

Could a decision support tool be the key to supporting choice for women regarding place of birth?

Abstract

Objective: To assess the effectiveness of using an innovative decision aid, MyBirthplace, to facilitate shared decision-making regarding place of birth.

Design: A quasi-experimental study comparing pre-test and post-test responses from participants who had access to the intervention. **Setting:** A large urban hospital in the south of England.

Participants: All pregnant women who accessed maternity care between April and December 2016.

Intervention: A decision aid (MyBirthplace) designed to provide information and support regarding place of birth. The digital tool (available in both an app and web-based version) was used to facilitate discuss between the women and her midwife at the booking visit. **Measurements:** Women's stage of decision making as measured by the Stage of Decision Making Scale. A questionnaire was administered before and after using MyBirthplace at booking, and again at 28 weeks gestation.

Findings: Nearly half the women (42.1%) had already decided where they wanted to give birth before the booking appointment, but a third (34.3%) had not yet begun to think about their choices.

The introduction of the decision aid during the booking visit was associated with a significant increase in the stage of decision making suggesting that women had greater certainty in their decision $P < 0.0001$ [SD 1.077]. Women who accessed MyBirthplace had lower decisional conflict after the booking appointment than those women that did not access the decision aid (35.5% compared with 22.0%) but this difference was not statistically significant.

Key Conclusions: Decision aids, as a standard part of practice, have the potential to ensure women are informed of their options and encourage shared decision making about place of birth. Women were more confident with their decision following the booking appointment and by 28 weeks; however, further research is needed to identify the role that the decision aid played in building this confidence.

Implications for practice: The introduction of a decision aid, Mybirthplace, within the hospital impacted early discussions between the woman and the midwife and appeared to benefit women's decision making regarding place of birth. Further studies of midwives' use of innovative technologies and their implementation are required.

Key Words: MyBirthplace, Decision aid, choice, birth place, decisional conflict.

Introduction

Current guidelines recommend that women are offered information regarding birth settings - home, freestanding midwifery unit (FMU), alongside midwifery unit (AMU) or obstetric unit (OU) - and supported to choose where they want to give birth (NICE, 2017). However, there is evidence that many women are not getting the information that they need to enable them to make an informed choice (Coxon et al., 2017; CQC, 2020). The 2019 Care Quality Commission report highlighted that 1 in 8 women were not offered any choices and not all birth settings were regularly discussed, for example only 43% of women were told about home birth as an option (2020). Recent research found that women need more information to understand the different options available to them and suggests that up to a third of women planning to birth in an OU might choose a midwifery unit if they had a better knowledge and understanding of the differences (Fletcher et al., 2019).

The high use of OUs has an impact not only on scarce resources, but also on the outcomes for women and their babies. Women at low obstetric risk, with a normal pregnancy, are more likely to experience unnecessary intervention if cared for in an OU (Hollowell et al., 2011) with no significant difference in adverse perinatal outcomes (National Perinatal Epidemiology Unit, 2016). Safety is something that is a concern to women (Preis et al., 2018; Fletcher et al., 2019) and further information is needed to reassure them. Understanding choice regarding place of birth can be complex for women expecting their first baby (Rowe et al., 2012) with a wide variety of information available of both good and bad quality, but it is a decision that most women want to be involved with (McCarthy, 2013). NICE defines shared decision making as “a joint process in which a healthcare professional works together with a person to reach a decision about care” and advocates patient decision aids as a mechanism for achieving this (NICE n.d.). Decision aids created by health professionals in partnership with women can also be a valuable way of ensuring the quality of information provided (Stacey et al., 2017).

Decision aids became available in the field of medicine to provide diagnostic decision support (Haur et al., 1999) before being used to support patient decision making (Lui et al., 2006). The term 'decision tool' or 'decision aid' describes "interventions that support patients by making their decisions explicit, providing information about options and associated benefits/harms, and helping clarify congruence between decisions and personal values" (Montgomery et al., 2000). The term decision aid is more familiar in health and for this reason is adopted in this paper.

A variety of pregnancy-related decision aids exist, with those dealing with choices such as mode of birth and place of birth after a caesarean section being the most popular (Shorten et al., 2005; Frost et al., 2009; Schoorel et al., 2014, Eden et al., 2014). They have also been used to inform parents of prenatal testing (Graham et al., 2000; Nagle et al., 2008; Kuppermann et al., 2014, Eldermann et al., 2014) labour analgesia (Raynes-Greenow et al., 2010) and breech presentation at term (Nassar et al., 2007). Decision aids are associated with informed decision making in pregnancy with positive improvement seen in patient's decision making, knowledge and a reduction in decisional regret (Vlemmix et al., 2013). The studies however are limited to assessing a small number of decision aids in a small range of subject topics. A few decision aids have looked at facilitating choice regarding place of birth, "The Having a Baby in Queensland Book Project" (Queensland Centre for Mothers and Babies, 2010) and Coxon's leaflet "birthplace and you" (Coxon et al., 2014), but to our knowledge no study has assessed the effectiveness of such tools.

This paper reports an evaluation of a decision aid designed to address a local need for greater information and support for women regarding place of birth. [MyBirthplace](#) is a digital tool that provides information on the different birth settings, including reasons for and against giving birth in each, underpinned by robust research evidence. The development of the tool, MyBirthplace, was supported by a Health Foundation SHINE 2012 award (The Health Foundation, 2012). Available in both an app and web-based version, MyBirthplace is a decision aid as it is directed at the patient

(pregnant women) and unlike mHealth it does not collect data, connect to social media or use their health records (Coulter et al., 2011). It is important that decision aids are integrated into practice, rather than being seen as standalone tools, in order for them to be used consistently and increase opportunities for shared decision making. For this reason, the tool driven by women's voices was designed by the local health care provider in response to the finding that low risk women were birthing on the OUs because they were not aware of their options, and it formed part of an integrated system of care (Gaskell et al., 2014).

Methods

This was a quasi-experimental study comparing pre-test and post-test responses from participants who had access to an innovative decision aid, MyBirthplace, designed to support decision making regarding place of birth. Ethical approval and permission to conduct the study was gained from the Science, Technology & Health Panel of the University Research Ethics Committee and National Research Ethics Service. Approval for access was sought from key stakeholders in the hospital including the Research and Development department, the Director of Midwifery and Director of Obstetrics and Gynaecology. All of which was granted prior to commencing the study.

Objective

The primary objective was to assess the effectiveness of the decision aid in facilitating the process of the woman and midwife reaching a decision together (shared decision making) regarding place of birth.

Study population

The study population was women aged between 16 and 45 years, who were newly pregnant and were accessing care from a large urban hospital in the south of England. Recruitment took place over

a nine-month period (April and December 2016). Women were excluded if they were unable to speak, read or write English because the decision aid was only available in English.

Procedures for recruitment

Prior to booking all eligible women received a Participant Information Pack (PIP), which included a cover letter, informational leaflet, an 'opt in' form and a prepaid envelope. Women who were willing to participate in the study returned an 'opt-in' form to the researcher by post. The woman could indicate that she would like further information or a discussion, and in these cases the researcher contacted the woman by telephone. A face-to-face meeting was arranged to answer any further questions and to seek informed consent, in writing, prior to the woman's booking appointment. For the majority of participants written informed consent was sought by the researcher 10-15 minutes prior to their booking appointment, which could be in the hospital, local maternity unit or community centre. On rare occasions, where a woman was unable to come any earlier to the appointment, a discussion was held over the telephone and written informed consent was sought in advance by post.

Intervention

The decision aid, MyBirthplace, is available to women to access on a variety of mediums. The decision aid was co-created by the hospital, with women, in response to an identified clinical need to ensure that women had quality evidence regarding place of birth (Gaskell et al., 2014). Although, women can use the decision aid to access information regarding birth place options, the decision aid was designed to be used at the booking visit to support the discussion with the midwife regarding place of birth. The hospital education department ran training sessions for midwives prior to the study commencing and a clear hospital guideline devised which directed midwives to introduce this at the booking appointment.

Data collection and measures

Data were collected by questionnaires administered at three points during pregnancy:

- prior to the woman's booking appointment with her midwife;
- immediately after the booking appointment;
- at 28 weeks gestation.

Prior to starting the study, a PPI (Patient and Public Involvement) group was held with pregnant women to identify the key topics that were important to them and to ensure that the language used in the questionnaire was acceptable and understandable. The tool and PIS were then piloted with a small group of antenatal women (n=7). All participants reported that the PIS was easy to understand and that they were aware of what would be required for the study. Participants stated that the questionnaires were easy to complete, and that this could be done in 5-10 minutes. Minor changes following the pilot included adding additional items in the list of qualifications and the use of a tick box, rather than an open question, for responding about previous mode of birth.

To assess how MyBirthplace was being used in practice, women were asked about the booking appointment and whether birth place options were discussed. The questions included the use of MyBirthplace by the midwife at the appointment and options to access the intervention after the appointment.

The questionnaire included a validated tool, the Stage of Decision Making Scale (SDMS) (O'Connor, 2000), in order to assess the primary outcome - decision making. The SDMS is a validated instrument that determines an individual's willingness and ability to engage in decision making, how they progress into making a decision or choice, and how receptive they are in considering or reconsidering their options (Grant et al., 2001). The SDMS is the only decision making scale that enables women's decision making to be assessed at various points, allowing for changes. The SDMS

was chosen over other tools, such as the Decisional Conflict Scale, because it allows for assessment of the individual's "willingness to consider and reconsider their options" (O'Connor, 2000 p.1). This is important for pregnancy, which can be a period when women encounter events that may change a decision such as the first or second trimester scan. It also allowed for women to make a decision prior to their first appointment (Davies et al., 2014).

The sample size was determined using data from available studies that utilised the SDMS, (Raynes-Greenow, 2010; Grant et al., 2001) the hypothesis regarding women's receptivity to decision making (Murray-Davies et al., 2012) and considerations such as the average number of referral/ births facilitated by the hospital. Changes in the SDMS are typically assessed using differences in the size of paired groups (median differences) using the Sign Test (Conover, 1999). In this study, responses prior to the intervention, after the intervention and at 28 weeks were compared to identify:

1. Those women whose score on the scale improved;
2. Those women whose score on the scale remained the same;
3. Those women whose score on the scale got worse.

In calculating the sample size the following assumptions were made: (a) the ratio of women in group 1 to group 3 would be 70:30 – that is for every 70 women whose scores improved using the decision aid we would allow for 30 participants to be more indecisive than previously indicated; (b) the percentage of women in group 2 would remain the same. Assuming a two sided 5% level of significance and allowing for a 20% loss to follow up, it was calculated that 169 participants were needed in the sample.

Data were analysed using the Statistical Package for the Social Sciences (SPSS) (version 24).

Descriptive statistics were used to describe demographic data and women's responses regarding sources of information and knowledge. The Sign test was used to compare women's stages of

decision making (using the SDMS) before accessing MyBirthplace at booking with responses after the booking appointment and at 28 weeks gestation. The psychometric properties of the SDMS identify that the construct (in this case women's choice on the scale) is "associated with decisional conflict measures in a hypothesized direction" (Ottawa Hospital Research Institute, 2015 p. 2). This means that early stages of decision making (e.g. not considering options) have been found to be associated with higher decisional conflict, while later stages (e.g. having already carried out choice) are associated with reduced decisional conflict (Murray et al., 2001).

Results

Of the 1584 women who were sent study information, 227 women (14.3%) opted in and agreed to be contacted by the research team (Figure 1). Twelve women were not eligible, leaving 215 for recruiting. A total of 172 of these women (80%) were recruited face to face by the researcher to participate in the study. The reasons for the 43 women not being recruited are detailed in Figure 1. An overall demographic picture was generated from data routinely collected by the study hospital using their maternity information system (Table 1). The study sample is broadly similar to the population of the hospital area, but it has more women who identified as white and a higher number of working individuals.

Figure 1 also shows the response rates for each questionnaire. All 172 women completed the prebooking appointment questionnaire (100%), and 169 (98.3%) women completed the post-booking appointment questionnaire. Of these 169 women sent a 28-week questionnaire, 95 (60.5%) responded. The characteristics of the responders at booking and at 28 weeks are shown in Table 2. Although the majority of women were multiparous (Table 2), most had not given birth in the study hospital before, having delivered out of area. Most of these women had previously experienced a normal vaginal birth (64.2%), while 15.6% had previously had an assisted birth and 20.1% a caesarean section. The majority of women were between 9-11 weeks of gestation at the booking

appointment (79.2%), which is the target gestation set by the hospital for the booking appointment. Just over half (52.3%) had not looked at information about place of birth prior to booking.

Decision regarding place of birth

Nearly three-quarters of the women discussed birth place options with the midwife at the booking appointment, and received information about the MyBirthplace decision aid (Table 3). However, only 31 (18.6%) women used the decision aid with the midwife during the appointment.

The Stages of Decision Making Scale (SDMS) was used to identify how effective the decision aid was in helping women to make a decision about place of birth (Table 4). Prior to the booking appointment, nearly half the women had already decided where they wanted to give birth (42.1%) and a quarter stated that they were unlikely to change their minds (Table 4). Just over a third (34.3%) had not yet begun to think about their choices. At 28 weeks gestation only 29.5% of women (n=28) had not accessed the app since the first appointment with more than two thirds of women stating that they had looked at least once (Table 3).

There was a shift in decision making following the booking appointment and this was more marked at 28 weeks gestation (Table 4). By 28 weeks just over a third of women (36.6%) had made a decision and were unlikely to change their minds. Only one woman had not begun to think about her choices.

In 24.3% of cases there was an increase in the SDMS after the booking appointment (post), suggesting that these women had greater certainty in their decision ($P < 0.0001$) [$7 = -4.201$ SD 1.077] (Table 5). At 28 weeks 53.5% of women (N=59) had an improved decision on the SDMS and only 2.9% of women had greater decisional conflict.

Accessing the MyBirthplace decision aid was associated with improved decision making (35.5%), as evidenced by lower decisional conflict, compared to those who did not access the decision aid (22.0%) (Table 6). Statistical testing was not conducted due to small numbers. Those women whose SDMS stayed the same were more likely to not have accessed MyBirthplace (72.8%).

Discussion

Communication and shared decision making are key components of quality maternity care (Say et al., 2011; Renfrew et al., 2014), and important in supporting women in choosing where to give birth (NICE, 2017; CQC, 2020). Our study is the first to assess the effectiveness of a decision aid to facilitate discussion and shared decision-making around place of birth. The introduction of a decision aid within the workplace appears to have promoted discussion regarding place of birth and the finding that there is statistically lower decisional conflict following the booking appointment, irrespective of whether women accessed the decision aid, is promising. It is disappointing that so few women were given the opportunity to access the decision aid during the actual booking visit, since the aim of doing so was to facilitate the discussion. However, there is evidence that booking appointments conducted within a hospital environment are frequently pressured in terms of time and opportunity for discussion (McCourt, 2006). It may be that this was not the most appropriate time to use MyBirthplace. Despite this finding, most women in our study did not desire further information from the midwife regarding place of birth. There is evidence that women draw on a variety of sources of information to inform their choice of birth place, and that they do not consider midwives to be the main source of information (Hinton et al., 2018).

Those women who did have the opportunity to use the decision aid during the booking visit reported lower decisional conflict, but the numbers were not sufficient to confirm this statistically and further research is required. A recent study suggests that both women and professionals perceive a need for interventions such as decision aids to encourage the practice of shared decision-making (Molenaar et al., 2018). However, the introduction of any intervention relies heavily on

engagement of the health professionals involved (Collins, 2018), in this case midwives, and it is disappointing that so few women were given the opportunity to access the decision aid at booking. Anecdotal feedback from the women confirms that time was a barrier to this shared decision-making, but the possibility of midwives' reluctance to utilise the technology should not be overlooked. A review of the evidence regarding the introduction of innovations into the NHS found that staff resistance was a major barrier to introducing change (The Health Foundation, 2015). Staff resistance was not expected as the decision aid was developed by the midwifery team within the NHS Trust (Gaskell et al., 2014), and a programme of training for midwives was provided, but our study did not explore midwives' views of the decision aid so this cannot be confirmed.

The ideal time to introduce a decision aid is when those making the decision are receptive to change (Murray-Davis et al., 2012). Only one prior study within midwifery has used the SDMS scale and found that pregnant women are receptive to change (Raynes-Greenow et al., 2010). Our findings are broadly in line with this with 23.8% of women being receptive to change. However, a greater proportion of women in our study had already made a decision regarding birth place prior to the introduction of the decision aid (25.5% compared to Raynes-Greenow et al's 17%), and these women were unlikely to change their minds. This could be because women tend to be fairly decisive regarding the place of birth, with most women having made a decision either before pregnancy or within the first trimester (Murray-Davies et al., 2013; Griggs et al., 2014). Timing regarding the provision of information about place of birth needs further consideration.

Our study provides evidence that using a decision aid appears to positively affect women's decision making in pregnancy. Raynes- Greenow et al. (2010) were unable to demonstrate a statistically significant impact with their decision aid for labour analgesia. However, MyBirthplace appears to have reduced decisional conflict giving women greater certainty in their decision about place of birth. The study is unique in also following up women later in their pregnancy (at 28 weeks

gestation) and appeared to have an ongoing impact in reducing decisional conflict despite a lower than desirable response rate (60.5%).

Strengths and limitations

The size of the sample and rates of completion are strengths of the study. The requirement to return an 'opt-in slip' (as required by the ethics panel) meant that a large proportion of eligible women chose not to participate, and the sample had a higher proportion of both white working individuals and women with a degree or higher level of education compared to UK data. These challenges are not unusual with opt-in studies (Hunt et al., 2013), but it is recognised that they may limit the generalisability of the study. Despite recruitment challenges, the required sample size was met and there was a high completion rate to the pre and post booking questionnaires. The follow up questionnaire at 28 weeks received a 60.5% response rate. Studies suggest that this is positive with similar studies utilising questionnaire having a response rate of 67% (O'Keefe et al., 2013).

Ideally interventions should be evaluated using a randomised controlled trial to control for potential confounding factors. The use of a quasi-experimental pre-test post-test design over a RCT was necessitated by the fact that MyBirthplace was already being routinely used within the hospital and ethically having a control group who were not given access to the decision aid would have been difficult. The quasi-experimental design brings internal validity into question; because of its inability to control for confounding variables (Harris et al., 2006).

Conclusion

Decision aids have the potential to remove bias and streamline discussions, ensuring women are informed of their options and have shared decision making about place of birth. Our study suggests that overall women were more confident with their decision following the booking appointment and

by 28 weeks. However, further research is needed to identify the role that the decision aid played in building this confidence.

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