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Study protocols

The effect of a birthplace decision support tool on women's decision-making and information gathering behaviours during pregnancy: mybirthplace study protocol

Daisy Wiggins
Centre for Midwifery Maternal and Perinatal Health, Faculty of Health and Social Sciences, Bournemouth University, UK

Vanora A. Hundley
Centre for Midwifery Maternal and Perinatal Health, Faculty of Health and Social Sciences, Bournemouth University, UK

Carol Wilkins
Centre for Midwifery Maternal and Perinatal Health, Faculty of Health and Social Sciences, Bournemouth University, UK

Carol Bond
Institute of Health, Faculty of Education, Health and Wellbeing, University of Wolverhampton, UK

Gill Walton
Royal College of Midwives, UK

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Author address for correspondence:
Daisy Wiggins
Centre for Midwifery Maternal and Perinatal Health
Faculty of Health and Social Sciences
Bournemouth University
Portsmouth PO3 6AD, UK
Email: dwiggins@bournemouth.ac.uk

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ABSTRACT

Background The Maternity Review for England highlighted the need for more accessible information to support decisions. This study assesses the effect of a decision support tool (DST) on women's decision-making regarding birthplace.

Methods A mixed method sequential exploratory design involving three phases and 169 women from a large UK maternity hospital. Phase one: A questionnaire survey pre and post-access to the DST examining knowledge level and stages of decision-making scale. Phase 2: Follow-up questionnaire at 28 weeks to enable the usefulness of Mybirthplace to be evaluated. Phase 3: Qualitative interviews with 10 purposely chosen women at 36 weeks gestation. Collection of data on actual birthplace.

Discussion This study is the first to assess the effect of a DST in supporting women's choice of place of birth.

Keywords: decision support tool, Mybirthplace, choice, decision-making, birthplace, mixed methods

BACKGROUND

The Government's ambition for the National Health Service (NHS) to achieve world-leading health outcomes[1] relies on a strategy of shared decision-making (SDM) and patient-led decisions.[2] The white paper promotes the philosophy of 'no choice about me without me' and stresses the need for SDM.[3,4]

SDM has been defined as a

> *'Two way process of information giving between the clinician and patient, whereby the final decision is made jointly'.*[1]

A prerequisite is information sharing, which is positively associated with adherence to treatment and care.[5]

The National Maternity Review highlighted the need for greater access to unbiased information with the aim of supporting inclusive decision-making about care.[1] Most women still give birth in hospital,[6] but the National Childbirth Trust[7] found that 49% of women were dissatisfied with the information they received about birthplace. New ways of providing women with information to support choice are needed.

EXISTING INTERVENTIONS

One way is through use of decision support tools (DSTs).[8] DSTs have a long history of use within health, for example, cancer treatment;[9] however, their use in midwifery care has been limited to only a few clinical scenarios that include mode of birth following a caesarean section,[10–14] antenatal screening for fetal anomaly[15] and delivery options for breech birth.[16] Research shows that these DSTs are effective in reducing the decisional conflict that women have when it comes to making a choice.[14,17] Although tools exist to support choice with regard to birthplace, for example, WHICH website,[18] no studies have reported the effectiveness of these tools.

THE INTERVENTION – THE MYBIRTHPLACE APP

MyBirthplace[19] is a DST created to support women's choice regarding place of birth.

The app, which is publicly owned and copyrighted to the Hospital that created it, offers information about the different local birthplace options available to pregnant women. All underpinning data are based on local statistics and information derived from the Birthplace in England national prospective cohort study.[20] The application programming interface (API) is open but licensed and is available via the internet https://mybirthplace.org/portsmouth/[21,22] with an option to download to a smart device. No personal information is taken or used in the app and therefore poses no security risks.

MyBirthplace is provided to women at the initial appointment with their midwife, but can be accessed throughout pregnancy. A clear preference for place of birth is required by the hospital at 36 weeks' gestation.[23]

This paper describes a protocol for a study to evaluate the effectiveness of the app.

Aim

To identify when women decide about place of birth and how effective the DST is in helping to make this decision.
Secondary aims: To

- explore women's information gathering and decision-making behaviours;
- understand women's views and opinions about using *MyBirthplace*;
- explore how *MyBirthplace* was used with women by their midwife;
- explore women's feelings about how well *MyBirthplace* supported them to make a decision;
- explore women's views around its usefulness.

Methods/Design

A three-phase mixed method sequential exploratory study.

1. Quantitative questionnaire survey of newly pregnant women, completed before and after accessing the DST.
2. Follow-up questionnaire survey at 28 weeks administered online via Bristol Online Survey (BoS) or on paper (postal), depending on participant's preference.
3. Qualitative interviews with purposely chosen women from the first two phases conducted at 36 weeks. Data on actual birthplace.

Setting

One of the largest acute hospitals in the United Kingdom (UK) serving a local urban population of 650,000 and providing care to around 6000 pregnant women each year.[21,23]

Sample and sample size

Newly pregnant women between 16 and 45 years will be identified following referral from the general practitioner surgeries.

The sample size of 169 women was determined by a power calculation based on changes in stages of decision-making scale (SDMS) that can be attributed to the DST.

Statistical significance will be assessed using the Sign test. This tests for differences in the size of paired groups (median differences); in this case, comparing pre-, post- and 28-week responses to the SDMS with the ability to understand

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

Women tend to be fairly decisive regarding birthplace and most decide before pregnancy, by booking visit[24] or within the first trimester.[25] It seems unlikely that women will be more indecisive following use of a DST. Previous studies have found that patients' anxiety and decisional conflict scores

improve after accessing a DST.[10,11,16,26] None of the previous studies show indecision, following access to DSTs.

As this is the first study in this area, it was difficult to predict the percentage needed in each group to allow for the margin of error. The sample size calculation was informed by a review of the current literature and advice from a statistician. A realistic ratio was set at 70:30 – for every 70 women whose scores improve using the DST we will allow for 30 participants to be more indecisive than previously indicated.

Inclusion criteria

- Age 16–45
- Newly pregnant and not yet accessed a midwife

Exclusion criteria

- Women unable to speak read or write English.
- Women deemed incapable of giving consent.

RECRUITMENT PROTOCOL

Women willing to participate will return the opt-in slip, allowing the researcher to contact them. Women will meet the researcher prior to their first midwifery appointments and written consent obtained. Participants will be advised that they can withdraw from the study without their care being affected.

Following consent, women will complete the first questionnaire and attend the appointment. A second questionnaire will be completed post-appointment.

Consent for the 28-week survey will be gained at this time and women will choose either a paper survey or an online survey.

Questionnaires, delivered in paper or online format, were created by the research team to meet the specific needs of the study. The questionnaires are free to use and the author may be contacted for use in the future.

For the qualitative interviews at 36 weeks of pregnancy, women will be purposively chosen from participants who accessed the DST. Purposive sampling selects participants who have experienced the phenomenon of the study,[27] in this case, exposure to the DST. Interviews will be conducted with at least 10 women to provide a rounded selection of opinions on the phenomenon being studied.

STUDY PROCEDURES

The questionnaires went through a four-stage validation procedure, involving verification by

- the supervisory team;
- an independent public engagement officer who specialises in ensuring questions are accessible to the public and easily understood in terms of language and layout;
- peers for face validity and to iron out any issues;
- a small group of antenatal women.

MEASURES

SDMS

The primary outcome measure is the SDMS.[28] This determines an individual's willingness and ability to engage in decision-making, how they progress into making a decision, and how receptive they are in considering/reconsidering their options.[29] This is especially significant when considering how decision-making changes when the individual has access to a DST.[30] Figure 1 shows the SDMS.

The SDMS is the only decision-making tool with the ability to assess women's decision-making at various points and allow for changes. This is important in pregnancy as there are many changes in health and wellbeing of mother and baby. SDMS data will provide a clear understanding of how participants feel about the decision at each stage of the study.

Information accessed before MyBirthplace

Women will be asked to identify where they currently access health information about birthplace, and to rate their satisfaction with this source. Response options in the questionnaire are based on previous research.[31]

Q16) Thinking about where you want to give birth, would you say.....? (*Please tick one*)

I have not begun to think about the choices	☐
I have not begun to think about the choices but I am interested in doing so	☐
I am considering options now	☐
I am close to selecting an option	☐
I have already made a decision but am still willing to reconsider	☐
I have already made a decision and am unlikely to change my mind	☐

Figure 1 SDMS. Adapted from O'Connor 2000 with permission

Level of knowledge

Women's knowledge and understanding of birthplace options within the local area will be assessed prior to and after their first appointment. Improvement in knowledge is expected with women reporting more options after their appointment.

Consideration of important factors

Choice is affected by a number of variables, for example, partners,[32] therefore women will be asked to identify factors they deem important when choosing birthplace.

Evaluation of the MyBirthplace DST

In the post-intervention and 28-week follow-up, women will be asked satisfaction with a number of concepts related to *Mybirthplace*; this includes visually appeal, ease of understanding and ease of use.

Quality and safety

Participant recruitment will be monitored daily to ensure adherence to the study timeframe, documents of recruitment and reporting of adverse events. Monitoring of miscarriages and retention rates will be monthly to ensure that sample size requirements are met.

Data collection

Data collection for the study is depicted in the flow diagram (Figure 2)

DATA MANAGEMENT AND ANALYSIS

Data management and analysis will follow a pre-set analysis plan. Data collated from phases 1 and 2 will be analysed via the statistical package for the social sciences. Descriptive analysis will be used to produce measures of central tendency for ordinal, interval and ratio data.[33] Non-parametric tests will be used to show relationships between the key variables using chi-square test.[33,34]

Thematic analysis will be utilised to analyse the face-to-face interviews. This was chosen due to its ability to get close to the data, while staying flexible.[35]

DISCUSSION

Evidence exists on choice of place of birth,[20] including factors that impact on a woman's choice[36,37] and midwives' influence on choice.[38] Despite this, women feel they lack information to make an informed choice;[39] *MyBirthplace* was designed to improve women's decision-making about place of birth. The study will contribute to knowledge and understanding of the effectiveness of *MyBirthplace* and will identify whether the use of the tool is justified within the shared discussion, recommending it for use to support other pregnant women in other localities. The study will begin to address the possibility of moving from NHS delivering information in traditional formats to digital information delivery.

The research outlined in this protocol aims to provide explicit, quantitative expressions of women's valuations and qualitative experience of the *MyBirthplace* DST and its use within pregnancy. Our protocol provides a template for other researchers interested in assessing DSTs specifically related to choice of birthplace. This study is timely and is the first study of its kind, no other study has looked at a birthplace DST and therefore it will be an original contribution to the field.

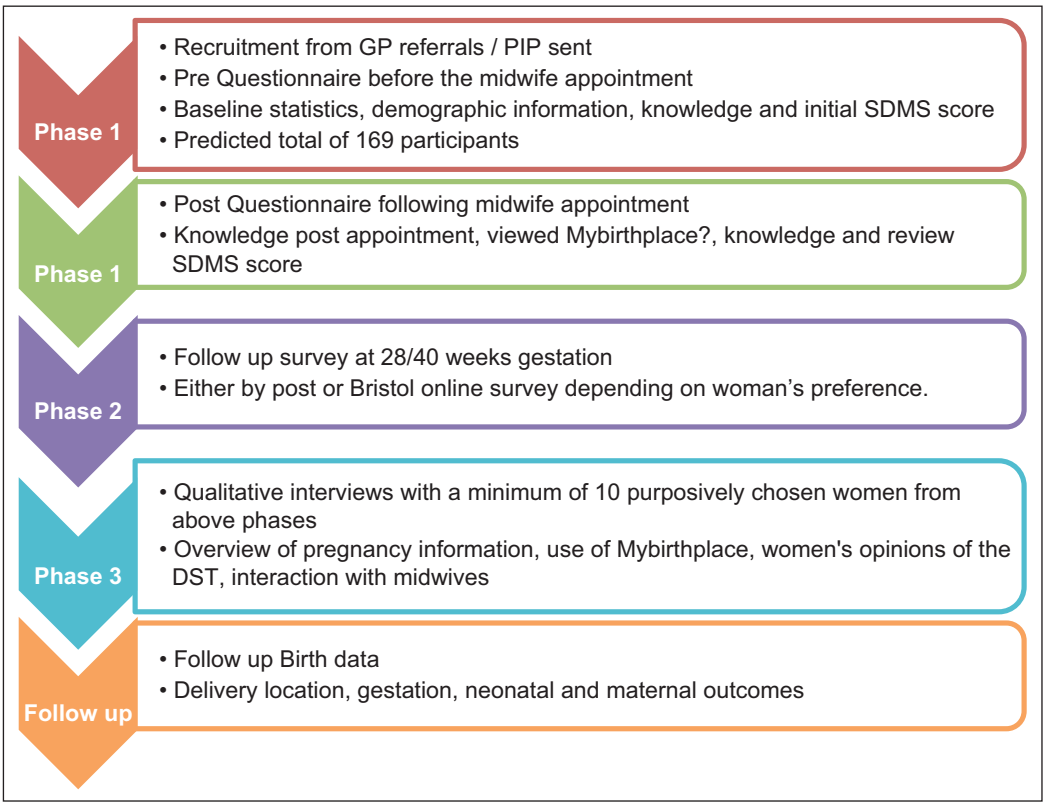

Figure 2 Mybirthplace study phases of data collection in a large urban hospital for the required 169 women

The app has been developed at a time where women are becoming more information savvy and the use of online resources is increasing. Digital services are more widely available, including access to medical records, as more is done to make online services accessible to patients[40] research is need to assess their effectiveness.

Ethics approval and consent to participate

Internal approval was granted by Bournemouth University Research Ethics Committee in August 2015 followed by National Ethical Approval December 2015 by South Central Hampshire B search Ethics Committee; REC reference 15/SC/05/06.

Consent for publication

Not applicable

Availability of data and material

Not applicable

Competing interests

No competing interests

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Authors' contributions

Vanora A. Hundley and Gill Walton conceived the study and secured funding for the work. Daisy Wiggins, Vanora A. Hundley, Carol S. Bond and Carol Wilkins were responsible for the drafting of the protocol for which all the authors contributed to the final version.

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Not applicable

REFERENCES

1. National Health Service England. *Shared Decision Making*. NHS England, 2006. Available from: https://www.england.nhs.uk/ourwork/pe/sdm/. Accessed 28 December 2016.
2. National Institute of Care Excellence. *Patient Experience in Adult NHS Services*. NICE.ORG, 2012. Available from: https://www.nice.org.uk/guidance/qs15/chapter/quality-statement-6-shared-decision-making. Accessed 28 December 2016.
3. Department of Health. *Equity and Excellence: Liberating the NHS*. Department of Health, 2010. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213823/dh_117794.pdf. Accessed 26 July 2016.
4. Tupara H. Facilitating functional decision making in midwifery lessons from decision theory. *New Zealand College of Midwives Journal* 2008;38(2):7.
5. Nunes V, Neilson J, O'Flynn N, Calvert N, Kuntze S, Smithson H, et al. *Clinical Guidelines and Evidence Review for Medicines Adherence: Involving Patients in Decisions About Prescribed Medicines and Supporting Adherence*. London National Collaborating Centre for Primary Care, Royal College of General Practicitioners, 2009. Available from: https://www.nice.org.uk/guidance/cg76/evidence/full-guideline-242062957. Accessed 14 Septemeber 2016.
6. Houghton G and Lavender T. Factors influencing choice in birthplace, an exploration of the views of women, their partners and professionals. *Royal College of Midwives* 2008;2:1. Available from: https://www.rcm.org.uk/learning-and-career/learning-and-research/ebm-articles/factors-influencing-choice-in-birth-place-%E2%80%93. Accessed 11 December 2016.
7. National Childbirth Trust. *Location: Making Choice of Place of Birth a Reality*. London, UK: National Childbirth Trust, 2009.
8. Gretton C and Honeyman M. *The Digital Revolution: Eight Technologies That Will Change Health and Care*. The Kings Fund, 2016. Available from: https://www.kingsfund.org.uk/publications/articles/eight-technologies-will-change-health-and-care. Accessed 11 December 2016.
9. Rupert D, Squiers L, Renaud J, Whitehead N, Osborn R, Furberg R, et al. Communicating risk of hereditary breast and ovarian cancer with an interactive decision support tool. *Patient Education and Counselling* 2013;92(2):188–96. Available from: http://www.sciencedirect.com/science/article/pii/S0738399113001663. Accessed 11 December 2016.
10. Shorten A, Shorten B, Keogh J, West S and Morris J. Making choices for childbirth a randomised control trial of a decision aid for informed birth after caesarean. *Birth* 2005;32:4. Available from: http://onlinelibrary.wiley.com/doi/10.1111/j.0730-7659.2005.00383.x/abstract;jsessionid=F835404A3EFE5D2CAA9C149E9A08D196.f01t04?deniedAccessCustomisedMessage=&userIsAuthenticated=false. Accessed 11 December 2016.
11. Montgomery A, Emmett C, Fahey T, Jones C, Ricketts I, Patel R, et al. Two decision aids for mode of delivery among women with a previous caesarean section: a randomised controlled trial. *BMJ* 2007;23:334. Available from: http://www.ncbi.nlm.nih.gov/pubmed/17540908. Accessed 28 December 2016.
12. Frost J, Shaw A, Montgomery A and Murphy D. Women's views on the use of decision aids for decision making about the method of delivery following a previous caesarean section: qualitative interview study [online]. *BJOG* 2009;116:7. Available from: http://www.ncbi.nlm.nih.gov/pubmed/19385964. Accessed 17 November 2016.
13. Schoorel E, Vankan E, Scheepers H, Augustijn B, Dirksen C, Koning M, et al. Involving women in personalised decision making on mode of delivery after caesarean section: the development and pilot testing of a patient decision aid. *BJOG* 2013;121:2. Available from: http://www.ncbi.nlm.nih.gov/pubmed/24373594. Accessed 11 May 2016.
14. Eden K, Perrin N, Vesco K and Guise J. A randomised comparative trial of two decision tools for pregnant women with prior caesarean [online]. *Journal of Obstetrics Gyneacology and Neonatal Nursing* 2014;43:5. Available from: http://www.ncbi.nlm.nih.gov/pubmed/25123822. Accessed 11 May 2016.
15. Bjorklund U, Marsk A, Levin C and Ohman S. Audiovisual information affects informed choice and experience of information in antenatal down syndrome screening—a randomised controlled trial. *Patient Education and Counselling* 2012;86:390–5. Available from: http://www.ncbi.nlm.nih.gov/pubmed/21807474. Accessed 11 December 2016.
16. Nassar N, Roberts C, Raynes-Greenlow C, Barratt A and Peat B. Evaluation of a decision aid for women with breech presentation at term: a randomised control trial. *The International Journal of Obstetrics and Gynaecology* 2016;10(2):326.
17. Dugas M, Shorten A, Dube E, Wassef M, Bujold E and Chaillet, N. Decision aid tools to support women's decision making in pregnancy and birth: a systematic review and meta-analysis.

Social Science and Medicine 2012;7(2). Available from: http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0048018/. Accessed 11 December 2016.

18. Which, WhichBirthChoice. 2016. Available from: http://www.which.co.uk/birth-choice. Accessed 11 December 2016.
19. Gaskell E, Walton G, Forrester M, Grosvnor M, Phillips D, Rees J, et al. MyBirthplace—an app to support shared decision making. *International Journal of Integrated Care* 2014;14. Available from: http://ijic.ubiquitypress.com/articles/10.5334/ijic.1789/galley/2614/download/. Accessed 11 December 2016.
20. Birthplace in England Collaborative Group. Perinatal and maternal outcomes by the planned place of birth for healthy women and low risk pregnancies: the birthplace in England national prospective cohort study. *BMJ* 2011;2:343. Available from: http://www.bmj.com/content/343/bmj.d7400. Accessed 11 December 2014.
21. Hampshire County Council, *Social and Deprivation Analysis*. 2015. Available from: http://documents.hants.gov.uk/Economy/Income.pdf. Accessed 17 February 2017.
22. UKPopulation. Population of Portsmouth in 2016, 2016. Available from: http://ukpopulation2016.com/population-of-portsmouth-in-2016.html. Accessed 17 February 2017.
23. Walton G. *Nurturing Maternity Service Development*. Portsmouth Hospital NHS Trust, 2011. Available from: http://democracy.portsmouth.gov.uk/Data/Health%20Overview%20&%20Scrutiny%20Panel/20110913/Agenda/hosp20110913AI7maternity.pdf. Accessed 17 February 2017.
24. Griggs C, Tracy S, Daellenbach R, Kensington M and Schmied V. An exploration of influences on women's birthplace decision making in New Zealand: a mixed methods prospective cohort within the evaluating maternity units study. *BMC* 2014;14(2):10. Available from: http://www.biomedcentral.com/1471-2393/14/210. Accessed 17 February 2016.
25. Murray-Davis B, Macdonald H, Reitsma A and Coubrough M. Deciding on home or hospital birth: result of the Ontario choice of birthplace survey. *Midwifery* 2014;30:7. Available from: http://www.ncbi.nlm.nih.gov/pubmed/24613009. Accessed 17 February 2017.
26. Raynes-Greenlow C, Nassar N, Torvaldsen S, Trevena L and Roberts C. Assisting informed decision making for labour analgesia: a randomised controlled trial of a decision aid for labour analgesia versus pamphlet [online]. *BMC Pregnancy and Childbirth* 2010;10(15):6. Available from: http://www.biomedcentral.com/1471-2393/10/15. Accessed 11 November 2014.
27. Palinkas L, Horwitz S, Green C, Wisdom J, Duan C and Hoagwood K. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health* 2013;42(5):533–44. doi: 10.1007/s10488-013-0528-y.
28. O'Connor AM. Validation of a decisional conflict scale [Online]. *Medical Decision Making* 1995;15(1):23–30. Available from: http://www.medscape.com/medline/abstract/7898294. Accessed 10 October 2016.
29. O'Connor A. *Stage of Decision Making* [Online]. Ottawa Hospital Research Unit, 2000. Available from: www.ohri.ca/decisionaid. Accessed 11 July 2014.
30. Grant FC, Laupacis A, O'Connor AM, Ruben F and Robblee J. Evaluation of decision aid for patients considering autologous donation of blood before open heart surgery. *CMAJ* 2001;164(8). Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC80970/#r11-21. Accessed 10 October 2016.
31. Anderson T and Kanuka H. On-line forums: new platforms for professional development and group collaboration. *Journal of Computer Mediated Communication* 1988;3(3). Available from: http://onlinelibrary.wiley.com/doi/10.1111/j.1083-6101.1997.tb00078. Accessed 4 April 2014.
32. Pearson M and Marshall J. Exploring father's influence on their partner's choice regarding place of birth. *MIDIRS Midwifery Digest* 2014;24(2):171–78.
33. Greasley P. *Quantitative Data Analysis Using SPSS an Introduction for Health and Social Science*, 2nd edition. Maidenhead, UK: Open University Press, 2008.
34. Sullivan L. *Nonparametric Tests*. Boston University. Available from: http://sphweb.bumc.bu.edu/otlt/MPH-Modules/BS/BS704_Nonparametric/BS704_Nonparametric_print.html. Accessed 17 February 2017.
35. Boyatzis RE. *Transforming Qualitative Information: Thematic Analysis and Codedevelopment*. Thousand Oaks, CA: Sage, 1998.
36. Cheyney MJ. Homebirth as a systems-challenging praxis, knowledge, power, and intimacy in the birthplace. *Qualitative Health Research* 2008;18(2):254–67.
37. Coxon K, Sandal J and Fulop N. To what extent are women free to give birth? How discourses of risk, blame and responsibility influence birth place decisions. *Health Risk and Society* 2012;16(1):11. Available from: http://dx.doi.org/10.1080/13698575.2013.859231. Accessed 17 February 2017.
38. Madi B and Crow R. A qualitative study of information about available options for childbirth venue and pregnant women's preference for a place of delivery. *Midwifery* 2003;19(4):328–36.
39. Sandall J, Soltani H, Gates S, Shennan A and Devane D. Cochrane review: Midwife-led continuity models of care compared with other models of care for women during pregnancy birth and early parenting. 2016. Available from: http://www.cochrane.org/CD004667/PREG_midwife-led-continuity-models-care-compared-other-models-care-women-during-pregnancy-birth-and-early. Accessed 11 August 2017.
40. Mold F, Ellis B, De Lusignan S, Sheikh A, Wyatt J, Cavill M, et al. The provision and impact of online patient access to their electronic health records and transactional services on the quality and safety of health care: systematic review protocol. *Informatics in Primary Care* 2012;20:271–82. Available from: https://hijournal.bcs.org/index.php/jhi/article/view/17/11. Accessed 5 September 2017.