Internet-mediated research: a reflection on challenges encountered and lessons learnt

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Abstract

Background. The internet is an exciting and relatively new medium for conducting midwifery research that, to date, only a few midwifery researchers have embraced. The different methodologies used in internet-mediated research (IMR) gives rise to additional challenges for researchers.
Aim. This paper aims to provide a personal reflection on some of the challenges encountered and lessons learnt by one researcher who utilised a multi-method IMR research strategy for a doctoral research project.
Method. The researcher's experience is presented as a case study from data that were collected from a reflective journal. Using a first-person writing style, alongside confessional and creative non-fiction vignettes, the author will reflect and discuss challenges encountered and lessons learnt, while using web-based questionnaires and asynchronous online focus groups to conduct a mixed-methods IMR research study.
Results. Challenges to using the internet to facilitate health research include ethical, technical, and methodological issues. The researcher's sustained passion for the topic and the novel methodology provided encouragement to explore ways to manage, resolve, and learn from such challenges.
Conclusion. Advances in technology, such as the internet, have extended opportunities for research. Many of the issues reported in this paper are transitional in nature due to the rapid pace of technological development. Significant lessons were learnt that will enhance the researcher's future research efforts and may help other researchers who decide to use a similar approach for their own research project.

*Key word*s: Internet-mediated research, reflection, challenges, lessons learnt, evidence-based midwifery

Introduction

The internet has become an important form of communication in modern society, with the latest figures showing almost 1.7 billion people in the world have internet access (Internet World Stats, 2010). Not only has the internet become an everyday communication tool for countless people, but it also offers many new ways of conducting quantitative and qualitative research (Pittenger, 2003; Rhodes et al, 2003). One-to-one interviews can be conducted via email or chat rooms, virtual focus groups can be conducted by email, chat rooms or discussion groups/forums and questionnaires can be administered by email, discussion forums or on the worldwide web.

Although data collected by online methods can be rich and valuable, to date, only a few midwifery researchers have embraced this medium for conducting research. The challenge for researchers is to learn to use this medium to their best advantage. However, this can be difficult as internet technology is changing rapidly and 'present' literature (books in particular) on internet-mediated research (IMR) date quickly.

This paper aims to provide a personal reflection based on one researcher's experience who utilised a multi-method IMR strategy for a doctoral research project. The researcher's experience is presented as a case study from data that were collected from a reflective journal. Finlay (2002) suggests that personal and methodological reflexivity should be included as a general element of integrity in the research process and without it, the validity of the research could be undermined. It is not the intention of this paper to focus on the advantages and disadvantages of IMR. Using a first-person writing style alongside confessional and creative non-fiction vignettes, the author will reflect and discuss some of the challenges encountered and lessons learnt, while undertaking a research project that employed this methodology. The author makes no apologies for utilising the first-person narrative, as authors such as Fulbrook (2003) recommend it when giving a personal 'reflection'. To preserve confidentiality, pseudonyms have been used throughout the text.

Background

The rationale for undertaking any research is to extend knowledge and understanding (Rees, 2003; Polit, 2006). This study was advertised by the University of Ulster's, Institute of Nursing Research and built on previous research conducted by Professor Marlene Sinclair and Professor George Kernohan. They advertised the study as a Department for Employment and Learning funded, full-time, three-year PhD. I was personally motivated to apply for the study as I had clinical experience of women coming to antenatal consultations with internet printouts and this research matched my personal, professional, and academic interests. I too wanted to know and understand why women were seeking information online, what kind of information was being sourced, and what type of websites women actually selected. As Louis Pasteur stated, '*to know how to wonder*

and question is the first step of the mind towards discovery' (cited by Yang, 2006).

The aim of the overall study was to investigate women's use of the internet in pregnancy and the effect it had on their decision-making and midwifery care. The study involved developing and conducting a three-phase sequential exploratory investigation using a multi-method IMR strategy to provide a coherent and rich picture of pregnant women's use of the internet in pregnancy. A sequential approach is ideal when one phase can contribute to the next phase and enhance the entire study (Creswell et al, 2004).

In phase one, a convenience sample of 303 international midwives completed a web-based questionnaire designed to explore midwives' attitudes, experiences and perceptions of women using the internet and whether or not they perceived the internet affected pregnant women's decision-making. Theoretical principles underpinning information-seeking behaviour and outcomes from phase one were synthesised to formulate a second web-based questionnaire designed to explore pregnant women's use of the internet. A convenience sample of 613 international women who were pregnant or had had a baby in the previous year participated in a web-based survey. In phase three exploratory, confirmatory online focus groups (n=13) enabled the researcher to confirm the essential theoretical structure of the decision-making processes of pregnant women who sought information from the internet.

This doctoral study was guided by my enthusiasm for the subject and self-motivation. I treated it as a job. Like any job, one has a role to play and goods to deliver. The goods were to fulfil the aims and objectives of the project and the roles included:
• Planning the project
• Determining the research plan
• Conducting the research
• Reporting and disseminating the results.

The following paragraphs will demonstrate how other attributes came into play such as the ability to make decisions, design, negotiate, moderate, facilitate and problem solve when I was faced with ethical, methodological and technological challenges when utilising a multi-method IMR strategy for a doctoral research project.

Challenges encountered

Challenge 1: ethical approval
Researchers frequently encounter ethical challenges when planning and undertaking research. My first main challenge was obtaining ethical approval. After months of planning, the study was first processed and approved through the University of Ulster Research Governance Filter Committee. The proposal was then presented to the Office for Research Ethics Committees Northern Ireland (ORECNI). ORECNI asked for the protocol to be strengthened with the justification for the non-inclusion of non-English speaking participants, and to reflect that this had been considered. In response to this request, the following statement was added to the protocol and was received favourably by ORECNI: '*...according to Buncombe and MacArthur (1999) within London alone, 300 different languages are spoken regularly. The choice to not*

have the online questionnaire translated into different languages was in part determined by the resources available to the researcher, the time period and funding available for the research and also it would not be feasible or practical to administer the questionnaire online in 300 languages and it was envisaged that only women who can read and understood English would actually access the questionnaire.'

Following ORECNI approval, I was able to proceed to the third part of the ethical review process. As I had decided to conduct the first part of the pilot studies for both phases one and two within two local Trusts, the proposal then had to be reviewed by each of these Trusts' research and governance committees. This is when my first real challenge began. I wrote to both Trusts' research governance committees. For one Trust, once they received a copy of the letter from ORECNI, I was granted permission to proceed with the pilot study. However, the second Trust's research governance procedures proved to be more of a challenge. The process took four months and involved completing seven different forms for each phase and an application form for an honorary contract. Completion of the forms was relatively easy, but the problem was the timeframe between when each form was forwarded, to it being approved by the Trust's research and development committee and the next form being sent. The process took so long that when it came to undertaking the pilot for the women's survey (phase two), I had less than 72 hours to conduct the pilot as my honorary contract would then expire. This meant I would not have been allowed to start recruitment without putting in an application for an extension, which I was very much reluctant to do, because of the time taken to get through the process initially. Following negotiating and explaining my circumstances to the midwifery sister in the antenatal clinic, she kindly arranged for me to attend the antenatal clinic sessions the following two days where I was able to pilot the questionnaire.

Challenge 2: instrumentation
During the pilot of phase one, when the questionnaire was sent out as an email attachment, some of the questionnaires were returned incomplete and some midwives identified that they did not receive the instrument in its original format, for example, tick boxes were missing. I then learned email questionnaires could only be accurately reproduced on every email system, regardless of the program, if 'simple text' was used. However, using 'simple text' allows recipients the possibility to reformat the questionnaire, which can result in reliability and validity issues. Once this problem was highlighted, I was no longer in favour of using the email mode and decided after further reading about online survey research to opt for using web-based questionnaires for the first two phases of the study. Although there are many advantages to web-based questionnaires compared to email-based questionnaires, with the web-based mode came further challenges.

IMR was relatively new to the midwifery/nursing department within the university. As I did not possess the skills to design and develop an IMR-based study, I had to seek assistance. First, I attended a short course on designing web-

surveys and read numerous papers in the literature providing guidance to researchers on the 'dos' and 'don'ts' derived from the experience of other researchers who have designed online questionnaires, such as Peytchev et al (2006), Dillman (2007), Tourangeau et al (2007), Toepoel et al (2009). However, as Madge et al (2006) point out the massive range of purposes of questionnaires and diversity of the populations to be studied mean that there is no single design approach that is appropriate for all online surveys.

In the first instance, I had to choose software for online questionnaire production before a web-based prototype of the questionnaires could be designed. Once the questionnaires were designed, I then required a website to host the survey that would be accessible to potential participants nationally and internationally. Next, I had to consider survey sampling and recruiting methods and, finally, when I would activate and how I would manage the surveys.

Much of the literature advised seeking technical help to gain practical advice and support. Following numerous emails, telephone calls and with perseverance, I obtained technical support from a web design technician. The assistance of the technician was invaluable. He explained the interface of the chosen software, and procedures for creating and managing the questionnaire. He also taught me how to design the web questionnaires using new software that had just been purchased by the university faculty. Once I had designed the questionnaires, the technician assisted me at each phase with hosting the questionnaire onto a webpage specifically designed for the study, with its own unique uniform resource locator (URL) address. He showed me how to activate the study and how to download the data in a format that could be easily imported into the statistical analysis package I planned to use.

Challenge 3: cross-cultural differences
As this was a global study, cross-cultural differences had to be considered. I had to bear in mind individual countries had different healthcare systems and maternity care/delivery models. Practical issues, such as using terminology and spellings that would be understood by all participants also had to be considered. Despite piloting the questionnaires internationally prior to undertaking the main study, I was still met occasionally with the challenge of having to consult international colleagues working within maternity services to clarify statements or terminology participants had used when answering the open-ended questions within the questionnaires.

A further cross-cultural difference was time zones. Although using online asynchronous communication to conduct online focus groups, where communication can take place at different times or over a certain period of time gave the study participants more flexibility, compared to synchronous communication where communication takes place at the same time, this placed a greater responsibility on the researcher. In order to successfully participate in online focus groups, the researcher must be well organised, self-motivated, and possess a high degree of time management and moderating skills to keep up with the pace of the discussion and to ensure that the focus of the discussion remains on tar-

get. This was especially challenging when the focus groups were in geographic regions where there was a vast time difference between the UK, for example, Australia.

Challenge 4: data transmission
In the first survey (the midwives' phase), the data were downloaded into Excel and then the Statistical Package for Social Sciences version 14 (SPSS, 2005) without any 'hitches'. However, when it came to the women's survey, there were twice as many questionnaires and this caused a major problem. The system only allowed 30 seconds for download, my data were taking much longer and I kept getting the message: '*Fatal error: maximum execution time of 30 seconds exceeded… '*. I was naturally concerned I had all these data sitting in a system that I could not access. I could visually see the data, it was not lost, but if I did not get the data to download I would have to manually enter it from the 613 questionnaires one-by-one into SPSS. Time was running out and I knew I would not have the time to do this and I needed to analyse the data from the survey before I could proceed with the focus groups. The team that managed the software were reluctant to reset the maximum execution time beyond the 30 seconds, because they had concerns that computer hackers could get into the system. After several negotiations, it was agreed they would extend the download time at 02:00 one morning (when they envisaged there would be less users on the system) to allow the data enough time to be exported from the survey package to a Microsoft Excel/CSV files spreadsheet from where I could then download into SPSS for data analysis.

Challenge 5: disclosures
Researchers have no control over what information participants disclose. In phase two, one woman mentioned in her web questionnaire searching the internet for information on cannabis use in pregnancy. I had to hope the woman would avail of information that I had supplied within the questionnaire homepage, which provided links to validated websites, one of which provided information on illicit drug use in pregnancy.

During the pilot study of the online focus groups (phase three), one of the participants 'Sarah', in her welcoming message mentioned that she had a stillbirth eight days previously', "*but would like to participate in this research if everyone is comfortable with that. I don't believe in burying my head in the sand and am trying to be as 'normal' as possible*". One of the six principles of research ethics is harm to research participants must be avoided (National Research Ethics Service, 2009). I was faced with the ethical dilemma: should Sarah be excluded from the group in which case there was a possibility that this could add to her distress at a difficult time, or let her participate, which could have implications for the other participants. As Sarah had already voiced her willingness to participate and as long as the remaining participants were happy, the decision was made in consultation with the chair of the university's ethics committee and a member of ORECNI to let Sarah remain in the group and let the other group members opt out if they

felt uncomfortable. In addition, and similar to phase two of the study, I also developed a link within each focus group homepage to a webpage that contained information on support groups that vulnerable women could avail of.

Lessons learnt

There were a few lessons learnt during the project. The first one being, with hindsight due to the length of time it took to get through the research governance procedures for one of the Trusts and the methodology being utilised. I should have focused on obtaining a sample for the pilot of the web-based questionnaires online, as I still had to conduct a second pilot for both phases one and two to test the feasibility of accessing the questionnaire via a URL address using different computer types and international sites/settings. However, there was an advantage of conducting the pilots within the two local Trusts as it provided the opportunity to gain a local perspective on women's use of the internet in pregnancy.

One key success factor in web-based research is choosing the right software package to program the survey. Releasing an online survey is not as simple as creating a questionnaire in Microsoft Word, copying it to a website and then sending around the URL address. Any data entered into the questionnaire has to be passed to a database somewhere. I was fortunate to have had access to a simple-to-use software package that fulfilled all my requirements. However, I was the first person to use the software in the university so in essence I was piloting a new system and therefore problems like the download perhaps I should have anticipated.

When choosing a software package, ensure it allows a copy of the completed web questionnaires and online focus group responses to be sent to an email account, so there is a back-up copy of each submission in the event of there being problems accessing the data collected via the databases. I was fortunate that I did not lose any data; however, previous researchers using IMR have not been so lucky, such as Braithwaite et al (2003) who suffered a technical error with the server they were using, resulting in the loss of some data. By having a back-up copy of the completed web questionnaire sent to an email account, it also allows the researcher to check that the data received are exactly what were submitted to the database. This is another check to ensure the reliability of the system being used.

Current online survey products and services can vary considerably in terms of available features, consumer costs, and limitations. At the time when the study was undertaken, I was not familiar with any web survey software that permitted online surveys to be published in different languages. However, with the advancement of emerging language technology, there are now software packages available that allow the automatic translation of web-based questionnaires into different languages and are able to create one report that includes all responses. I envisage if I was to give the explanation that I gave to ORECNI for not including non-English speaking participants today, it would be challenged. However, as Day (2009) points out, conducting a global multi-language survey brings with it its own challenges that need to be addressed, especially in relation to ambiguity. With the possibility of

having potential respondents from many different countries accessing and completing a web survey, the researcher must ensure the questionnaire undergoes linguistic and cultural validation to ensure it is valid for extensive use in different cultures, for example, occasionally the same words can have different connotations for different cultures.

I took for granted that all websites had a website counter that would have provided a 'count' of the number of 'hits' the two individual websites had when the web surveys went live. It was only when I asked for the number of hits to the sites that I realised that the individual sites I had used could not record the number of visitors. This is something I will consider when I undertake any future online surveys especially when I now realise there are services that provide a free website counter and have free built-in statistics facilities.

Many of the issues and problems of conventional research methods still apply in the virtual field (Madge et al, 2004). As Duffy (2002: 87) points out: '*Experimenting with this new methodology requires understanding how to use the strengths of web-based research and to compensate for its limitations*.' Conducting a pilot study is a crucial element of a good study design, as it may provide an insight into where the main research project could fail, where research protocols may not be followed, or whether proposed methods or instruments are inappropriate (Oppenheim, 2000; Hundley and van Teijlingen, 2002). Piloting is of increased significance in IMR because if the researcher acts too quickly, the result can be disastrous, as a poorly designed study can be sent around the globe at the click of a button. However, as identified in this paper even with pilot studies and the best planning, the unexpected can still happen. Like any researcher, midwifery researchers have a responsibility to anticipate problems and, insofar as is possible, to resolve them without harming the research participants. We should endeavour to protect the physical, social and psychological wellbeing of those whom we study.

Having had the experience of using both traditional methods of data collection and online data collection tools, I would concur with Gunn (2002) that there is no other method of collecting survey data that offers so much potential for so little cost as IMR. Using an online medium to conduct research enabled the researcher to obtain a global and diverse group of participants and present a cross-cultural dimension. As there is so little up-to-date information on conducting IMR, a lot of the learning was self-taught as I went along. Research is about problem-solving and there will always be problems to be solved.

Motivational feedback

This research project was filled with highs and lows, tears and laughter, late nights and early mornings. However, my commitment to learn and personal vision to produce a quality research project that was innovative and exciting and would add to knowledge, all contributed to my determination to accomplish my goals. I was and continue to be passionate about my research topic and methodology. It was also reassuring when others felt the same. Feedback from research participants, research and midwifery colleagues, conferences and seminar presentations provided me with the

reassurance that others also felt that this was a topic and methodology worth exploring. For some midwives it made them reflect. For example, a community midwife from Scotland wrote:

"Congratulations for coming up with such a good topic… I may have to rethink my practice and broaden my outlooks. No one is ever too old to learn new things."

And a midwife from New Zealand wrote:

"This survey has made me aware of the power of the internet. I have not previously followed up information that clients have talked about. I shall in future make a point of asking clients their information source and follow it up."

Even some of the women who participated in the focus groups wrote positively of their experience in participating: *"Thank you for allowing us to answer these questions at our pace and read the responses of the others in our group. I am a mother of five-month-old fraternal twins, so if you have any focus groups for twins I would love to take part!"* (Becca, US).

Staying focused and motivated was never a problem as the topic was stimulating and IMR not only provided me with a whole range of new technical and research skills, but also brought with it unique experiences. For example, during the online focus groups one of the participants moved house, but still made a huge effort to contribute to the focus group discussion and two of my antenatal participants became mothers and also continued to participate in the online focus group discussion. I cannot visualise that being possible within the traditional face-to-face focus group setting!

Conclusion

This paper has provided a personal reflection and discussed challenges encountered and lessons learnt while using web-based questionnaires and asynchronous online focus groups to conduct a mixed methods IMR study. My doctoral journey was a journey of discovery both professionally, personally and academically. There is no doubt that research is demanding and brings with it highs and low. As a novice researcher, I learnt how important it is to be passionate about your research topic. My passion for the topic and the novel methodology maintained my enthusiasm about the project and gave me encouragement to explore ways to manage and resolve challenges. Researchers must not become disillusioned when problems become frustrating. Problems are part of the research process. Be persistent and resilient. Do not be afraid to ask and seek support from others with skills and expertise where and when necessary. A final word of advice, focus on the highs, the lows will pass.

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