	-0.083	>0.1

Summary

Almost half of the patients studied had high levels of trait anxiety as measured at the pre-admission clinic. Approximately 50% of the patients experienced high state anxiety pre-operatively up to the point prior to the anaesthetic. At the point immediately before the anaesthetic, two-thirds of the sample experienced high state anxiety. Post-operatively, 20% of these patients continued to experience high levels of anxiety.

Anxiety levels in the immediate pre- and post-operative periods exhibited considerable variation between individuals, although a general pattern was seen to emerge. Pre-operatively, state anxiety steadily rose from the night before surgery to the point of leaving the ward to go to theatre. Anxiety then increased sharply prior to the anaesthetic and then a dramatic decrease in anxiety was observed at day one post-operatively. Little variation in anxiety levels was seen from day one to day two post-operatively.

Univariate analysis found that patients with higher levels of trait anxiety were more likely to experience higher levels of anxiety throughout the admission period (p<0.0001). Similarly, those patients having major surgery (p=0.002) or reporting pain prior to admission (p=0.006) were also more likely to experience higher levels of anxiety. Thus, patients entering hospital with a proneness towards anxiety, experiencing pain, or facing major surgery, were likely to experience higher levels of anxiety whilst in hospital.

Logistic regression using the 50th percentile revealed that patients with a higher trait score (OR 1.13, 95%CI 1.06,1.21) and those having major surgery (OR 6.58, 95%CI 2.04,21.63) were significantly more likely to fall into the 'high' state anxiety group (defined by the 50th percentile). A second logistic regression model using the 75th percentile revealed that

patients with a higher trait score (OR 1.17, 95%CI 1.07,1.27) and those experiencing pain prior to admission (OR 4.86, 95%CI 1.09,21.63) were significantly more likely to fall into the 'high' state anxiety group (defined by the 75th percentile).

Elevated levels of pre-operative anxiety were associated with increased levels of post-operative pain (p=0.011). A positive correlation was also observed between post-operative anxiety and pain (p<0.0001). Additional analyses were performed to test questions that had arisen from the qualitative analysis. Whilst no statistically significant associations were found, they have raised issues for further consideration.

Qualitative Findings

Introduction

Of the 47 patients that were telephoned, 44 were successfully interviewed. Following coding and thematic analysis, four major themes emerged: 'causes of anxiety', 'alleviation of anxiety', 'personal coping strategies' and 'patient-reported improvements for anxiety management'.

These major themes provide the four main sections for the presentation of the qualitative findings. For the major themes, 'causes of anxiety' and 'alleviation of anxiety', Tables 13 and 14 set out their categories and themes. The data for the major themes 'personal coping strategies' and 'patient reported improvements for anxiety management' are presented in diagrammatic form (Figures 6 and 7).

An overall summary of the qualitative findings follows the description of the last of these major themes.

Causes of Anxiety

The major theme 'causes of anxiety' comprises four themes: 'not knowing', 'organisation and delivery of care', 'becoming a patient' and 'concerns over others'. The categories that form each of these themes are displayed in Table 13. Each theme is introduced and described, using quotes from the interview data to illustrate points. A summary is provided for each theme.

Table 13: Categories and themes for 'causes of anxiety'

Categories	Themes
Information	Not knowing
Unexpected events	
Complications and side effects	
Pain	
Waiting/time	Organisation and delivery of care
Cancellations	
Staff	
Hospital environment	
Psychological aspects of being a patient	Becoming a patient
Behavioural aspects of being a patient	
Concerns about family and friends	Concerns over others
Concerns about fellow patients	

Not Knowing

The theme 'not knowing' is made up of four categories: 'information', 'unexpected events', 'complications and side effects' and 'pain'. 'Information' may be viewed as the core category in this theme since it is intrinsically linked to the other three. Each category is described in turn and followed by a general summary of the theme.

Information

The information a patient receives impacts upon the degree of anxiety experienced, not only during the course of the admission but also during the pre-admission and discharge periods. The two groups of information that were found to increase anxiety were a lack of information and inaccurate information. Patients reported a lack of information in relation to a variety of events and situations, ranging from:

- the admission policies:

    I came in Sunday evening, I couldn't really see the reason for that…
    (P6)

- to the effects of an epidural:

    I ended up having an epidural…but I didn't realise when I came round, because I couldn't feel my legs, that's what it was. That was the only time I felt a bit anxious. (P42)

- to the expected course of recovery after discharge:

    ...most people do have this loss after they have this type of operation and at no point was I told how long this was likely to go on. (P37)

A lack of information was not only due to a failure to inform the patient but also due to a lack of personal experience with hospital admissions and surgery in particular. Relating to this, information gained through previous negative hospital experiences also contributed to elevated anxiety levels.

Receiving inaccurate information was also reported as a cause of anxiety. Two main sources of such information were identified: healthcare professionals, and family and friends.

> *…my consultations were, one of them was inaccurate, the consultant had to write to me afterwards to correct what the doctor had told me at the consultation.* (P10)

> *…just what their* [family and friends] *experiences of having had the surgery, and how painful it was and how uncomfortable they felt afterwards.* (P33)

In contrast, several of the patients in the study were healthcare professionals or worked in a hospital environment, and the majority of these patients reported that their greater knowledge and understanding was in some regards a cause of anxiety. One healthcare professional, when asked about what caused her increased anxiety before the operation, replied:

> *…probably knowing as much as I do actually, from working in the hospital, and knowing…about what the operation involved…* (P31)

Complications and side effects

Patients' pre-operative anxiety was elevated as a result of concerns over possible complications arising from surgery. The majority of such fears were related to concerns surrounding the anaesthetic.

I was anxious about having the anaesthetic because some people don't survive it. (P49)

However, several patients had pre-operative fears concerning possible complications that were grounded in information received from a healthcare professional.

When I saw the doctor...he told me there was the likelihood that there would be complications because of the severity of the problem…but that worried me…(P10)

I was quite concerned because the size of the lump was, it was like a grapefruit, and I was concerned whether it was malignant or not. (P67)

Post-operative complications or side effects also impacted on anxiety levels. In some cases this was due to more extensive surgery being carried out than anticipated, and in others it was related to post-operative infections or reactions to medication.

I was a little bit anxious to find out what…had happened, cause I ended up having a hysterectomy rather than just having the fibroid removed, and I was anxious about finding out about that. (P54)

I was a bit anxious cause I was on the morphine, I was a bit anxious then cause I started to get a real bad itch. (P43)

In addition to the experience of a complication or side effect, the implications that such an occurrence had on the course and nature of the care then received by the patient also impacted on anxiety levels; for example, the increased medical intervention received, a longer than anticipated hospital stay, or the need for re-admission.

I had drips and I had injections…I felt like a pin cushion, I've never had so many injections…My veins aren't very good, they kept collapsing so they had to put drips in other places. So that wasn't very nice, cause both my hands blew up and they couldn't use those veins anymore, then they had to go in to my upper arms, and of course then they broke. (P22)

Unexpected events

A frequently cited cause of anxiety was the experience of an event that was not anticipated. These events fall into three broad groups: psychological, procedural and physical. Some patients reported feeling distressed at reacting and behaving in a manner that was not typical.

When my parents came in in the afternoon I just burst into tears, it's very unlike me because I'm never like that ever. (P6)

Other patients mentioned unexpected changes in the procedural aspect of their care as a cause of anxiety.

I was supposed to be having a pre-med and then in the end there wasn't time for one because I was changed round to being first on the list. I got very anxious then. (P49)

The unexpected physical events occurred generally in the immediate post-operative period and included dizzy spells, nausea and shaking.

I don't know what it was that was making me shiver, but I was really sort of shaking when I came round…I didn't realise that would happen. (P23)

Pain

The experience of a higher than expected degree of pain was also reported as a trigger for anxiety. The majority of cases referred to post-operative pain.

They said it was going to be uncomfortable after the operation but it was more pain than uncomfortable…It was painful when I moved and I didn't think it would be. (P3)

However, in some instances it was related to anaesthetic procedures. One patient when recalling her experience of a spinal anaesthetic said:

I was absolutely wringing with perspiration because obviously I was concerned and the pain was far more than I was anticipating. (P2)

Pre-operative concerns regarding post-operative pain were also expressed.

I was concerned about pain relief. (P35)

…pain, that was what I was more concerned about…pain really. (P48)

Summary

The patients' anxiety was elevated due to a deficiency in awareness of the various events, procedures and sensations that accompany surgery, and gynaecological surgery in particular. For example, not knowing why an event has occurred, not knowing the possibility or likelihood of an event occurring and not knowing how much pain to expect post-

operatively. This resulted in patients not being as prepared for surgery as anticipated. In the main, this may be attributed to an insufficiency or inaccuracy in the information provided to the patient. However, anxieties also arose due to inherent fears and concerns for the future, for which information would only play a part role.

Organisation and Delivery of Care

The theme 'organisation and delivery of care' is made up of four categories: 'waiting/time', 'hospital environment', 'cancellations' and 'hospital staff'. Each category is described in turn, followed by a general summary of the theme.

Waiting/time

There were three separate occasions during the patients' hospital experience where waiting/time was found to be an issue. Firstly, from the interviews it appears that the general procedure for informing the patients of their planned admission date is to send them a letter approximately two weeks before that date. The patients generally felt that this was not a sufficient period of notice because it had implications for the organisation of personal affairs, such as time off work and childcare arrangements. It was also felt that the amount of pre-admission time provided was inadequate to mentally prepare for the impending operation.

> …you only get two weeks notice of having this operation…and then you get this letter and you've only got two weeks and there is an awful lot of stuff to organise…but it's also a big thing to get your head around. (P34)

The second occasion where waiting/time was found to cause anxiety occurred when a patient was admitted the day before their operation. The lack of activities to divert attention, increased time to ponder the coming operation, isolation from significant others, as well as the lack of reinforcement for this admission procedure were all factors that contributed to the anxiety.

> I had to be in for 1.30 and absolutely nothing at all was checked or done with me on that day at all. So I went in from 1.30 and stayed there all afternoon for absolutely no good reason at all. (P40)

> …I didn't have to do anything different until the morning of the operation, so I think I could have come in the morning of the operation really. (P10)

I came in Sunday evening, I couldn't really see the reason for that, for coming in Sunday evening and then it was a whole 24 hours before I went up to theatre. (P6)

The final occasion where waiting/time was found to impact upon anxiety was on the day of the operation – the waiting period on the ward before going in to theatre. This was exaggerated if the patient was one of the last on the operating list for that day.

I think time hangs very heavy sort of waiting to go down, especially on the morning of your op if you're not actually scheduled to go down first. (P51)

When you are waiting to go up [to theatre]…you know that you are going to have your operation that day and it [anxiety] increases as you get to the point. (P68)

Hospital environment

Various characteristics of the hospital environment were found to bring about an elevation in anxiety. The main incident cited was the inability to sleep properly.

I think if I had been in there [hospital] *much longer I would have done* [become more anxious] *because…I found it quite hard to sleep…at night, because of the light and the activity on the ward.* (P33)

…because the other ladies were being dealt with through the night, so I didn't get any sleep. (P15)

Other environmental characteristics that were mentioned in the interviews were:

- hospital food:

The food I thought was pretty poor, and I'm not a fussy eater, I normally eat anything…I couldn't eat, toast was about my limit whilst I was in hospital. (P52)

- activity of other patients:

…her daughter and two grandchildren visiting her and they actually stayed three hours and brought their picnic lunch, and that was constant movement and noise…but at a time when a lot of patients would like a little rest. (P37)

- faulty telephones:

  …I was trying to ring my husband and the payphone wasn't working very well…I could hear him but he couldn't hear me, and that got me quite upset really. (P46)

- minimal attention diversion:

  So basically you're left on the ward…you can't go for walks…you can read, you can sit there and that's all I could do all day. (P15)

- and isolation:

  You're just sitting in a bed reading, you can feel very lonely I think. (P16)

Cancellations

There were two separate aspects to surgical cancellations that were a cause of anxiety: the possibility of, and actually having the operation cancelled. It is general procedure that the patients' are asked to telephone the ward on the morning of their planned admission date to check bed availability. If no bed is available then it is likely that the patient's operation will be postponed. The anxiety created in this situation is compounded by the organisational and preparation issues mentioned above in the category 'waiting/time'.

The only thing…is not knowing whether you've got a bed or not. That's the worst thing you know. (P26)

Several of the patients had previous admission dates cancelled. All of these patients, when asked about the effects this had on their anxiety, stated that it was a significant contributor. Again, this is compounded by organisation and preparation issues as well as the severity of the symptoms being experienced.

I was feeling very worried, and I wasn't feeling well at all that day, and to be told that day that I wasn't going in. I didn't know if I was going to be able to cope with the rest of that day. (P2)

Hospital staff

There were several incidents where a member of the hospital staff had raised patient anxiety levels as a result of something that had been said or done to the patient, or in some cases, fellow patients. The majority of the incidents were attributed to poor communication or a lack of understanding between staff and the patient. One patient, when talking about her experience at the outpatient clinic, said:

…I came home in floods of tears…basically he [doctor] *didn't listen to anything that I told him. He didn't listen to any of my symptoms…that just about had me, I was up in the sky, I was ready to thump him really.* (P35)

Other stories related to the care received whilst in hospital.

…one of the orderlies was quite sharp…and I found that quite disturbing…that was the only incident that really upset me whilst I was in hospital and that really did upset me. It was her manner and her attitude, the way she spoke. (P67)

I could overhear the nurse and the patient, she wanted a commode and it was used and I don't think she was able to wipe her own bottom and the nurse refused to do it for her…the woman ended up in tears…that did bother me and I still think about it now. (P68)

Summary

Factors related to the organisation and delivery of care within the hospital environment were found to impact negatively on a patient's anxiety levels. In some instances this was related to hospital policies e.g. design of the admission schedule, and in other cases it was related to management issues that are part of the wider political picture e.g. bed availability and subsequent cancellation policies. The general nature of the hospital environment as well as cases of poor communication between staff and patients were also found to exacerbate anxiety.

Becoming a Patient

The theme 'becoming a patient' is made up of two categories: 'psychological aspects of being a patient' and 'behavioural aspects of being a patient'. Each category is described in turn, followed by a general summary of the theme.

Psychological aspects of being a patient

Whilst being admitted to hospital and becoming a patient is acknowledged as stressful (Dodds 1993), younger patients found this particularly anxiety provoking. The loss of independence together with unexpected feelings of helplessness and vulnerability contributed to this. In some cases it was manifested by actions designed to delay taking on the role of a patient, or by actions designed to regain independence as soon as possible post-operatively. In some instances it was felt that the nature of the surgery (gynaecological) exacerbated such feelings.

I just found the whole experience very strange, you know, I lead an extremely busy life normally and look after myself, and when you are

stuck in bed in a nightie you begin to feel very odd, as if you are totally not yourself and out of control. (P16)

The vulnerability of not being able to do things for yourself, yes, makes you very anxious. (P35)

I'm very much a person who is always in control of everything in my life and this was quite difficult for me to have to actually give over control of everything to other people…(P31)

Behavioural aspects of being a patient

The perceived behavioural expectations of a patient also contributed to anxiety. Although patients reported that staff had stated to use the call button if a member of staff was needed, patients still described a reluctance to do so unless it was absolutely necessary. In part this was because the patient did not want to be considered troublesome, but it was also due to the fear of disturbing fellow patients.

…you don't want to have to ring the bell unless you absolutely have to, and that makes you quite anxious I suppose. (P35)

You're very aware all the time that…people are very busy…and the last thing you want to be is a nuisance to anyone. (P16)

I was aware that everyone was being woken up because I had called the nurses in, you know, which doesn't help, does it. (P6)

Summary

Assuming the role of a patient contributed to rises in anxiety levels, particularly for the younger sector of the study population. The change from normal independence to having to rely on others was considered a stressor, which was accompanied by feelings of powerlessness and vulnerability. The need to adhere to perceived behavioural expectations of a patient compounded this situation further.

Concerns over others

The theme 'concerns over others' is made up of two categories: 'concerns about family and friends' and 'concerns about fellow patients'. Each category is described in turn, followed by a general summary of the theme.

Concerns about family and friends

Admission to hospital results in separation from family and friends. This separation was cited as a cause of anxiety for some patients, especially in cases where a spouse was left on their own or admission to hospital meant missing a significant family event.

*Only niggles about what my husband was going to get up to, I only
mean, basically because he is hopeless in the house…*(P4)
*I also felt a bit down in the dumps I think because…it was my son's
birthday and I hadn't seen him cause he has gone off to university,
and all the little things, you know, and they build up and I was having
a really down day, really down*. (P6)

Concerns about fellow patients

The nature of the ward environment meant that the degree of privacy for patients was minimal. Activities and conversations, and fellow patients in distress or not progressing well post-operatively, were quoted as causes of anxiety.

*I was just very concerned about one lady who had pretty extensive
surgery.* (P50)

*Well when you are in a ward like that you hear other people being ill.
Yes, I worry about the other people who are obviously in distress.*
(P68)

Some patients acted on such observations and would try to help fellow patients overcome their distress.

*I spoke to two or three patients while I was on the ward because they
looked very anxious and worried and a bit alone.* (P51)

Summary

Concerns over family and friends or fellow patients whilst in hospital was found to cause an elevation in the patients' anxiety levels. Such concerns were constant throughout the admission period.

Alleviation of Anxiety

The major theme 'alleviation of anxiety' comprises three themes: 'people', 'being prepared' and 'good pain management'. The categories that form each of these themes are displayed in Table 14. Each of the themes is introduced and described using quotes from the interview data to illustrate points. A summary is provided at the end of each theme.

Table 14: Categories and themes for 'Alleviation of Anxiety'

Categories	Themes
Hospital staff	People
Other patients	
Family and friends	
Returning to self	
Previous experiences	Being prepared
Accurate information	
Good pain management	Good pain management

People

The theme 'people' is made up of four categories: 'hospital staff', 'other patients', 'family and friends' and 'returning to self'. Each category is described in turn, followed by a general summary of the theme.

Hospital staff

The strongest theme within the qualitative findings was the positive effect that hospital staff had on the alleviation and management of the patients' anxiety. The comments related to a wide range of staff, from the medical teams to the administrative support, but the majority concerned the nursing staff.

> *I have to say, I would give them 100 out of 100 percent for everything, from the top right down to the lady who cleaned our floors. They were brilliant.* (P56)

The nursing staff's constant presence on the ward provided reassurance should the patient require assistance or support. It was also felt that the sense of approachability by the staff contributed to the minimisation of anxiety.

> *Anxiety, well no, because the nurses were there all the time and if I needed them they would have seen to me…I felt safe because there was the nurse should I have needed her.* (P48)

…. they came across as very approachable which I think is important if you've got somebody who is a bit anxious. (P33)

Anxiety was also alleviated by staff acting on verbal and non-verbal cues in response to physical or psychological problems experienced by the patients. A key element to this was the promptness of the action.

…there was a nurse that was there, she was wonderful, I mean she did say to me at the time I was having the injection, and she knew that it was hurting me far more, she said, 'hold my hand as hard as you like', and I thought that was a comfort. (P2)

…one night when I felt sick, and I was worried about that cause I couldn't be sick because I, you know, it would hurt my stomach if I was retching. I got one of the nursing staff across and they gave me an injection and I was fine. (P43)

I asked him [doctor] *if he had any results and he said not at the time. He went away, came back and found out for me. Told me there and then that I was clear on my second one. That was a positive thing. …he could have said , "I'll find out for you", spoke to somebody, forgot and went away…but he didn't…he was back in a couple of minutes.* (P15)

Additionally, patients found it reassuring when staff explained to them why events had occurred or why procedures were to be carried out.

When the consultant came round to talk to me the morning after [the operation] and explained exactly what had happened and why he had to take it [cervix] and then I understood, so that was fine. (P34)

They just came along and asked me…if I had a concern, I explained what was wrong and they explained what they could do, what they thought was causing it, and that was it really. Everything was explained to me at each stage if I asked a question. (P33)

There was an inherent confidence in the ability of the staff that aided the creation of a relaxed and safe environment on the ward. The relaxed ward environment was also attributed to a more personalised form of care.

I sort of felt as though I was in good hands, you know, I felt quite safe. I felt that they knew what they were doing. (P23)

You weren't just a number, you know, we've done number four and now it's number six. You actually felt you were a real person and they all knew who you were. (P56)

The staff also acted as a distraction from current anxieties:

…the nurses are around you and talking to you, and chatting with you, and doing different things with you and it takes your mind off it. (P67)

In summary, the qualities and attributes of the staff that were highlighted by the patients in relation to alleviating anxiety were wide ranging, but the more commonly reported terms were: supportive, caring, reassuring, helpful and attentive.

…the thing is they [nurses] *are so reassuring in there* [hospital] *that if you, you have that anxiety for minutes really before they sort it out and you're feeling better.* (P38)

I think that if their [nurses] *attitude had been anything different, any less caring… yes, I would have been totally different.* (P15)

Other Patients

Fellow patients were frequently quoted as a key source of support during the patient's hospital admission. Other patients were used as a source of information, as a distraction from current worries but most importantly as a forum for discussion and validation of emotions and physical symptoms.

One thing that really, really helped, there was another lady on the ward…and we got on like a house on fire. I was talking to her the evening before the operation, all the same sort of anxieties…every thing that I'd worried about she'd got exactly the same worries and that really helped talking to her. In fact she was one of the best things about the whole thing I can honestly say. Someone who was in the same boat as me. Actually we've kept in touch. We spoke on the phone yesterday and it was great even now saying have you got this pain, that pain, and what tablets are you still taking... (P34)

We tended to talk amongst ourselves, the patients, you know, and compare notes and what we had done and how we were feeling, and to know that other people were feeling good or better or whatever was very helpful and supportive… (P31)

Some patients felt that they had a greater tendency to be more open and honest regarding how they were feeling with other patients than with any other group e.g. family or staff. This was attributed to the first-hand knowledge that other patients have through shared experiences, which increases the value of that source of support. The tendency to greater openness was also attributed to the fact that this form of support was mutual.

…you are conscious of the fact that this person is going through a similar experience to yourself and unless the nurses and doctors have been in a similar situation…the people you are in hospital with do know because they are obviously going through it themselves…it is the people who have gone through it that understand you much better than even your own family… (P11)

Family and friends

The support received by family and friends also aided the minimisation of anxiety. This type of support covered a period wider than the hospital admission, and reference to the value of this support was made in regards to the pre-admission and discharge periods.

…as it turned out he [husband] *was able to come down to the theatre with me, which was, it was fantastic.* (P53)

Wonderful having my sister, being able to go to my sister's [after discharge] *because I only had her support…and they* [sister and friends] *sort of ease you into the state of being on your own completely.* (P11)

Returning to self

Actions that were taken which signalled moving away from the patient identity and back towards their own, were reported by several patients to alleviate anxiety. A factor inherent in this is a good post-operative recovery. Actions reported included:

- wearing make-up:

…I was up and had put my make-up on and I felt quite good...(P6)

- wearing own clothes on the ward:

...they [staff] *suggested that it might be an idea to bring in your own clothing to wear during the day and make-up…and I did that and it certainly did make a big difference.* (p53)

- mobilising as soon as possible post-operatively:

I was allowed to be as independent as I wanted to be which helped. I got mobile very early which again was important to me. (P51)

Summary

Various groups of people played a role in the alleviation of the anxiety associated with hospital admission and surgical procedures. Indeed, the strongest theme within the qualitative findings was the positive effect the hospital staff, nurses in particular, had on the alleviation and management of such anxiety. Fellow patients as well as family and friends also played a significant role in this anxiety management. The final group found to contribute to the reduction of anxiety was the patients themselves, with regards to returning to their pre-patient identity.

Being Prepared

The theme 'being prepared' is made up of two categories: 'previous experiences' and 'accurate information'. Each category is described in turn, followed by a general summary of the theme.

Previous experiences

Familiarity with hospitals and surgical procedures was often cited as a factor in the minimisation of anxiety. Experience of such procedures was gained mainly through previous hospital admissions. Such experience not only took away an element of the unknown but also meant that patients were aware of the possible emotional and physical consequences of surgery. Therefore, if such consequences were to occur, their impact on anxiety levels was minimal. The most frequently reported example was where a patient had previously reacted post-operatively to the anaesthetic e.g. nausea, so repeated experiences did not cause such concern.

I think I took it all in my stride. Been there done that before you see. (P11)

It's not the first operation I've had…I had operations before and I'd come through them. (P44)

Knowledge of the 'hospital experience' was also gained through the experience of others, as well as professionally if the patient worked in a hospital environment.

I've been there, done that. My son has been in and out of hospital a lot so I've had to learn to be patient and to switch off…I just manage to switch into a different mode… (P35)

Accurate information

Receiving accurate and honest information also helped to alleviate anxiety. This relates to information received pre-admission (e.g. possibility of a cancer diagnosis), whilst in hospital (e.g. reasons why more extensive than planned surgery had to be carried out) as well as after discharge (e.g. expected course of post-operative recovery).

> *All my meetings with all the doctors, all my appointments…were very informative. Not at one time did they ever put me at the stage where I got frightened of what might happen. All they did was be very honest…They just took me through it, told me basically what I had, what they were going to do, and that was it. I was fine with it.* (P15)

However, the level of accuracy of the information fell in importance if the actual experience exceeded the expectations acquired through the information; for example, if the post-operative pain experienced was less than the patient was told to expect.

> *I was forewarned so therefore perhaps I was expecting the worst, didn't get it, so therefore I feel a lot better. (P33)*

Summary

Being prepared and knowing what to expect contributed to the alleviation and management of anxiety. This knowledge may be acquired through previous experiences or through the attainment of accurate and honest information.

Good Pain Management

The theme 'good pain management' does not have any categories. This is because, during the analysis, when the coded data was collapsed into categories, good pain management was found to be a strong independent code that stood out as a theme in its own right. The occurrence of this theme is not surprising given that poor pain management, as well as patient concerns regarding post-operative pain, were highlighted above as a cause of anxiety. The theme 'good pain management' is described, followed by a general summary.

Patient reports indicate the importance of good post-operative pain management. This was an important variable in the alleviation of anxiety for two reasons: post-operative pain was a pre-operative concern for patients, and some patients had previous bad experiences regarding the management of post-operative pain. The patients' perspective of the merits of the various methods of pain control were not explored in the interviews, thus conclusions cannot be drawn beyond the general experience of the patients' post-operative pain management.

…I was very impressed with the pain management, because you come round and obviously you are uncomfortable with tubes going in and out and I could say that my pain was minimal...the pain management, I would say, is second to none. (P68)

I came to and they said 'any pain, any pain' and I kept saying 'no, no, no', and I thought I must be out of the ordinary because I didn't have any pain. (P8)

I was given all the pain relief I needed when I wanted it. (P48)

I was sterilised six years ago and I was in more pain then than what I have been now, because I've felt no pain at all with this. (P26)

I thought they were very good with their pain control, you know, that was being said to you all the time, 'there is no need for you to be in pain, let us know, tell us, tell us, tell us'. (P11)

…last February I had my tonsils out and this February I had a full hysterectomy…the pain with the tonsils was horrendous. The pain with the hysterectomy, because of the pain control with the morphine and whatever else they gave me…it's been fine. (P30)

Summary

Patients reported the importance of good post-operative pain management as a significant factor in the alleviation and management of anxiety. Given that poor pain management increased anxiety it is not surprising that patients mentioned good pain relief in the context of reducing anxiety.

Personal Coping Strategies

As part of the interview, patients were asked about their personal coping strategies for the management of anxiety. The responses were varied and can be viewed below in Figure 6. Of the 44 patients interviewed, 31 (70.4%) reported a personal coping strategy. The most common response (n=16) referred to a practical approach, such as reading or listening to music. Mental approaches were the next most frequent response (n=12) e.g. positive thinking and trying to calm self down. Strategies included within the 'alternative therapies' category were, healing crystal, homeopathic remedies, yoga relaxation techniques and strength stone. The totals do not add up to 44 since some patients had more than one response.

Figure 6: Interview responses regarding personal coping strategies for the management of anxiety.
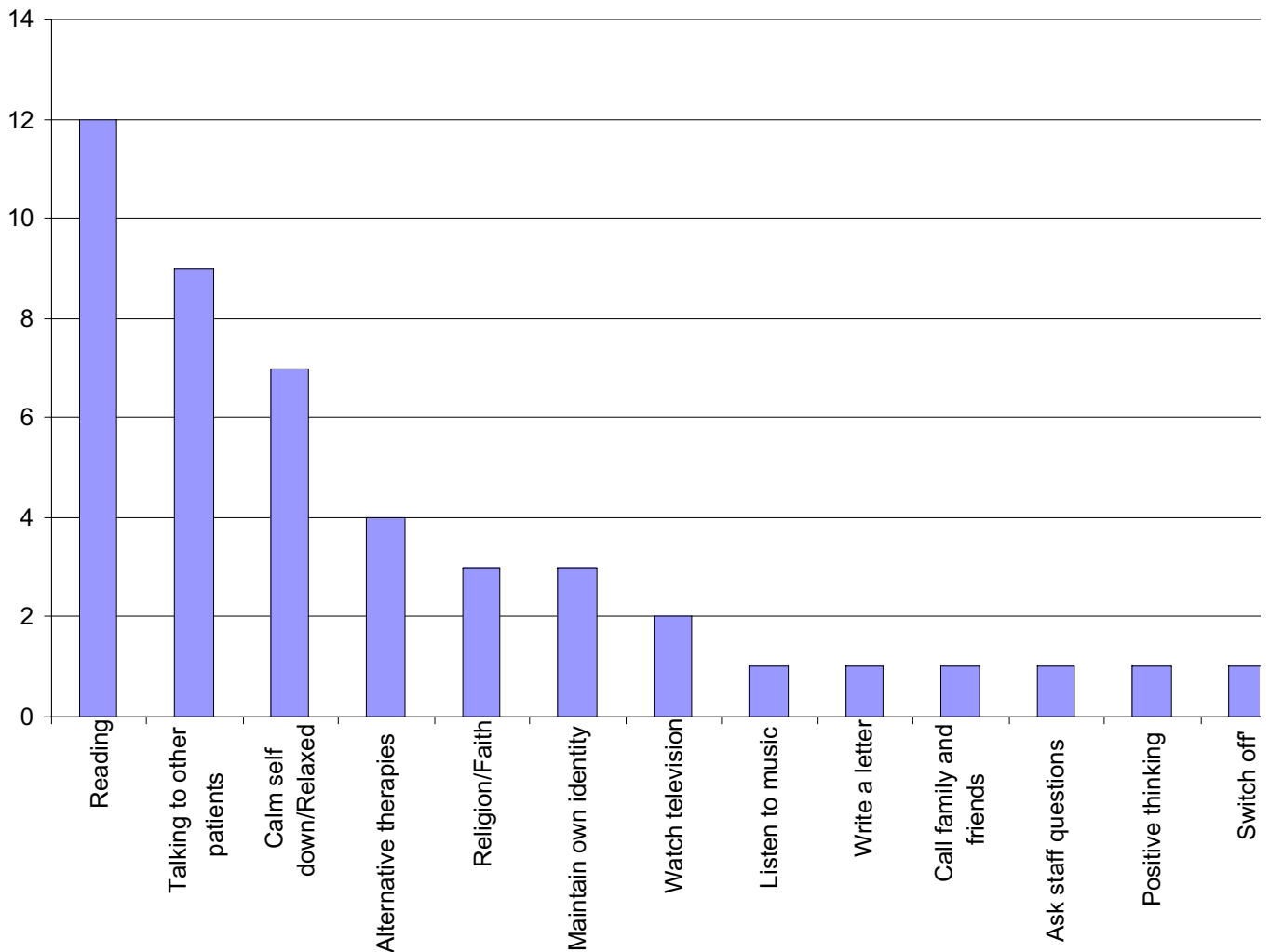
Patient Reported Improvements for Anxiety Management

Patients were also asked for their feedback regarding ways in which improvements could be made for the minimisation and management of anxiety. The majority of patients (n=26, 59.1%) did not have any suggestions. Figure 7 illustrates the suggestions received. The most frequent response (n=6) was to be provided with personal access to music or a radio. Other responses included improved access to a television (n=2), a wider range of food choices (n=2) and improvements to create a quieter ward environment at night in order to aid sleep (n=2).

Figure 7: Patient reported improvements for the minimisation and management of anxiety.
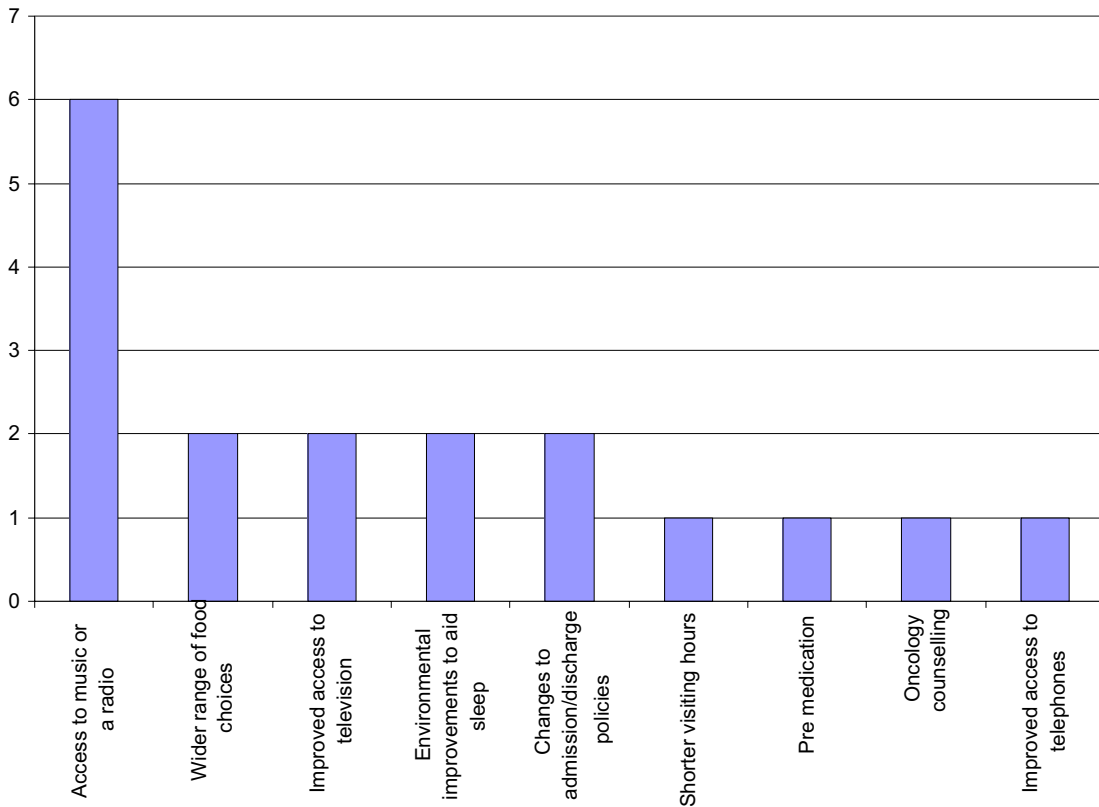
Overall Summary of Qualitative Findings

The aim of the patient interviews was to gain an insight into the subjective experience of anxiety from the patient's perspective, and in particular, to further understand the events and situations that cause an elevation or decrease in anxiety associated with hospitalisation for surgery. Anxiety levels were raised when a deficiency in the patient's knowledge and awareness of the various events, procedures and sensations that accompany gynaecological surgery occurred. This represented a failure to adequately prepare the patient for the experience of hospitalisation and surgery. Aspects of the organisation and delivery of care were also found to elevate anxiety. In particular, characteristics of the hospital environment, inappropriate staff communication as well as instances where hospital policies and the delivery of care were not patient focused. The threats to personal identity and control associated with hospitalisation were also identified as stressors. Finally, concerns over the well-being of family, friends and fellow patients raised anxiety levels.

Undoubtedly the strongest theme within the qualitative findings was the positive influence people had on anxiety levels, particularly the nursing staff and fellow patients. Individualised care that emphasised and helped maintain the personal identity and control of the patient prevented elevations in anxiety levels. Fellow patients provided emotional support and information, as well as the opportunity to validate personal experiences. Patients also reported experiencing less anxiety if they were sufficiently prepared for the experience of hospitalisation and surgery. Finally, patients highlighted the importance of good pain management. This need appeared to be generally well met and contributed to the minimisation of anxiety.

Discussion

The following section of the report presents a discussion of the study findings in the context of previously published research. The structure of the discussion follows the original study objectives; prevalence and pattern of anxiety, events/situations that cause an elevation or decrease in anxiety, and the associations between anxiety and post-operative pain. A summary of the discussion is provided at the end of the section.

Prevalence of anxiety

State anxiety

In the current study the prevalence of 'high' state anxiety ranged, pre-operatively, from 45% (evening before surgery) to 67% (pre-anaesthetic). Table 15 summarises the results of other studies that have also investigated the prevalence of anxiety. In a superficial comparison, it appears that the prevalence of anxiety in the current study is higher than that found elsewhere. Kindler et al. (2000) found, in their study of pre-operative anxiety, that 25% of their sample had 'high' anxiety the evening before surgery. Teasdale et al. (2000) classified 30% of their general medical and surgical population as 'high' anxiety cases. Whilst it appears that the prevalence of anxiety in the current study is higher than that found elsewhere, different methods and populations may account for the discrepancy. In particular, the definition used to define anxiety would affect prevalence rates (see Limitations). The closest comparison that can be made is with Thornton et al. (1997) who studied negative mood states in gynaecological patients. In this study, 54% of the sample reported clinically significant levels of anxiety pre-operatively.

Table 15: Reported prevalence of 'high' anxiety within published literature.

Reference	Tool used	N (valid)	Sex M/F %	Population type	Time measured	Prev 'high' anxiety
Davies (2000)	HADS	54	88/12	Cardiac surgery	Post discharge	15%
Kindler et al. (2000)	STAI	486	55/45	Mixed surgical	Evening before surgery	25% (s)
Moerman et al. (1996)	STAI	200	42/58	Mixed surgical	Anaes. outpt dept	32% (s)
Nelson et al. (1998)	STAI	96	68/32	Cardiac surgery	Not stated (t) Post-op day 2(s)	45% (t) 5% (s)
Teasdale et al. (2000)	STAI	94	45/55	General medical and surgical	Not stated	30% (s)
Thornton et al. (1997)	HADS	89	0/100	Gynaecological surgery	3 weeks pre admission 2 months post-op	54% 24%
Current study (2002)	STAI	80	0/100	Gynaecological surgery	Pre-admission Eve before op Morning of op Pre leave ward Pre anaesthetic Post-op day 1 Post-op day 2	41% (t) 45% (s) 53% (s) 52% (s) 67% (s) 20% (s) 19% (s)

HADS – Hospital anxiety and depression scale, STAI – State trait anxiety inventory, (s) – State anxiety, (t) – Trait anxiety.

Despite apparently superficially high levels of pre-operative state anxiety within the study population, these levels may be considered lower than perhaps would be expected, bearing in mind the nature of the sample. The sample was composed of relatively young female patients. Female gender and young age are variables consistently reported in the literature as associated with heightened levels of anxiety (Badner et al. 1990, Caumo et al. 2001, Domar et al. 1989, Duits et al. 1998).

Additionally, patients in the study were undergoing gynaecological surgery. Women attending hospital for gynaecological problems experience particularly high rates of psychological morbidity (Lalinec & Engelsmann 1985, Ryan et al. 1989, Salter 1985). In a study of women attending a gynaecology clinic for menorrhagia, 62% of the sample were

also suffering from mild to moderate neurotic depression (Greenberg 1983 cited by Hunter 1995). Therefore, this group of patients is vulnerable and may have additional psychological needs.

Conversely, the results of the qualitative analysis suggest that a number of patients experienced minimal levels of anxiety pre-operatively:

> *…I don't think I was overly anxious at all.* (P53)

> *…obviously I was a bit nervous but otherwise not too bad.* (P25)

> *…I didn't feel too bad just before I had it done.* (P67)

Post-operatively, the prevalence of 'high' anxiety in the sample was 20% and 19% respectively on days one and two. This compares favourably with Thornton et al. (1997), who found clinical levels of anxiety in 24% of women two months post-operatively. However, findings of lower than anticipated levels of 'high' anxiety should not be used to promote a relaxed attitude to anxiety in such patients. Anxiety may be a natural consequence of hospitalisation, particularly surgery, but the negative effect of anxiety on anaesthetic requirements (Macario et al. 1999), recovery (Johnston 1986) and post-operative pain (Munafo & Stevenson 2001) should be reiterated.

Trait anxiety

The prevalence of 'high' trait anxiety within the sample was higher than may have been expected, with almost half of the sample scoring higher than 44. Knight et al. (1983) reported that the female population's mean score for trait anxiety was 37. The mean trait anxiety score in the sample of gynaecological patients studied by Kain et al. (2000) was 39.

Even though trait anxiety refers to 'relatively stable individual differences in anxiety proneness' (Spielberger et al. 1970 p3), higher trait scores within the sample population may reflect the enduring character of gynaecological symptoms and the effect these have on the patients' lives (Thornton et al. 1997). It has also been suggested that many women who are anxious present themselves as medical cases with gynaecological symptoms (Hunter 1995, Swales & Sheikh 1992 cited by Thornton et al. 1997). Furthermore, the prevalence of 'high' trait anxiety may also be a result of the close temporal proximity of the completion of the trait questionnaire to surgery. Thus, it may be state anxiety and not trait anxiety that is being measured prior to admission (Thornton et al. 1997).

Pattern of anxiety

Individual differences in anxiety profiles

In the current study, the individual differences in the anxiety profiles were highly variable, confirming that anxiety is not a static entity but one which is highly individual. Indeed, it is widely acknowledged that patients do differ in their psychological response to hospitalisation, and in particular to surgery (Kincey 1995). This raises clinical issues in relation to the recognition of such individual variance and subsequent interventions to reduce anxiety. Thus, requiring 'individualised care' rather than traditional rituals in practice.

Characteristics that influence such individual differences in anxiety response may be crudely categorised as personality, demographic and situational. Personality characteristics that may influence the situational anxiety response include trait anxiety and coping style. Patients with higher levels of trait anxiety, i.e. anxiety proneness, have been shown to respond to stressful situations with higher levels of state anxiety (Chapman & Cox 1977, Spielberger et al. 1973, Wallace 1984b). This concept will be discussed in more detail below. Coping styles embrace the characteristic ways in which individuals appraise and respond to a threat (Wallace 1984b). Some studies of coping styles have examined locus of control. The theory of locus of control was developed by Rotter (1966 cited by Gross 1992), and refers to our beliefs about what controls the events in our lives. Lowery et al. (1975), in a study of pre-operative anxiety, found that 10% of the variance in anxiety was accounted for by locus of control.

Demographic characteristics that have been shown to manipulate the anxiety response include age, sex and education (Caumo et al. 2001, Kincey 1995, Kindler et al. 2000). Numerous studies have also examined the impact of various situational variables on anxiety levels, e.g. previous surgery, degree of surgery and surgery for cancer (Auerbach 1973, Caumo et al. 2001, Domar et al. 1989, Kindler et al. 2000). In the current study, patients having major surgery and those who reported pain prior to admission experienced higher levels of anxiety. Caumo et al. (2001) also found an association between the degree of surgery and anxiety (major surgery OR=1.49). In the same study, patients with pain pre-operatively were associated with higher levels of pre-operative anxiety (OR 1.84) (Caumo et al. 2001). Such findings have clinical implications for the assessment and identification of patients who might be at 'high risk' of anxiety.

General pattern of anxiety

Despite the high variance in the individual anxiety profiles within the current study, a general pattern of anxiety over the study period was seen to emerge. This was a curvilinear pattern where anxiety rose during the pre-operative period to a peak prior to the anaesthetic, and then declined sharply on day one post-operatively, with little observed change on day two. This pattern is generally supported within the literature in spite of variations in study design (de Groot et al. 1996, McCrone et al. 2001, Visser 1988, Wallace 1984a).

The two most notable exceptions to this are the studies conducted by Chapman and Cox (1977) and Johnston (1980). Chapman and Cox (1977) found that day one post-operatively was the most anxious point for patients. This difference in findings may be attributed to the difference in the type of surgery under investigation. Chapman and Cox (1977) studied kidney donors and recipients, and post-operative concerns for these patients may vary considerably with those of gynaecological patients. Johnston (1980) conducted four studies that explored the pattern of anxiety in surgical patients. Two of the studies investigated gynaecological patients and found that the highest level of anxiety occurred pre-operatively, at one or two days prior to admission. However, the studies conducted by Johnston (1980) did not measure anxiety in the 24 hours leading up to surgery, which may limit comparability with the current study. Additionally, the studies by Chapman and Cox (1977) and Johnston (1980) were conducted over 20 years ago, and since then nursing and surgical practices, patterns of hospitalisation as well as patients' knowledge and expectations have changed.

Pre-admission anxiety levels

Within the quantitative data, there was little observed difference between the median pre-admission clinic trait anxiety score (40.5), and the median state anxiety score the evening before surgery (41). Indeed, as mentioned above, scores obtained for trait anxiety were higher than anticipated. This was not an expected finding and raises questions regarding the time point at which the impending surgery impacts upon anxiety levels. The findings from the qualitative analysis also indicate that anxiety levels were raised in advance of admission. For example, in the qualitative analysis, the theme, 'organisation and delivery of care' contained instances where specific events or hospital policy had resulted in increased anxiety before admission, such as surgical cancellation.

Furthermore, this observation is substantiated by previous published research. Thornton et al. (1997) studied gynaecological patients and found that 54% of their sample had clinically significant levels of anxiety prior to admission. Wallace (1987) found that state anxiety scores were elevated at the outpatient visit six to eight weeks before hospitalisation.

Duits et al. (1998), had a mean state anxiety score for women 14 days prior to cardiac surgery of 52, compared with 48.8 the day before surgery. Such findings indicate a need for further studies in this area to consider a much wider time scale. Interventions to reduce anxiety may need to be administered 'upstream' if they are to impact on the sustained levels of anxiety prior to hospital admission.

When considering possible explanations for this observation, the points raised above in the discussion of the prevalence of anxiety should be revisited. Namely, the nature and characteristics of gynaecological symptoms and patients, and the close temporal proximity of the trait questionnaire to surgery.

Association between trait and state anxiety

In the current study, an association was found between trait and state anxiety (r=0.587, p<0.0001). This suggests that the patients who are admitted to hospital with a higher level of trait anxiety, i.e. anxiety proneness, experience higher levels of anxiety during the admission period. This association is well documented in previous published research (Chapman & Cox 1977, Johnston 1980, Taenzer et al. 1986, Wallace 1987). Caumo et al. (2001) found that high trait anxiety determined a risk of 3.96 for pre-operative state anxiety. In the research conducted by Kain et al. (2000), significant positive correlations were identified between trait anxiety and state anxiety on the ward and at home after discharge. However, despite the general trend indicated by the current and previous studies, Munafo and Stevenson (2001) warn of a potential confounding variable with such associations: behavioural consistency. Questionnaires designed to measure anxiety are in fact measuring a particular behaviour, and behaviours tend to show consistency over time (Munafo & Stevenson 2001).

Nurse-patient interaction

Caring for patients as individuals

During the qualitative analysis, one of the strongest themes to emerge was the importance of the nurse-patient relationship for the alleviation and management of anxiety. In particular, the amelioration of anxiety was maximised where the qualities and attributes of the nursing care received led to a sense of individualised care; being cared for as an individual. The various qualities and attributes ascribed to the nurses by the patients as positively effecting their sense of well-being were wide ranging. Some examples include a sense of approachability, genuine concern, availability, warmth and attentiveness.

In a study of patients' experiences with nursing, Kralik et al. (1997) found that patients described nurses as being either engaged or detached with

their nursing care. The presence of an engaged nurse was found to be important to patients and greatly influenced their perception of the quality of nursing care received. The presence of an engaged nurse was indicated by the nurses' acknowledgement of the physical, emotional, spiritual and environmental dimensions of the individual patient. This was conveyed by nurses' awareness of the patients' needs, sensitive responses to such needs, involvement of the patient in care planning, frequent patient contact and the creation of open dialogue with the patient (Kralik et al. 1997).

Support for these findings is provided by other published research into the patients' experience of nursing (Appleton 1993, Bouthillette 2001, Ersser 1991, Ersser 1998, Koch et al. 1995, Wallace & Appleton 1995). In a study conducted by Astedt-Kurki and Haggman-Laitila (1992), patients, in describing their care, emphasised the importance of the interaction between patient and nurse. In particular, kindness, friendliness, sense of humour, as well as how well the nurse secured the intimacy and safety of the patient, were described as important components of nursing care. Again, returning to a sense of being cared for as an individual rather than as an object of care.

Episodes of detachment

The majority of patient reports in the current study regarding the nursing care received, indicated the presence of an engaged form of care. However, there were instances where nursing care appeared detached. Detachment refers to care that was approached in a procedural nature, avoided personal contact with patients and was task orientated (Kralik et al. 1997). Although such instances were few, their importance is recognised through the psychological distress caused to the patients, which for some persisted after discharge. Such distress was evident during the interviews through tone of voice and the emphasis placed by the patient on the story being told. In some cases, the patients themselves stated that the incident of concern was still a source of distress.

I mean that did bother me and I still think about it now…(P68).

The experience of a detached form of care is a concern since such experiences have been shown to be detrimental to patients' emotional and physical well-being (Koch et al. 1995), and certainly are in sharp contrast to the Government's emphasis on the quality of care (Department of Health 1998).

Reassurance

In the current study, patients reported that an important therapeutic function of the nurse-patient relationship was providing reassurance;

through information, words of assurance and non-verbal communication. Providing information, thus reducing uncertainty, has strongly been associated with the management of anxiety (Walker 2002). This concept is examined below in 'Patient Preparation'. The efficacy of words of assurance, also referred to as 'Cognitive Re-framing' (Teasdale 1995), for the reduction of anxiety has also been explored. Ridgeway and Mathews (1982) summarise the results of such studies, which generally report positive and statistically significant results.

Non-verbal communication has been reported as an effective means of providing reassurance, as well as the most underestimated nursing intervention for relieving anxiety (Blondis & Jackson 1982 cited by Dodds 1993). The most extensively studied form of non-verbal communication is touch, and the psychological benefits of touch are generally acknowledged (Moon & Cho 2001). Moon and Cho (2001), in their investigation of the effects of hand-holding on pre-operative anxiety, found that physiological indicators of anxiety as well as self-reports of anxiety were significantly lower in the group that received the intervention (hand-holding). However, it should be stated that a major aspect of non-verbal communication, such as hand-holding, is that nurses are spending time and giving attention to patients (Moon & Cho 2001).

Teasdale (1995) suggests that an additional way in which nurses provide reassurance is through attachment. In response to a perceived threat, an individual forms an attachment to a person believed to be able to protect them from that perceived threat (Bowlby 1971 cited by Gross 1992). Therefore, as stated by Grieve (2002 p672), 'nurses can become attachment figures who are able to reassure patients merely by their presence'. Additionally, anything the nurse does to promote trust within the relationship will increase the possibility of the nurse being seen as a reassuring figure of attachment (Teasdale 1995). Not surprisingly, in a study conducted by Teasdale (1995), patients appeared to respond particularly well to this form of support.

Affiliations

Analysis of the qualitative data revealed that the social support derived from fellow inpatients was an important contributory factor in the amelioration of anxiety. Fellow patients were used as a source of information, as a distraction from current worries, and most importantly, as a forum for discussion and validation of emotions and physical symptoms. Indeed, the patients felt that there was a greater tendency to be more open and honest with fellow patients than with any other social group, such as family.

The affiliation tendencies of people who are faced with acute, threatening situations is an area of research interest in social psychology (Helgeson & Taylor 1993, Kulik et al. 1994, Schachter 1959). The majority of the early stress and affiliation research was conducted in laboratory settings (Schachter 1959) and therefore its generalisability to real life situations is questionable (Kulik & Mahler 1990). However, several more recent studies have attempted to explore affiliation tendencies in a healthcare setting and the effects these affiliations have on patient outcomes.

Kulik and colleagues conducted a series of studies that examined the affiliation tendencies of surgical patients and the effects these affiliations had on recovery. Kulik and Mahler (1987) found that pre-operative coronary artery bypass patients who were assigned to a post-operative roommate were less anxious prior to the surgery, more physically active post-operatively and had a shorter post-operative length of stay than patients who shared a room with another pre-operative patient. These findings were reproduced in a further study conducted by Kulik et al. (1996) who also found that patients engaged in more cognitive clarity and emotional self-evaluation affiliations with a roommate who had a similar rather than dissimilar surgical problem. It has also been shown that the degree to which a patient affiliates depends on the perceived similarity with the other roommate (Moore et al. 1998).

A few studies in this area have been conducted outside the social psychology arena. In one such study, Parent and Fortin (2000) examined the effects of peer support for cardiac surgery patients. In comparison to the control group, it was found that patients who received support from former patients were less anxious before surgery, reported greater self-efficacy and increased physical activity post-surgery. Additionally, Johnston (1982) in a study of gynaecological patients found that patients were more accurate in their recognition of fellow patients' worries and concerns than nurses.

Patient preparation

The importance of the degree to which the patient was prepared for the experience of hospitalisation and surgery was apparent from the interview data. This importance was expressed in two ways. Firstly, the patients' anxiety was elevated when an insufficient awareness and knowledge of the various events, procedures and sensations that accompany surgery, particularly gynaecological surgery, occurred. A lack of information was reported by the patients as the main cause for this. Secondly, the amelioration of anxiety was attributed by the patients to a sense of knowing what to expect. Such knowledge was obtained, for example, through previous experiences and accurate information.

The effect of pre-operative preparation on the well-being of the patient has been studied extensively. Janis (1974) was one of the first to conclude that the importance of pre-operative information lies in its ability to stimulate the patient to mentally prepare for the impending surgical event, develop accurate expectations and thus cope better than patients who have not been able to prepare mentally. Since then, other mechanisms of stress reduction via preparation have been proposed. These include the opportunity for the patient to develop coping strategies as well as being encouraged to focus on the objective, non-emotional aspects of the impending surgery (Wallace 1985a).

In the extensive studies conducted on the effect of patient preparation a wide range of interventions have been tested. These fall into six broad categories: procedural information, sensory information, behavioural information, modelling, relaxation and cognitive coping strategies (Mitchell 1994). However, for the purposes of this discussion, the informational aspects of preparation shall be focused on since they bear most relevance to the findings of the current study. Additionally, since this area has been so widely studied, only a cursory overview is possible.

An important observation from the current study was the substantial number of instances where patients reported an information need that was not met. Other studies have also demonstrated a failure to meet such patient needs (Lithner & Zilling 2000, Wallace 1979 cited by Wallace 1984b, Wallace 1985a). A considerable lack of knowledge was demonstrated in a group of surgical patients studied by Williams (1993) in relation to basic surgical variables. For example, over 80% of the patients reported receiving little or no information in relation to the anaesthetic. Additionally, over 70% of the patients reported receiving little or no information regarding return to fitness.

The effect that information has on the level of anxiety experienced by the patient has been examined in studies covering a wide range of surgical procedures such as cataract surgery (Morrell 2001), cholecystectomy (Schwartz-Barcott et al. 1994) and gynaecology (Wallace 1984a). Meta-analyses have been performed with such studies and generally indicate that informational preparation has statistically significant beneficial effects on psychological outcome variables such as anxiety (Devine 1992, Devine & Cook 1986, Johnston & Vogele 1993). Additionally, such meta-analyses have also shown that the beneficial effect of preparation extends beyond the psychological variables to pain, recovery, length of stay, and physiological indices such as blood pressure and heart rate.

Patient preparation using informational strategies, as mentioned above, can be divided into procedural, sensory and behavioural (Mitchell 1994). The comparative and combined success of these three types of information in relation to patient well-being has been explored. Generally, it has been concluded that procedural information in isolation yields small non-significant results in comparison with control groups (Suls & Wan 1989). In a meta-analysis performed by Suls and Wan (1989) it was found that procedural information in conjunction with sensory information produced the strongest most consistent benefits. However, in this meta-analysis, behavioural information interventions were not included.

In addition to the type of information provided, two other variables of importance are the timing of the information and the method of delivery. Previous studies, as well as the current study, have suggested that surgery impacts upon anxiety levels in advance of hospital admission (Johnston 1980, Thornton et al. 1997) which has implications for education since anxiety states can be intrusive to learning new information (Wallace 1984b). Research findings generally indicate that pre-admission education, as opposed to providing information once admitted, exerts greater beneficial effects in relation to anxiety levels (Cupples 1991, Lookinland & Pool 1998). However, little attention has been given to the timing of such pre-admission education (Walker 2002). One further point in relation to the timing of information is the observed focus of studies on the pre-operative time period only.

Methods of providing information are varied and include pre-operative videotape for home viewing, pre-operative postal information and structured pre-operative telephone discussion (Mitchell 2000). The effects of booklets have been the subject of a number of studies. Wallace (1986) found that patients who received an informative booklet reported knowing more information on admission and having fewer worries than the control groups. Leigh et al. (1977) found that anxiety levels were reduced to a greater degree in patients who received a visit from a representative of the anaesthetist compared to patients who had received a booklet designed to reassure them about anaesthesia. However, in general it appears that a combination of verbal and written information is preferred (Lithner & Zilling 2000). The use of verbal information gives the patient a chance to ask questions and clarify points where as written information can be re-read and used as a reference (Walker 2002). Patients in the study received written information at the pre-admission clinic in addition to verbal information.

To conclude this section of the discussion, two further points will be raised briefly. Firstly, it has been suggested in the literature that

preparation should be matched to the patient's preferred coping style (Mitchell 2000) according to whether the patient is an information seeker (monitors) or information avoider (blunters) (Miller & Mangan 1983). It is hypothesised that mismatching the level of information provided with the coping style of the individual can negatively affect patient outcome variables (Miller & Mangan 1983). Research findings, however, do not appear conclusive (Miller & Mangan 1983, Wallace 1984a).

Finally, Salmon (1993) raises an interesting argument and suggests that techniques designed to reduce anxiety, such as patient preparation, may not necessarily be in the patient's interest as it represents the 'medicalization' (sic) of a natural emotional response which allows the patient to adjust more adequately for the impending surgery. Janis (1974) termed this the 'work of worry'.

The patient role

In the current study, it emerged from the interviews that an important contributory factor for increasing anxiety was the adoption of the role of patient. The loss of independence and control, together with unexpected feelings of helplessness and vulnerability, contributed to this stressor. Additionally, patients had to adjust to the perceived need to conform to the rules and expectations of a new social world (i.e. hospital). Past research findings support such observations. Grieve (2002) conducted a qualitative study in a day surgery unit where patients were asked via open questioning to describe how they felt about their impending surgery. A central feature reported by the patients, which compounded their anxiety, was the loss of personal identity and control, leading to a sense of disempowerment. A particularly interesting piece of research was conducted by Webb (1986). Webb, who worked as a sister on a gynaecology ward, studied women going through the process of having a hysterectomy and the experiences of gynaecology nurses. However, during the study period, Webb herself became a gynaecology patient and used this experience to further inform the study. Recalling her own experiences, Webb states:

> Despite being an experienced nurse and a fairly confident woman in other realms of my life, I was reduced to feeling inadequate, a person who could not be talked to on an equal basis by doctors, and someone whose worries and distress were of no importance (Webb 1986 p105).

This quote illustrates the psychological distress that can accompany the patient role, particularly in a gynaecology setting. Additionally, it may be

suggested that the psychological consequences experienced were not anticipated even though Webb was an experienced nurse. Such observations have clinical significance.

Gynaecology patients may be particularly vulnerable to psychological distress resulting from a loss of personal identity and control. Indeed, in the current study, several of the patients interviewed highlighted the importance of the type of surgical intervention on such feelings. Gynaecology surgery may be associated with an alteration in body image (e.g. hysterectomy) with associated implications for the patients' normal personal identity (e.g. loss of fertility). Such feelings may be compounded by consequential hormonal changes which have been linked to higher rates of psychological distress (Hunter 1995).

The degree of negative impact that the adoption of a patient role can have is affected by the nursing care received. A key feature of the studies discussed above in 'Nurse-Patient Interaction', was the importance placed by patients on the experience of an individualised form of care where the identity of the person was acknowledged and respected. In one of these studies, Koch et al. (1995) found that geriatric patients reported feelings of being treated as an object when the concerns of the individual were ignored, leading to a depersonalisation of care.

Organisation and delivery of care

Some aspects of the organisation and delivery of care were found to cause anxiety to patients, the main aspect being admission policies. The lack of notice regarding the admission date in conjunction with the uncertainty regarding the amount of time the patient would have to spend on the waiting list was found to raise anxiety levels. Another aspect that caused anxiety for some patients occurred when the patient was admitted the day before surgery as opposed to the day of surgery. Related to this, concerns about bed availability and cancellation lead to further uncertainty. The hospital environment itself was also found to heighten anxiety, in particular, the disturbances to sleep, quality of hospital food, and activity of other patients and their visitors.

> *I think if I had been in there* [hospital] *much longer I would have done* [become more anxious] *because…I found it quite hard to sleep…at night, because of the light and the activity on the ward.* (P33)

More recently, studies have attempted to examine and evaluate care and service delivery from the patients' viewpoint, and how this affects the well-being of the patient. In one such study, the experience of waiting for

coronary artery bypass surgery was investigated from a qualitative perspective (Fitzsimons et al. 2000). Patients felt that they were not given enough information in relation to the amount of time that they would have to spend on the waiting list or how they were progressing on the list. Additionally, once admitted, many of the patients expressed 'gross dissatisfaction' in relation to the quality of the service. One particular aspect was the lack of time given to ask questions (Fitzsimons et al. 2000). A lack of information, together with a poor standard of care is known to heighten anxiety as discussed above in 'Patient Preparation' and 'Nurse-Patient Interaction'.

Pattison and Robertson (1996) explored how the design of the ward can affect the well-being of patients from the patient's perspective. In this study, 'bay' and Nightingale wards were compared. Seventy-five per cent of the patients studied preferred the bay design ward. The mean anxiety levels were higher for patients in the Nightingale ward, although this difference was not statistically significant. However, the lack of information on nurses' whereabouts and the activity on the rest of the ward was a cause for concern on the bay ward. Overall, no significant differences were found between ward designs in relation to patient well-being (Pattison & Robertson 1996).

Such findings suggest instances where the organisation and delivery of care is not grounded in the patients' viewpoint. Tasa et al. (1996) state that the creation and change in policies and service delivery is often based instead on criteria that are deemed of importance to the organisation. Additionally, research in this field is relatively new and requires the development of valid and reliable measurement tools. However, there is a trend towards a more consumer-orientated National Health Service so such opinions and research activity should be increasingly sought. This trend is apparent within documents such as *A First Class Service* (Department of Health 1998). Additionally, patients increasingly wish to be involved in decision making and the shaping of service delivery (Cleary et al. 1993). Examples of where patient reports have been used to improve the quality of care are provided by Cleary et al. (1993).

Post-operative pain and anxiety

Experience of post-operative pain

Post-operative pain, overall, appeared to be moderately well managed, with some instances of inadequacy. This is supported by both the quantitative and qualitative findings. The mean pain scores for pain on movement on days one and two post-operatively were 3.21 and 2.52 respectively. Cleeland and Ryan (1994) suggest a score of five or greater to indicate a clinically significant level of pain.

This finding is favourable in comparison with published work on post-operative pain. Carr (2000) found that the majority of patients studied experienced significant pain in the early post-operative period. Lynch et al. (1997) found that mean pain scores on movement for day one post-operatively ranged from 3.2 to 7.2 depending on the surgical procedure. However, the findings of the current study only represent a cursory look at the immediate post-operative pain experience and therefore conclusions should be drawn cautiously.

Post-operative pain and pre-operative anxiety

An interesting finding was the correlation between pre-operative state anxiety and post-operative pain (r=0.295 p=0.011). This indicates that patients who experience increased levels of anxiety before surgery are more likely to suffer from higher levels of pain post-operatively. In the literature, uncertainty is evident regarding the role of pre-operative anxiety on post-operative pain. Many studies have found associations between pre-operative state anxiety and increased post-operative pain (Boeke et al. 1991b, Kain et al. 2000, Perry et al. 1994). In the study conducted by Scott et al. (1983), state anxiety was demonstrated to be a significant, linear predictor of post-operative pain.

However, other studies have reported that it is trait and not state anxiety that is the important predictor variable for post-operative pain (Munafo & Stevenson 2001). For example, Taenzer et al. (1986) found, in a multiple regression analysis, that trait anxiety and neuroticism were the most important predictors of pain. The current study did not find any significant associations between trait anxiety and post-operative pain. Kain et al. (2000) examined in more detail the roles of trait and state anxiety on pain post-operatively. They conducted a path analysis which indicated a complex time-based relationship between pre-operative anxiety and post-operative pain. It was found that trait anxiety did not have any direct effects on post-operative pain, but that the effects of trait anxiety were mediated through the effects of trait anxiety on pre-operative state anxiety (Kain et al. 2000). Additionally, Kain et al. (2000) found a relationship between pre-operative state anxiety and pain at home one week after discharge.

Post-operative pain and post-operative anxiety

The quantitative analysis also showed that increased post-operative anxiety was positively correlated with post-operative pain (day one r=0.382 p=0.001, day two r=0.515 p<0.0001). The link between anxiety and pain is well documented (Lynch et al. 1997, Nelson et al. 1998, Oberle et al. 1990, Perry et al. 1994, Taenzer et al. 1986). Walding (1991) reports that anxiety induces a similar general physiological response from the body as acute pain. Therefore, anxiety may have a role in potentiating pain by enhancing the physical symptoms (Walding

1991). However, it is important to reinforce that such findings do not explain the direction of the relationship between anxiety and pain, whether anxiety makes the experience of pain worse or whether pain leads to increased anxiety (Carr 2000).

It is worth noting that in the correlation analysis between anxiety and post-operative pain, the significant correlation identified was not strong. This may indicate that there are other factors affecting the post-operative pain experience. Indeed, anxiety is only one of the psychological variables reported as a source of the variability in post-operative pain. Other psychological variables include: patient expectations (Carr 1990, Wallace 1985b), need for control (Perry et al. 1994), neuroticism (Taenzer et al. 1986) and pessimism (Mahler & Kulik 2000).

Summary

The main findings of the study have been discussed in the context of previous published research. In summary, the study has found higher rates of anxiety than previously reported, although patient characteristics such as sex and type of procedure may predispose the sample to higher rates of anxiety. Interestingly, anxiety levels appear raised prior to admission although the time point at which the impending surgery impacts upon anxiety levels is uncertain. This has implications for the implementation and success of anxiety management interventions.

This has been one of the first studies to examine in detail the pattern of anxiety in the immediate pre- and post-operative periods. The between individual difference observed in psychological response to hospitalisation and surgery was highly varied, and personality, demographic, and situational characteristics may account for such variation. However, a general pattern of anxiety was identified: a gradual rise in anxiety from the evening before surgery to the point of leaving the ward to go to theatre, followed by a sharp increase in anxiety immediately prior to the anaesthetic with a sharp decline on day one post-operatively and little observed change on day two post-operatively. This pattern supports the 'intuitive hypothesis' (Johnston 1980) regarding the course of anxiety.

One of the most important factors implicated in the level of anxiety experienced is the quality of nursing care received. Individualised care that acknowledges the emotional, physical, spiritual and environmental dimensions of a patient is well recognised in the literature as crucial to maximising a patient's sense of well being. However, the value of such simple interventions in the management of psychological distress is

perhaps not as well recognised in the clinical setting. Fellow patients can also have a positive impact on anxiety. The positive physical effect of affiliations made during episodes of stress has been demonstrated in previous published research.

It is widely acknowledged that preparing a patient for impending surgery has beneficial psychological effects. The effects of such preparation are maximised when procedural, behavioural and sensory information are combined and delivered using a variety of techniques. Informing the patient is a vital process that should start prior to admission and continue after discharge. Hospital policies and service delivery can also affect psychological well-being if the patient is not at the centre of service design, appraisal and re-design. The importance of this dimension of care is currently acknowledged and emphasised through Government documents such as *A First Class Service: Quality in the new NHS* (Department of Health 1998).

Limitations, Clinical Implications and Further Research

This research project has built upon existing work pertaining to the prevalence and experience of anxiety in a surgical population, as well as contributing several new dimensions. A particular strength of this study has been the perspective of the patient experience. However, there are also limitations which have implications for the generalisability and authenticity of the study. The findings of this project also have important implications for clinical practice as well as further research.

Limitations

Patient recruitment

Anxiety research

Patients who are naturally more anxious may be less inclined to participate in research. Antrobus (1988) investigated this possibility and found that high anxiety levels did predispose patients to withhold consent. Such self-selection bias in the sampling would affect the validity of the results. However, the refusal rate in the current study was low (9.8%) and therefore such effects would be minimal. This may be attributed to the non-intrusive nature of the study as well as patient awareness that their participation could potentially inform future patient care.

Sample size

In the original study protocol, the aim was to recruit 105 patients to the study with a final sample size, allowing for attrition, of 85 patients. This number was not obtained due to time constraints and a lower number of patients attending the clinic than anticipated. This was only problematic from the viewpoint of the quantitative analysis. Therefore, the decision was made by the steering group to include the quantitative data obtained during the pilot study (n=15) in the main study. Thus, the final sample, after attrition, was made up of 80 patients. The threat to validity by inclusion of the pilot data was considered minimal since no changes were made to the methodology and only a short time had passed from the pilot to the main study.

Data collection

State Trait Anxiety Inventory

It has been reported elsewhere that patients can find the State Trait Anxiety Inventory (STAI) (Spielberger et al. 1970) confusing, with some of the questions being ambiguous and open to misinterpretation (Brown

1990). To a degree, this was also found in the current study. In particular, patients occasionally questioned the pertinence of some of the questions on the state anxiety questionnaire to gynaecology patients. However, it was possible to address such problems and queries at the pre-admission clinic where the researcher was able to go over the questionnaires with the patients thoroughly and answer any concerns. This minimised the potential threat to validity posed by such misinterpretation and confusion.

Self-completion of questionnaires

The state component of the STAI was administered six times during the patient's hospital admission, four pre-operatively and two post-operatively. The pre-operative questionnaires were given to the patients to administer themselves due to practical and time constraints. This introduced the possibility of patients failing to complete the questionnaires and the resultant lack of data. Overall, the completion rates were good, with the most notable exception being the pre-anaesthesia questionnaire. Reasons for not completing the last pre-operative questionnaire were varied but most commonly included lack of time and failure to take the questionnaire to theatre. This was not surprising, as this was a very stressful time. Such occurrences require consideration in the design of further anxiety studies that involve the pre-anaesthesia time point.

Telephone interviews

The telephone interviews that were conducted with the patients after discharge proved to be a rich source of data. Only three patients could not be contacted. The researcher was able to establish a good rapport with the patient prior to the interview; rapport is a crucial element in successful interviewing (Barriball et al. 1996), and telephone interviews have been criticised for the difficulty they can pose in the creation of rapport (Carr & Worth 2001). An additional factor that may have enhanced the data obtained was the length of time after discharge that the interviews were conducted (Carr 1999). This gave the patients an opportunity to reflect on their experience and feel more able to be critical about the care they received. An opportunity to reflect may be considered particularly important in anxiety research, where it has been reported that subjects find vocalising causes and experiences of anxiety difficult (Wiens 1998).

Data analysis

Defining anxiety

The greatest problem encountered during the analysis was the lack of information available to be able to define 'high' anxiety in the sample and thus assess the prevalence. The STAI is accompanied by a manual which provides reference data. However, the data presented for general

medical and surgical patients was normalised and related to males only (Spielberger et al. 1970 p8). Also, this data is over 30 years old and therefore may not accurately represent anxiety profiles within the current population. This led to an extensive literature search in order to assess the methods used by other researchers when investigating the prevalence of anxiety using the STAI. The results of this search can be seen in Table 16.

From Table 16 it can be seen that the definitions used by researchers when defining 'high' anxiety are varied. For state anxiety, the values used to define 'high' anxiety range from 39 (Caumo et al. 2001) to 60 (Nelson et al. 1998). Such observations have important implications for the comparison and transferability of research findings. However, the majority of the values used are in the low to mid 40s. From the results of the literature search, a value of 45 was decided on as appropriate to define 'high' anxiety for the purposes of the current study. This value was superficially assessed using internal reference values derived from percentiles, and no substantial problems were identified. However, the value of 45 is an arbitrary figure and may not take into consideration the vulnerable nature of gynaecology patients. Therefore, further validation of anxiety tools, such as the STAI, in a wide range of medical as well as surgical patients is warranted.

Table 16: STAI reference values used by other studies to define 'high' anxiety and the resulting prevalence.

Study reference	STAI Cut-off value	N (valid)	Sex M/F (%)	Population type	Time completed	% 'high' anxiety
Auerbach (1973) *	36 (t) 42 (s)	56	100/0	Mixed surgical	Day before op Day before op	50 (t) 32.1 (s)
Caumo et al. (2001)*	38 (t) 39 (s)	592	26/74	Mixed surgical	Afternoon before surgery	24.5 (t) 24 (s)
Duits et al. (1998)**	45 (s)	217	81/19	CABG patients	Pre- and post-operatively	Not calculated
Kindler et al. (2000)**	45 (s)	486	55/45	Mixed surgical	Evening before surgery	25
Moerman et al. (1996)**	46 (s)	200	42.5/57.5	Mixed surgical	Anaesthesiology outpatient dept.	32
Nelson et al. (1998)**	32.7 (t) 60 (s)	96	68/32	CABG surgery	Not stated (t) Post-op day 2(s)	45 (t) 5 (s)
Spielberger et al. (1973)*	34 (t)	26	100/0	Mixed surgical	Day before surgery	50 (t)
Teasdale et al. (2000)**	41.33 (t) 42.38(s)	94	45/55	Medical and surgical patients	Not stated	30.4
Wallace (1986)**	43 (s)	59	0/100	Gynaecological surgery (minor)	Pre-operatively	Not calculated
Current study (2002)**	45 (s&t)	80	0/100	Gynaecological surgery	Trait Eve before op Morn of op Pre leave ward Pre anaesthetic Post-op day 1 Post-op day 2	41.3 44.9 52.7 51.8 66.7 20 18.9

* – use of internal reference values, ** –- use of external reference values, t – trait anxiety, s – state anxiety.

Multiple significance testing

During the analysis, a substantial number of statistical tests were performed. Such multiple significance testing can present difficulties in the interpretation of the results. As stated by Gore (1981), by chance, one group out of 20 (p<0.05) will show an association, even when no real association is present. Therefore, the greater number of analyses carried out, the greater the risk of false-positives. Altman (1980) reported that it is not reasonable to restrict the analysis purely to relieve problems of statistical interpretation. Therefore, with such potential problems in mind, 95% confidence intervals were also reported in addition to 'p' values. Confidence intervals can convey more information, as a range of possible values is indicated (Gardner & Altman 1986). Additionally, it was considered that the problems associated with multiple significance testing would be minimised since the study was not primarily concerned with hypothesis testing.

Clinical implications

Identification of potential anxiety 'cases'

The identification of patients who are more likely to experience adverse levels of anxiety pre- and post-operatively could be important when the detrimental effects of anxiety on variables such as anaesthetic requirements (Maranets & Kain 1999), post-operative pain (Nelson et al. 1998), psychological adjustment to (Wallace 1984b) and recovery from surgery (Johnston 1986) are considered. Therefore, the finding that trait and state anxiety are positively correlated may prove useful in the clinical area for screening purposes. The trait component of the STAI is a simple self-report tool that could be used to identify high-risk patients at the pre-admission clinic or on admission to hospital. Generally, patients in the current study completed the trait questionnaire confidently in a relatively short time.

Early identification of such high-risk patients would enable the development and implementation of anxiety reduction interventions whose effectiveness could then be assessed (McCrone et al. 2001). Also, given the positive linear relationship between pre-operative anxiety and post-operative pain, such screening may also provide healthcare professionals with an opportunity to educate patients who are at high-risk of anxiety, in pain reduction strategies. The information gained may also be used to guide post-operative analgesia strategies. Even though the educational and managerial implications associated with such interventions are acknowledged (Wilson-Barnett 1994), targeting a 'high risk' group as opposed to the whole patient population may be seen as a better utilisation of scarce resources.

Raising awareness/ education

From the patient's perspective it would appear that the quality of nursing care received is a significant determinant of the patient's psychological well-being. Caring for people as individuals, rather than as a component of a patient population, minimises the psychological distress that can accompany the adoption of a patient role and the resultant perceived threat to self. Awareness of this should be raised within the healthcare professions as it appears that the value of basic 'engaged' nursing interventions is presently underestimated (Dodds 1993). This could be addressed through the pre-registration nursing curriculum and reflective practice. Patient feedback to nursing staff may also provide an opportunity to raise awareness of the important qualities of nursing care. This may be considered particularly important in specialities such as gynaecology nursing, in recognition of the vulnerability of such populations (Webb 1986).

Reports from patients in various studies, in addition to the current one, indicate the value of words of assurance (Ridgeway & Mathews 1982), non-verbal communication (Dodds 1993) and attachment (Teasdale 1995) in the alleviation of anxiety. In qualitative research conducted by Ersser (1991, 1998), which explored the therapeutic nature of nursing, patients placed the greatest emphasis on the way in which nurses presented themselves in relation to patient welfare and satisfaction with care. The two primary features of the nurse's presentation were the nurse's personal qualities during interaction and the nurse's ability to communicate their physical or psychological presence to a patient (Ersser, 1991, 1998). These types of anxiety management interventions are relatively cost-free and easy to perform. It appears that the value of such basic interventions is not fully appreciated, and may even be played down by healthcare professionals (Teasdale 1995) in favour of uncertainty-reduction approaches such as patient information leaflets (Grieve 2002). This imbalance requires re-examination and could be rectified through basic educational initiatives.

Patient focused care

One of the most important interventions for managing anxiety is the provision of accurate and honest information for patients (Devine & Cook 1986, Suls & Wan 1989). This is reinforced by the findings of the current study where increased anxiety was associated with a lack of awareness and knowledge about the events, procedures and sensations that accompany surgery. Information ensures that the patient has some degree of control over a stressful event and minimises the occurrence of unexpected, thus anxiety provoking, events (Walker 2002). Maintaining a degree of control also preserves dignity and personal identity. Therefore, providing the patient with a combination of procedural, sensory and behavioural information should be prioritised. The provision of such

information is a continual process, which should start prior to admission and continue after discharge.

A mixed method of delivering information is preferable, combining written and verbal and maybe even visual (e.g. videos) approaches. To ensure a high level of information, collaboration should be encouraged between surgeons, nurses and other healthcare professionals, as well as the patients themselves, when deciding content and style of presentation. Such collaboration will not only enhance creativity, but also enable the information to address issues that were previously either not considered by healthcare professionals to be a priority to the patients, or not known to create anxiety.

In the current study, patients identified fellow patients as a key source of information and support. The creation and maintenance of affiliations between patients should thus be encouraged and facilitated. Such affiliations are known to be beneficial to psychological as well as physical patient outcomes (Kulik & Mahler 1987) and could be encouraged either with fellow pre-operative patients or with post-operative patients. Affiliations could be facilitated through giving preparatory information to patients in groups, through the initiation of one-to-one peer support, through the involvement of previous patients in educational initiatives or through the establishment of a formalised 'buddy' support network. The gynaecology setting may be a prime environment for developing such programmes.

Use of patient experiences in the creation and change of healthcare policy and service delivery

This study shows that aspects of healthcare policy and service delivery heighten patient anxiety. This increasingly occurs when policies and changes to service delivery fail to consider the patient viewpoint. This, therefore, suggests a need to obtain patient feedback on the design, critical appraisal and re-design of such services. One such strategy is continuous improvement, which utilises a framework focusing on underlying knowledge of the organisation, policy for leadership, tools and methods, and daily work applications of improvement trials (Batalden & Stoltz 1993). The emphasis on knowledge and learning is central and a variety of tools are available to build knowledge about the processes of care. An important component of learning is an inclusion of the patients' perspective and experiences of their care, as this is critical for feeding into the improvement cycle using quantitative and qualitative feedback systems (Tasa et al. 1996).

Implications for Further Research

This study both confirmed existing research and provided insight for new areas of research. Uncertainty exists about when the impending hospital admission/surgical procedure affects a patient's anxiety levels. Further research aiming to resolve this uncertainty is important due to the implication anxiety has for the success of interventions designed to manage it. It may also be unethical not to acknowledge and intervene if a patient is experiencing psychological distress in advance of admission.

The findings of this study indicate that there is a distinct patient group at higher risk of anxiety and its negative consequences. Research into the value of interventions designed to minimise such anxiety may be considered worthwhile. Indeed, the steering group from the current study is in the process of designing a pilot study to investigate the use of guided imagery on anxiety in surgical patients at different time periods pre-operatively.

The current study explored the anxiety experienced by gynaecology patients. As mentioned in the discussion, this group has unique characteristics. Therefore, it would be valuable to replicate the study in a different patient population in order to assess the generalisability of the current findings.

From the qualitative analysis, additional research questions were generated that were not previously considered. Since the current study was not designed to investigate these additional questions no significant conclusions could be drawn, although general trends were apparent. The investigation of these additional research areas may be considered particularly important since they were derived from the patients' experience:

- Question 1: Do patients who are admitted to the ward the day before surgery experience more anxiety than those patients who are admitted the day of surgery?

- Question 2: What are the psychological and physical consequences for patients who have had their surgery cancelled previously?

- Question 3: Does the time of day that the surgery occurs have any impact on the patients' anxiety levels?

Summary

This section of the report has discussed the limitations of the study, together with the clinical implications of the findings and areas of further research. Patient recruitment was the main limitation during the study, as well as a lack of clarity from previous studies in relation to how the prevalence of anxiety should be measured. Significant clinical implications were identified for the screening of potential high-risk groups, professional educational initiatives, the preparation of patients for hospitalisation and surgery, as well as the ways in which healthcare policy and service delivery are designed and appraised. Further research should focus on the anxiety experience prior to admission as well as the use of interventions in groups at risk of higher levels of anxiety.

Overall Summary and Conclusions

For the purposes of the overall summary, five key points are highlighted:

- There is a distinct pattern of anxiety as experienced by surgical patients, which is variable over time.

- Anxiety levels may be raised well before admission to hospital. This has important clinical and research implications.

- It may be possible to identify a specific patient group at particular risk of high levels of anxiety, using variables such as trait anxiety, degree of surgery and pain prior to admission. Interventions designed to reduce anxiety could be targeted to this vulnerable group.

- Nursing care needs to be 'engaged' (Kralik et al. 1997) and should provide individualised care that acknowledges the emotional, physical, spiritual and environmental dimensions of a patient. This is the essence of nursing care and is a key ingredient in the provision of psychological support for patients.

- The delivery and service of care needs to consider patient experiences and views, and be re-designed to meet their needs better, for example, not admitting patients 24 hours before surgery if there is no obvious clinical reason. Such service re-designs have cost implications. This links to the Government's modernisation programme (Department of Health 1998).

References

ALTMAN, D.G. 1980. Statistics and ethics in medical research VII – interpreting results. *British Medical Journal,* 281, 1612-1614.

ANTROBUS, J.H.L. 1988. Anxiety and informed consent – does anxiety influence consent for inclusion in a study of anxiolytic premedication? *Anaesthesia,* 43, 267-269.

APPLETON, C. 1993. The art of nursing: the experience of patients and nurses. *Journal of Advanced Nursing*, 18, 892-899.

ASTEDT-KURKI, P. and HAGGMAN-LAITILA, A. 1992. Good nursing practice as perceived by clients: a starting point for the development of professional nursing. *Journal of Advanced Nursing*, 17, 1195-1199.

AUERBACH, S.M. 1973. Trait-state anxiety and adjustment to surgery. *Journal of Consulting and Clinical Psychology*, 40 (2), 264-271.

BADNER, N.H., NIELSON, W.R., MUNK, S., KWIATKOWSKA, C. & GELB, A.W. 1990. Preoperative anxiety: detection and contributing factors. *Canadian Journal of Anaesthesia*, 37 (4), 444-447.

BARBOUR, R.S. 1999. The case for combining qualitative and quantitative approaches in health services research. *Journal of Health Services Research and Policy,* 4 (1), 39-43.

BARRIBALL, K.L., CHRISTIAN, S.L., WHILE, A.E. & BERGEN, A. 1996. The telephone survey method: a discussion paper. *Journal of Advanced Nursing,* 24, 115-121.

BARRIBALL, K.L. & WHILE, A. 1994. Collecting data using a semi-structured interview: a discussion paper. *Journal of Advanced Nursing,* 19, 328-335.

BATALDEN, P.B. & STOLTZ, P.K. 1993. A framework for the continual improvement of health care. *Joint Commission: Journal of Quality Improvement*, 19, 424-452.

BEGLEY, C.M. 1996. Using triangulation in nursing research. *Journal of Advanced Nursing,* 24, 122-128.

BILEY, F.C. 1989. Nurses' perception of stress in preoperative surgical patients. *Journal of Advanced Nursing,* 14, 575-581.

BODLEY, P.O., JONES, H.V.R. & MATHER, M.D. 1974. Preoperative anxiety: a qualitative analysis. *Journal of Neurology, Neurosurgery and Psychiatry,* 37, 230-239.

BOEKE, S., STRONKS, D., VERHAGE, F. & ZWAVELING, A. 1991a. Psychological variables as predictors of the length of post-operative hospitalisation. *Journal of Psychosomatic Research,* 35 (2/3), 281-288.

BOEKE, S., DUIVENVOORDEN, H.J., VERHAGE, F. & ZWAVELING, A. 1991b. Prediction of postoperative pain and duration of hospitalization using two anxiety measures. *Pain*, 45, 293-297.

BOEKE, S., JELICIC, M. & BONKE, B. 1992. Pre-operative anxiety variables as possible predictors of post-operative stay in hospital. *British Journal of Clinical Psychology*, 31, 366-368.

BOUTHILLETTE, F. 2001. Patients with cancer described eight attributes of high quality nursing care that contributed to a sense of well-being and increased fortitude. *Evidence Based Nursing*, 4 (1), 30.

BROWN, S.M. 1990. Quantitative measurement of anxiety in patients undergoing surgery for renal calculus disease. *Journal of Advanced Nursing,* 15, 962-970.

BRUSTER, S., JARMAN, B., BOSANQUET, N., WESTEON, D., ERENS, R. & DELBANCO, T.L. 1994. National survey of hospital patients. *British Medical Journal,* 309, 1542-1546.

BURNARD, P. 1994. The telephone interview as a data collection method. *Nurse Education Today,* 14, 67-72.

CARR, E.C.J. 1990. Postoperative pain: patients' expectations and experiences. *Journal of Advanced Nursing*, 15, 89-100.

CARR, E.C.J. 1999. Talking on the telephone with people who have experienced pain in hospital: clinical audit or research? *Journal of Advanced Nursing*, 29 (1), 194-200.

CARR, E.C.J. 2000. Exploring the effect of postoperative pain on patient outcomes following surgery. *Acute Pain,* 3 (4), 183-193.

CARR, E.C.J & WORTH, A. 2001. The use of the telephone interview for research. *NT Research*, 6 (1), 511-523.

CAUMO, W., SCHMIDT, A.P., SCHNEIDER, C.N., & BERGMANN, J. 2001. Risk factors for preoperative anxiety in adults. *Acta Anaesthesiologica Scandinavica*, 45, 298-307.

CHAPMAN, C.R. & COX, G.B. 1977. Anxiety, pain and depression surrounding elective surgery: a multivariate comparison of abdominal surgery patients with kidney donors and recipients. *Journal of Psychosomatic Research*, 21, 7-15.

CHOINIERE, M., RITTENHOUSE, B.E., PERREAULT, S., CHARTRAND, D., ROUSSEAU, P., SMITH, B. & PEPLER, B. 1998. Efficacy and costs of a patient-controlled analgesia versus regularly administered intramuscular opioid therapy. *Anaesthesiology,* 89 (6), 1377-1388.

CLEARY, P.D., EDGMAN-LEVITAN, S., WALKER, J.D., GERTEIS, M. & DELBANCO, T.L. 1993. Using patient reports to improve medical care: a preliminary report from 10 hospitals. *Quality Management in Health Care,* 2 (1), 31-38.

CLEELAND, C. & RYAN, K.M. 1994. Pain assessment: global use of the Brief Pain Inventory. *Annals of Academic Medicine*, 23 (2), 129-138.

COHEN, J. 1977. *Statistical Power Analyses for the Behavioural Sciences*, New York: Academic Press.

COYLE, J. & WILLIAMS, B. 2000. An exploration of the epistemological intricacies of using qualitative data to develop a quantitative measure of user views of health care. *Journal of Advanced Nursing*, 31 (5), 1235-1243.

CRICHTON, N. 2001. Visual analogue scale (VAS). *Journal of Clinical Nursing,* 10, 706.

CUPPLES, S. 1991. Effects of training and reinforcement of preoperative education on knowledge and recovery of patients having coronary artery bypass graft surgery. *Heart Lung,* 20 (6), 654-660.

DALTON, J.A. & MCNAULL, F. 1998. A call for standardizing the clinical rating of pain intensity using a 0 to 10 rating scale. *Cancer Nursing,* 21 (1), 46-49.

DAVIES, N. 2000. Patients' and carers' perceptions of factors influencing recovery after cardiac surgery. *Journal of Advanced Nursing*, 32 (2), 318-326.

DAVIES, D. & DODD, J. 2002. Qualitative research and the question of rigor. *Qualitative Health Research,* 12 (2), 279-89.

DE GROOT, K.I., BOEKE, S., DUIVENVOORDEN, H.J., BONKE, B. & PASSCHIER, J. 1996. Different aspects of anxiety as predictors of post-operative anxiety and physical complaints. *Personality and Individual Differences,* 21 (6), 929-936.

DE GROOT, K.I., BOEKE, S., VAN DER BERGE, H.J., DUIVENVOORDEN, H.J., BONKE, B. & PASSCHIER, J. 1997. Assessing short- and long-term recovery from lumbar surgery with pre-operative biographical medical and psychological variables. *British Journal of Health Psychology,* 2, 229-243.

DENZIN, N.K. & LINCOLN, Y.S. 2000. *Handbook of Qualitative Research*, 2nd Ed., Sage Publications: California.

DEPARTMENT OF HEALTH. 1998. *A First Class Service Quality in the New NHS,* Department of Health: London.

DEVINE, E.C. 1992. Effects of psychoeducational care for adults surgical patients: a meta-analysis of 191 studies. *Patient Education and Counseling*, 19, 129-142.

DEVINE, E.C. & COOK, T.D. 1986. Clinical and cost-saving effects of psychoeducational interventions with surgical patients: a meta-analysis. *Research in Nursing and Health,* 9, 89-105.

DODDS, F. 1993. Access to the coping strategies managing anxiety in elective surgical patients. *Professional Nurse,* October, 45-52.

DOMAR, A.D., EVERETT, L.L. & KELLER, M.G. 1989. Preoperative anxiety: Is it a predictable entity? *Anesthesia Analgesia*, 69, 763-767.

DUITS, A.A., DUIVENVOORDEN, H.J., BOEKE, S. & TAAMS, M.A. 1998. The course of anxiety and depression in patients undergoing coronary artery bypass graft surgery. *Journal of Psychosomatic Research*, 45 (2), 127-138.

EDELMANN, R.J. 1992. *Anxiety Theory, Research and Intervention in Clinical and Health Psychology*, John Wiley and Sons.

ERSSER, S. 1991. A search for the therapeutic dimensions of nurse-patient interaction. In MCMAHON, R. & PEARSON, A. (Eds.) 1991. *Nursing as Therapy*, Chapman and Hall: London, 43-84.

ERSSER, S.J. 1998. The presentation of the nurse: a neglected dimension of the therapeutic nurse-patient interaction? In MCMAHON, R. & PEARSON, A. (Eds.) 1998. *Nursing as Therapy*, 2nd Ed., Stanley Thornes: Cheltenham, 37-63.

EVERITT, B.S. 1994. *Statistical Methods in Medical Investigations,* Edward Arnold: London.

FITZSIMONS, D., PARAHOO, K. & STRINGER, M. 2000. Waiting for coronary artery bypass surgery: a qualitative analysis. *Journal of Advanced Nursing,* 32 (5), 1243-1252.

GARDNER, M. & ALTMAN, D. 1986. Confidence and clinical importance in research findings. *British Journal of Psychiatry,* 156, 472-474.

GOLDMAN, L., OGG, T.W. & LEVEY, A.B. 1988. Hypnosis and daycase anaesthesia. *Anaesthesia*, 43, 466-469.

GORE, S. 1981. Assessing methods – art of significance testing. *British Medical Journal*, 283, 600-602.

GRIEVE, R.J. 2002. Day surgery preoperative anxiety reduction and coping strategies. *British Journal of Nursing,* 11 (10), 670-678.

GROSS, R.D. 1992. *Psychology: The Science of Mind and Behaviour*, 2nd Ed., Hodder and Stoughton.

HELGESON, V.S. & TAYLOR, S.E. 1993. Social comparisons and adjustment among cardiac patients. *Journal of Applied Social Psychology,* 23 (15), 1171-1195.

HOLDEN-LUND, C. 1988. Effects of relaxation with guided imagery on surgical stress and wound healing. *Research in Nursing and Health,* 11, 235-244.

HOLLOWAY, I. & WHEELER, S. 1996. *Qualitative Research for Nurses*, Blackwell: Oxford.

HUNTER, M. 1995. Gynaecology. In BROOME, A. & LLEWELYN, S. (Eds.) *Health Psychology - Processes and Applications*, 2nd Ed., Chapman and Hall, 261-282.

JANIS, I.L. 1974. *Psychological Stress,* New York: Academic Press.

JOHNSTON, M. 1980. Anxiety in surgical patients. *Psychological Medicine*, 10, 145-152.

JOHNSTON, M. 1982. Recognition of patients' worries by nurses and by other patients. *British Journal of Clinical Psychology,* 21, 255-261.

JOHNSTON, M. 1986. Pre-operative emotional states and post-operative recovery. *Advanced Psychosomatic Medicine*, 15, 1-22.

JOHNSTON, M. 1987. Emotional and cognitive aspects of anxiety in surgical patients. *Communication and Cognition,* 20 (2/3), 245-260.

JOHNSTON, M. & CARPENTER, L. 1980. Relationship between pre-operative anxiety and post-operative state. *Psychological Medicine,* 10, 361-367.

JOHNSTON, M. & VOGELE, C. 1993. Benefits of psychological preparations for surgery: a meta-analysis. *Annals of Behavioral Medicine,* 15 (4), 245-256.

KAIN, Z.N., SEVARINO, F., ALEXANDER, G.M., PINCUS, S. & MAYES, L.C. 2000. Preoperative anxiety and postoperative pain in women undergoing hysterectomy a repeated-measures design. *Journal of Psychosomatic Research*, 49, 417-422.

KIECOLT-GLASER, J.K., PAGE, G.G., MARUCHA, P.T., MACCALLUM, R.D. & GLASER, R. 1998. Psychological influences in surgical recovery. *American Psychologist,* 53, 1209-1218.

KINCEY, J. 1995. Surgery. In BROOME, A. & LLEWELYNS, S. (Eds.) 1995. *Health Psychology - Processes and Applications,* 2nd Ed., Chapman and Hall, 391-403.

KINDLER, C.H., HARMS, C., AMSLER, F., IHDE-SCHOLL, T. & SCHEIDEGGER, D. 2000. The visual analog scale allows effective measurement of preoperative anxiety and detection of patients' anesthetic concerns. *Anesthesia Analgesia*, 90, 706-712.

KIRKWOOD, B.R. 1988. *Essentials of Medical Statistics,* Blackwell Scientific Publication.

KNIGHT, R.G., WAAL-MANNING, H.J. & SPEARS, G.F. 1983. Some norms and reliability data for the State-Trait Anxiety Inventory and the Zung self rated depression scale. *British Journal of Clinical Psychology*, 22, 245-249.

KOCH, T. & HARRINGTON, A. 1998. Reconceptualizing rigour, the case for reflexivity. *Journal of Advanced Nursing,* 28 (4), 882-890.

KOCH, T., WEBB, C. & WILLIAMS, A.M. 1995. Listening to the voices of older patients: an existential-phenomenological approach to quality assurance. *Journal of Clinical Nursing*, 4, 185-193.

KRALIK, D., KOCH, T. & WOTTON, K. 1997. Engagement and detachment: understanding patients' experiences with nursing. *Journal of Advanced Nursing,* 26, 399-407.

KULIK, J.A. & MAHLER, H.I.M. 1987. Effects of preoperative roommate assignment on preoperative anxiety and recovery from coronary-bypass surgery. *Health Psychology*, 6 (6), 525-543.

KULIK, J.A. & MAHLER, H.I.M. 1990. Stress and affiliation research: on taking the laboratory to health field settings. *Annals of Behavioral Medicine*, 12 (3), 106-111.

KULIK, J.A., MAHLER, H.I.M. & EARNEST, A. 1994. Social comparison and affiliation under threat: Going beyond the affiliate-choice paradigm. *Journal of Personality and Social Psychology*, 66 (2), 301-309.

KULIK, J.A., MAHLER, H.I.M. & MOORE, P.J. 1996. Social comparison and affiliation under threat: Effects on recovery from major surgery. *Journal of Personality and Social Psychology*, 71 (5), 967-979.

LALINEC, M.M. & ENGELSMANN, F. 1985. Anxiety, fears and depression related to hysterectomy. *Canadian Journal of Psychiatry*, 30 (1), 44-47.

LAST, J.M. 1995. *A Dictionary of Epidemiology*, 3rd Ed., Oxford University Press.

LEIGH, J.M., WALKER, J. & JANAGANATHAN, P. 1977. Effect of pre-operative anaesthetic visit on anxiety. *British Medical Journal* 2, 987-989.

LITHNER, M. & ZILLING, T. 2000. Pre- and post-operative information needs. *Patient Education and Counseling,* 40, 29-37.

LOOKINLAND, S. & POOL, M. 1998. Study of effect of methods of preoperative education in women. *AORN Journal,* 67 (1), 203-213.

LOWERY, B., JACOBSEN, B. & KEANE, A. 1975. Relationship of locus of control to preoperative anxiety. *Psychological Reports,* 37, 1115-1121.

LYNCH, E.P., LAZOR, M.A., GELLIS, J.E., ORAV, J., GOLDMAN, L. & MARCANTONIO, E.R. 1997. Patient experience of pain after elective noncardiac surgery. *Anesthesia Analgesia,* 85, 117-123.

MACARIO, A., WEINGER, M., TRUONG, P. & LEE, M. 1999. Which clinical anesthesia outcomes are both common and important to avoid? The perspective of a panel of expert anesthesiologists. *Anesthesia Analgesia*, 88, 1085-1091.

MACKENZIE, J.W. 1989. Daycase anaesthesia and anxiety a study of anxiety profiles amongst patients attending a day bed unit. *Anaesthesia,* 44, 437-440.

MAHLER, H.I.M. & KULIK, J.A. 2000. Optimism, pessimism and recovery from coronary artery bypass surgery: prediction of affect, pain and functional status. *Psychology, Health and Medicine*, 5 (4), 347-358.

MARANETS, I. & KAIN, Z.N. 1999. Preoperative anxiety and intraoperative anesthetic requirements. *Anesthesia Analgesia*, 89, 1346-51.

MARKLAND, D. & HARDY, L. 1993. Anxiety, relaxation and anaesthesia for day-case surgery. *British Journal of Clinical Psychology,* 32, 493-504.

MATTHEWS, J.N.S., ALTMAN, D.G., CAMPBELL, M.J. & ROYSTON, P. 1990. Analysis of serial measurements in medical research. *British Medical Journal,* 300, 230-235.

MCCRONE, S., LENZ, E., TARZIAN, A. & PERKINS, S. 2001. Anxiety and depression: incidence and patterns in patients after coronary artery bypass graft surgery. *Applied Nursing Research*, 14 (3), 155-164.

MCGUIRE, D.B. 1992. Measuring pain. In FRANK-STROMBORG, M. 1992. *Instruments for Clinical Nursing Research*, Jones and Bartlett Publishers, 333-356.

MILES, M.B. & HUBERMAN, A.M. 1994. *Qualitative Data Analysis An Expanded Sourcebook,* 2nd Ed., Sage Publications.

MILLER, S.M. & MANGAN, C.E. 1983. Interacting effects of information and coping style in adapting to gynecologic stress: should the doctor tell all? *Journal of Personality and Social Psychology,* 45 (1), 223-236.

MITCHELL, M. 1994. Preoperative and postoperative psychological nursing care. *Surgical Nurse,* 7 (3), 22-25.

MITCHELL, M. 2000. Nursing intervention for pre-operative anxiety. *Nursing Standard*, 14 (37), 40-43.

MOERMAN, N., VAN DAM, F.S.A.M., MULLER, M.J. & OOSTING, H. 1996. The Amsterdam preoperative anxiety and information scale (APAIS). *Anesthesia Analgesia*, 82, 445-451.

MOON, J-S. & CHO, K-S. 2001. The effects of handholding on anxiety in cataract surgery patients under local anaesthesia. *Journal of Advanced Nursing,* 35 (3), 407-415.

MOORE, P.J., KULIK, J.A. & MAHLER, H.I.M. 1998. Stress and multiple potential affiliates: Does misery choose miserable company? *Journal of Applied Biobehavioral Research,* 3 (2), 81-95.

MORRELL, G. 2001. Effect of structured preoperative teaching on anxiety levels of patients scheduled for cataract surgery. *Insight,* XXVI (1), 4-9.

MORSE, J. 1999. Myth #93: reliability and validity are not relevant to qualitative inquiry. *Qualitative Health Research*, 9(6), 717-718.

MORSE, J., SWANSON, J. & KUZEL, A. 2001. *The Nature of Qualitative Evidence*, Sage Publications.

MUNAFO, M.R. 1998. Perioperative anxiety and postoperative pain. *Psychology, Health and Medicine,* 3, 429-433.

MUNAFO, M.R. & STEVENSON, J. 2001. Anxiety and surgical recovery – reinterpreting the literature. *Journal of Psychosomatic Research*, 51, 589-596.

NELSON, F.V., ZIMMERMAN, L., BARNASON, S., NIEVEEN, J. & SCHMADERER, M. 1998. The relationship and influence of anxiety on

postoperative pain in the coronary artery bypass graft patient. *Journal of Pain and Symptom Management*, 15 (2), 102-109.

NORRIS, W. & BAIRD, W.L.M. 1967. Pre-operative anxiety: a study of the incidence and aetiology. *British Journal of Anaesthesia*, 39, 503-509.

OBERLE, K., PAUL, P., WRY, J. & GRACE, M. 1990. Pain, anxiety and analgesics: a comparative study of elderly and younger surgical patients. *Canadian Journal on Aging*, 9 (1), 13-22.

O'HALLORAN, C.M. & ALTMAIER, E.M. 1995. The efficacy of preparation for surgery and invasive medical procedures. *Patient Education and Counselling,* 25, 9-16.

PARENT, N. & FORTIN, F. 2000. A randomized, controlled trial of vicarious experience through peer support for male first-time cardiac surgery patients: Impact on anxiety, self-efficacy expectation, and self-reported activity. *Heart and Lung,* 29 (6), 389-400.

PATTISON, H.M. & ROBERTSON, C.E. 1996. The effect of ward design on the well-being of postoperative patients. *Journal of Advanced Nursing*, 23, 820-826.

PERRY, F., PARKER, R.K., WHITE, P.F. & CLIFFORD, A. 1994. Role of psychological factors in postoperative pain control and recovery with patient-controlled analgesia. *The Clinical Journal of Pain,* 10, 57-63.

RAMSEY, M.A.E. 1972. A survey of pre-operative fear. *Anaesthesia,* 27(4), 396-402.

RIDGEWAY, V. & MATHEWS, A. 1982. Psychological preparation for surgery: a comparison of methods. *British Journal of Clinical Psychology*, 21, 271-280.

RYAN, M.M., DENNERSTEIN, L. & PEPPERELL, R. 1989. Psychological aspects of hysterectomy: a prospective study. *British Journal of Psychiatry*, 154, 516-522.

SALMON, P. 1993. The reduction of anxiety in surgical patients: an important nursing task or the medicalization of preparatory worry? *International Journal of Nursing Studies*, 30 (4), 323-330.

SALTER, J.R. 1985. Gynaecological symptoms and psychological distress in potential hysterectomy patients. *Journal of Psychosomatic Research*, 29 (2), 155-159.

SCHACHTER, S. 1959. *The Psychology of Affiliation,* Stanford, CA: Stanford University Press.

SCHWARTZ-BARCOTT, D., FORTIN, J.D. & KIM, H.S. 1994. Client-nurse interaction: testing for its impact in preoperative instruction. *International Journal of Nursing Studies*, 31 (1), 23-35.

SCOTT, L.E., CLUM, G.A. & PEOPLES, J.B. 1983. Preoperative predictors of postoperative pain. *Pain*, 15, 283-293.

SENN, S., STEVENS, L. & CHATURVEDI, N. 2000. Repeated measures in clinical trials: simple strategies for analysis using summary measures. *Statistics in Medicine,* 19, 861-877.

SHIH, F.J. 1998. Triangulation in nursing research: issues of conceptual clarity and purpose. *Journal of Advanced Nursing,* 28(3), 631-641.

SLEVIN, E. & SINES, D. 1999-2000. Enhancing the truthfulness, consistency and transferability of a qualitative study: utilising a manifold of approaches. *Nurse Researcher*, 7(2), 79-97.

SMITH, L. 1992. Ethical issues in interviewing. *Journal of Advanced Nursing,* 17, 98-103.

SPIELBERGER, C.D., GORSUCH, R.L. & LUSHENE, R.E. 1970. *STAI Manual for the State-Trait Anxiety Inventory*, Consulting Psychologists Press, Inc.

SPIELBERGER, C.D., AUERBACH, S.M., WADSWORTH, A.P., DUNN, T.M. & TAULBEE, E.S. 1973. Emotional reactions to surgery. *Journal of Consulting and Clinical Psychology*, 40 (1), 33-38.

SPIELBERGER, C.D. & RICKMAN, R.L. 1990. Assessment of state and trait anxiety. In SARTORIUS, N., ANDREOLI, V., CASSANO, G., EISENBERG, L., KIELHOLZ, P., PANCHERI, P. & RACAGNI, G. (Eds.) 1990. *Anxiety Psychobiological and Clinical Perspectives,* Hemisphere Publishing Corporation, 69-82.

SULS, J. & WAN, C.K. 1989. Effects of sensory and procedural information on coping with stressful medical procedures and pain: a

meta-analysis. *Journal of Consulting and Clinical Psychology,* 57 (3), 372-379.

SWINDALE, J.E. 1989. The nurse's role in giving pre-operative information to reduce anxiety in patients admitted to hospital for elective minor surgery. *Journal of Advanced Nursing,* 14, 899-905.

TABACHNICK, B.G. & FIDELL, L.S. 1996. *Using Multivariate Statistics,* 3rd Ed., Harper Collins.

TAENZER, P., MELZACK, R. & JEANS, M.E. 1986. Influence of psychological factors on postoperative pain, mood and analgesic requirements. *Pain*, 24, 331-342.

TASA, K., BAKER, G.R. & MURRAY, M. 1996. Using patient feedback for quality improvement. *Quality Management in Health Care,* 4 (2), 55-67.

TEASDALE, K., MULRANEY, S., BLANCHARD, H., ROLFE, J. & PALLETT, S. 2000. An analysis of the ability of nurses to identify the anxiety levels of patients in general medical and surgical wards. *NT Research,* 5 (5), 364-370.

TEASDALE, K. 1995. Theoretical and practical considerations on the use of reassurance in the nursing management of anxious patients. *Journal of Advanced Nursing*, 22, 79-86.

THOMAS, V.J., HEATH, M., ROSE, D. & FLORY, P. 1995. Psychological characteristics and the effectiveness of patient-controlled analgesia. *British Journal of Anaesthesia,* 74, 271-276.

THORNTON, E.W., MCQUEEN, C., ROSSER, R., KNEALE, T. & DIXON, K. 1997. A prospective study of changes in negative mood states of women undergoing surgical hysterectomy: the relationship cognitive predisposition and familial support. *Journal of Psychosomatic Obstetrics and Gynecology*, 18, 22-30.

TYRER, P. 1999. *Anxiety A Multidisciplinary Review,* Imperial College Press.

VISSER, A.P. 1988. Situational and individual determinants of state anxiety in surgical patients. In SPIELBERGER, C.D. & SARASON, I.G. (Eds) 1988. *Stress and Anxiety,* Vol. 11, Hemisphere Publishing Corporation, 219-229.

WALDING, M.F. 1991. Pain, anxiety and powerlessness. *Journal of Advanced Nursing*, 16, 388-397.

WALKER, J.A. 2002. Emotional and psychological preoperative preparation in adults. *British Journal of Nursing,* 11 (8), 567-575.

WALLACE, L.M. 1984a. Psychological preparation as a method of reducing the stress of surgery. *Journal of Human Stress,* Summer, 62-77.

WALLACE, L. 1984b. Psychological preparation for gynaecological surgery. In BROOME, A. & WALLACE, L. (Eds.) 1984. *Psychology and Gynaecological Problems,* Tavistock Publications, 161-188.

WALLACE, L.M. 1985a. Surgical patients' preferences for pre-operative information. *Patient Education and Counseling,* 7, 377-387.

WALLACE, L.M. 1985b. Surgical patients' expectations of pain and discomfort: does accuracy of expectations minimize post-surgical pain and distress? *Pain*, 22, 363-373.

WALLACE, L.M. 1986. Communication variables in the design of pre-surgical preparatory information. *British Journal of Clinical Psychology*, 25, 111-118.

WALLACE, L.M. 1987. Trait anxiety as a predictor of adjustment to and recovery from surgery. *British Journal of Clinical Psychology*, 26, 73-74.

WALLACE, C.L. & APPLETON, C. 1995. Nursing as the promotion of well-being: the client's experience. *Journal of Advanced Nursing,* 22, 285-289.

WEBB, C. 1986. Women as gynaecology patients and nurses. In WEBB, C. (Ed.) 1986. *Feminist Practice in Women's Health Care,* Wiley: Chichester, 93-112.

WELSH, J. 2000. Reducing patient stress in theatre. *British Journal of Perioperative Nursing,* 10 (6), 321-327.

WHITTEMORE, R., CHASE, S. & MANDLE, C. 2001. Validity in qualitative research. *Qualitative Health Research,* 11, 522-537.

WIENS, A.G. 1998. Preoperative anxiety in women. *AORN Journal,* 68 (1), 74-88.

WILLIAMS, O.A. 1993. Patient knowledge of operative care. *Journal of the Royal Society of Medicine*, 86, 328-331.

WILLIAMS, J.G.L., JONES, J.R., WORKHOVEN, M.N. & WILLIAMS, B. 1975. The psychological control of preoperative anxiety. *Psychophysiology*, 12 (1), 50-54.

WILSON-BARNETT, J. 1981. Anxiety in hospitalised patients. *Royal Society of Health*, 101, 118, 122.

WILSON-BARNETT, J. 1994. Preparing patients for invasive medical and surgical procedures 3: Policy implications for implementing specific psychological interventions. *Behavioral Medicine,* 20 Spring, 23-26.

WILSON-BARNETT, J. & BATEHUP, L. 1988. *Patient Problems: A Research Base for Nursing Care,* London: Scutari Press.

Appendix A

State Trait Anxiety Inventory Questionnaires

STAI Form x - 2 (Trait Component)

Self Evaluation Questionnaire
Developed by D.D Spielberger, R. L Gorsuch and R Lushene
STAI Form x - 2

Directions

A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you **generally** feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

NAME : _____ DATE: _____TIME: _____ am/pm

	not at all	somewhat	moderately so	very much so
21. I feel pleasant……………………………………………..	①	②	③	④
22. I tire quickly ..…………………………………………..	①	②	③	④
23. I feel like crying..…………………………..………………..	①	②	③	④
24. I wish I could be as happy as others seem to be……………	①	②	③	④
25. I am losing out on things because I can't make up my mind soon enough……………………………………………	①	②	③	④
26. I feel rested ..…………………………………………….	①	②	③	④
27. I am 'calm, cool and collected'………………..…………….	①	②	③	④
28. I feel that difficulties are piling up so that I cannot overcome them.……………………………………………..	①	②	③	④
29. I worry too much over something that really doesn't matter	①	②	③	④
30. I am happy……………………………………………….	①	②	③	④
31. I am inclined to take things hard…………………………….	①	②	③	④
32. I lack self-confidence…..…………………………………..	①	②	③	④
33. I feel secure………………………………………………….	①	②	③	④
34. I try to avoid facing a crisis or difficulty ……………………….	①	②	③	④
35. I feel blue ………………………………………………..	①	②	③	④
36. I am content………………………………………………..	①	②	③	④
37. Some unimportant thought runs through my mind and bothers me……………………………………………….	①	②	③	④
38. I take disappointments so keenly that I can't put them out of my mind………………………………………………..	①	②	③	④
39. I am a steady person………………………………………..	①	②	③	④
40. I get in a state of tension or turmoil as I think over my recent concerns and interests……………………………………	①	②	③	④

State Trait Anxiety Inventory Questionnaires

STAI Form x - 1 (State Component)

Self Evaluation Questionnaire
Developed by D.D Spielberger, Rl L Gorsuch and R Lushene
STAI Form x - 1

Directions

A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you **feel** right **now**, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

NAME : _____ DATE: _____TIME: _____ am/pm

	not at all	somewhat	moderately so	very much so
1. I feel calm	①	②	③	④
2. I feel secure	①	②	③	④
3. I am tense	①	②	③	④
4. I am regretful	①	②	③	④
5. I feel at ease	①	②	③	④
6. I feel upset	①	②	③	④
7. I am presently worrying over possible misfortunes	①	②	③	④
8. I feel rested	①	②	③	④
9. I feel anxious	①	②	③	④
10. I feel comfortable	①	②	③	④
11. I feel self-confident	①	②	③	④
12. I feel nervous	①	②	③	④
13. I am jittery	①	②	③	④
14. I feel 'high strung'	①	②	③	④
15. I am relaxed	①	②	③	④
16. I feel content	①	②	③	④
17. I am worried	①	②	③	④
18. I feel over-excited and 'rattled'	①	②	③	④
19. I feel joyful	①	②	③	④
20. I feel pleasant	①	②	③	④

Appendix B

Visual Analogue Scale

TOP SHEET & SUPPLEMENTARY DATA
ANXIETY STUDY

NAME_____

Previous surgery?	Yes	No
Pre medication?	Yes	No
Night sedation?	Yes	No
Sx Ca?	Yes	No
Hold up?	Yes	No
Previous Pain?	Yes	No

Fix hospital label

1 _ 2 _ 3 _ 4 _ 5 __
Single Married Separated Widow Div

Type of surgery _____

	STAI
Pre-admission clinic	
6pm night before operation	
8am/on wakening day of operation	
Before leaving the ward to theatre	
In theatre	
8 am day one	
8 am day two	

HOME TEL NO   (   )
Best time to call between 10 am - 12 noon☐ or 2pm -4pm ☐ or other _____

Pain Score day 1

No pain ————————————————— Worst pain
imaginable

Pain Score day 2

No pain ————————————————— Worst pain
imaginable

Appendix C

Semi-structured taped telephone interview schedule

Brief introduction and thank them for participating.
Reconfirm consent to conduct interview.

I would like to ask you a few questions about your anxiety whilst you were in hospital.

Was there any event or situation which particularly increased your anxiety before your surgery?

Was there any event or situation which particularly increased your anxiety after your surgery?

If you felt anxious, was anything done to reduce it?

Did you use any strategies to lessen your anxiety?

Was there anything you would have liked to have been available to you while you were in hospital that you feel would have helped to reduce anxiety?

Is there anything else that you would like to tell me about that you feel would be relevant to the project?

Close the interview and thank them for participating.

Appendix D

Patient Information Sheet

Prevalence and Patterns of Anxiety in Patients Undergoing Gynaecological Surgery

Dear Patient

We are conducting a study looking at how anxious patients feel before surgery and how this anxiety changes before surgery and afterwards. We hope that by identifying any events which either make patients more anxious or reduce their anxiety we can improve patient care. We obtained your name from the surgical operating list, with the permission of your consultant. We would like to tell you about the study and invite you to participate.

<u>Before your surgery</u>
Today we would like you complete a short questionnaire about your current levels of anxiety. Also we would like to know a little bit more about you and will ask you some questions relating to this, which will take about 10 - 15 minutes.

<u>Before your surgery</u>
We will ask you to complete the anxiety questionnaire (which will take you about 5 -10 minutes) at 6pm the evening before your operation and then again when you wake up on the morning of your operation. To understand how your anxiety may change over time we will also ask you to fill it in again just before you leave the ward to go to theatre and if there is time before you go into the anaesthetic room.

<u>After your operation</u>
We will ask you to complete the questionnaire at 8am (or as near as possible to this time) on the first day after your operation (day one) and at the same time on day two. At these times we will also ask you to score your current level of pain on movement. We will do this by asking you to score your pain by marking a point on a 10cm line (from no pain to worst pain imaginable).

 No pain _____Worst pain imaginable

<u>A week after your operation</u>
One of us will telephone you at home (usually either between 10 am and 12 noon or 2pm and 4pm) and ask you about your anxiety whilst in hospital. In particular we will want to know if anything made you feel more or less anxious. This conversation will be taped to avoid writing notes when we are talking.

All information will be strictly confidential. You will be assigned a patient number for the duration of the study and any information you give will not be personally identifiable. At the end of the study, the results will be written up and published in a nursing journal. Your participation in this study is voluntary and you will be free to withdraw at any time without giving a reason and without your medical care or legal rights being affected

Should you require any further information you can call **Katrina Brockbank** at XXXX XXXX (XXXX XXXX) on Bleep **XXXX**

Appendix E

Informed Consent Form

Patient Information Number for this study:

CONSENT FORM

Title of Project: Prevalence and patterns of anxiety in patients undergoing gynaecological surgery

Name of Researchers: **Katrina Brockbank, Sandra Allen**

Please initial box

1. I confirm that I have read and understand the information sheet for the above study…………. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time without my medical care or legal rights being affected
    ....…………..…………………………………………..☐

3. I am willing to allow access to my medical records but understand that strict confidentiality

    will be maintained.

    The purpose of this is to check that the study is being carried out

correctly………………..…☐

4. I agree to take part in the above
    study.....................………..…………………………………….☐

Name of patient	Date	Signature
Name of person taking consent (if different from researcher)	Date	Signature
Researcher	Date	Signature

1 for patient; 1 for researcher; 1 to be kept with hospital notes

Appendix F

Letter to General Practitioners

Dear Dr

Re: Prevalence and patterns of anxiety in gynaecological surgery patients

One of your patients (   ) has kindly agreed to participate in a research project which is exploring patterns of anxiety before and after surgery. Brief biographical information will be collected and the Spielberger State-Trait questionnaire used to assess anxiety pre-operatively and then for the first two days after surgery.

A week after surgery patients will be followed up with a short semi-structured telephone interview to explore factors which heightened their anxiety or lessened it during the time spent in hospital.

Ethical approval from Salisbury Local Ethics Research Committee has been obtained. Should you have any concerns or questions about this project then please do not hesitate to contact me at XXXX XXXX (XXXX) XXXXXX Bleep XXXX or extension XXXX.

If I do not hear from you I will assume you are happy for your patient to continue being involved with this project.

Thank you.

Sandra Allen, Research Assistant

Appendix G

Steering Group Membership

Miss Sandra Allen BSc (Hons), MPH
Research Assistant, Institute of Health and Community Studies, Bournemouth University

Dr Richard Barrett MBBS, FRCA
Consultant Anaesthetist, Salisbury District Hospital

Mrs Katrina Brockbank RGN
Senior Nurse, Acute Pain Control Office, Salisbury District Hospital

Dr Eloise Carr MSc, PhD, BSc (Hons), RGN, RNT
Senior Lecturer, Institute of Health and Community Studies, Bournemouth University

Dr Christina Cox MBChB, FRCA
Consultant Anaesthetist, Salisbury District Hospital

Dr Nigel North BA (Hons), MSc, MPhil, PhD, C.Psychol.
Clinical Psychologist, Salisbury District Hospital

Appendix H

Coded Interview Extract

ID	Transcript	Coding
SA	How about after your surgery, did anything happen to you then that caused you increased anxiety?	
35	Ummmm, I don't know. I had one nurse who was very rough. I had to stop her from washing me cause she was extremely rough. But again you see that's down to personality isn't it. That's how she is so umm, it's quite scary though. If you are feeling vulnerable and you have somebody who is heavy handed. You don't want them near you again.	Poor staff handling Vulnerability
SA	Did that vulnerability contribute to your anxiety?	
	Yes, yes. Having to rely on somebody else. I know the effects of an epidural, I knew that beforehand. But knowing that I couldn't move my legs, and one of the auxiliaries was very nice, she kept coming in and moving my, I had one leg that was more dead than the other, and she would come in and move that leg for me cause it felt like it needed to be moved. The vulnerability of not being able to do things for yourself, yes, makes you very anxious. And also you don't want to keep ringing the bell cause you know they're all busy. So, when they say, feel free to ring the bell whenever you need anything, you still are more, again its personalities isn't it, you don't want to ring the bell unless you absolutely have to and that makes you quite anxious I suppose.	Loss of independence Informed Staff +ve – attentive Vulnerability / Loss of independence Being a "good" patient
SA	So being a patient and coming in to hospital did that cause you anxiety?	
35	Yes, I mean, yes. Just simply because you're used to your own routine and you're used to looking after yourself. Having to rely on other people is quite difficult.	Changes from "normal" routine Loss of independence
SA	So is there anything else that you can identify that happened after your surgery that made you feel more anxious?	
35	I don't think so. Everybody was very attentive. The doctors were very good. You have that worry of being on a ward where you don't know anybody anyway. So, you're surrounded by strangers basically. I was lucky, cause the lady I was admitted with, we got on very well, and we've spoken since as well to compare aches and pains and scars. So, that helped, if you've got somebody else to talk to about it who is going through the same thing. Umm, but otherwise, no. I went back to have my clips out on the ward, which was very nice as well cause it meant I saw the nurses that knew me from when I had it done instead of seeing somebody totally different. You know, you have that option to go to the ward instead of seeing your GP or whatever.	Staff +ve – attentive Unknown environment Peer support Compare physical symptoms First hand knowledge Continuity of care

Appendix I

Classification of Surgical Procedure

Major Surgery	N (% total sample)	Minor Surgery	N (% total sample)
Total abdominal hysterectomy +/- add pro	28 (35%)	Vaginal hysterectomy +/- add pro	15 (18.75%)
Laparotomy +/- add pro	6 (7.5%)	Anterior and/or posterior repair	13 (16.25%)
Subtotal hysterectomy +/- add pro	3 (3.75%)	Colposuspension	5 (6.25%)
Myomectomy	3 (3.75%)	Laparoscopy	2 (2.5%)
		Colpocleisis	1 (1.25%)
		Pelvic floor repair and sacrospinous colpopoxy	1 (1.25%)
		Perineal repair	1 (1.25%)
		Sacrospinus fixation	1 (1.25%)
		Tubal surgery	1 (1.25%)
Total	40 (50%)	Total	40 (50%)