Improving the quality and content of midwives' discussions with low-risk women about their options for place of birth: co-production and evaluation of an intervention package

Abstract

Objective

Women's planned place of birth is gaining increasing importance in the UK, however evidence suggests that there is variation in the content of community midwives' discussions with low risk women about their place of birth options. The objective of this study was to develop an intervention to improve the quality and content of place of birth discussions between midwives and low-risk women and to evaluate this intervention in practice.

Design

The study design comprised of three stages: (1) The first stage included focus groups with midwives to explore the barriers to carrying out place of birth discussions with women. (2) In the second stage, COM-B theory provided a structure for co-produced intervention development with midwives and women representatives; priority areas for change were agreed and the components of an intervention package to standardise the quality of these discussions were decided. (3) The third stage of the study adopted a mixed methods approach including questionnaires, focus groups and interviews with midwives to evaluate the implementation of the co-produced package in practice.

Setting

A maternity NHS Trust in the West Midlands, UK.

Participants

A total of 38 midwives took part in the first stage of the study. Intervention design (stage 2) included 58 midwives, and the evaluation (stage 3) involved 66 midwives. Four women were involved in the intervention design stage of the study in a Patient and Public Involvement role (not formally consented as participants).

Findings

In the first study stage participants agreed that pragmatic, standardised information on the safety, intervention and transfer rates for each birth setting (obstetric unit, midwifery-led unit, home) was required. In the second stage of the study, co-production between researchers, women and midwives resulted in an intervention package designed to support the implementation of these changes and included an update session for midwives, a script, a leaflet, and ongoing support through a named lead midwife and regular team meetings. Evaluation of this package in practice revealed that midwives' knowledge and confidence regarding place of birth substantially improved after the initial update session and was sustained three months post-implementation. Midwives viewed the resources as useful in prompting discussions and aiding communication about place of birth options.

Key conclusions and implications for practice

Co-production enabled development of a pragmatic intervention to improve the quality of midwives' place of birth discussions with low-risk women, supported by COM-B theory. These findings highlight the importance of co-production in intervention development and suggest that the place of birth package could be used to improve place of birth discussions to facilitate informed choice at other Trusts across the UK.

Keywords

Place of birth discussions, midwifery, behaviour change, co-production

Introduction

Women's planned place of birth is gaining increasing importance in the UK, with recent guidance from the National Institute for Health and Care Excellence (NICE) recommending that all low risk women are given information about the safety, intervention and transfer rates of giving birth in different settings, to promote informed choice (NICE, 2014). Their recommendations state that for low risk multiparous women, there is no difference in the composite perinatal outcome for those who give birth in an obstetric unit (OU), a midwifery-led unit (MLU), or at home, with fewer interventions at home and a low transfer rate of 12%. For low risk nulliparous women, there is a small but significant increase in babies born with poor outcomes at home compared to an OU or MLU, with fewer interventions in midwifery-led settings and a transfer rate of around 40% (NICE, 2014). Planned birth at home has been shown to be the most cost-effective birth setting (Schroeder et al., 2012) and studies have reported increased maternal satisfaction with non-OU settings (Hodnett et al., 2010; Royal College of Midwives/Royal College of Obstetricians, 2007). Increasing the uptake of non-OU settings for intrapartum care may also relieve pressure on inpatient maternity service capacity, with substantial increases in the birth rate placing it under significant strain (Royal College of Midwives, 2015; NHS England, 2016).

Choice of place of birth has long been enshrined in UK policy (Department of Health, 1993) and has been reinforced by the 2016 National Maternity Review which found that despite policy and evidence advocating choice, many women remain unaware of their options (NHS England, 2016). Many women consider hospital birth the "default option," with recent history and social norms

strongly influencing women choosing hospital birth (Coxon et al., 2014). Midwives have the opportunity to raise awareness and provide women with information and discussion, to open up choice about place of birth. Currently this discussion takes place at a woman's booking visit, ideally being revisited later on during pregnancy. However, in the 2014 National Perinatal Epidemiology Unit *'You and Your Baby'* survey, a third of women were only aware of one option for where to give birth (NPEU, 2014). In addition, midwives' own beliefs and experiences, alongside variation in service availability, can influence the type of decision-making support midwives give women (Henshall et al., 2016) and they may present risk differently depending on their medical or sociological outlook (Dahlen, 2009; Henshall et al., 2016). Indeed, a recent systematic review of the literature found that organisational pressures, professional norms, the influence of colleagues, inadequate knowledge and confidence of midwives, together with variation in what midwives told women, influenced midwives' place of birth discussions with women (Henshall et al., 2016). Existing interventions to assist midwives in undertaking place of birth discussions have not provided sufficient evidence of effectiveness, and the papers reporting on these interventions include a number of quality issues (Henshall et al., 2016).

Discussion between midwives and women about their options for where to give birth is clearly important for women and maternity services, yet the detail of the quality of the content and delivery of these discussions are unclear. Additionally, midwives often face challenges integrating place of birth discussions into their practice (Henshall et al., 2016). Thus the aim of the study was to improve the quality and standardise the content for place of birth discussions with low-risk women. The study comprised of three discrete stages, 'identifying influences on place of birth discussions', 'intervention development' and 'evaluation of the package in practice', using a mixed methods design.

Setting

All stages of the study took place at an NHS Maternity Trust, in the West Midlands, UK between March 2015 and September 2016. The Trust is a tertiary centre, with over 8000 births per year. It comprises an obstetric unit, an alongside midwifery-led unit, four community midwifery teams and a homebirth team.

The study was developed in collaboration with community and homebirth midwifery services at the participating Trust. Clinical midwifery managers, strategic leads and women were consulted throughout and were invited to comment on the research idea, how the project design would best fit with the service and how best to engage community midwives. Ethical approval was sought and obtained from the University Research Ethics Committee for both research stages of the study (ERN_15-0059S and ERN_16-0239). Individual written consent was taken from all participants by the researchers prior to their study involvement.

Stage One – Identifying influences on place of birth discussions

Methods

The first stage of the study aimed to understand midwives' behaviours relating to place of birth discussions with low-risk women and to develop an intervention package to address these behaviours. A qualitative approach was taken to address the first stage of this study to obtain rich, in-depth data, and to generate new insights on this phenomenon (Miles et al., 2013). Focus groups were used to gather qualitative data, as the interaction between participants enables differing views to be shared, explored and reflected upon (Finch et al., 2014). Focus group discussions also allow researchers to assess the level of agreement and disagreement on a topic in a short period of time (Kitzinger, 1994).

Six focus groups were conducted with midwives from the homebirth team, the four community teams and the community team managers, to explore any challenges to carrying out place of birth discussions with women. Access to midwives was gained through contacting the community matron and team managers and seeking their permission to take part. Following this, the researchers visited the teams to introduce the project and address any comments or concerns. Participants were selected using 'convenience sampling'; all midwives who were available were eligible for inclusion, and were given a participant information leaflet by their team manager and invited to participate. Focus groups (of 4-10 midwives) were held at midwifery bases during convenient times, as advised by the team managers. Sessions lasted around one hour and were moderated and facilitated by two members of the research team who are experienced qualitative researchers (authors 1 and 2). A topic guide containing open ended questions such as 'what do you feel works well in place of birth discussions?' and 'how long do you tend to spend on place of birth discussions with women?' was used to guide the discussions. Discussions were digitally recorded and transcribed verbatim for analysis.

Data were thematically analysed and managed by the two researchers who undertook the data collection using the Framework Method (Gale et al., 2013). This involved deductively identifying which of the emerging data themes had already been uncovered in a previous systematic review of the literature (Henshall et al., 2016), and inductively identifying any newly emerging themes. A selection of the transcripts were double coded and any emerging themes were discussed and debated regularly. This ensured that the data analysis process was as transparent as possible and ensured that the researchers were in agreement in terms of their interpretations of the data. The COM-B framework (Michie et al., 2014) was then applied to the focus group data to categorise the influences on midwives' place of birth discussions with women and identify issues relating to the

capability, opportunity and motivation of midwives to carry out high quality place of birth discussions with women.

Findings

A total of 38 midwives participated in focus groups. Participant characteristics are reported in Table 1.

Focus group discussions revealed numerous midwife-related factors which acted as barriers to the provision of high quality place of birth discussions, and which related to aspects of capability, opportunity, and motivation. ~~These included aspects of~~In terms of capability, some midwives reported a ~~(~~lack of confidence and knowledge in providing safety, intervention and transfer information about different birth settings, and in their own clinical skills regarding homebirth:

> *And it will be their confidence as well, because I think if they're not confident delivering a low risk woman and they're reliant on a CTG monitor, instead of a Doppler and stuff, they're less likely to encourage somebody to deliver at home because they wouldn't feel comfortable delivering them at home.*
>
> *(Focus Group 1)*

Other factors relating to capability included uncertainty about the 'right' language to use, a tendency to make assumptions about what women want, and limited understanding of the service offered by the homebirth team. As highlighted in the extract below, lack of knowledge regarding the homebirth service often meant that midwives were not confident, or in the habit of offering this service to women:

~~), opportunity (lack of time, competing priorities, inadequate resources, lack of exposure to homebirth and language barriers) and motivation (other tasks prioritised, perception that women were not interested in homebirth so discussions of low value).~~

P1: I was at training with one of the homebirth midwives and she was talking about referring [to the homebirth team] at any gestation and I didn't realise that we could. So I've been trying to – I haven't' done very well at bring it up at more antenatal contacts, but it's something I'd like to do…

P2: Yeah. It's just getting into the habit, because I keep thinking, 'I need to remember it at the booking,' or, 'I need to remember it then,' and it's just getting into the habit of it.

(Focus Group 3)

Issues regarding the opportunity for high quality place of birth discussions were discussed in terms of competing priorities, inadequate resources, lack of exposure to homebirth, language barriers and lack of time:

And in doing clinic, when you're already don't have enough time to do the patient stuff, it's really hard to add [place of birth discussions]~~that~~ in.

(Focus Group 3)

~~*And it will be their confidence as well, because I think if they're not confident delivering a low-risk woman and they're reliant on a CTG monitor, instead of a Doppler and stuff, they're less likely to encourage somebody to deliver at home because they wouldn't feel comfortable delivering them at home.*~~

~~*(Focus Group 1)*~~

For some midwives, motivation appeared to be a barrier to high quality place of birth discussions: midwives referred to situations where other tasks were prioritised, or where discussions were seen as being of low value for women, due to assumptions around women's interest or eligibility.

If they've had a bad pregnancy or they've got underlying issues I never even bring [homebirth] up. That's not going to happen and it's going to be disappointing for them and stressful…Quite a lot of women aren't interested at all. They say, 'This is my first baby and I'd rather be in hospital.'

(Focus Group 3)

Midwives described how the model of care provision also impacted on their motivation to discuss homebirth, reporting historical concerns about the reliability of homebirth provision (women having to come into hospital when no midwives were available for homebirths), and reluctance to attend homebirths themselves (they supported homebirth but didn't want to go on call to deliver it), but reported that these influences had been addressed at the participating Trust by setting up a dedicated homebirth team.

Now that we've got a homebirth system and it's a bit more robust, I feel more happy about offering it, whereas I went through a phase where I wasn't offering it because I thought, 'I'm sorry. The system's not working well. I don't want to offer a woman something that I don't think is... will be delivered to birth.'

(Focus Group 2)

Midwives also attributed other, external factors as influencing their motivation to speak to women about their place of birth options. These included differences in women's social relationships, home environments and socio-demographic variation, which midwives perceived made them more or less likely to be open to discussion. Cultural norms, the UK media and differing opinions amongst health professionals were viewed as deterring women from homebirth due to the increased perception of risk conveyed, again making midwives less motivated to discuss it. Midwives acknowledged these external influences on place of birth discussions, and described how they were mostly beyond their control. As such, they prioritised action to improve the quality of their place of birth discussions as the focus of this project.

Stage Two – Intervention Development

Output design was informed by the Capability, Opportunity, Motivation-Behaviour (COM-B) theory of behaviour change, and the Behaviour Change Wheel approach to designing interventions (Michie et al., 2011). The COM-B model divides influences on behaviour into three broad 'components': 'C' is a person's capability to perform the behaviour (psychological or physical); 'O' is the opportunity to perform the behaviour (due to social/environmental influences); 'M' is the motivation to perform the behaviour (due to our conscious and subconscious thoughts and beliefs) (Michie et al., 2011). The Behaviour Change Wheel approach links these components to a range of 'intervention functions' (for example education, modelling), which in turn are associated with a range of behaviour change techniques (for example goal setting, rewards). This approach was utilised by researchers to identify influences on midwives' behaviour, along with the approaches (intervention functions) and techniques that might be used to address these influences, and thus change their behaviour.

A 'co-production' approach informed the design of the second stage of the study, aiming to cross professional and organisational boundaries, so that the different groups involved actively participated in the production, interpretation and implementation of findings (Hewison et al., 2012; Martin, 2010). As such, three key 'groups' (community midwives, homebirth midwives and women's representatives) were brought together by researchers to produce the outputs included in the package. Co-production helped ensure that the work undertaken addressed the real issues midwives face in clinical practice and identified realistic, meaningful solutions to any challenges. Co-production involved the following steps:

1. **Midwifery feedback visits:** Following the focus groups, feedback visits were held at each midwifery team to share the findings and ensure they resonated with the midwives. The midwives then produced and prioritised a list of service improvement ideas, based on these findings. These were pooled by the researchers who collated an overall list of priorities for change. The behavioural influences identified through the focus groups, along with the COM-B resources (Michie et al., 2014), were then used to develop a list of intervention functions and potential behaviour change techniques that could be used in an intervention package for midwives (Table 2).

2. **Workshops with midwives and women:** Following the feedback visits three workshops were held: (1) Women with ongoing interests in maternity projects at the Trust (n=4) were invited to attend a workshop with researchers in a Patient and Public Involvement (PPI) capacity, to agree what the components of a good quality place of birth discussion were and to decide on the main priority issues for change (from the ~~collated~~ list collated at the workshops by researchers); (2) The community matron purposively invited a diverse range of midwives (n=20) to represent different levels of midwifery experience, working environments and groups of women to a workshop with researchers, to discuss the components of a good quality place of birth discussion, the main priority issues for change, and the feasibility and acceptability of implementing specific behaviour change techniques that had been identified using the Behaviour Change Wheel. (3) Midwives and women who had attended the previous workshops met with researchers to agree the elements of the place of birth intervention package, and discussed how to support its implementation in practice.

Workshop discussions identified that, primarily, women should receive standardised information about the safety and practicalities of giving birth in different settings and that midwives should talk confidently, using appropriate language, to women about their place of birth options. Midwives felt

that this discussion should occur at the 16-week antenatal appointment rather than at the 'booking' visit, and should last a maximum of 4 minutes, as to realistically fit with time pressures on appointments. It was agreed that the information given should be used as a scaffold to build on throughout pregnancy and be tailored to individual women.

To facilitate this, midwives agreed that the first step was to develop a pragmatic, standardised script to support this discussion, and that it should last under five minutes, so as to be realistically built into clinical practice. The introduction of a script aligns with Behaviour Change Wheel techniques of 'instruction on how to perform the behaviour' and 'adding objects to the environment' (see Table 2). Workshop attendees were split into three groups to develop different sections of the script (openers and phrases - to engage women, safety and practicalities). Over the next six weeks the researchers supported each group with developing the script, through face-to-face meetings, email and telephone contact. The script's three sections were integrated prior to the combined workshop.

During the combined workshop with midwives and women, two role players acted out the place of birth script (as a midwife and a pregnant woman) to demonstrate a real-life scenario. Facilitated by the researchers, the participants suggested script modifications, which the role-players re-enacted, until one script for nulliparous and one for multiparous women were agreed on, to reflect differences in safety and risk information.

Consideration was then given as to what additional interventions would support midwives to discuss place of birth effectively with women. The Behaviour Change Wheel (Michie et al., 2014) had been used to explore the data regarding influences on midwife behaviour, and to identify which types of behaviour change techniques might effectively change practice (Table 1). Workshop participants agreed a number of interventions they felt were feasible and acceptable in practice to improve midwives' place of birth discussions with women, supported by the researchers who mapped the

relevant behaviour change techniques onto the suggested interventions. This enabled the creation and development of a theoretically underpinned 'place of birth intervention package' that was designed to be acceptable and feasible for use in everyday midwifery practice. This consisted of an update session, a script, a leaflet and support through leadership within each team - including regular team meetings (Table 3).

Once the intervention package was agreed, a place of birth lead (PoBL) from each community team was appointed to support its overall direction and continuing development. Monthly PoBL meetings were established, attended by PoBLs, researchers, a homebirth team midwife, consultant midwives and the community matron. The meetings provided opportunities to discuss ideas for developing the package and allowed the different skills and perspectives of attendees to be recognised, drawn on and actioned.

Stage Three – Evaluation of the Package in Practice

Methods

The third stage of the study aimed to evaluate the implementation of the co-produced 'place of birth intervention package' at the local Trust, from the perspective of the community midwives using the package. A mixed methods design was used for this stage of the study, including the following components:

1. **Questionnaires:** ~~Place of Birth Lead~~PoBLs administered questionnaires to all community midwives at the Trust both before the initial update session, immediately after this session and then again at 3-4 months post implementation of the package. The first part of the questionnaires required midwives to self-rate their level of knowledge and confidence

regarding safety and intervention rates for the different birth settings for low-risk women, using a Likert scale from 1-5 (where 1 is low, and 5 is high). Objective knowledge of the safety and intervention rates for the different birth settings was calculated using six multiple-choice questions (reported as a score out of 6). A number of questions were also included to ascertain midwives' views of the individual components of the intervention package; for example how useful each component had been in facilitating their place of birth conversations with women, how easy the package was to use, and how well this package had been embedded in practice. Questionnaire responses were recorded and analysed in a Microsoft Excel spreadsheet, and descriptive statistics were calculated.

2. **Focus groups and semi-structured interviews:** Seven focus groups with community midwives and five individual semi-structured interviews with PoBL from each community team were held at 3-4 months post implementation of the Place of Birth package to explore midwives' use of the different aspects of the intervention package, along with their views on what worked well and what could be improved. Participants were selected using 'convenience sampling'; all available midwives ~~who were available~~ were eligible for inclusion and were given a participant information leaflet by their team manager as an invitation ~~and invited~~ to participate. Focus group discussions lasted around 60 minutes and interviews lasted between 30-60 minutes. All sessions took place at the respective community and homebirth team bases. ~~Both f~~Focus groups ~~and semi-structured interviews~~ were moderated and facilitated by two members of the research team who were experienced in qualitative research, and who had not been involved in the intervention development (authors 4 and 5). Interviews were conducted by author 4. A topic guide containing open ended questions such as 'How much are you using the place of birth leaflet to support your place of birth discussions with women?' and 'Can you think of any ways the monthly place of birth meetings could be improved upon?' was used to guide the discussions. Focus groups and

interviews were digitally recorded and transcribed verbatim for analysis. Data were then subjected to thematic analysis (Braun and Clarke, 2006). Data analysis was led by the two researchers who undertook the data collection (authors 4 and 5).

Findings

A total of 66 midwives completed the first two ~~evaluation forms~~ questionnaires, and 38 midwives completed the 3-4 month post implementation questionnaire ~~evaluation form~~. All respondents were band 5 and 6 midwives working in the community. The questionnaires were anonymous and did not collect demographic information, to increase the likelihood of the midwives accurately reporting on their perceived knowledge around the safety of giving birth in different settings. Overall, 43 community midwives took part in seven separate focus group sessions (one in each of the four community teams, one in a homebirth team, one group of community managers and one mixed group). The five midwives who had taken on the role of PoBL took part in individual semi-structured interviews. Participant demographics for focus groups and interviews are presented in Table 4.

Midwives' self-rated knowledge of the safety and intervention rates associated with different birth settings for low risk women increased ~~from an average of 3.1/5 before the initial update session to 4.5/5~~ after the initial update session: the percentage of midwives reporting their knowledge as 'high' (a score of 4-5) increased from 36% (24/66) before the update session to 97% (64/66) afterwards. Three months post implementation of the package, this same knowledge score range was reported by 82% (31/38) of midwives. ~~At the three-month evaluation, self-reported knowledge was 4.1/5~~. Similarly, midwives' self-rated confidence in speaking to women about place of birth options increased after ~~from 3.4/5 before~~ the initial update session: the percentage of midwives reporting their confidence as 'high' (a score of 4-5) increased from 41% (27/66) before the update session to 98% (65/66) afterwards. Three months post implementation of the package, this same confidence

score range was reported by 84% (32/38) of midwives. ~~to 4.5/5 after the initial update session. As with self-rated knowledge, this increase in self-rated confidence was sustained at three months post implementation (4.3/5).~~

Midwives' average score on the multiple-choice knowledge test increased from 3.7/6 to 4.8/6 following the initial update session. Before the initial update session the range of correct answers was 0-6, whilst after the update session the range of correct answers was 2-6. In the three-month follow up evaluation, the average score on the knowledge test was 4.7/6.

Focus group and interview data on knowledge and confidence reflected the questionnaire findings. ~~;~~ ~~m~~Midwives reported feeling more knowledgeable and up to date regarding the evidence for different birth place settings after the initial update and place of birth team meetings, and reported increased confidence in undertaking place of birth discussions with women~~.~~:

> *I think I've definitely grown in confidence, I feel like the level of passion is still the same, but actually I feel like I've got something to give and offer… I have knowledge and evidence presented in a way that helps me focus that conversation.*
>
> *(Interview 1)*

In the three-month follow up ~~evaluation~~questionnaire, 68% (26/38) of midwives reported that the place of birth leaflet had been either largely or extremely helpful for facilitating their place of birth discussions with women, and 29% (11/38) reported that it had been moderately helpful. The majority of midwives (79%, 30/38) felt the leaflet provided them with an appropriate amount of information to give to women, whilst 21% (8/38) felt there may have been too much information included in the leaflet.

During focus group sessions, midwives reported that the overall 'package' (update session, place of birth script, leaflet and monthly team meetings) had been useful in helping them to deliver information about place of birth settings to women and had supported changes to their place of birth discussions with women. As shownseen below, even when midwives felt that their previous knowledge on birth place settings was good, the package acted as a reminder to continue these discussions with women throughout the pregnancy.

> *It has changed my practice, definitely. If anything it's more of a reminder to talk to women about it, because I've got to be honest, before this all came out, although I did talk to them at booking about their place of birth, I probably never spoke to them again about it until right at the end when we're doing their birth talk and arranging their birth plan. So it's just like a little gentle reminder really.*
>
> *(Focus Group 4)*

This change in practice of place of birth discussions appeared to reflect an embeddedness of the place of birth intervention, which was further supported by the questionnaire data. Indeed, after the initial update session, 82% (47/57) of midwives who answered the question reported that they planned to change their practice as a result of the intervention, and at the three month follow-up, 94% (33/35) reported that they had changed their practice.

Specifically, the place of birth leaflet was viewed positively by midwives and described as a *'very good tool…for us and our knowledge' (Focus Group 2).*: Regarding ease of use, 68% (26/38) of midwives reported that the information contained on the leaflet was presented either 'largely' or 'extremely' clearly, with the remaining 32% reporting this information as 'moderately' clearly presented. The majority of midwives (79%, 30/38) felt the leaflet provided them with an appropriate amount of information to give to women, whilst 21% (8/38) felt there may have been too much

information included. ~~t~~The document was praised for its visual nature, and participants felt that information was presented clearly~~:~~.

~~*It's a very good tool and very good for us and our knowledge.*~~

~~*(Focus Group 2)*~~

I find it useful just to have that information there, it does really and the pictorial and the dots, the actual numbers represented in terms of dots I find helpful.

(Interview 2)

Many midwives reported incorporating the leaflet into their practice, and noted that it could be used at home by women to 'make the case' for a specific birth option with family members.

If they've come to the appointment on their own they can take [the leaflet] then and show their partner or parents and sometimes that can help them.

(Focus Group 1)

However, participants expressed a less positive view of the place of birth script. A number reported that they did not use it in practice as it was not helpful to them, and others felt that it was too prescriptive and at odds with the principle of personalised care:

I don't think it should be referred to as a 'script' because even if you come out in clinic and work with three different midwives, everybody will do their information giving completely different and I don't think you can expect however many midwives in the Trust to give the same information in the same way and I think that depersonalises the women, to be honest. So I use it as a skeleton but not as a script.

(Focus Group 4)

Having a ~~Place of Birth Lead~~PoBL within each team was seen as important to support practice and to ensure that the intervention was sustained. Midwives suggested that having these leads *'takes the pressure off a little bit because you recognise that the person who's actually leading on it recognises and understands the difficulties you're finding in delivering [the intervention]', 'because she actually does it and she does it with us' (Focus Group 3).* This 'insider' knowledge was seen to promote realistic expectations from leads, described by midwives as *'what you need' (Focus Group 3).*

~~*P1: [having a POBL] takes the pressure off a little bit because you recognise that the person who's actually leading on it, recognises and understands the difficulties you're finding in delivering it and that makes a huge difference.*~~

~~*P2: Because she actually does it and she does it with us. It's not like somebody is sitting up there and comes down and say, 'Do this, this and this' and they haven't got a clue how it works.*~~

~~*P1: She knows the difficulties and she says, 'Just try. Sometimes, I can't get it done either'.*~~

~~*P2: She just tries. She knows it's hard.*~~

~~*P3: She's realistic.*~~

~~*P1: That's what you need.*~~

~~*(Focus Group 3)*~~

Managerial support was also seen as important for initiating and sustaining successful implementation of the package. Positive accounts of managerial support included making time for place of birth monthly meetings, which were evaluated positively by midwives. Participants suggested that these monthly place of birth meetings had clarified midwives' understanding of the information contained within the leaflet, maintained their motivation, and encouraged group discussion and sharing of ideas and knowledge.

I think the sessions are good because we discussed a lot about the different ways and the difficulties different people have found it. So that progressive updating all the time is a good way of seeing how we're getting on and hopefully, do things slightly differently by hearing different people implementing it.

(Focus Group 3)

Team meetings were originally designed to run for 45 minutes however during the early stages of place of birth package implementation, midwives suggested that a shorter meeting time might be more appropriate as 45 minutes *'is a long time for an update, keeping everybody engaged, because they kind of switch off after a while' (Interview 4)*. PoBLs also suggested that it would be good to run these meetings alongside (or directly after) the normal team meetings, so that as many midwives as possible could attend. As a result, meetings were shortened to 10 minutes and midwives gave positive feedback about this change.

~~*I think [45 minutes] it's a long time for an update, keeping everybody engaged, because they kind of switch off after a while. So I think something short, sweet, 15 minutes update, and that's better.*~~

~~*(Interview 4)*~~

~~In addition to these preliminary changes, PoBLs suggested that it would be good to run these meetings alongside (or directly after) the normal team meetings, so that as many midwives as possible could attend.~~

Within the maternity unit at the time of the implementation of this package there was also a drive to increase homebirth. Findings suggested different interpretations of the intervention's objective, with some seeing it as promoting informed choice, while others saw it as a mandate to actively promote homebirth. This point is illustrated in the extract below, where a midwife answers a question about promoting choice with a statement about the difficulties of promoting homebirth.

I: What are the main barriers when it comes to you getting this idea of choice across?

P: They just don't want a homebirth.

(Focus Group 5)

Misinterpretation of the intervention's aim was also seen in midwives' descriptions of some teams as being 'disadvantaged' in their ability to use the intervention, as they worked in areas where community birth was viewed negatively; suggesting that they viewed the intervention as a tool to increase a particular birth option (namely homebirth), rather than promote knowledge and choice. This confusion regarding the intervention's aim appeared to act as a potential barrier to the use of the tool, as some midwives expressed the view that the resources and additional information would not 'change women's minds' about where to give birth; something which the intervention was not designed to do.

Discussions during focus group sessions revealed that offering midwives control over which changes (identified using the Behaviour Change Wheel) they accepted and rejected, had increased their sense of engagement, ownership and control of the resources. This was reflected in the strong, effective and sustainable research partnership which was maintained throughout the project. The continued, collective midwifery input meant that by the time the package was developed most community midwives had been involved in and supported the project.

Discussion

Evaluation of the place of birth intervention package in practice found that it improved midwives' knowledge (both self-rated and measured) regarding the safety and intervention rates for the different birth settings for low-risk women. Self-rated confidence in providing this information to

543 women was also increased post-implementation of the package. Midwives reported that the
544 separate components of the package were useful and helpful, and changed the way they practiced.
545
546 These findings reflect the key objectives of the co-production approach, where researchers aim to
547 develop effective collaboration between research teams, frontline practitioners and target
548 populations, to harness the expertise of key stakeholders so that the acceptability and feasibility of
549 the intervention is maximised at the development stage (Bartholomew et al., 2011; Cargo and
550 Mercer, 2008). As seen in previous public health intervention research (Hawkins et al., 2017), co-
551 production created a sense of ownership and buy-in of the intervention. Through the adoption of
552 this approach, the realities of delivering the intervention during antenatal appointments could be
553 explored and addressed at an early stage of the package development. Similar findings are reported
554 by Hawkins et al. (2017), who found that co-production of a peer-led smoking prevention
555 intervention highlighted important potential barriers to intervention implementation which could
556 then be addressed at an early stage of design. Furthermore, in this study, co-production combined
557 the varied expertise of the academic, clinical and target population members of the team. This is
558 seen in previous co-production literature. For example, Reeve et al. (2016) report that co-production
559 of a mental health intervention led to a blurring of traditional boundaries between practice and
560 academia to co-create trustworthy practical knowledge.
561
562 In health services research there are often gaps between evidence and practice, with many patients
563 not receiving care consistent with current evidence (Eccles et al., 2005; Grol et al., 2003). Where the
564 transfer of findings into practice does occur, it can be slow, erratic and inconsistent, often due to
565 difficulties changing health professionals' behaviours (Grol et al., 2003). However, by implementing a
566 range of behaviour change interventions which focus on changing specific attributes of health
567 professionals (such as knowledge, beliefs and attitudes), sustainable, effective behavioural change is
568 more likely to occur (Michie et al., 2011). The place of birth study exemplifies the benefits of using

569 co-produced research to facilitate the development of interventions designed to bring about
570 changes to health care practice, whether at a local, national or international level.
571
572 Co-production requires ongoing engagement from all parties (Donetto et al., 2014), and can be
573 challenging due to the sometimes conflicting priorities between clinicians and academics. Indeed,
574 the importance of producing a high quality, credible study was tempered by the exacting clinical
575 pressures on the community midwives, limiting the time they could give to the research. As such,
576 this necessitated commitment from both sides and a flexible approach to developing the package
577 (Donetto et al., 2014). Researchers ensured that midwives remained involved in the study process,
578 resulting in a sense of shared ownership. Additionally, focus groups and feedback sessions with
579 midwives resulted in them acknowledging that problems existed with their place of birth discussions
580 with women, meaning that suggested changes to the discussions were harder to disregard. Similarly,
581 offering midwives some control over intervention development ensured that the division of power
582 was balanced and that time pressures were acknowledged and responded to (Jones and Wells,
583 2007).
584
585 The update session and monthly team meetings (Table 3) were designed to be delivered *to midwives*
586 *by midwives.* This reflects previous behaviour change literature which suggests that listening to a
587 colleague with shared knowledge, understanding and experience, will likely result in greater
588 recognition, consideration and acceptance of the changes suggested than if they are delivered by a
589 researcher ostensibly telling midwives how to practice (Wenger et al., 2002; Wenger 2003). This
590 approach overlaps with the Behaviour Change Wheel approach (Michie et al., 2014), which enabled
591 a focus on changing midwives' practice using behaviour change techniques such as a credible source
592 (midwife colleague), knowledge transfer, sharing experiences and providing social support . Mapping
593 these behaviour change techniques to corresponding community of practice approaches may
594 increase the likelihood of change occurring, as midwives may be more open to improving the quality

595 of their place of birth discussions and thus more likely respond to interventions to facilitate this
596 behaviour.
597
598 Midwives reported that the separate components of the package were useful and helpful, and
599 changed the way they practiced. The combination of verbal and written information for women
600 (leaflet and script) was not only designed to change midwives' behaviour, but is also shown in
601 previous literature as beneficial for increasing women's knowledge and retention of information,
602 compared to providing written information (for example a leaflet) on its own (Johnson and Sandford,
603 2005; Muthusamy et al., 2012). Indeed, qualitative studies of pregnant women's health education
604 experiences suggest that women often report an excess of leaflets and booklets, some only using
605 this information for reference after an appointment (Baron et al., 2016). A recent systematic review
606 of the literature on patient information leaflets echoes this sentiment by suggesting that leaflets
607 should always be accompanied by verbal explanation (Sustersic et al., 2016). As demonstrated by the
608 resources developed during this study, healthcare professionals are encouraged to discuss this
609 written information with service users, to highlight the important points that are relevant to the
610 individual (Sustersic et al., 2016).
611
612 The study had its limitations. For example, the co-production process involved midwives from a
613 single hospital Trust, so the views captured may not be representative of midwives working in other
614 areas, due to differences in socio-demographic and environmental contexts. In addition, only a
615 handful of women participated in the intervention development, and their views may not be
616 illustrative of the diversity of women under the Trust's care, though this project was informed by
617 earlier work with local women who highlighted a need to improve place of birth discussions (Naylor-
618 Smith, 2014).
619

Midwives reported a number of influences on place of birth conversations which could not be addressed by the intervention; namely factors such as differences in women's social relationships, home environments, socio-demographic variation, cultural norms, the UK media, and differing opinions amongst health professionals. Whilst these external influences on place of birth discussions were perceived as outside of their control, midwives suggested that improving the quality and consistency of information provided during place of birth discussions between women and midwives during antenatal appointments was a realistic and important area for influence. This echoes the key message from the recent National Maternity Review (NHS England, 2016) which suggests that women should have "genuine choice, informed by unbiased information" (NHS England, 2016: pg 8).

Although we would have liked to have evaluated whether women who were presented with birth place options subsequently altered their choice of place of birth, this was not possible in the study setting as data were only available for actual place of birth, not preferred place of birth. Furthermore, place of birth data from the study site are not measured accurately; MLU and OU births are all listed as hospital births, so it would not have been possible to extract this data.

The package's development took over a year, with continuous involvement from midwives, making it hard to evaluate whether any improvements in midwives' place of birth discussions with women were due to the package's implementation or midwives' ongoing study involvement. As discussed, commitment and engagement was required to ensure successful co-production of the intervention and to encourage midwives' feelings of ownership towards the package. It is possible, therefore, that positive evaluation of the package in practice may have been due, at least in part, to midwives' feelings of investment in the resource. Consequently, this package is currently being implemented and evaluated in further Trusts in the West Midlands, UK, to determine the credibility of the findings and the potential transferability of this package more widely.

Conclusions

This paper has reported on the development, implementation and evaluation of a place of birth intervention package, designed to help improve the quality of the place of birth discussions midwives have with low-risk women. It has described the stages of the co-produced research process and the COM-B theory underpinning it, explained how the findings informed the package's development, and reported the findings from a service evaluation of the package in practice. Findings from the evaluation support the assumption that co-produced research can contribute to a supportive, iterative and interactive learning environment, facilitating changes to healthcare practice and promoting effective research partnerships.

List of abbreviations

Capability, Opportunity, Motivation – Behaviour (COM-B)

Midwifery-Led Unit (MLU)

Obstetric unit (OU)

Place of Birth Lead (PoBL)

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Tables

Table 1: Demographics of focus group participants in stage one (n=38)

Demographic	All participants n=38	n (%)
Age	20-29 years	10 (26.3)
	30-39 years	5 (13.2)
	40-49 years	16 (42.1)
	50+ years	7 (18.4)
Ethnicity	Black	4 (10.5)
	Mixed	3 (7.9)
	White	30 (79)
	Asian	1 (2.6)
Number of years qualified	<1 year	4 (10.5)
	1-5 years	13 (34.2)
	6-10 years	9 (23.7)
	11-15 years	4 (10.5)
	>15 years	8 (21.1)
Band/registration status	Not registered	1 (2.6)
	5	3 (7.9)
	6	31 (81.6)
	7	3 (7.9)

Table 2: Possible behaviour change techniques identified for midwives using COM-B

	Component of place of birth intervention package for midwives				
Behaviour change technique (adapted from the Behaviour Change Wheel)	**Update session**	**Script**	**Leaflet**	**Regular meetings**	**Ongoing leadership from PoBLs**
Use credible source: information delivered to midwives by midwives	X			X	X
Give information about social, environmental and health outcomes of talking to women	X			X	X
Provide feedback on midwives behaviour (from systematic review/focus groups)	X			X	X
Provide feedback on outcomes of behaviour (women don't know their options)	X			X	X
Highlight that policy, women and midwives think providing women with choice is a good thing	X			X	X
Give instruction on how to change behaviour (discussion/distribution of script)	X	X			
Provide social support through praise and encouragement	X			X	X
Ask midwives to set specific goals	X			X	X
Troubleshoot difficult scenarios	X			X	X
Action plan to work through tackling difficult situations	X			X	X
Review behaviour goals	X			X	X
Provide verbal persuasion about midwives' capabilities	X			X	X
Highlight to midwives that they are role models for promoting good discussion	X			X	X
Use prompts/cues/objects in the clinical environment		X	X		
Share stories about talking to women about options with colleagues				X	X
Test different strategies and approaches for engaging women				X	X
Highlight gap between midwives current behaviour and the goal of providing women with information	X			X	X
Discuss pros and cons of changing behaviour	X			X	X
Compare behaviour and performance across community teams				X	X
Self-monitor behaviour	X			X	X
Behavioural substitution (instead of doing X, replace with Y)	X			X	X
Demonstration of behaviour through role-playing					

* The behaviour is midwives not providing women with standardised information about the safety, intervention and transfer rates of giving birth in different settings

** X indicates the identification of a behaviour change technique identified for midwives in each component of the place of birth intervention package

Table 3: Components of the Place of Birth Intervention Package (selected using the COM-B theory) (Michie et al., 2014)

Components of the PoB Intervention Package for low risk women
PoB update session for midwives: • One off, mandatory 45 minute session led by PoBLs in community teams • Held at each community team **Includes:** • Scenarios of 'bad' PoB discussions (identified by midwives) • Information on safety, intervention and transfer rates of giving birth in different settings (NICE, 2014) • Update on co-production study • How PoB script can support midwives in their discussions (using recordings of role players) • Trouble-shooting about successes and challenges of using script • How to use the PoB leaflet alongside PoB discussion • Goalsetting to encourage midwives to start using the PoB script and leaflet • Distribution of PoB script and leaflets to midwives
Standardised 'PoB' script: • Written script intended to support midwives discussions to convey information on safety and practicalities of giving birth in different settings • For use by midwives with women at 16 week antenatal appointments and lasts about 5 minutes • Separate scripts for first and second+ time mothers (to reflect differences in safety information)
PoB leaflet for low risk women: • Presents safety, intervention and transfer rate information of different birth settings (NICE, 2014)using icon arrays (Coxon, 2014) and graphs and includes photo of birth settings • Separate leaflets for women having first baby and having second, third or fourth baby • Intended to support discussions with women and can be used alongside 'PoB' script • Laminated A4 copy for midwives to carry and paper copies to be left with women
Ongoing support through regular meetings: • Monthly, 45 minute meetings in each community team • Led by PoBLs with researcher present • Flexible content and structure but may include discussion of any challenges to using script, reflection, sharing stories, goal setting, checking knowledge, advice and support, feedback from women
Ongoing leadership from PoBLs who will: • Demonstrate passion and enthusiasm for standardising content of PoB discussions • Provide a safe environment for midwives to seek advice and encouragement • Deliver ongoing informal feedback and support

Table 4: Demographics of participants in stage two (n=48)

Demographic	All participants n=48	n (%)
Age	20-29 years	6 (12.5)
	30-39 years	15 (31.3)
	40-49 years	14 (29.2)
	50+ years	13 (27.1)
Ethnicity	Black	7 (14.6)
	Mixed	5 (10.4)
	White	34 (70.8)
	Asian	2 (4.2)
Number of years qualified	N/A	4 (8.3)
	1-5 years	13 (27.1)
	6-10 years	15 (31.4)
	11-15 years	5 (10.4)
	>~~<~~15 years	11 (22.9)
Band/registration status	Not registered	4 (8.3)
	Band 6	38 (79.2)
	Band 7	6 (12.5)