CITY UNIVERSITY LONDON

Point of Conception: A study of women’s information behaviour during pregnancy

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January 2016

Submitted in partial fulfilment of the requirements for the degree of MSc in Information Science at City University London.

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1. Abstract

Women who stay informed throughout their pregnancy have the opportunity to have the best health outcomes for themselves and their baby. In the UK women use a variety of information systems, and rely heavily on the resources provided by the NHS. With a myriad of sources available to pregnant women, it is important to see how well their chosen resources meet their information needs. The focus of this dissertation is to understand what causes pregnant women to search for information and how they reach a satisfactory conclusion to their information needs. This dissertation met the research aims through a mixed method research approach which included a survey and in-depth interviews of women who were pregnant in the UK in the last five years. The research provided a number of key findings: women conduct general preparatory research over the course of their pregnancy using a small number of trusted resources; commonly new information needs were provoked by interactions with physicians or midwives; unexpected events such as complications triggered the most intensive periods of research; women had a greater number of information needs during pregnancy and typically adapted their pre-pregnancy information behaviour to satisfy these needs; while women sought out scientifically-backed information, their emotions strongly influenced whether they decided to trust new sources. The main conclusion drawn from this research was the importance of midwives as information providers to facilitate healthy information searching. The midwife is perfectly positioned to verify the vast amount of pregnancy-related information women access and can help them answer queries quickly.

Key words: information behaviour, pregnant women, midwives, NHS antenatal care
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To borrow an appropriate metaphor, writing this dissertation felt at times like I raising a child that is now set free into world. The love and care that I’ve put into this work would not have been possible without the support and help many dear ones.

Thank you to: my supervisor, Prof David Bawden, for your guidance, advice and encouragement throughout my writing. Phil for coaching me and providing me with the nurturing environment I needed to write. And my editors – Erin and Dad – for whipping it into shape.

To the wonderful women who I interviewed, thank you for opening up and sharing about such a personal time. I wish you joy with the beautiful beings you created.

And to my own spark of inspiration – Orson you gave me all the smiles I needed to remember why this was so important for me to write.
5. Introduction

Pregnancy is a time of continual physical change and preparation for a woman. Throughout the course of their pregnancy, women in the UK will have access to a wealth of information ranging from regular updates on the fetal development to how to care for the baby in the first weeks following birth (NICE, 2008). The woman will start to make decisions over the nine months ranging from how they will feed their baby to the level of intervention they will accept in the delivery room. The rapid physical change and influx of information marks a period of discovery and learning, but it can also signify stress and anxiety from perceived information gaps (Case, 2002).

For pregnant women in the UK, there are a myriad of sources readily available through the National Health Service (NHS) and public libraries. These include brochures and magazines from the NHS, books, websites, apps, antenatal classes, midwives and General Practitioners (GPs), and friends and family (Chezem, Friesen and Clark, 2001; Johnson, 2014; Luyben and Fleming, 2005).

Because of this growing pool of accessible information, pregnant women are expected to assume the role of an “expert patient”, keeping abreast of the current studies and advice to achieve optimum health (Johnson, 2014). What lies amongst all of these resources though are differing opinions and advice about how to lead a healthy pregnancy. The multitude of sources pregnant women have access to because of the internet and mobile devices can inundate them with conflicting information as well as options and opinions presented as facts or truths. Studies show that access to high volumes of information causes information overload and anxiety (Weston and Anderson 2014; Case, 2012). People cope with this overload through a variety of methods, most of which are some form of information avoidance (Case, 2012). This response however can have adverse consequences for pregnant women who need to stay informed throughout their pregnancy in order to improve their health outcomes (Shieh, McDaniel and Ke, 2009).
How do women strike a balance between needing information and filtering out the cacophony of excess information made available to them? Can they satisfy their information needs in a healthy and productive manner during a pregnancy? Once a search begins, how many sources are needed for a woman to feel that she has enough information to answer her query? Within that search, how many sources did it take to reach a conclusion? This is a study about the journey pregnant women take from the inception of an information need to the finding of a satisfactory answer.

The majority of information behaviour studies on pregnant women have focused on the sources the women used. This study will look at the women’s information behaviour over the entire pregnancy and will look to understand what caused them to search for information and to see how they meet their information needs.

The research will help to inform ways to improve systems that exist to provide pregnant women with relevant information. In the UK the core information service for pregnant women is embedded in the NHS’s antenatal care pathway. As maternity services continue to face budget cuts, it is important to understand how women utilise this service, from the brochures and NHS Choices website to the appointments and antenatal classes. In particular, recent budget cuts have put huge pressure on the time and quality of care midwives can offer their patients, which degrades the relationship of the primary information source: the midwife (Royal College of Midwives, 2015). Learning how or if pregnant women use their midwife and other NHS offerings to satisfy information needs can provide evidence to support future funding decisions.

A closer look at the midwife/patient relationship can also provide insight into how a patient’s emotional state and/or reactions at an appointment influences how receptive they are to accepting information given by their midwife. If patients would rather accept information they find themselves over their expert medical staff’s advice, then there are potential issues of trust within the doctor/patient relationship. This study is focussing on one cohort of patients: pregnant women under the care of a midwife and/or GP, and can potentially add to understanding how long-term doctor/patient relationships can improve patient use of information available from their physician.
As Bawden and Robinson point out, “without reliable knowledge of the way in which people find and use information, provision of effective services can be based only on guesswork and prejudice” (2012). This study will contribute to the existing body of pregnancy information behaviour research, in the hopes of providing more reliable evidence to improve the services women elect to use and trust during their pregnancy.

5.1 Outline

Following the introduction are the research aims and questions, methodology and scope and definitions. The literature review summarises past information behaviour studies related to pregnancy to show the current understanding in this domain. The literature review also explains how Brenda Dervin’s Sense-Making information behaviour theory provided the theoretical framework for this study.

The research findings from the survey and interviews are detailed in separate sections. The discussion interprets these findings and analyses the research in view of the research questions, and it includes additional findings that were outside of the proposed questions.

Finally, the conclusion summarises the key findings and provides recommendations to extend the work of this study.
6. Research Aims and Questions

This dissertation aims to find out what causes women to search for information during pregnancy, and how they reach a satisfactory answer to their information needs. The aim can be broken into two areas: what are the triggers for information search and how is the search determined to be answered/complete. The research questions for the aims are as follows:

What triggers a pregnant woman to perceive a knowledge gap?

- Is it more common for women to search for information because an external source identifies a need or are they reacting to internal, biological changes?
- For external triggers, are these more often from personal encounters or from reading material?
- Which knowledge gaps do pregnant women choose to react to? Are they selective or do they generally respond to them all?

How do pregnant women determine when they have reached a satisfactory level of knowledge?

- How many different sources do they use to reach a satisfactory answer?
- What are the means for measuring satisfaction – do they have logical criteria or is it more emotionally (‘gut’) based?
- Would one search affect the next; if they spend a long time searching on one aspect of their pregnancy, are they learning from that process or repeating it again when they have another question?

The project will look to answer these questions through research, a survey and interviews.
7. Methodology

This study uses a mixed method research approach which includes a qualitative online survey and quantitative interviews. The survey was constructed first and the interviewees were selected from survey volunteers.

This approach was chosen because it provided the richest data set, with the survey answering specific portions of the research questions and the interview answering the remainder. As Hesse-Biber argues in *Mixed Methods Research: Merging Theory with Practice*, using surveys and interviews allows the researcher to “enhance the credibility of the research findings”, “gain a fuller understanding of the research problem [...] to clarify a given research result”, while “the results from one method...help develop or inform the other method” (2010). These two different data sets informed different facets of the research aims. Combining the survey and interviews allowed for an in-depth exploration of the research questions.

In addition, Brenda Dervin explains with Sense-Making research the need to acquire both qualitative and quantitative information within the research. This is because of the nature of her information behaviour model, which looks at both the information systems and the personal responses to the systems (Dervin, 1983). She states, “In the argument between qualitative and quantitative approaches to research, sense-making likewise refuses to choose a side. It is explicitly both qualitative and quantitative” (Dervin, 1992).

Dervin devised a “Sense-Making triangle” of questions that must be examined: “1) what happened in the situation?, 2) what gaps were present in the situation?, and 3) what helps were sought?” (Dervin, Harpring and Foreman-Wernet, 1999). In order to answer these questions fully, Dervin describes a research approach that requires both qualitative and quantitative data. The mixed-methods research for this study was structured in order to meet this need, with the survey collecting primarily quantitative data and the semi-structured interviews elaborating on this data with qualitative data from a smaller segment of the respondents.
7.1 Survey

The online survey provides the core quantitative data for this study. There were 22 questions that varied from yes/no, multiple choice, multi-selection and three optional open-ended questions for participants to add comments. The survey questions were designed to first screen the women for eligibility to participate in the study. Suitable candidates then moved into general questions about their last pregnancy before delving into their information behavioural practices during that pregnancy. Appendix III has the complete survey questions and response options.

The survey ran in two stages; the pilot survey ran until there were 20 responses, from 7 July to 9 July 2015 (2 days, 22 responses). The questions were then amended to include an “other” open-response field for some of the multiple choice questions and two “additional comments” sections after questions 19 and 20. The ratings system in question 19 was also changed from 1-to-5 to 0-to-5. Because these were minor changes, I included the beta results with the final survey results.

The final survey ran until I reached (and surpassed) 100 responses, from 10 July to 18 August 2015 (40 days, 173 responses). The survey was administered on Google Forms and promoted online through the dissertation’s bespoke website, email, Twitter, Facebook, and two popular online forums, MumsNet and NetMums. The final question encouraged participants to share the survey which helped it reach a wider audience. The total response rate was 173 women. Of these, five did not give birth through the NHS and so the final number of responses analysed was 168. All interviewees were volunteers from the final survey.

7.1.1 The questions

The initial questions in the survey screened the respondents to ensure they were eligible to participate in the study. These questions were used to verify that the respondents had given birth in the UK in the last five years through the NHS (versus privately). Then basic questions were asked about the women’s pregnancy to determine if this was a first pregnancy, where they gave birth (labour ward, birth centre, home or
C-section), and if there were any complications or high risk factors to the pregnancy. This provided context for later analysis of the responses. For example, high risk and complications in pregnancies will escalate the woman’s care to be seen regularly by a consultant along with the midwife, so the women would have additional information sources during their pregnancy. After these questions, the remainder of the survey focused on the types of information sources they used, the types of information they researched and how they judged the importance and quality of this information. Unlike the interviews, the survey provided mainly quantitative data and was used to build a basic construct of the current information behaviour patterns of women in this study.

7.1.2 The respondents
The survey was completely voluntary and anonymous and did not include any demographic data questions. This decision was made to keep the survey from being too long and to prevent incomplete responses. In retrospect a few basic optional demographic questions to determine the respondent’s age, education and income level would have been very useful to ascertain a simple profile of the women taking the survey. It would also make the data more comparable to other studies on women’s information behaviour. However, the majority of women who took this survey would most likely match a profile similar to myself, as many were from the researcher’s personal network. This assumption would make the majority of women respondents in their mid-20s and 30s, with a middling income and educated to at least an undergraduate degree level.

7.2 Interviews
From the survey responses, six women volunteered to participate in the follow-on interviews. Three interviews were conducted in person and three were over the phone due to geographic constraints. All interviews were recorded. The interviews provided qualitative data that allowed further insight into pregnant women’s information behaviour that was not attainable through a survey alone.

All six women interviewed were UK residents who had a child in the last five years. Each described varying circumstances with their pregnancies that influenced their
information behaviour throughout their pregnancy. The interviews were open-ended and semi-structured. While there were 12 core questions asked in every interview, the remaining questions were tailored to the woman’s experience. For example, women with multiple pregnancies talked about how previous pregnancy experiences influenced their information searching.

7.3 Limitations of the study

While the survey attempted to capture as many different types of responses as possible, a few questions with write-in answers exposed overlooked areas. For example, in the question about judging information, there was no option that it came from a friend, family member or another mother, thus leaving out social circles. Two respondents wrote in this answer, and perhaps more would have given that response had it been available.

Also evident post-survey was that there was no question asking women to think about the linear journey they took when searching for information. This could be attained by following-up the question about what sources they used by asking the women to order the sources they selected, or to group them according to the information need (i.e. for a medical question, they went to the midwife, then they looked things up online).

7.3.1 Diversity in the study

As previously stated, demographic data was not collected in an effort to encourage participation. However, studies do show noticeable differences in information behaviour between educated, middle class women and women who are younger, without higher education and/or on a lower income bracket. It is important to replicate this and other studies across the groups who are most vulnerable and least likely to have access in the home to resources such as the internet to access information.
8. Scope and definitions

This study looks only at the information behaviour of women who have been pregnant in the last five years (2011-2015), who lived in the UK during the pregnancy and who received their antenatal treatment from the NHS. The time period of five years was used to ensure the women are able to recall their information behaviour to a satisfactory level of detail.

The study was limited to women who were pregnant in the UK and looked after by the NHS to ensure a standardised antenatal care throughout the pregnancy. Private care and other countries can have very different models of care and procedures for pregnant women and could therefore affect the base level of information provided during the pregnancy.

The researcher did not interview women who were currently pregnant as she wanted understand a woman’s information behaviour for the duration of her nine-month pregnancy. Therefore, all participants were recruited on the basis that they had one full-term pregnancy.

This study allowed for multiple pregnancies and made comparisons between the two groups of women. Throughout this dissertation, respondents whose first full-term pregnancy occurred within the prescribed date range for the survey are be referred to as nulliparous women, and women who had children prior to their pregnancy during that date range (or multiple pregnancies during it) are be referred to as parous women.

Throughout this study, “the woman” or “women” always refers to pregnant women. All other people are referred to by their job or relationship, e.g. “midwife” or “family member.”
This literature review analyses research studies on women's information behaviour during a pregnancy. All pregnancy information behaviour studies cited were all published after 1993, the year that the NHS adopted a policy providing and enabling women's choice in their maternity care, an ethos that is still reflected in their guidelines today (Sandall, 2014). This ensures that the studies were looking at women within a similar care model to the one used today. Because of the wide-ranging guidelines for antenatal care that exist around the globe, all of the studies in this review focus on women from western countries, mainly the UK and Europe. The studies examine the women's information behaviour in view of the medical treatment, support and care they receive.

In addition to information behavioural studies, the literature review also includes current reports and guidelines on maternity services in the UK. Any research that focused on specific vulnerable groups such as immigrant populations or drug addicted women were excluded because these women were too dissimilar to the respondents in this study.

The concluding portion of the literature review summarises Brenda Dervin's Sense-Making information behaviour theory and applies it to the research methodologies used for this study. The literature is primarily from Dervin’s work explaining her theory, and Spink and Heinström's *New Directions in Information Behaviour* provides additional theoretical context for this information behaviour study.

### 9.1 Knowledge gaps in pregnancy

#### 9.1.1 Encounters and experiences that lead to research

The first trimester in a woman's pregnancy is the period with the highest information needs (Papen, 2013; Larsson, 2009; Lagan, Sinclair, and Kernohan, 2011). This is due to a number of external factors that newly pregnant women have to take in at the onset of
a pregnancy. Initially they have to assess things like diet, exercise and lifestyle to ensure they are adopting safe and healthy habits at the start of their nine-month pregnancy. They also have their first appointment with a midwife during this time, called the booking appointment. Along with information on how to have a healthy pregnancy, during that appointment the midwife will cover: the antenatal appointment schedule for their pregnancy, antenatal screenings and the risks associated with the tests, the options for place of birth (home, birth centre or hospital), initial information on breastfeeding, antenatal classes offered by the NHS, and maternity rights in the UK (NICE, 2008). This is often the longest appointment and offers the most information that newly pregnant women will need to research and assess.

As the pregnancy evolves over the nine months, women continue to do research but to a lesser extent (Larsson, 2009). However, complications in a pregnancy can bring women back into intensive research and information seeking behaviours. In her study, *Conceptualising information literacy as social practice: a study of pregnant women’s information practices*, Papen remarks about one of her subjects, “When Ruth was diagnosed with gestational diabetes, she engaged in a process of ‘systematic’ search to inform herself about this condition and what she needed to do to monitor and control it” (2015). It is logical then that during pregnancy, when women are more sensitive to any health concerns, they would also respond to news of a condition or complication by researching to learn more about it.

However, Papen notes further on in her study that the women were seeking information on their own because they did not feel like they had adequate time to discuss concerns or health issues with their midwife (2015). The antenatal appointments are supposed to be designed with space for discussion, to allow women to open up about any concerns that they have (NICE, 2008). With midwife staff shortages at hospitals, it seems that pregnant women are conducting more of their own research and relying less and less on their midwives as a primary source of information. In 2013 the NHS reported a 15% reduction to maternity services across England, despite a 22% rise in birth rates over the last 20 years and an increase in pregnancy complications. This increased demand on the maternity services, which are operating on a shrinking budget and stretched staff,
has a direct impact on the pregnant women seeking NHS services (Royal College of Midwives, 2015).

9.1.2 Midwives as information providers

As Luyben and Fleming demonstrated in their comparative study of women from three different European countries, there can be notable differences in information behaviour due to the design of the country’s antenatal treatment. Even the difference of midwife versus doctor-led care affected how frequently women used the internet for information (2005). Since the introduction of the UK’s first antenatal care programme in 1929, there has been several changes in the best practice guidelines on how midwives should care for women, allowing for more discussion time and emphasising the midwife’s role as a facilitator of women’s choice rather than as an instructor telling women what they should do (Luyben and Fleming, 2005; Beldon and Crozier, 2005). This shift has lead to an improvement in communication between midwives and expectant mothers, and provides the midwives with flexibility to tailor the information they provide to the woman’s needs and circumstances (Beldon and Crozier, 2005).

All women using the NHS are seen by a midwife, and some will also combine those appointments with ones with their GP. While the Royal College of Midwives (RCM) and the National Institute for Health and Care Excellence (NICE) both recommend that women see the same midwife throughout their antenatal care, more often the care is shared by a team of midwives. Nulliparous women will have up to 10 antenatal appointments, and parous women will have seven appointments. These appointments are structured to provide essential information at each stage of the pregnancy. This information includes diet and lifestyle practices for pregnancy health, what to expect in the coming trimesters, and options for labour and pain relief. Doctors and midwives give both oral and written information, which is updated regularly by the NHS in accordance with current medical guidelines (NICE, 2015). Midwives are the “most commonly used source of information” and “the source [pregnant women] found most useful” (Luyben and Fleming, 2005). This supports other studies that have women citing the importance of research-backed information, as the midwives will provide evidence-based information from the NHS and from their own medical experience (Papen, 2013).
However, changes to the model of care around the UK in the last three years has shown a shift in attitude towards midwives as information sources. A recent report by the Royal College of Midwives (RCM) showed that 43% of women in England did not see the same midwife at their appointments; 23% of the women surveyed also reported not getting help when they contacted their midwife and 27% did not trust their labour and delivery staff (Sandall, 2014). Papen’s study found that women could tell if their midwife was overscheduled and pressed for time; the appointments were rushed and the women felt unable to discuss questions or concerns. This made their midwife “not always sufficient to meet [the women’s] needs” (Papen, 2013). The RCM survey figures and Papen’s study highlight a disconnect between the NHS’s aim for continuity in antenatal care and the actual services provided.

Questions regarding serious medical concerns or advice were largely directed to a midwife (Weston and Anderson, 2014), but women were found to verify or further research the information from midwives through additional research, a behaviour Bernhardt and Felter termed “information convergence” which infers a more “holistic approach to information-seeking” (Shieh, McDaniel and Ke, 2009). The midwife looses their authority as they become one source amongst many consulted. Though there are a lot of positive reactions to this transition as it enables and empowers women to make their own choices, it also diminishes the value of the studied knowledge that the midwife holds (Lagan, Sinclair and Kernohan, 2011). While many pregnant women can navigate routine pregnancy information, most women would still need a midwife for interpretation and guidance with more complex information needs.

9.2 Selectivity in pregnancy-related research

9.2.1 A reliance on scientific information

Luyben and Fleming in their study on women’s antenatal care needs found that “access to different sources of information and [the woman’s] ability to comprehend that information” was the biggest factor for women having their information needs met (2005). A pregnant woman’s information seeking strategies are directly correlated to her ability to understand the literature (Shieh, McDaniel and Ke, 2009). Though women
can find literature that details the complexities of pregnancy (trimesters, complications, risk, etcetera), they most likely do not have the training to understand the medical language and to know what applies to their pregnancy. This shows the importance of both having literature that is comprehensible, and having someone, such as the midwife, to help them navigate complicated information.

This does not deter women from wanting scientific, research-based information about their pregnancy (Shieh, McDaniel and Ke, 2009; Papen, 2013). This requirement for factual information is presumably because of the growth of social media and online forums where advice and opinions are shared usually without sources to verify any facts. By sticking to medical research pregnant women are more confident that they are following safe, valid advice.

9.2.2 The influence of the internet

One of the reasons researchers believe the midwife is no longer seen as the absolute authority for information is the increased use of the internet to conduct pregnancy related research (Weston and Anderson, 2014). Women can access the internet anywhere at any time if they have a smartphone device or tablet, which makes it easy to dive in and out of questions, worries or curiosities that they may have surrounding their pregnancy. Recent information behaviour studies have focused on the sources pregnant women use and in particular whether or not the internet is becoming the dominant source for information (Weston and Anderson, 2014; Johnson, 2014; Larsson, 2009; Lagan, Sinclair and Kernohan, 2011). It is important to distinguish the types of sites visited online as there is a vast difference between medical information sites and community forums in regards to the perceived and actual quality of the information published. In Verbeke and De Bourdeaudhuij’s study, they examined the different roles the internet played in women’s information searching and found that different types of resources were able to meet different information needs, as is the case in offline sources. Medical questions and clarification were answered by professional websites, while online forums and blogs provided support through shared experience (2007).

Papen found that the internet was used as a way to “supplement” other information sources that women relied on. Her study showed the women's individual experiences
within their pregnancy determined how often and how much information they needed. When a problem arose they conducted “systematic search[es] to inform” them of how to “monitor and control” circumstances (2013). Her subjects used printed materials and books as their primary sources, and would turn to medical websites, their midwives and friends and family to gain additional details or insights to their queries.

There are several other studies that do show the internet as a primary source for pregnant women. As mentioned earlier, the pervasiveness of pregnancy information on the internet has invited in a scepticism of the advice from midwives. In Weston and Anderson’s study, Internet use in pregnancy, they found that women had access to a greater volume of material, from medical websites to online forums to informal pregnancy sites. While these sites made the women better-informed throughout their pregnancy, it was sometimes at the expense of expert advice (2014). Other studies have shown that with an increase in internet use, midwives have experienced more patients challenging their authority (Murray, et. al., 2003 and Giveon, et. al., 2009 cited in Weston and Anderson, 2014). Though pregnant women may be assuming a role of an expert patient, this does not mean they have the breadth of training or experience midwives do. If allowed, midwives can provide an invaluable role as mediators between pregnant women and their own research.

Larsson’s study on internet use by pregnant women found that women used the internet throughout their pregnancy and the majority of the women did not share this information with their midwife, even when it was on topics related to their appointments (2009). The study was concerned that this competition between the internet and midwives was an indication that antenatal care did not provide adequate empowerment for the women over their pregnancy. Midwives have also reported patients eschewing the websites they recommend to them (Weston and Anderson, 2014). If a woman does not feel comfortable discussing information they read elsewhere it could signal a lack of trust and/or a lack of confidence in their midwife. Ultimately the tension that exists between these two key sources (internet and midwife) has increased information searching and information sources used by pregnant women.
9.2.3 Traditional information sources

While the internet and the midwife are the two information sources that women have the most direct access to in the UK, more traditional sources still play a role in their information seeking throughout pregnancy. The NHS provides women with pamphlets and notes throughout their antenatal care that covers essential information about pregnancy related to the women’s health and the medical screening and care provided by the NHS (NICE, 2008). Studies do show that women prefer to use a variety of sources, including written information such as books, and oral information such as classes and one-on-one appointments with midwives (Beldon and Crozier, 2005; Larsson, 2009; Papen, 2013; Luyben and Fleming, 2005).

Books are always listed in studies as a resource for pregnant women, and in some studies the majority of women read books and reported them to be the most helpful source for resolving information needs (Luyben and Fleming, 2005). Books were primarily focused on general information about pregnancy and labour, and the popular What to Expect When You’re Expecting (WTEWYE) was mentioned in more than one study as a primary resource (Papen, 2013). Compared to more temporal resources like websites and magazines, books were described as “quality” information sources that provided “detailed medical knowledge” (Papen, 2013). Presumably a woman would review a book before purchasing it and thus they have pre-screened the source to be one that they are going to trust. In contrast, they are constantly evaluating information found online to determine whether or not it is relevant, helpful or trustworthy in regards to their search query. Book offer simplicity and peace of mind that the internet lacks.

What these studies have ultimately determined is that pregnant women use multiple sources to research and then verify information they find, which often leads them to have a more holistic information behaviour than in other areas of their lives (Shieh, McDaniel and Ke, 2009). However, these studies do not detail are the number of sources women use in a single search. Understanding the average number of sources used per search, and if there is a pattern in how these sources are used, will give more context to how pregnant women satisfy their information needs.
9.2.4 Trusting information: intuition versus logic

Papen addresses in more detail the way women perform relevance judgements on the information that they find. She says that women “assessed information not just in relation to their objective or scientific value, i.e., on cognitive grounds, but also with regards to how this information made them feel” (2013). Women therefore did not always use rational means to judge sources.

Luyben and Fleming determined that women felt a strong need to be confident throughout their pregnancy, and this drove a lot of their information searching early on. However, as the women became more knowledgeable they relied less on searching for information and more on responding to the fetal movements they felt (2005). This shows an interesting transition in behaviour. In the early trimesters when women will feel none to very little movement from their baby, they desire literature to know what is happening at that stage in the pregnancy. Later, when women can feel their baby's movements, such movement becomes a primary feedback source for sensing their baby’s health and thus they rely less on the literature. Perhaps this is a shift from knowing in the scholarly sense to knowing in the ‘gut’ sense.

9.2.5 Learning and modifying information behaviour

While there is little research that tracks the evolution of women’s information behaviour over the course of a pregnancy, there is enough to suggest that negative experiences can affect a woman’s future searching habits. In a study about pregnant women researching medication use during pregnancy, conflicting or confusing advice lead to anxiety and stopping their research altogether (Nordeng, Ystrøm and Einarson, 2010). There are other scenarios that could cause anxiety, from receiving negative results from a screening test, to experiencing unusual symptoms, to hearing foreboding anecdotes from family or friends about pregnancy. If anxiety leads women to halt research, then they could miss out on important information they need; in order for women to have the best health outcomes, they need to be informed throughout their pregnancy (Shieh, McDaniel and Ke, 2009). This is why it is important to gain an understanding of what affects a woman’s information behaviour over her pregnancy – particularly when she chooses to stop receiving information.
9.3 A Sense-Making theoretical framework

It is impossible to understanding a pregnant woman's information behaviour without also observing their physical and emotional state. Dervin’s Sense-Making information behaviour theory states, “Sense making mandates attention not only to the material embodiment of knowing, but to the emotional/feeling framings of knowing as well.” Sense-Making focusses on the individual’s process of arriving at a knowledge gap, the activities they embark on to close that knowledge gap and all of the variables that will influence their decision making process (cultural, emotional, situational, physical, and so forth) (Dervin, 1998).

Dervin found in her studies using Sense-Making that people are most receptive to information providers they feel are like them. She states, “They are more likely to use the same sources and channels as the information providers do and to evaluate source credibility as the providers do” (Dervin, 1983). Other research has shown that individual preferences and personalities will influence their choice of methods and sources for seeking information (Spink and Heinström, 2011). If the information provider’s ability to relate to people is correlated to how well their information is received, then midwives need to be able to quickly develop a rapport with new patients if they want their knowledge to be trusted and used.

The challenge of most information providers is that:

“All people are individuals, and will seek and use information in different ways... [information gathering] is an integral part of our personalities, and we all do it differently. There is no such thing as a homogenous body of information users” (Line, 1998 via Spink and Heinström, 2011).

While this may be the case, it is still possible to determine weak areas within existing systems that are not serving users in their intended ways. Sense-Making understands that there is no “one right way to produce knowledge or to use information” (Nycyk, 2010). Instead it takes into account both how a person uses an information system, as
well as their internal thought process throughout the experience, which includes their mood, personality and comprehension capabilities (Dervin, 1998). This theory, which was used to ground the methodology of this study, provides a rich understanding of the complex nature of information behaviours, and it incorporates the unique experiences that every one has when trying to fulfill their own information needs. As noted earlier, pregnant women rely on both their emotions and their physical sensations when fulfilling information needs, and so Sense-Making provides a holistic way of looking at pregnant women's information behaviour practices.
10. Survey analysis

The survey analysis reviews the findings from the online survey of 168 women who had a pregnancy in the last five years in the UK. All survey participants gave birth in an NHS hospital. The initial questions of the survey focused on the conditions of their pregnancy before moving into questions about their information seeking habits and then ending with some questions to rate the information, the sources they used and the practices they carried out. When there was a significant difference between the responses of nulliparous and parous women it was recorded. Otherwise the responses are analysed for all women who took the survey.

What follows is a detailing of the responses for each question in the survey, with occasional research references for clarification. The questions are divided according to the survey segments: 10.1 Participant profile, 10.2 Antenatal classes, 10.3 Sources of information, 10.4 Trusting information, 10.5 Evaluating information, 10.6 Research topics, 10.7 Reviewing information behaviour and 10.8 Additional comments.

10.1 Participant profile

A basic profile of the women’s pregnancies was:

47% nulliparous women
53% parous women

33% had a complication in their last pregnancy
67% had no complications

22% had a high-risk pregnancy
78% had a normal pregnancy

High-risk pregnancies were usually related to pregnancy complications or to factors from a previous pregnancy. The most common complications were gestational diabetes,
gestational hypertension, hyperemesis gravidarum (severe morning sickness), polyhydramnios (high levels of amniotic fluid), previous C-sections, preterm labour, rhesus status and blood clots. Most of these are conditions that are diagnosed during the pregnancy and would be known to the women before the birth of their baby. Therefore, they could contribute to the topics the women researched while they were pregnant.

10.2 Antenatal classes

10.2.1 Did you take an antenatal class?

63% took an antenatal class
37% did not take an antenatal class
41% of the women who took an antenatal class were nulliparous

10.2.2 What type of antenatal class did you take?

12% took antenatal yoga
9% took hypnobirthing
59% took a National Childbirth Trust (NCT) course
52% took an NHS course
5% took a course with a private organisation

The most popular courses were run by either the NCT or NHS. The NHS Choices website, the NHS's website which provides medical research, guidance and information, specifically mentions the NCT on their antenatal classes page and also provides links to the Daisy Foundation and Twins and Multiple Births Association (TAMBA), two classes that were indicated in the "other" section (2015). The NHS can be seen as validating the NCT methods by mentioning them on their site. This active promotion of the NCT, along with its strong association with community support post-pregnancy are probable reasons why the course was so popular.
10.2.3 What topics were covered in your class(es)?

The most common topics covered in antenatal classes tend to focus on labour and delivery and caring for the baby: birth interventions, caring for baby, feeding methods (bottle or breast feeding), labour and birth stages, labour positions, pain relief options, relaxation techniques and the partner’s role during labour. This is logical as antenatal classes are typically scheduled at 30-32 weeks into the pregnancy (NHS Choices, 2015). Topics that were less common tended to be things that are typically covered within the first trimester, such as exercise and diet. Interestingly only 50% of those surveyed said they covered postnatal recovery, a topic that later in the survey some of the women said did not receive enough attention.
10.3 Sources of information

10.3.1 Where did you go for information throughout your pregnancy? Please choose all of the sources you used.

The most popular sources for information (used by 50% or more) were midwives, followed by baby-specific websites (such as MumsNet, NetMums and BabyCentre), search engines, books or brochures and online chat forums. Since all women are required to see a midwife, if there are any medical concerns, it is natural that the midwife was the most frequently listed information source (NICE, 2008). Online sources were also heavily relied upon, with websites prevalent in three of the five top sources cited by the women. This is aligned with many of the studies showing a growth in the use of the internet as an information source during pregnancy (Larsson, 2009). However, similar to other studies, books were also an important resource and used by 60% of women.
The chart above shows the number of sources used per respondent over the course of their pregnancy. The average number of sources used was seven, though as the graph shows this number was skewed slightly from the median, which was six. Whilst the majority of women used between five and eight sources, a significant number of women employed more sources.

10.3.2 What caused you to look for information on your pregnancy?

Figure 3: Number of sources used per respondent

Figure 4: Reasons to search for information
The most common reasons cited for looking for information were: tracking the pregnancy progress (86%), searching for general information about pregnancy (63%), requiring more in-depth research to a question (59%) and experiencing a physical change during the pregnancy (57%). This indicates that physical sensations were one of the big drivers for seeking information during pregnancy.

10.4 Trusting information

10.4.1 How did you decide to trust the information you found?

When judging information, reliability of the source was the most important factor influencing a woman’s decision to trust the information. Information written by the NHS was the most trusted source with 69%, whilst that provided by an expert also rated highly at 44%. Information corresponding to other sources was the second most common answer (56%) whilst references to scientific studies also provided strong assurances to the credibility of information. This is inline with other research that stated women prefer the information to be research-based (Papen, 2013). The lowest ranked responses were that the information was well written (15%) and provided by an antenatal class teacher (13%). Interestingly, although the majority of women used
their midwife as an information source (noted earlier), only 27% selected information recommended by their midwife as a trusted source. This can be due to many factors, from personality clashes to limited time at appointments, which make the women less trusting of the advice they receive. These factors are explained further in the interviews.

10.5 Evaluating information

10.5.1 What do you value most when making decisions?

![Factors influencing decisions](image)

When the women were asked to rate the factors that mattered the most to them when making decisions, medical research and opinion again was cited most frequently (46%), similar to the reason to trust information. Following the research though, instinct was the next highest factor weighing in their decisions (30%), followed by previous experience (14%), social opinion (7%) and natural birth philosophy (3%).
10.5.2 Did you always share the information you found with your midwife or GP?

23% yes
77% no

10.5.3 What prevented you from talking about the information you found with your midwife or GP?

The most commonly cited reason for not sharing information with a midwife or GP (amongst the 77% who responded that they did not always share information) was that their information was not relevant to the appointments (30%). Though most studies on pregnant women focus on their information behaviour in the context of the medical aspects of their pregnancy, there is a lot of information that women research beyond that, from baby rearing information to determining what products to purchase for their baby. This then would be information that would not be relevant to an appointment.

Beyond this, the remaining responses infer that the midwife was not considered a primary resource. The next most common answer was that the women were happy with their information and did not need validation (23%). This could indicate that women rated the knowledge of their midwife or GP lower than either their own research, their instinct or their previous experience. This corresponds with remarks that some women
made in the interviews; depending on the relationship that women formed with their midwife they were more or less open to using them as a source for information.

10.6 Research topics

10.6.1 How important were the following topics to you during your pregnancy?

Rank the topics from 1=very low priority to 5=very high priority according to how much time you spent searching for information.

![Figure 8: Ranking research topics](image)

The most important topics to women during their pregnancy were screenings, labour, breastfeeding and weekly pregnancy progress. The lowest-rated topics were vaginal birth after C-Section (VBAC), bottle feeding and pregnancy product research. This data mirrors similar findings in other research studies that say screenings are the most researched topic for pregnant women (Papen, 2013). Screenings provide information about the pregnancy that potentially have a life-long impact on the baby and mother’s
life. Certain tests are optional, so the parents have to make decisions early in their first trimester of pregnancy.

Labour is another area that other studies report as an important research topic, particularly in the third trimester as women are preparing for the delivery of their baby. It is interesting that breastfeeding and bottle-feeding are at opposite ends of the importance rating, which is most likely a reflection of the demographic of women taking the survey. VBAC is rated low most likely because it only affected a small portion of the women taking the survey (9%).

While the women indicated that they researched postnatal topics like baby care, postnatal recovery, baby products and baby names, they rated these topics as less important to their research.
10.7 Reviewing information behaviour

10.7.1 Looking back on your information searching throughout your pregnancy, please select how you feel about each of the following statements

Rating: Yes, always (4); Yes mostly (3); Somewhat (2); Not at all (1)

![Figure 9: Reviewing information searching practices](image)

In general, the women answered that they were mostly or somewhat informed across all of the questions. The following breakdown of responses for each statement will discuss nuances between responses not represented above.
10.7.2 Individual statements responses

The majority of women felt like their own research was useful and helped them to be prepared throughout their pregnancy.

The greatest division in this statement is between “yes, mostly” (34%) and “somewhat” (37%). In circumstances when there is a complication that leads to a birth intervention or C-section, women do not usually have the time or ability to research their options and must rely on the information given to them by the midwife or obstetrician. In retrospect, it appears that some of the women felt the information they were provided was inadequate. However, there is still a sizeable proportion of women (21%) who were completely happy with the information they received from their midwife/GP.
This question attempts to draw out whether women rely on their instinct rather than their research. In labour, the majority of women felt they either always (18%) or mostly (43%) were able to rely on instinct rather than information they had learned prior to the labour.

Baby care and products are topics where women have the most choice and control. This statement had the highest rate of confidence, with 52% of women selecting “yes, always” and 38% selecting “yes, mostly”. Compared to other aspects of pregnancy there is more freedom of choice when acquiring things for a baby or learning about early parenting techniques, and this response clearly shows that the women were satisfied with their ability to research and prepare for their baby.
The majority of women (61%) said they were prepared for their postnatal care. This contradicts statements in the last question of the survey which indicate that there is not consistency across postnatal education. Postnatal care is an area that past research indicates is lacking (Luyben and Fleming, 2005), and the division in responses in this study show this is an area of worthy of further research.

Figure 14: I was prepared for my immediate postnatal care

The majority of women felt they were able to trust their instincts in pregnancy (50% mostly and 17% always).
Generally, the women feel less enthusiastic about the advice received from friends and family. While other research shows family and friends play an important role providing information along with emotional support to pregnant women (Chezem, J., Friesen, C. and Clark, H., 2001), the majority of women said friends and family were only somewhat (40%) or not at all (12%) helpful. The interviews provided more clarity, showing that family and friends were very important if they were considered highly informed because they either had a similar pregnancy experience or were experts (midwives, GPs).

In general women felt positive towards their midwife or GP during their pregnancy. 44% mostly and 21% always felt they were kept informed during their pregnancy.
10.8 Additional comments

The last two questions allowed the women to expand on and provide additional information or comments on their responses. In total there were 38 comments.

Several of the comments mentioned that while they indicated which topics they felt were important to research during their pregnancy, in hindsight they felt very unprepared for their postnatal care and recovery period. For example, one woman stated: “I spent a lot of time learning about labour and not enough on how to look after a baby or breast feeding which I found really tough.” This sentiment was echoed by five other women who left comments (out of 18 women who left comments). Another woman said more frankly: “I was an idiot. The birth is just one day. I focussed all my research on that and not on caring for an actual baby.” These comments reflect what was previously mentioned in other research, which is a lack of knowledge about the postnatal period. What is unknown from this survey data is why there is a sharp contrast between women feeling very satisfied with information for postnatal recovery and others feeling very unprepared, and this will be reviewed in the discussion section.

In addition, a lot of the women were either providing details about their pregnancy (e.g. that they were delivering twins) or commenting on a personal interaction with medical staff. A sample of some of the comments:

“I had [a] simple and healthy pregnancy, however [I] then had an induction (not explained to me) and emergency C-section (not explained before, during the emergency, or after at any point), followed by very complex post partum pre-E[clampsia] and infection, in addition to confused and conflicting hospital staff with at least 9 different consultants and midwives confusing drugs and care. This shocked me, and I was not prepared for the idea of having a C-Sec[tion], nor how it came about as well as what happened afterwards and how to care for a baby after - I had no emotional or family support and even 2 years later have not quite dealt with the shock. I somehow do not feel there has been an avenue for me to deal with this.”
“I felt the GP and nurse were pretty hands off, so felt alone in the matter. I think my choices were respected because I delivered in a birth centre, that was what I wanted. Don’t know how it would have been handled in a hospital setting”

“So much conflicting information even from similar sources, e.g. 2 midwives in the same hospital”

“In the pre-birth appointments with my Midwife I found her quite dismissive and not particularly helpful. During labour I felt weirdly a little side-lined and not really supported carefully or thoughtfully (conveyor belt like!”

“I was very pressured by a consultant/midwife to have a natural birth (VBAC)- I did a lot of research on this subject but didn’t really have a choice in the matter as I was very pushed down this route rather than being allowed to consider a second C-section (which I ended up having anyway due to complications in induced labour)”

These comments tend to highlight a negative aspect of their pregnancy or delivery and more often attribute the negative experience to their medical staff. While the comments were not always relevant to their information behaviour, they did provide a glimpse of the highly charged emotions that are present in every human interaction throughout pregnancy. Because antenatal appointments are personal interactions, it was harder for some of the women to separate out the objective advice and information from the person giving it. Birth is a very unpredictable situation and NHS staff are trained to analyse each situation to provide the best possible medical care for the women and their babies. However, if the NHS staff-member does not communicate well with the women about their options and progression of care, and/or if the women do not feel like they are able to fully participate in labour decisions, they can feel distrust, anger, and resentment. Unlike other hospital situations where the medical staff is considered to have full authority, women are encouraged by the NHS to be active participants in their labour and birth, and are encouraged to do research to make informed decisions. However, when the staff impose their own opinions about the course of a woman’s
pregnancy or labour, the woman may highly resent them if the result is not something they expect or desire.

The women logically knew and stated that their midwife and GP were important sources of information, and they highly valued information that came from the NHS. However, in the context of pregnancy emotions are extremely important in validating trust in a human information source. If a woman feels she is not being listened to or her concerns are being dismissed by the midwife or GP, she may in turn dismiss the advice given by them.
11. Interview analysis

The six women interviewed were: Ashley, Lana, Christine, Polly, Ingrid and Rachelle*. Lana, Polly and Ingrid had nulliparous pregnancies and Ashley, Christine and Rachelle had parous pregnancies. All of the women gave birth in an NHS hospital. Christine and Rachelle had C-section deliveries, and the rest gave birth in a labour ward. As English-speaking, long-term residents, none of these women had any trouble with communicating with their medical care staff or with searching and reading information they found.

11.1 What triggered research?

11.1.1 External sources

Routine appointments commonly spurred additional research. Christine said that after her appointments she often had to research medical terms she had been told. After a scan showed that she might have oligohydraminos (low amniotic fluid levels), she had to research the term as she was unclear both about the condition and what it meant for the health of her baby. Aside from that though, she said often she felt confused after her appointments about the advice from her midwife, so she turned to friends whom she trusted for other options.

Occasionally Ashley said she would unintentionally happen upon information. She was sparked to do research because of things she read on Facebook. She said in general she tried to steer away from research in this pregnancy, but there were a few times when she read about something new related to pregnancy on Facebook and she ended up reading more about it to make sure she was up to date with important information. “You just assume things don’t change in a year and then there’s something else to know.”

The strongest external driver to do research was to further understanding about unexpected information provided by, or discussed with their midwife. By the time a

* All of the women’s names have been changed, along with any personally identifiable information in their interview.
pregnant woman reaches 12 weeks they will have had a booking in appointment with their midwife, initial blood tests and the first ultrasounds. For three of the women, Lana, Ashley and Polly, these tests and scans were catalysts for their most intensive research periods.

11.1.2 Lana – ultrasound

Lana discovered in her first ultrasound that her child’s legs were measuring extremely small in comparison to the rest of his body. She describes her reaction following the conversation with the technician:

“So what do you do, you go straight to Google and type in ‘baby’s short legs’ and all sorts of horror comes up - dwarfism, downs, whatever - and I think that really panicked us for a couple of weeks.” After she and her husband went to a follow-up scan and found that his growth was picking up, they felt reassured and were able to put their worries to rest. However, the experience scarred Lana and she said it made her “much more reluctant to look at too much information because it ends up just scaring you.”

11.1.3 Ashley – screening test

Ashley’s early blood tests indicated that her child had a highly likelihood of having Down’s Syndrome. She received a call from the NHS alerting her to the results, and because of the limited timeframe to perform additional testing she had 24 hours to decide if she wanted to have the more invasive Chorionic Villus Sampling (CVS) test, which carries an increased risk for miscarriage. After having a relatively normal pregnancy with her first child, she felt very unprepared for this news and said she turned first to the internet. She wanted to find out more information about testing – what was the test, what alternative options did she have – and she initially used Google to direct her to a variety of websites from online forums to medical sites. When this became overwhelming she used a telephone hotline she learned about in a brochure from her first midwife appointment. The “calmer” woman she spoke to provided unbiased facts about the testing procedure so Ashley was able to understand the risk and reliability of the test. Ultimately though, it was a conversation with her mother and
mother-in-law that helped her make her final decision to go ahead with the test. Their advice was not based on the facts but rather the emotional toll Ashley would go through if she did not have it. She said, “She told me that she had it done and everything was fine, and that if I could bear going on with the rest of my pregnancy without worrying then fine. But she said she knew what I was like, and I needed to have the full picture.” The reassurance from someone who knew Ashley and understood the decision she had to make was what helped her decide to take the test.

11.1.4 Polly – scans and kidney

Polly’s first scan showed that her child had a cystic kidney. She and her husband had never heard of this condition and she said she felt “completely beside myself,” so when they returned home from the appointment they began a very systematic research. First they went to one of their trusted resources, the NHS website, for a basic understanding of the condition. For more details, they visited the National Institutes of Health (NIH) website and followed links to additional websites which provided them with questions they should ask at their next appointment. By the time they saw a consultant to check again on the cystic kidney they felt informed and prepared, and they were able to gain a “truly informed picture saying this is not going to affect the health of [their] baby.” Though she was worried throughout her research about what was happening, Polly was very careful to only look at information from sources she trusted that based their information on scientific studies. She found the most comfort talking to the consultant who was able to provide specific information about her child’s health.

11.2 Internal sources

All of the women interviewed with the exception of Rachelle said at some stage they researched general pregnancy information. This means they were reading about pregnancy without a specific question, but with the intention to learn about what they should do and expect in a normal pregnancy. Especially in first pregnancies, women tend to read about the changes they experience and the stages of growth of the fetus (Carolan, 2005, via Papen 2013). Ingrid said she researched every day:
“I think like lots of people I like to feel informed well in advance so I was doing a lot of research about labour, about postpartum care, well in advance and I was just spending, as soon as I found out I was pregnant really, I was just spending my time thinking and reading and planning and, you know, researching.”

Ingrid’s own research started when she realised her first appointment with a midwife was at 10 weeks and she had six weeks of waiting, so she took it upon herself to begin learning about her pregnancy. This general research ebbed and rose depending on the individual, but all of the women (again with the exception of Rachelle) cited some form of it at the start of the pregnancy. It could be considered an internal drive to feel prepared and informed.

Apart from this general pregnancy research, some of the women began their research after a symptom presented itself. Rachelle said the only time that she actually did research throughout her pregnancy was when she started to suffer from acid reflux in her third trimester. Up until then she had not done any research, choosing instead to rely on her experience from her first pregnancy. She said this time around she was “much more blasé,” remembering that a lot of aspects of pregnancy are things that you just have to accept and no amount of research will change the situation. However, with the severe heartburn she did turn to online forms and friends for advice and potential remedies to try and ease the discomfort.

### 11.3 Selective research

Among respondents, there were differences in attitudes towards information searching, with some wary of the information they could find, and so they actively limited or avoided looking for things unless they were in need of a swift answer. However, when there was a specific issue the women needed to understand or address, they always conducted research, such as the experiences from Lana, Ashley and Polly with their test results. However, almost all of the women enforced breaks from researching, citing stress, anxiety or apathy as reasons why they chose to stop.

Lana, Ashley and Polly all stated that after their experience of intensive research they
decided to take a hiatus unless they had something important to address. Lana said, “Sometimes we felt that the internet is a bit too big for some of this stuff in that it’s kind of gone beyond the realms of useful, factual information into a bit kind of hocus pocus and kind of quite perceived wisdom and people’s opinions...” She attributed her lack of research for the remainder of her pregnancy to her laid-back nature, her decision to sign up for an NCT course, and the support from family and friends who reassured her that she was doing well.

Polly also limited her information searching because she knew her tendency to over-research could cause additional stress or paranoia. While she allowed for “burning questions” and tracking general pregnancy symptoms, she said she consciously took several long breaks during her pregnancy from looking up things altogether:

“There were times when I looked at what was going on with me and I was like, ‘I don’t want to know because I don’t want to scare myself, because I could believe anything at that time. [...] I figured [information] overload would be a really horrific thing and I could have done that. I could have nit-picked and been obsessed with one particular issue and I researched it endlessly and know it from back to front but would that really help me with paranoia, I’m not quite sure. So with paranoia, and because I also have prone to obsessiveness when it comes to these kind of things I just basically called it quits at times.”

Ingrid also decided to take a break in her research during the middle part of her pregnancy. She said,

“When I was reassured I had a little bit less anxiety and therefore less need for consuming lots of information.” Like Lana she too signed up for an NCT course which would fulfil a lot of her information needs about birth and labour. This allowed her to take a break from her regular pattern of research and “enjoy the middle part of pregnancy.”

As stated earlier Rachelle did very little research in her second pregnancy. She believed this was mostly because “the curiosity wasn’t there to drive the search.” She also felt
strongly that too much information can be harmful and said, “There’s so much that you can become bombarded, so I just chose to not bother.”

These are all examples of how the women were selective in their research, choosing both what and when they would read about things related to their pregnancy. Most of the women had a lull during their second trimester, a time when they also have a break from appointments, before picking up again in their research as they neared the birth in the third trimester.

The main exception to choosing not to do research for one reason or another was Christine. She said that her research became more time consuming as her pregnancy progressed. This was her fifth pregnancy and the two previous ones had ended as a miscarriage and then a termination because it was an ectopic pregnancy, so she classified as a high-risk pregnancy. This lead her to a very different outlook towards research than the other women:

“If anything I was more obsessed with looking up anything and everything, and I would often look up the same things over and over. What I used to find is I would Google something and I would have to go to like page four or five, a page that didn’t have a date stamp that I’d already visited. [...] Because I had my son and then 10 years, 11 years later I had my daughter and then I had two losses and then I got pregnant then I was extremely paranoid.”

Christine’s research was a way of providing herself with continual reassurances about her worries and so she opted to research any new piece of information that she came across.

11.4 Conflicting information

One of the main instigators for continued searching for information was the conflicting advice that is published and verbally given to pregnant women. Ashley, Ingrid and Rachelle all specifically cited conflicting opinions, advice and information as a source of frustration and a reason to seek out more information on their own. Often this conflict
came from within the NHS with midwives differing between themselves or with the consultant GPs.

Ashley ultimately found this made her trust her “instinct” more saying, “The conflict of information from health visitors, to midwives to doctors it’s always different. Sometimes I just used my instinct most of the time because sometimes everyone was saying something different.”

Ingrid said bias in the information would cause her to do further research:

“I felt at lots of times quite angry about the sort of politics and the policy behind a lot of the ways the information was given and presented and some of the information that was out there would be biased towards a particular life-view. And I felt I was doing a lot of weighing up and I felt quite cross that I wasn’t getting more neutral support.”

Rachelle simply stated,

“I find with midwives, [...] you hardly ever get the same opinion from two women. You know, even if you asked them within a 24 hour shift after you’ve had the baby, ‘What should I do if this,’ and one tells you A and one tells you B. ‘Can you just agree on something because I’m confused and now you’re confusing me more.’ [...] They’d say, ‘Well do this.’ And I’d go in and say, ‘Last time I was having concerns about this and they said do that.’ And they were like, ‘oh no you shouldn’t be doing that, you should do this.’ And I’m like [throws hands in the air] So yeah it was annoying.”

11.5 Number of sources

When asked to describe the path they followed with an information need from start to finish, on average the women would use three sources. Below is a list of the number of sources they used each search and the usual ones they would refer to (in order of use).
Table 1: Number and type of sources used per information need

<table>
<thead>
<tr>
<th>Woman</th>
<th>Average number of sources</th>
<th>Sources used (in order of use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lana</td>
<td>Two</td>
<td>NHS or family member, pregnancy sites or apps</td>
</tr>
<tr>
<td>Ashley</td>
<td>Four</td>
<td>Online search, medical websites, pregnancy advice hotline, family member</td>
</tr>
<tr>
<td>Rachelle</td>
<td>Three</td>
<td>Online search, online mom forums, friends</td>
</tr>
<tr>
<td>Ingrid</td>
<td>Four</td>
<td>Pregnancy reference books, online search, medical websites, online mom forums</td>
</tr>
<tr>
<td>Polly</td>
<td>Two</td>
<td>Medical sites, consultant GP</td>
</tr>
<tr>
<td>Christine</td>
<td>Four</td>
<td>Online search, online mom forums, medical websites, online social network</td>
</tr>
</tbody>
</table>

Most of these women described a similar pattern of realizing an information need and fulfilling it through research whether it was for a general question or curiosity about their pregnancy or a more serious inquiry. The main difference between the two information needs would be that for the more serious inquiries they tended to consult several of the same types of sources. For example, Christine said she would use an online search for the same question that she had multiple times and would read several pages of the same online “mom” forums to glean as much information as she could from these sources. Likewise, Lana, though she indicated that in general she did very little research throughout her pregnancy, described a very similar practice for her search for both a simple request and a more complex one.
11.6 Measuring satisfaction

For some of the women, deciding that they reached an answer to their information need was as straightforward as consulting a few sources, comparing the information and determining if the information was credible. Ingrid said she relied on her “own reasoning capability” to determine if her sources were providing “a credible explanation or reason.” She used two books as main sources and also used websites to answer any queries she had. As a professional researcher, she was confident in her ability to conduct a thorough investigation by comparing her sources and looking to see if the content was based in medical research. Her main consideration was whether the information was evidence-based. She said, “I’m more inclined to think I want the benefits of modern medicine and what will be best for me and my family.”

Polly and Lana were both similar to Ingrid, stating that they placed their trust in research and medical studies, and thus were able to conclude their research after using between two and three sources. Polly was adamant that the sheer amount of information you can access is unhelpful and that “if you have at least two or three sources that you know that you can trust, you can actually look that up and say, ‘hey yeah this actually makes sense.’” Lana too consulted medical sites like the NHS Choices website, as a way to limit herself. She said, “I wanted to keep as much of the fear out as possible by not inviting too many opinions.” For these women the most important factors in deciding their research was sufficient were: looking up information that was backed by scientific studies and comparing information from a limited number of trusted sources.

Ashley took a very different approach, relying more on her intuition and feelings, and favouring the opinions of family and friends over medical ones. She specifically noted that empathy was very important for her when she spoke with her medical staff, and because this was often absent, she preferred to speak with family and friends about questions or concerns she had and chose to heed their advice in most situations. The one exception was with her consultant who she described as “arrogant”, but extremely knowledgeable. She appreciated his confidence and trusted him more for it.

Christine was the only woman whose process of evaluating information changed
throughout her pregnancy. She performed the most research of any of the women interviewed on any one topic, and she was mainly interested in research-based information. However she also placed high value on her instinct and her social network of friends. Depending on the situation she would vary between following her friends’ advice or going with the advice from the medical team. Because of her traumatic experience with her miscarriage and ectopic pregnancy she would often find herself researching the same topics again and again and so was never really able to conclude her research. The searching for information was more a way to keep reminding herself that she was okay rather than to fulfil an information gap.

11.7 Instinct and faith

Ashley and Rachelle both said they relied heavily on their instincts over continuing research when making decisions. Ashley based most of her decisions about what courses to take on her instinct. As stated earlier this was usually her way of deciding between two conflicting pieces of advice. What is important to note is that she always researched her questions before making decisions, which indicates this was not instinct in the true sense, as she was always informed about her options.

Rachelle said, “I just really did trust my instinct. And I think faith comes into it because I trusted God that He was gonna [sic] protect me during my pregnancy, so maybe that’s part of it.” She was the only respondent who combined faith and instinct into her decision to eschew research.

Her faith in particular was what she attributed to helping her decide how to deliver her baby. Rachelle previously had a C-Section and with this pregnancy had been encouraged to attempt a VBAC, attending a class on the delivery and getting information about the risks and complications from her midwife. However, she said it was ultimately because of prayer that she came to her final decision to have another C-Section. She said,

“I had people praying for me about making the right choice between being induced and [having a] C-section [sic] and I definitely believe prayer was what brought that answer more than any opinions. [...] When it came down to it I just felt so
confident that it was the right decision and I don’t think I would have [had] that just on my experience and the medical opinion. Because medical opinion was, ‘let’s give it a go, there’s no harm let’s give it a go,’ but that wasn’t obviously right.”

Similar to instinct, faith fulfilled an information need for her when making a decision and answering other questions in her pregnancy. Again, like instinct it holds some of the same behaviour characteristics of information avoidance as it meant she did not do further research, but unlike information avoidance Rachelle had confidence in her decision that came from an internal feeling or sense that she had from her prayer.

11.8 Learning from research

As the women described their information searching habits, no patterns or changes emerged whether they were talking about how they conducted research in the first trimester to the third. What did change was the volume of research they conducted, peaking at the start of their pregnancy, waning off in the second trimester and then going up again in the third trimester; this follows the patterns that other studies have shown (Papen 2013, Larsson 2009). Generally, within the first few weeks of pregnancy, these women spent time choosing trusted sources, whether they were books, apps, websites or people, and then consulted and relied on these to answer information needs throughout their pregnancy. Occasionally they would supplement these sources with additional material, most often from the internet. Polly followed this pattern and said that she was most comfortable using the same resources throughout her pregnancy because “there’s so much stuff out there that you don’t know what to trust.” She used two websites and two books throughout her pregnancy and this made her feel “able to make an informed opinion” about any questions that she had.

Rachelle had similar sentiments to Polly saying, “I think people can become too obsessive about reading so many things and I just think it confuses you in the end.” She would talk to friends about any questions she had, and if she needed a medical opinion she consulted a midwife friend.
All of women said that their research methods were the same when they were not pregnant, indicating that pregnancy may amplify how often and how much you research, but not how you approach it. Ingrid said she felt very capable doing research because she does a lot in her profession. Polly also felt confident in her research skills and replicated some of the search skills she had learned through a course.

Lana and Rachelle, who did very little research, both said that researching was not part of their personality. Rachelle described it as, “I’m just not that curious and it drives some people crazy but I’m just not. And I don’t really care. If it’s not affecting me then I’m not interested.” Lana was similar, crediting her personality as a reason to do little research: “I’m lucky in my natural disposition is not to get too worried about stuff.”

Christine did say that she is a natural researcher for any topic that is interesting or important to her, so this extended to her pregnancy. She said, “It’s part of my personality to be researching and looking up things and doing that sort of thing. I do [it] constantly [for] everything so it goes hand in hand with who I am as a person to do that.”

Interestingly though, she was very self-aware of her habits and the fact that they are not common or necessarily helpful to most other people, and so when asked if she would recommend her strategy for looking up information she said she would advise other women to do the opposite and “if someone were to ask me I would tell them not to be obsessive about it.”

Interestingly, each woman said that they believe their information behaviour was right for them and that they would not have changed their searching habits if they could, or if they were to have another pregnancy.

**11.9 Sources used**

Often the women’s primary resources were books or friends with medical backgrounds. Christine, Rachelle and Lana had friends who were midwives and they would turn to them with questions before going to their own midwife or GP. Rachelle knew the head
midwife at her hospital, and because she knew and trusted her as a friend she often went to her to clarify conflicting information or advice.

Christine said she would often consult her friend who was a midwife explaining that, “It was a lot easier because you could ask any question without worrying whether you looked silly or whether they'd be annoyed.” Later in the interview she mentioned this concern again of being judged by her midwife or GP, and cited this as a reason why she did not share her research with them.

Other primary sources cited by the women were the NHS website, WTEWYE and pregnancy tracking resources such as the BabyCentre app. Nulliparous women, Polly, Ingrid and Lana, relied mostly on these types of sources because of their strong reputations and evidence-based information. Lana described her reason for choosing only medical research and authoritative sources as a way to filter out anything that may provide confusion or other people's opinions. She said:

“I kind of really wanted NHS or something like BabyCentre or some of the other ones that are more mainstream [which] I felt had a slightly more medical overview. You know I liked a good ‘medical-looking’ diagram at that stage. I didn’t really want the opinion of another mum somewhere in a different country saying 'yeah this really worked for me.'”

Ingrid equated the need to use research-backed sources with the ability to be confident in her decision-making. She said:

“You know you're making the best decisions you can so that things go the best way they can and I think there’s a lot of anxiety about doing the wrong thing and then it being your fault if something goes wrong. I find that problematic in lots of ways. [...] I felt like you're asked to justify a lot of your behaviour so I wanted to be sure I was justifying it to myself comfortably first I think.”

She used two books as her primary sources - WTEWYE and The Pregnancy Bible – which she chose for their slightly differing takes on pregnancy. She believed this gave her a
well-rounded perspective on pregnancy.

### 11.9.1 Midwives

For the most part these women did not use their midwives as a main resource. This is despite the fact that nulliparous women have 10 appointments with a midwife and parous women have seven, and women with complications during their pregnancy have additional appointments with a consultant midwife or doctor. Though these appointments were a face-to-face interaction, something that these women preferred when using expert friends for information, the lack of a relationship seemed to lead them to rely on the midwife less than they would other sources such as search engines like Google or reference books.

Some of the women specifically stated that they had a bad experience with a midwife, which perhaps was the reason they did not ask them as many questions. Polly said one of her midwives made her cry in an appointment and after that experience she felt, “I can’t really use them as a true resource.”

When they had a really positive experience with a midwife who made them feel supported and unrushed and responded with unbiased information, the women saw the value in their role as information providers. However, none of the women interviewed saw the same midwife more than once so there was no way to build a trusting relationship or guarantee that they would be able to see someone they got along with.

### 11.9.2 Consultants

In the instances where they saw a consultant, Ashley and Polly both said that they highly valued their expertise and knowledge and the information provided by the consultant was enough to put an end to their information search.

Polly saw her consultant because of her child’s cystic kidney. She said, “With the consultant we were able to get a truly informed picture saying this is not going to affect the health of the baby. [...] And so we were able to get an informed opinion from the consultant as well as our own research.” Because she had done her own research she
was prepared to talk with her consultant about any concerns and the consultant was able to answer her general questions and relate them to her child’s condition.

Ashley saw a consultant in the middle of her pregnancy because she had a high Body Mass Index (BMI), which classified her pregnancy as high risk. She appreciated his frank manner and confidence, saying, “He wasn’t there to give you any sort of care he was just there to give you the facts and that was it. [...] Yeah, I trusted him because he was so confident actually.”

11.9.3 Friends and family

Friends and family were an important source of information for many of the women because they were able to offer advice and support them emotionally. Rachelle, Ashley, Christine and Lana all turned to friends and family for advice, reassurance or information. Ashley and Lana in particular used their friends and family to help them understand and make decisions regarding complications they had in their pregnancies. Lana used her social group as a precursor to her own personal research; they provided reassurance and basic information, which in turn removed her need to do further research.

Rachelle and Christine would use their friends to seek advice on common questions faced in pregnancy and used the group wisdom to find answers without having to go to the medical community for them. Christine has a group of friends who connected in 2011 after the birth of their children, and they continue to give support and information about their children and subsequent pregnancies. She said, “I use them still now to ask questions probably half the time before I go to doctors. [...] more often than not you get [quicker and more useful] on the ground help as it were, from other mums in that situation.”

11.9.4 Online forums

In general, social groups often provided more common sense answers to questions and were able to cut through the medical jargon and perhaps appeal to the woman’s emotional needs rather than her rational needs. Social groups where the woman
developed relationships in person were more highly valued for information than online-only networks. Anonymous social networks tailored for pregnant women and mothers such as MumsNet and NetMums were mentioned as resources, but the women always included the caveat that they knew the information was often unfounded in science and could contain extreme opinions.

Ingrid said, “I must admit I didn’t ever find the answers on the chat boards very [...] reliable or I felt often they sort of replied the same thing. They were sort of reassuring to one another and that’s great but it wasn’t particularly helpful.” However, she did use these forums as a way to ascertain whether or not her questions were actually related to pregnancy by seeing how many other women asked a similar question. As she did not have other friends or family who had been or were pregnant at a similar time, this seemed to be another way to survey a community for common experiences.

Christine, when researching a VBAC delivery did a lot of research, which included reading online forums where women had written about their experiences with a VBAC. Christine used these women’s stories as a way to learn what conversations they had with their GP or midwife, so she could go to her own appointments feeling prepared with the questions she wanted to ask and the information she would likely hear.
12. Discussion

Even women who have the most straightforward, textbook pregnancies spend more time researching during those nine months, preparing themselves in anticipation of what is to come next. As constructive research can aid better birth outcomes for the mother and child, it is important to understand pregnant women's information behaviour as a way to improve the information systems that they rely on during this time. The research conducted in this study aimed to understand both the triggers that caused women to search for information and then how they evaluated the information they gathered to determine that they reached a satisfactory answer. This focused the study on the start of an information need and the end of the information-seeking journey.

The discussion will address each of the research questions outlined in the beginning, and conclude with additional interesting findings from the research.

12.1 What triggers a pregnant woman to perceive a knowledge gap?

12.1.1 Is it more common for women to search for information because an external source identifies a need or is it a reaction to internal, biological changes?

Different scenarios in pregnancy, much as in life, can cause an information need. All previous pregnancy information behaviour studies refer to the heightened information needs during pregnancy, and this study found that the underlying drive seems to be fuelled by the newness of pregnancy – the women are experiencing changes they never had before or during a previous pregnancy – and the rapid pace of change (Carolan, 2005 via Papen 2013). Women respond to information needs triggered by the changes in their bodies, and this is a primary reason to seek information. Even for parous women there are new questions related to each pregnancy as they can experience different symptoms or complications compared to previous pregnancies. This correlates
with the finding that most of the women said general pregnancy research was very important.

Women also have information needs following routine antenatal appointments. Uncertainty after an appointment can cause them to search for more clarity on information they are given from their GP or midwife. An example that is well established and was affirmed by this research is a heightened period of information searching prior to and directly after the 11-14 week appointment when women receive information about screenings.

The other main research triggers were related to specific events. Both the survey and the interviews showed that women experiencing complications went in search for information about their condition (one-third of the women in this study reported a complication). Notably, as the interviews showed, the women who conducted the most research were those who had a condition or complication that created concern. Discovering a complication caused an intensive research period, but once they felt reassured they tended to move into the opposite behaviour of doing very little and infrequent research thereafter.

Because complications can either be felt or discovered through testing, they can be an external or internal source of an information need depending on the situation. External sources, such as a midwife or GP, will typically diagnose and hence trigger an information need for complications such as Gestational diabetes or Rhesus Status. However, other complications, such as hyperemesis gravidarum or preterm labour, may surface through physical symptoms noticed by the mother, and thus an internal source would drive these information needs. While the survey asked women to list any complications, it did not delve into further detail to surface how they found out about the complication. Pregnancies with complications warrant their own study to understand the impact on the woman’s information behaviour.
12.1.2 For external triggers, are these more often from personal encounters or from reading material?

The women’s greatest reason to search for information while they were pregnant was simply to learn more about pregnancy and their growing baby. What the survey did not reveal was what lies within their general pregnancy research. As Ingrid indicated in her interview, general research can resemble a breadcrumb search pattern. She described a specific time when she stumbled on to information that she did not intend to look up, and said that with the amount of information that exists online it is easy to “happen across things that are not the information you need”. As more pregnancy resources become internet-based, and as more women turn to the internet as their primary source for research, it is likely in their general research they will stumble upon new and unintended information that leads them to further research whether they are aware of this happening or not.

While the research did not reveal whether personal encounters or reading material were more likely to trigger an information need, it did show that information received at an appointment (a personal interaction), especially if that information was about a complication, would provide a catalyst for the most intense periods of research.

While the NHS provides the basic information about what to expect in a healthy pregnancy, nearly two-thirds of the respondents required more in-depth research when they had a question about their pregnancy. This could come from either reading their maternity notes or following an antenatal appointment.

12.1.3 Which knowledge gaps do pregnant women choose to react to? Are they selective or do they generally respond to them all?

From the interviews it was clear that many women will limit their reading materials and research in order to not cause unnecessary information needs. They will periodically avoid researching as a way to minimise potential stress or anxiety from the information they may find. The only outlier was who Christine was unrestrained in her research, gathering as much information as she could. The other women admitted that they were
careful not to feed into their naturally curious or obsessive nature and took intentional breaks from researching or reading anything pregnancy related.

12.2 How do pregnant women determine when they have reached a satisfactory level of knowledge?

12.2.1 How many different sources did they use to reach a satisfactory answer?

On average women reported using seven different sources for finding information. The chart shows the range went from zero to 17, with most women falling into the range of five to eight sources. The most common sources were midwife, baby-specific websites, search engines, books or brochures, online chat forums, medical websites and the GP.

In the interviews, when the women were asked to detail how they went about researching information, they cited an average of three sources (splitting between looking at either four or two sources) when they were trying to fulfil a single information need. Often their search would start with a search engine, which would lead them to their preferred websites (medical, pregnancy or chat forums), and then they would validate these with either books or a trusted person (medical, family or friends). Interestingly, with the women interviewed this was the same regardless of the severity of the situation. Whether they were researching advice on how to alleviate pregnancy symptoms or trying to find out more about potentially serious medical conditions with themselves or their baby, they followed the same patterns of research. This indicates that these are probably similar patterns that they follow and use for other information gathering, though it would be interesting to see how it correlates to their information behaviour before pregnancy.

12.2.2 What was the means for measuring satisfaction - did they have logical criteria or was it more emotionally ('gut') based?

Instinct certainly played a role in the decision-making process for a lot of women. Over half the women stated that in pregnancy and during labour they trusted their instincts in making decisions (67%). However, there was a decline to only 30% of women when
this question was phrased, “What do you value most when making decisions”. Then when they were asked about what they valued for trusting information, information grounded in medical research was clearly a priority (82% cited either NHS-written, reference to scientific studies or written by an expert). While these seem to contradict each other, it is important to remember that decisions are not made in a vacuum; everything will play into a woman’s decision-making process.

While some women stay grounded in the facts that they find in their research, just under one-third will ultimately make their decision on how they feel in the moment – what they refer to as instinct, which is emotionally based. This can provide an explanation for the discrepancies between women looking to medical research and opinion but at the same time disregarding the advice and opinion of their midwife who they may not get along with. Perhaps a better term to describe this behaviour is emotional reasoning. Women research a wide variety of things related to pregnancy, so when they have to make a decision, they are fully informed of their options and choosing to do what appeals most to their beliefs or world views. For example, Ashley repeatedly said that she relied on her instinct to make decisions in her pregnancy, but further questions showed that she used her instinct in reacting to conflicting information. In actuality she was making a judgment between two different opinions, allowing her emotions to guide the final choice.

The only woman who appeared to have a true reliance on instinct was Rachelle, who had to make a choice about attempting a VBAC delivery or a second C-Section. The advice of her doctor was to attempt a VBAC and Rachelle said she prayed about what to do rather than research her options, and ultimately chose, on instinct and her faith, to have an elective C-Section. She later felt confirmed in this choice when the surgeon post-delivery admitted it was the best option for her safety.
12.2.3 Would one search affect the next; if they spent a long time searching on one aspect of their pregnancy, were they learning from that process or repeating it again when they had another question?

In effect, no. These women, rather than learning a new pattern of search appear to simply be amplifying their existing information behaviours. As Christine said, “It’s part of my personality to be researching and looking up things and doing that sort of thing. I do [this] constantly [for] everything, so it goes hand in hand with who I am as a person to do that.” In the interviews it came out that a lot of the women fell back on their natural information behaviour practices whether these were ones they used in their everyday lives or for their professional work research. They relied on the methods that they were most comfortable with and that produced the most satisfying results.

What did seem to change though was how frequently they searched for information. The start of the pregnancy is when most women concentrate on research as they learn for the first time about the condition of their personal health for the pregnancy and the health of their baby (Papen, 2013; Larsson, 2009; Lagan, Sinclair, and Kehnonah, 2011). But this research suggests that women who learn about a complication or health concern early on and research it constantly experience fatigue, both mentally and physically, from the anxiety and stress it can induce. This seemed to be the case for Polly, Lana and Ashley who all received negative information at the start of their pregnancy. After they felt assured about their child’s health, they appeared to practice information avoidance for the majority of the second trimester. In the third trimester, however, they resumed research to learn about labour, birth and the postnatal period.

12.3 Additional findings in the research

12.3.1 Emotional reasoning in information behaviour

Paramount to understanding the information behaviour of pregnant women was understanding the part emotions played in their pregnancy experience. The women used emotive words to describe their research: information was “scary” and “daunting”; information needs left them “worried”, “curious”, “panicked”, “stressed”; sources made them feel “irritated”, “confident”; they described their own research as “obsessive”,

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“blasé”. When describing how they searched for information, they always added context around how they were feeling both physically and emotionally, and indicated throughout how much support they received from family and friends. This highlights the importance when designing an information behaviour study to look at theories that take into account and recognise how external and internal circumstances will influence people’s information behaviour. In this study looking at pregnancy, to simply ask women about their research patterns and sources without understanding why they made those choices misses critical details that inform all of the factors that influence those choices. Knowing the motive for selecting sources improves understanding and allows for better recommendations for improving information systems and sources.

12.3.2 Gaps in postnatal education

From the survey there were two contrasting messages from women about postnatal information. A majority of women stated they were happy with their research about postnatal recovery, but further comments at the end showed that there were some women who had a dearth of information about the postnatal period. There could be a variety of things contributing to this from unexpected outcomes of the birth, the baby or mother’s health or the stress of caring for a new baby. It is clear that there is a gap in the information the NHS provides to women at their appointments, and this is potentially an information service they could fulfil in antenatal appointments or classes.

12.3.3 Midwife-patient relationship

The midwife is especially positioned to both provide information to and aid the research of the pregnant women they see. Whilst their role encompasses other important antenatal care requirements, it is their involvement, or lack of, in a pregnant woman’s information behaviour that has the most potential to influence the health of both the woman and her child. This is why it is so worrisome to see through this study, and reinforced through findings in other studies, an erosion of the relationship between midwives and pregnant women.

Midwives go through extensive training in all areas of antenatal and postnatal care so they are able to relate to any questions along a woman’s pregnancy experience. They
are also equipped to direct women to other resources to meet more specific information needs. This makes midwives a very valuable source and intermediary of pregnancy-related information. It did appear that the women respected midwives, knew they were very knowledgeable and used them to satisfy basic information needs. However, it was hard for the women to establish a rapport when they saw a new midwife at every appointment. As the appointments were personal interactions between a midwife and patient, there were also times when the women did not feel like they could trust their midwife’s advice or consult with them on pregnancy questions. The resulting sentiment towards midwives for these women was at times either distrust or apathy. The causes for distrust or apathy varied, but the most common reasons were: conflicting information provided by different midwives, insensitivity towards a woman’s situation, personality clashes and rushed appointments.

Having one midwife care for each woman all of the way through her pregnancy, having empathy training, having longer appointment times and few patients per midwife would all help to alleviate this issue. It would promote a trusting relationship and ultimately allow the midwife to better understand the woman’s individual circumstances to provide meaningful advice that she will trust and use. Midwives also need to be more explicit about what information they can provide to women during their appointments, how they can assist in personal research and what resources they have access to on behalf of pregnant women. This can be achieved through better communication between the midwife and her patients, and is the easiest to remedy if the NHS lacks the resources to attend to the other recommendations.

12.3.4 ‘Trusted’ resources

The strategy of using a few trusted resources throughout a pregnancy seemed to be the most stable and reliable method for quickly resolving information needs. The women interviewed used a combination of a few books or websites for most of their questions in pregnancy, and if they were unable to find an answer there then they would expand their search. This helped to filter out unwanted information which can cause anxiety or more information needs complicating the situation. This trusted resource was also a person in a few cases; it appears when the women had access to someone who was an independent midwife or doctor they would turn to them for a final consultation when
they had any concerns about their pregnancy. While not everyone has that luxury, it does show the importance of face-to-face consultation with a real person over things read.
13. Conclusions and further research

Most pregnant women will conduct some amount of general preparatory research to stay informed over the course of their pregnancy. For this research they often consulted a small number of resources selected early on in the pregnancy. The interviews provided several anecdotes that indicated general pregnancy research lead to further enquiries by uncovering information that the women had not considered before. However, more commonly it was personal interactions with a physician or midwife that provoked an information need. When these medical staff revealed new information about the pregnancy (benign or otherwise), women usually investigated it more on their own. These information behaviour practices are useful for pregnant women - the women are able to understand the rapid changes they experience and comprehend the incoming medical care information as it pertains to their pregnancy.

Unexpected events, such as a complication, were the most common trigger for conducting research. These could be either something they physically experienced or something they learned at an appointment. Usually these events lead to a period of intensive search for information, followed by a prolonged break from all research. This strategy of taking breaks, and notably stopping altogether in the second trimester, was a way to avoid research fatigue or information overload. While pausing from research is a good strategy for avoiding stress during the pregnancy, it is important that nulliparous women are not put off from doing research altogether as they will need need to make informed choices up through the birth of their baby.

In general, women adapted their information behaviours they had pre-pregnancy; their style of looking for information did not change, but the frequency of their searches did increase. On average women used five to eight sources throughout their pregnancy and three to answer a single information need. Women overwhelmingly wanted scientifically-backed information, but they did not always base their decisions on rational measures. Emotions were a huge influence for how they judged a source and if they decided to trust it. Therefore, the women’s emotional considerations affected the outcome of their decisions just as much as the research they obtained.
The most crucial aspect of women's information behaviour during pregnancy is making sure they receive information over the nine months that enables a healthy pregnancy, without generating information overload or anxiety. Midwives can and need to improve their prominence as information providers as they are best placed to facilitate healthy information searching. They are the medical staff pregnant women see most frequently, and could become one of the women's trusted resources from the outset of pregnancy. The midwife is perfectly positioned to verify the vast amount of pregnancy-related information women access and can help them answer queries quickly.

13.1 Further study recommendations

While this study found insights into all of the research questions and objectives, it did reveal areas that deserve further study.

13.1.1 Tracking postnatal information behaviour

Several participants in the survey mentioned that they spent a lot of time researching specific topics, or focusing on the birth and labour. After birth however they indicated regret that they had not read more about the postnatal recovery period. There is value in exploring this more, to see what topics women felt they under-researched versus those they researched more than was needed. It would also be interesting to continue this study to learn about the evolution of women's information behaviour after the birth of the baby. For example, Lana mentioned that while she was very interested in medical opinions and did very little research when she was pregnant, after she had her baby she was much more interested in learning from other mothers and hearing about shared experiences and advice. She researched more during her initial postnatal time and continued to conduct research as her child developed, which was in stark contrast to the very little research she did throughout her pregnancy. Understanding women’s information needs and behaviours during their postnatal period could show what information is important for women to receive whilst they are still pregnant.
13.1.2 Comparing private antenatal care to the NHS

A sentiment repeated in interviews was the feeling that the midwives rushed women through their appointments, or that they did not empathise with the women and their concerns. These were both reasons why women said they did not rely on their midwife as a primary information source. For women using the NHS for antenatal care, they have little choice in who sees them and for how long. However, women who elect for private maternity care are able to select their provider. Given that, it begs the question: do women who pay for their antenatal care place a higher value on their provider as an information source than the women in this study?

A similar scenario would be women who elected to hire a private midwife or doula to attend their birth. These are trained professionals who can offer advice (whether medical or personal) and can coach a woman during her pregnancy. They can offer the stability that the NHS lacks and the relationship that a lot of the women in this survey would have benefitted from. A study on women who use private midwives or doulas could provide insight on how important an emotional connection is to an information provider when they are offering medical advice.
14. References


15. Appendices

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Appendix I: Reflection

I was inspired to write about this topic midway through my masters degree when I became pregnant. Perhaps because of the lectures I was attending at the time, I was very aware of my information seeking behaviour throughout the course of my pregnancy and how the information I consumed was affecting me. I was very well informed, but there were periods when my search for information caused anxiety and stress because of conflicting or confusing information, and too much information. Researching one question could highlight more reasons to worry and more problems to research. Reflecting on this I wanted to see what caused other women to search for information during a pregnancy, and how they satisfied their information needs.

From the start I quickly saw how important my proposal was for guiding my research, keeping it focused on the research questions and ensuring that I met my deadlines. I spent a lot of time preparing the proposal, and while there was some evolution along the way from what I thought I would find in the research, my research questions and aims remained the same. Another resource that aided my work was the website I created for my dissertation (www.pointofconception.com, disabled on 5 June 2016) which helped me to promote my research and recruit participants for the survey and interviews.

While I took great care at the start of my project to research and outline each stage, there were still areas that did not fully meet my expectations (covered in my dissertation and again here). My first disappointment was the realisation that I would not be able to obtain a truly representative sample of women. With limited time and means to recruit participants to the study, I opted to leave out questions about demographics to encourage as many people as possible to complete the survey. While this meant that I was unable to describe a profile of the participants, I made the conjecture that the women who took the survey were very similar to myself as they most likely came upon the survey through one of my personal networks. I would have preferred to have more diversity in my sample, but what I compromised in diversity I gained in expediency and volume.
Also evident when analysing the survey responses was a missed opportunity to ask women about the steps they took during a single information search. Using Google Forms limited the format of questions I could ask, and had I employed a more flexible online survey service this would have been a simple question to include.

My favourite part of the research was conducting the interviews. It was fascinating to hear about the different experiences the women went through that influenced their information needs. I was very grateful to the women who participated, especially as recruiting interviewees was not as simple as I anticipated. Initially I had several women pose an interest in being interviewed for the study. While I reached out to all volunteers, only six women followed through. I was satisfied as this was within my range of interviews needed, but the experience did show me how difficult it is to engage people in a research study.

The most valuable resource I drew on was peer review to edit my final paper. I know that the final dissertation would not be as coherent as it is without the help of several people who read over and interrogated my draft. Along with careful initial planning, this would be my top recommendation to any future students embarking on their masters dissertation.

Overall the experience of writing this dissertation felt like a true test of what I had learned on this course. I had the pleasure of working within a vibrant community of peers who encouraged each other on and I met inspiring women who graciously opened up to me about their lives. It was incredibly rewarding, and I am proud that I put together a meaningful piece of work.
Appendix II: Dissertation proposal

Dissertation Project Definition Document

Working title: Point of conception: studying women’s information behavior during pregnancy

Supervisor: David Bawden

INTRODUCTION

Pregnancy for a woman is a time of continual physical change and preparation. Throughout the course of their pregnancy, women in the UK will have access to a huge wealth of information ranging from regular updates on the fetal development to how to care for the baby in the first weeks. A mother will start to make decisions over the nine months from how they will feed their baby (breastmilk or formula) to the level of intervention they will accept in the delivery room. The rapid physical change and influx of information can welcome in a period of discovery and learning, but it can also invite stress and anxiety from perceived information gaps.

In today’s society pregnant women have more and more information at their disposal, and it is my belief that they more often than not feel the need not to find an answer to their information needs, but the answer - whether it exists or not. There is greater pressure from within and externally to have the right answer and do what is best for their baby.

In this study I want to find out what are the incidences that instigate a woman to search for information and how do they reach a satisfactory answer to their information needs.
Once they start down their searching path, how long does it take for them to feel satisfied that they have enough information to answer their query? And within that search how many sources did it take to come to that conclusion? This is a study not on what sources pregnant women use so much as what is the journey they take to arrive at the sources.

AIMS AND OBJECTIVES

This dissertation aims to find out what causes a woman to search for information during their pregnancy, and how do they reach a satisfactory answer to their information needs. The aim can be broken into two areas: what are the triggers for information search and how is the search determined to be answered/complete. The objectives for the aims are as follows:

What triggers a pregnant woman to perceive an information knowledge gap?
- Is it more common for women to search for information because an external source identifies a need or are they a reaction to internal, biological changes?
- For external triggers, are these more often from personal encounters or from reading material?
- Which knowledge gaps do pregnant women choose to react to? Are they selective or do they generally respond to them all?

How do pregnant women determine when they have reached a satisfactory level of information knowledge?
- How many different sources did they use to reach a satisfactory answer?
- What was the means for measuring satisfaction - did they have logical criteria or was it more emotionally (‘gut’) based?
- Would one search affect the next; if they spent a long time searching on one aspect of their pregnancy, were they learning from that process or repeating it again when they had another question?
The project will look to answer these objectives through research, surveys and interviews.
SCOPE/DEFINITION

This study will only look at the information behavior of women who have been pregnant in the last five years, who lived in the UK during the pregnancy and who received their antenatal treatment from the NHS.

The time period of five years is used to ensure the women responders are able to recall their information behaviour to a satisfactory level of detail that this study needs.

The study is limiting participants to women who were pregnant in the UK to ensure a standardised level of medical care throughout the pregnancy as these women will have all received antenatal treatment from the NHS. Other countries can have very different medical approaches and procedures for pregnant women and could therefore affect the base level of information provided during the pregnancy.

The study is not seeking to interview women who are currently pregnant as it wants to understand a woman’s information behavior for the duration of their nine month pregnancy and therefore will be looking to interview women who are mothers to at least one child.

This study is not concerned with the number of children a women has had but may look to compare women's information behavior of multiple versus single pregnancies if there is enough data captured to compare the two groups.

RESEARCH CONTEXT

I decided on this topic following my own recent pregnancy. During my pregnancy I was very aware of how my information seeking behavior was evolving; the more my body changed and became less familiar to me, the more questions I had about what was happening to me and my baby. However I was often met with conflicting or confusing information, and too much information. Researching one question could highlight more reasons to worry and more problems to research.
A few months after having my baby I began to reflect on this and wonder how other women felt about seeking information at the time of their pregnancy(ies). What drove their information searches – was it physiological changes that sparked their need? The introduction to new information that left more questions than answers? Fears and paranoia from other friends telling them their own pregnancy/birth/parenting stories? Curiosity? Excitement? A way to feel in control during a time that is largely out of their control? It was these questions and others that I pondered before deciding I wanted to look into this more.

A search of existing research turned up a few information behaviour studies on pregnant women, but the majority of them focused solely on the sources the women used. My study will look at the information behaviour over the entire pregnancy and will look to understand what caused women to search for information, and to see how they meet their information needs.

**LITERATURE REVIEW**

This dissertation will contribute to the small but growing number of studies on pregnant women’s information behaviour. Pregnancy is a time of “heightened information needs and mothers-to-be may spend much time searching for and assessing information on issues,” (Papen, 2013). This is a crucially important time in both a woman’s life as well as the life of their developing baby as the information they receive - or do not receive - can have a huge impact on the positive outcomes of their and their baby’s health (Shieh, McDaniel and Ke, 2009). But while the original forms of antenatal care provided a rubric of medical guidance on how to have a healthy pregnancy, today’s modern society has expanded the information needs to include all aspects of child-rearing, breastfeeding, labour and birth and medical interventions. This has thus increased the amount of time pregnant women spend searching for information (Johnson, 2014). Though some studies note that the height of information searching appears at the start of a woman’s pregnancy (Papen, 2013; Larsson, 2009; Lagan, Sinclair and Kernohan, 2011), there is no further remark on how their early information behaviour has an affect on the remainder of the pregnancy. What this dissertation
wants to find out is whether or not during this intensive time, women learn more effective means for finding information that satisfies their needs.

Because of the wide-ranging models of antenatal health care existing around the globe, the majority of the studies like mine are focused on a group of women from one country, examining their information behaviour in view of the medical treatment, support and care they receive. As Luyben and Fleming demonstrated in their comparative study of women from three different European countries, there can be notable differences in information behaviour due to the design of their antenatal treatment. Even the difference of midwife versus doctor-led care had an outcome on the women’s use of the internet for information (2005).

Most recently information behaviour studies have focused on the sources pregnant women use and in particular whether or not the internet is becoming the dominant source for information (Weston and Anderson, 2014; Johnson, 2014; Larsson, 2009; Lagan, Sinclair and Kernohan, 2011). What these studies ultimately determine is that pregnant women use multiple sources to research and then verify information they find which more often leads them to have a more holistic information behaviour than they do in other areas of their lives (Shieh, McDaniel and Ke, 2009). Therefore, I determined it was not what sources they used that was important to understand, but rather the journey they take to reach an understanding of the new existence they occupy as mothers-to-be.

At the start of my research I believe the most relevant information behaviour theory will come from Brenda Dervin’s Sense-making which incorporates information behaviour into the human journey and allows for the influence of emotions and the fluid nature of information that can be constructed by the user to help them bridge moments of their existence (Dervin, 1998). As each woman’s experience of pregnancy can be both markedly the same in some areas and vastly different in others, Dervin’s model of Sense-making helps to focus instead on the socio-cognitive aspects of information seeking behaviour and allow for concepts such as maternal instinct, hormonal emotions and societal pressures that can all have huge influences on women’s behaviour throughout their pregnancy.
The literature review will provide background research from all of the available studies on pregnant women's information behaviour as well as an explanation of the sense-making information behaviour theory and how it will be applied to the research methodology. Other areas of research that may be relevant and will be reviewed include information behaviour of midwives and obstetricians, and women's more general health seeking information behaviour.

METHODOLOGY

To measure my objectives I will be conducting both a survey and interviews.

Background research

I plan to include along with my literature review two informal interviews: one with a member of staff from the National Childcare Trust (NCT) and another with a midwife. NCT practitioners run regular antenatal courses for women and partners as well as local support groups. I would interview someone who runs these workshops and groups to get their views of the kind of information women seek during the course, how they seem to go about finding it and any issues the practitioner has had as a result of their information seeking (such as faulty information or anxiety).

By interviewing a midwife I hope to understand the care pathway that they must follow for each of their patients, and within that the information they are required to provide, the information they elect to provide and the information they suggest patients research on their own. This will give me an understanding of the standard set of information pregnant women should receive over the course of their pregnancy from the NHS.

Survey
Armed with my background research I will create a survey which will make up the quantitative data for my research. The questions will be primarily quantitative, though it may include a few open-ended questions for reflection. I want to split the survey into three stages to cover each trimester which will help to see if there are any information behaviour changes over the course of the pregnancy. The questions will cover:

- Demographics (age, county they live in, number of pregnancies, month and year of the start of the last pregnancy, level of education, race/ethnicity, married/single/divorced)
- Events that triggered a search for information (visit to GP/midwife, results from scan/test, information/advice from friends and family, curiosity, information from another source, experience from previous pregnancy, experience during pregnancy)
- Type of information they were seeking (monthly updates of pregnancy, baby prep, labour prep, work entitlements...)
- Resources they used in pregnancy (books, online forums, doctor, ...)
- How they rated the resources they used
- How long it took to resolve an information need, including how many resources they reference before they were satisfied

My survey will run in two stages. The first stage will be a pilot survey which will go out to a small sample of women to determine the suitability of the questions and the format of the survey. Once the results are returned I will adjust the survey, if needed, and carry out the full survey. I plan to run this survey both online and in person at mother/parent groups around London. It is my aim to collect at least 100 responses.

 Interviews

At the end of the survey I will ask for volunteers for me to interview. The interviews will be conducted at the same time I am running the survey. For each interview I will use the same set of questions and I am aiming to interview between five and 10 women. These will be conducted either by phone, skype or in person. All interviews will be recorded and transcribed.
Once the survey and interviews are complete I will analyze the data from both. The survey will be able to provide me with primarily quantitative data that I will be able to chart, while the interviews will give rich qualitative data. I hope to be able to draw conclusions by combining these two data sets.

**WORK PLAN**

The schedule that I have laid out breaks the work into six stages over the next 36 weeks.
<table>
<thead>
<tr>
<th>Task</th>
<th>Dates</th>
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<tr>
<td><strong>I: Kick-off</strong></td>
<td></td>
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<tr>
<td>a Confirm topic and supervisor</td>
<td>04/05/2015</td>
</tr>
<tr>
<td>b Literature review</td>
<td>18/05/2015</td>
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<tr>
<td>c Project definition document</td>
<td>25/05/2015</td>
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<tr>
<td><strong>II: Research</strong></td>
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<tr>
<td>a Research (online/in library)</td>
<td>06/06/2015</td>
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<tr>
<td>b NCT informal interview</td>
<td>15/06/2015</td>
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<tr>
<td>c Midwife informal interview</td>
<td>22/06/2015</td>
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<tr>
<td>d Write up literature review</td>
<td>29/06/2015</td>
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<tr>
<td><strong>III: Survey</strong></td>
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<tr>
<td>a Formulate initial survey</td>
<td>08/06/2015</td>
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<td>b Pilot survey</td>
<td>15/06/2015</td>
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<tr>
<td>c Refine survey following pilot</td>
<td>22/06/2015</td>
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<tr>
<td>d Run survey (online)</td>
<td>29/06/2015</td>
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<tr>
<td>e Run survey (mother’s groups)</td>
<td>06/07/2015</td>
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<tr>
<td><strong>IV: Interviews</strong></td>
<td></td>
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<tr>
<td>a Contact and arrange five to 10 interviews</td>
<td>08/07/2015</td>
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<tr>
<td>b Write transcript from interviews</td>
<td>15/07/2015</td>
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<tr>
<td><strong>V: Data analysis</strong></td>
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<tr>
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<th>Compile and review data from survey</th>
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<tr>
<td>a</td>
<td>Review evidence from interviews</td>
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<tr>
<td>b</td>
<td>Cross-reference survey and interviews</td>
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<tr>
<td>c</td>
<td>V1: Write up</td>
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<td>Write</td>
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<td>Edit</td>
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<td>d</td>
<td>Peer review and final edits</td>
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<td>e</td>
<td>Submit</td>
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RESOURCES

Survey
- Google Forms
- iPad for conducting surveys
- Excel

Interviews
- iPhone and voice recorder app for interviews
- Backup recorder for interviews
- Skype for interviews
- £40 travel expense for interviews (will only travel to interviews in Greater London area, all others will be conducted over the phone or Skype)

ETHICS

The main ethical issues I will need to address are: participation of pregnant women, informed consent, anonymity and confidentiality.

Participation of pregnant women: I will not seek, target or require the participation of currently pregnant women in my study. The women who participate need to have experienced a full-term pregnancy so they are able to reflect on their information behavior over the entirety of their pregnancy.

Informed consent: For both the online survey and the interviews I will ask respondents to give informed consent about their participation and the use of their data in this study. Interviewees will also receive a participant information sheet and consent form to sign before the start of their interview. All participants also have the right to remove themselves from the study at any time with no consequences.

Confidentiality: For both the online survey and the interviews all participants will be informed of how I will ensure confidentiality of any sensitive or personal information they supply. This is covered in more detail in the final section of this proposal.
Below is my research ethics checklist.

1. Does your project pose only minimal and predictable risk to you (the student)?  **YES**

2. Does your project pose only minimal and predictable risk to other people affected by or participating in the project?  **YES**

3. Is your project supervised by a member of academic staff of the School of Informatics or another individual approved by the module leaders?  **YES**

4. Does your project involve animals?  **NO**

5. Does your project involve pregnant women or women in labour?  **NO**

6. Does your project involve human participants? For example, as interviewees, respondents to a questionnaire or participants in evaluation or testing?  **YES**

7. Could your project uncover illegal activities?  **NO**

8. Could your project cause stress or anxiety in the participants?  **NO**

9. Will you be asking questions of a sensitive nature?  **NO**

10. Does your project rely on covert observation of the participants?  **NO**

11. Does your project involve participants who are under the age of 18?  **NO**

12. Does your project involve adults who are vulnerable because of **NO**
their social, psychological or medical circumstances (vulnerable adults)?

13. Does your project involve participants who have learning difficulties? NO

14. Will you ensure that participants taking part in your project are fully informed about the purpose of the research? YES

15. Will you ensure that participants taking part in your project are fully informed about the procedures affecting them or affecting any information collected about them, including information about how the data will be used, to whom it will be disclosed, and how long it will be kept? YES

16. When people agree to participate in your project, will it be made clear to them that they may withdraw (i.e. not participate) at any time without any penalty? YES

17. Will consent be obtained from the participants in your project? YES

18. Have you made arrangements to ensure that material and/or private information obtained from or about the participating individuals will remain confidential? YES

All information gathered through my survey will be anonymous so I will not know the identity of the person participating. All of the people I will interview will have their personal details removed from their transcripts so as to not identify them with the consent form they sign.
19. Will the research be conducted in the participant’s home or other non-University location?  YES

I intend to conduct interviews and plan to do them either by phone, Skype or in person. In the case of in person interviews, I will choose a safe, public location that is accessible for myself and the interviewee such as a coffee shop or a local library. No interviews will be conducted in a person’s home. I will make sure someone knows my location for all of my interviews and I will take sensible precautionary measures (phone at hand, day time travel) to stay safe.

CONFIDENTIALITY

The women participating in the online survey will be able to complete the survey anonymously.

I will assign each woman interviewed an identity number to keep them anonymous; the only time their name will be present is on the consent form they have to sign to be interviewed. All other instances will be redacted from any transcripts or material included in the dissertation. All women interviewed will receive a consent form prior to the interview so they are aware of the nature of the interview and the way I will be using the transcripts for my study, and they will be allowed to at any time before or during the interview to retract any statements they have made.

Only myself and my supervisor would have any access to any personal information and it will be stored securely. I will not share any personal information with any companies, groups or organisations.

REFERENCES


Appendix III: Survey questionnaire

This survey ran on Google Forms and was accessed through the dissertation website, www.pointofconception.com.

Seeking information during pregnancy

I’m Tess, an MSc Information Science student at City University London, and this is a survey about how women seek information during their pregnancy. Participants must have given birth in the UK in the last five years. The survey will take approximately 8 minutes to complete.

My dissertation aims to understand why women search for information during their pregnancy. By taking this survey you agree that I can use your responses in my dissertation research. You can withdraw your participation by not submitting the survey and closing the browser. Your personal information and participation is completely anonymous. If you have any questions about the survey or my research, please email tess.stackley.1@city.ac.uk.

Let’s begin!
These are questions about your pregnancy history.

1. How many pregnancies have you had?
   [numeric response]

2. Type the year of your last pregnancy.
   [numeric response]
All of the remaining questions should be answered in regards to your most recent pregnancy.

3. Did you give birth in the UK?
   - Yes
   - No

4. What was your healthcare provider for your pregnancy (antenatal, labour and postnatal care)?
   - NHS
   - Private
   - Combination of NHS and private

5. Where did you give birth?
   - In a labour ward
   - In a birth centre
   - At home
   - I had a C-section delivery

6. In your last pregnancy, did you have any complications?
   - Yes
   - No

7. Which complication(s) did you have in your pregnancy? Tick any that you had.
   - Gestational diabetes
   - Blood clots
   - Gestational hypertension
   - Pre-eclampsia
   - Anemia
   - Ectopic pregnancy
   - Oligohydramnios (low amniotic fluid levels)
   - Placenta abruption
   - Previous C-section
- Previous pregnancy complication
- Low Papp-A
- Rhesus Status
- Mental health
- Hyperemesis gravidarum
- Polyhydramnios (elevated amniotic fluid levels)
- Placenta praevia
- Preterm labour
- Fetal problems
- Miscarriage

8. Was your pregnancy classified as high risk?
   - Yes
   - No

9. Why was your pregnancy high risk?
   [open response]

Your antenatal care and education

10. Did you take an antenatal class?
    - Yes
    - No

11. What type of antenatal class did you take?
    - NHS
    - NCT
    - The Daisy Foundation
    - Hypnobirthing
    - Antenatal Yoga
    - Other [open response]
12. What topics were covered in your class(es)? Please choose all topics that were discussed.

- Diet
- Exercise
- Labour and birth stages
- Pain relief options
- Labour positions
- Relaxation techniques
- Your partner's role in labour
- Birth interventions
- Vaginal birth after a C-section
- Feeding the baby (breastfeeding, formula or mixed feeding)
- Postnatal recovery
- Emotional health
- Caring for your newborn baby
- Other [open response]

13. Where did you go for information throughout your pregnancy? Please choose all of the sources you used.

- Midwife
- GP
- Doula or private midwife
- Books or brochures
- Newspapers or magazines
- TV (news, shows, documentaries)
- Talks given by a hospital or community centre
- Radio or podcasts
- Health fairs or community events
- Support groups
- Phone/tablet apps
- Email newsletters
- Online chat forums
- Social media
- Medical websites
- Baby-specific websites
- Search engines (such as Google)
- Telephone hotlines (such as NHS Direct)
- Other [open response]

14. What caused you to look for information on your pregnancy? Please choose all that apply
- Tracking my weekly pregnancy progress
- Experiencing a physical change in me or my baby
- Following or leading up to a midwife or GP appointment
- Following or leading up to an antenatal class
- Talking to family or friends
- Reading something on social media or in an online forum
- Looking for an alternative to the medical opinion
- Needing more in-depth research to a question
- Searching for general information about pregnancy
- Reading/seeing something in the news
- Getting an update/alert from an app or email
- Other [open response]

15. How did you decide to trust the information you found?
- There were references to scientific studies
- It was written by an expert in the field
- The information was up-to-date
- It corresponded with facts from other things I read
- The government or NHS was responsible for the information
- It was recommended by a friend
- It was recommended by a midwife
- It was recommended by my antenatal class teacher
- The content was well written
- I learned about it from another trusted source (such as a book, article, website)
16. What do you value most when making decisions? Please select the best answer.
   - Your instinct
   - Your previous experiences
   - Medical research and opinion
   - Social opinion (family, friends, peers)
   - Natural birth philosophy

17. Did you always share the information you found with your midwife or GP?
   - Yes
   - No

18. What prevented you from talking about the information you found with your midwife or GP?
   - The appointment was not long enough
   - I did not know how they would react
   - It was not relevant to my appointments
   - I was not looking for a medical opinion
   - I trusted my own instincts and beliefs
   - I was happy with the information and did not need their validation
   - Other [open response]

**Reviewing your information searching**

19. How important were the following topics to you during your pregnancy?
   Please rank the topics using 1=very low priority to 5=very high priority according to how much time you spent searching for information. Please skip any topics you did not research.

   - The antenatal care appointment schedule
   - Screenings
• Miscarriage
• Pregnancy complications
• Week-by-week pregnancy progress
• The differences in home birth vs birth centre vs hospital birth
• Birth plans
• Vaginal birth after C-section
• Labour
• Pain relief options
• Inducing labour
• Baby names
• Breastfeeding
• Bottle feeding
• Baby rearing and care
• Pregnancy nutrition
• Exercise
• Other women’s birth stories
• Products for pregnancy
• Baby products
• Community groups for pregnancy and after birth
• Postnatal recovery

20. If you have any additional comments for this question, please write them below.
[open response]

21. Looking back on your information searching throughout your pregnancy, please
select how you feel about each of the following statements
Rating: Yes, always; Yes, mostly; Somewhat; Not at all

• The information I found was helpful; I felt prepared throughout my
  pregnancy
• My midwife / GP kept me informed and allowed me to make my own choices
during labour and delivery
In labour and delivery, I trusted my instincts and my body over other opinions (read and told) when making decisions

I knew and had the essential things to care for my new baby

I was prepared for my immediate postnatal care

In pregnancy, I trusted my instincts and my body over other opinions (read and told) when making decisions

My friends and family provided helpful insights and information on pregnancy and childbirth

My midwife / GP kept me informed and allowed me to make my own choices throughout my pregnancy

22. If you have any additional comments for this question, please write them below.
   [open response]

Thank you for taking this survey and contributing to my research. Please share www.pointofconception.com/survey with other women who can take the survey. Any help to spread the word is greatly appreciated! To learn more about this study, please visit www.pointofconception.com.
Appendix IV: Email sent to interview participants

This email was sent out to everyone who volunteered to take part in the study’s interviews.

Hi,

Thank you for your interest in my dissertation study! As my website states, I am looking to interview women to learn about their information behaviour during their pregnancy. The questions I’ll be asking are about what caused you to search for information, what process did you take to find an answer, and how did you verify that the answer was correct. Your participation would be completely confidential and you can withdraw at any point in the study. Depending on how much detail you provide in your answers, the interview will be about an hour long.

Attached is the participant information sheet and consent form for you to review (you can also download these files here: http://pointofconception.com/interviews with the password “partici2015”). I am scheduling interviews from 3 August - 11 September. If you are happy to participate in an interview after reviewing this information, please let me know what dates and times you have available. If you live in the Greater London area I can travel to interview you at a convenient location, or I can arrange a phone or video conference.

If you have any questions, please do let me know.

Kind regards,
Tess Stackley
Appendix V: Interview participant information sheet

All interviewees received this participant information sheet to review before signing their consent form.

Participant information sheet

Title of study Point of conception: A study of women’s information behaviour during pregnancy

We would like to invite you to take part in a research study. Before you decide whether you would like to take part it is important that you understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.

What is the purpose of the study?
This study is trying to find out what are the incidences that instigate a woman to search for information during pregnancy, and how do they reach a satisfactory answer to their information needs. Once they start down their searching path, how long does it take for them to feel satisfied that they have enough information to answer their query? And within that search, how many sources did it take to come to that conclusion? This is a study not on what sources pregnant women use so much as what is the journey they take to arrive at those sources.

This dissertation aims to find out what causes a woman to search for information during their pregnancy and how do they reach a satisfactory answer to their information needs.

Why have I been invited?
You have been invited to participate in an interview. You completed the initial study survey and volunteered to participate in a follow-on interview for the study. You were chosen by the researcher according to your profile matching the target audience of this study:

- Have had one pregnancy within the last five years
- UK resident at time of pregnancy
- Had antenatal and postnatal care in the UK NHS

The study will interview between five and ten other women who match this profile; all will be selected from survey participants who volunteer.

**Do I have to take part?**

Participation in this project is voluntary and you may choose not to participate in part of or all of the project. You can withdraw your participation at any stage of the project without being penalised or disadvantaged in any way.

You may choose not to answer any questions in the interview that you feel are too personal or intrusive, and this will not affect any future treatment. This will not affect the grades of any City University students participating in this project.

It is up to you to decide whether or not to take part. If you do decide to take part you will be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

**What will happen if I take part?**

- The interviews will take place from 10 August – 14 September 2015.
- The research study will be conducted over the course of eight months and will be submitted on 10 January 2016.
- Interviews will last between one and two hours.
- The interview will take place either at an agreed public location (such as a café or local library), by phone or by Skype; this will be agreed between the researcher and the participant.
• There will be one interview; the researcher may contact the interviewee after to clarify interview transcripts but not further interviews will occur.

• Prior to the interview the researcher will send the participant the participant information sheet and consent form. At the meeting the researcher will review the project again before conducting the interview. The interview will:
  o Collect some personal information about the participant relating to their demographics and their information behaviour whilst pregnant
  o The interview will be semi-structured

What do I have to do?
Research participants need to have first completed the online survey (where they will have volunteered to participate in a follow-on interview). The researcher will coordinate a suitable time and place to conduct the interview. During the interview they need to answer the questions asked in the way they see fit. They can ask for clarification at any time and they can choose to not answer any questions they wish to skip. The researcher may ask for clarification or elaboration during the interview and the participant may be as brief or detailed as they see fit in their answers.

What are the possible disadvantages and risks of taking part?
The researcher is unaware of any disadvantages of taking part aside from the use of your personal time to participate.

What are the possible benefits of taking part?
By taking part you will be contributing to research that aims to identify the information behaviour of women in the UK during their pregnancies, and therefore help to aide future guidance on the best way to reach and answer their information needs in the future.

What will happen when the research study stops?
On the completion of this research study all confidential personal information that is kept on participants will be destroyed. All personal information published in the final research paper will be made anonymous. This information will be stored only on the
researcher’s secure hard drive as evidence of the research carried out in the case of any inquiries.

**Will my taking part in the study be kept confidential?**

- Any identification information (name, email, phone number) will only be seen by the research and supervisor at City University. It will be kept on a secure hard drive for the duration of the study and will be destroyed on completion of the research (8 January 2016).
- All other personal information obtained will be made anonymous; participants in interviews will be given pseudonyms.
- The audio transcripts from the interviews will only be accessed by the researcher and their supervisor. They will be transcribed, and on completion of the study all audio files will be destroyed. The written transcripts will be made anonymous at this time as well.
- No personal information will be passed on to any third parties; all personal contact information will be kept in the strictest of confidence.
- All data from this study will be made available for five years following the study on the researcher’s personal hard drive, accessed only through Freedom of Information requests.
- In the event that the participant indicates or reveals harm to self or others, the researcher will contact the relevant authorities with this information.
- Records will be stored on the personal hard drive of the researcher; no records will be stored online to aid in keeping them secure. The personal details stored in the study will be destroyed by paper shredding and digital file deletion on submission of the research report on 10 January 2016.

**What will happen to results of the research study?**

This study will be submitted to City University London’s review board. It will be accessible via the university once it has received approval.

**What will happen if I don’t want to carry on with the study?**
Your participation is voluntary. You can choose not to participate in part or all of the project, and you can withdraw at any stage of the project without being penalized or disadvantaged in any way.

**What if there is a problem?**

You can contact the researcher, Tess Stackley on email (tess.stackley.1@city.ac.uk) or by phone (07792956109). During 21 June – 21 July she will be out of the country and can only be reached by email.

If you have any problems, concerns or questions about this study, you should ask to speak to a member of the research team. If you remain unhappy and wish to complain formally, you can do this through the University complaints procedure. To complain about the study you need to phone 020 7040 3040. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is: Point of Conception: A study of women’s information behaviour during pregnancy.

You could also write to the secretary at:

Anna Ramberg  
Secretary to Senate Research Ethics Committee  
Research Office, E214  
City University London  
Northampton Square  
London  
EC1V 0HB  
Email: Anna Ramberg.1@city.ac.uk

City University London holds insurance policies which apply to this study. If you feel you have been harmed or injured by taking part in this study you may be eligible to claim compensation. This does not affect your legal rights to seek compensation. If you are harmed due to someone’s negligence, then you may have grounds for legal action.

**Who has reviewed this study?**
This study has been approved by City University London School of Mathematics, Computer Science and Engineering Research Ethics Committee.

Further information and contact details
Tess Stackley (researcher, City University London student)
Email: Tess.stackley.1@city.ac.uk
Phone: 07792956109

David Bawden, supervisor, City University London lecturer
Email: d.bawden@city.ac.uk
Phone: 020 7040 5060

Thank you for taking the time to read this information sheet.
Appendix VI: Interview participant consent form

Consent Form

Title of Study: Point of conception: A study of women’s information behaviour during pregnancy

Please initial box

1. I agree to take part in the above City University London research project. I have had the project explained to me, and I have read the participant information sheet, which I may keep for my records.

I understand this will involve

• complete questionnaires asking me about my information behaviour during my pregnancy(ies)
• be interviewed by the researcher
• allow the interview to be audiotaped

2. This information will be held and processed for the following purposes:

I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. No identifiable personal data
will be published. The identifiable data will not be shared with any other organisation.

3. I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalized or disadvantaged in any way.

4. I agree to City University London recording and processing this information about me. I understand that this information will be used only for the purpose(s) set out in this statement and my consent is conditional on the University complying with its duties and obligations under the Data Protection Act 1998.

5. I agree to take part in the above study.

____________________  ________________________  ____________
Name of Participant   Signature         Date

____________________  ________________________  ____________
Name of Researcher    Signature         Date

When completed, 1 copy for participant; 1 copy for researcher file.