Do mothers use the internet for pregnancy-related information and does it affect their decisions during the pregnancy? A literature review

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ORIGINAL

Over the last decade, the internet has become a popular source of health information among prospective parents. The aim of this literature review is to examine and review what is currently known about the use of the internet by mothers-to-be and the impact it has on their decision making. The review will examine studies published in the last ten years as it is thought that since 2004, major demographic, cultural and socio-economic changes have taken place in the United Kingdom, and one of the key leading factors, responsible for the changes, is the wider use of the internet (DH 2011).

Keywords: **Prospective parents, pregnant women, internet, influence, impact, decisions**

Introduction

Today's maternity services face unprecedented challenges, caused by the need to provide high-quality care to a population where the number of registered midwives in practice is decreasing (RCN 2014) and the use of the internet as a primary source of information is rising annually. Pregnant women are increasingly engaging with the internet, and specifically with social media (Broom 2005, Lagan *et al* 2010, Gao *et al* 2012, Lima-Pereira *et al* 2012), to ask questions which traditionally would have been directed towards their midwife. Over the last ten years, there has been an increase in internet usage by women seeking pregnancy-related information, creating new challenges for the midwifery profession (Bakhireva *et al* 2011, Lewandowska 2012) where pregnant women are more able and ready to challenge their health care professional. This literature review aims to describe the current body of evidence relating to pregnant women's engagement with the internet and social media as part of their maternity care, examine what impact it has on their decision making, and to consider the implications for practice within maternity services in the UK.

Method

Studies published over the past ten years examining the use of the internet, the quality of the available information and the influence of it on decisions made by pregnant women were sourced following a systematic search of a range of databases including the Cochrane Public Health Group Specialised Register, MEDLINE, CINAHL, EMBASE, AMED and popular pregnancy-related websites. The initial search uncovered over 1000

articles and a more specific search within this provided 200 articles which were then subjected to critical appraisal, reading the abstract and main findings.

Findings

It has been argued that today's information technology has had a bigger influence on routine life than the Industrial Revolution (McCartney 2000). The advancement of electronic technology poses challenges not only in regard to the amount of information available on the internet, but more importantly in relation to how this information is evaluated in terms of reliability and dependability and how its use affects both professionals and prospective mothers. From this review of the literature, four main themes have emerged:

- the impact of demographics
- the role of social networking
- the accessibility of the internet and the reliability of information
- the impact on pregnant women's decision making processes.

Demographics

An analysis of the studies by Larsson (2009), Lagan *et al* (2010), Gao *et al* (2012) and Leahy-Warren (2012) shows recurrent themes in relation to the demographic profile of the mothers and the frequency of internet searches according to the stage of pregnancy. It appears from these studies that most women accessing the internet for pregnancy-related information have completed college/A levels or higher level education and that the majority of mothers-to-be consult web sources most frequently during the first trimester of their pregnancy. A study conducted by Santis *et al* (2010) reported similar results, where 72.4% of the mothers referred to the internet for pregnancy-related information in the first trimester of their pregnancy. Although it is difficult for conclusions to be drawn from limited numbers of studies, the available data is an important indicator of the current lifestyle behavioural changes in pregnant women's approach to retrieving information. It is likely that in the future, pregnancy-related information on the internet will play a significant role in the provision of antenatal care and will present significant challenges for health care providers. There are likely to be additional demands on GPs, midwives, sonographers and support workers because expectant mothers are likely to need additional reassurance and explanations about materials they have sourced online. Other sources of information like textbooks, magazines, books or brochures are still likely to be used to provide support during pregnancy, but more women are turning to the internet as a source of information (Kouri *et al* 2006). A Childbirth Connection study (2012) showed that 69% of women who responded to the survey found that information on websites was a significant factor in helping them to choose which hospital to give birth in.

The findings of the literature review suggest that the degree of influence that online information has on maternal choice may actually be underestimated. Predominantly studies are published in English, with English-speaking participants. Studies examining the impact that internet information has on non-English-speaking UK-based pregnant women are limited (Rees 2003, Larsson 2009, Lagan *et al* 2010). Another factor to be taken into consideration is the jargon used on different internet sites. Information containing evidence-based data is often created for medical professionals so may be written at a higher than average reading level, which women from cultural or linguistically diverse backgrounds, including those with lower socio-economic status, may not interpret correctly (Evans *et al* 2012, Newman *et al* 2012, Rodger *et al* 2013). Comer & Grassley (2010) and Shieh & Carter (2011) identify the lack of linguistic and cultural diversity in content as a limitation that has an impact on the overall influence of the website information. They suggest that different populations use media in different ways and have diverse information-seeking habits, with consequently unpredictable outcomes. Global accessibility poses another risk for prospective mothers. Because different internet sources originate from different countries, the content is not necessarily compatible with the guidelines or clinical practice of the home country of the person performing the search; decisions with regard to a condition or treatment may be based on contradictory information.

Social networking

A decade of research has demonstrated a consistent and persistent increase in the percentage of pregnant women having access to the internet and using it frequently as a source of health information (Declercq *et al* 2007, Johansson *et al* 2010, Arrish *et al* 2014). Although the internet is not a new phenomenon, between 2004, where only 4.5% of all searches on the internet were health-related (Eysenbach & Köhler 2004), and 2009, there was a 56.5% increase in the number of adult internet users for health-related information (Fox & Jones 2009). Lagan and colleagues, who have conducted a number of extensive studies on internet use in pregnancy and its implications (Lagan *et al* 2010, 2011a, 2011b), found that about 97% of the mothers who responded to their study (Lagan *et al* 2010) were using search engines, such as Google, to identify online web pages and access a large variety of pregnancy-related information. The internet has now overtaken the role of pregnancy-related social networking and support, and significantly influences the decision making process (Johansson *et al* 2010, Lima-Pereira *et al* 2012). Traditionally, the most influential factor during the transition to motherhood was the strong family support network from the mother's own family. However, the current socio-economic climate and the modern lifestyle of the early 21st century are effectively changing the way a woman approaches her motherhood role. The perfect model of the contemporary mother, widely promoted in social media, increases even more

the need for confidence in mothering skills through the process of maternal role transition (Pond & Kemp 1992). To build up confidence and self-esteem, the pregnant woman is now directing her attention to the internet as a source of information and support. This online environment provides emotional and informational support at the click of a button.

What is clear from the review of the literature is that the internet is creating an entirely new social network that is accessed and shared by pregnant women. This social support network has been identified as a major factor in increasing maternal parental self-efficacy (Sarason *et al* 1990, WHO 2005, Leahy-Warren *et al* 2012). The importance of an effective social network has been closely linked with Bandura's (1997) theory that social persuasion in the guise of informal support positively influences parenting self-efficiency, hence self-esteem. It is not surprising that when strong family support is absent, the internet has been chosen by expectant mothers as one of the best sources of information.

Access to the internet and the reliability of the information

Widespread access to the internet has probably had the biggest impact on the way that mothers are searching for pregnancy-related information. In 2007, 91% of women had a computer (Larson 2009) and access to the internet in their homes, whereas in 2013 (Rodger *et al* 2013) almost all women had access to the internet either in their own home or on their mobile phone. Although there is not enough evidence to conclude that mass accessibility to the internet is having a crucial effect on maternal decisions, it is likely that this results in an increase in the pregnant woman's perception that the use of the internet will significantly increase their chances of being better prepared for motherhood (Lu *et al* 2010, Evans *et al* 2012, Gao *et al* 2013, Velson *et al* 2013). However, Shieh & Carter (2011) acknowledge that the linguistic and cultural diversity in different societies will have an overall effect on different information-seeking habits. Lima-Pereira *et al* (2012), Evans *et al* (2012) and Gao *et al* (2012) found that online information had a stronger impact on women who were educated to degree level or above. Studies have found that 85.8% of women with secondary school or higher level of education self-assess their ability to use the internet as 'good' or 'very good' and at the same time they have very good comprehension skills when assessing and implementing medical information (Cohen & Raymond 2011, Elwyn *et al* 2013, Nellsch *et al* 2013). According to these studies, women are more sensitive towards information regarding the negative impact of smoking or alcohol on the pregnancy and more proactive in searching for information in relation to healthy diet and physical activities. In two different studies (Larsson 2009, Gao *et al* 2012), where the same testing criteria where used (Table 1), the participants were asked to select three out of the 14 factors listed in order to define how they judged the reliability of the health-related information they accessed on the internet. Although the two most important factors for reliability were the same, there was a significant difference between the study conducted in 2005 and the one conducted in 2012. In the later study over 30% of the participants identified the number of 'hits' a website received as a measure of its' reliability. That element has been closely related to the fact that more and more women are using different online forums to cross-match information and share experiences (HONF 2010, Kim *et al* 2011). If the assumption is that the internet is effectively changing the way mothers are forming their decisions during pregnancy, there is a need for appropriate guidelines to support pregnant women in assessing the reliability of the online health-related information they access.

Table 1: Women's perception of factors related to the reliability of information on the internet

	Larsson 2009		Gao *et al* 2012	
	Number (*n*=153)	%	Number (*n*=297)	%
Correspond with facts from other sources	67	51	199	67.0
References are provided	56	42	125	42.1
Facts are reviewed by experts within the field	44	33	101	34.0
Continuous updating	44	33	113	38.0
Governmental institution responsible for the information	42	32	23	7.7
Recommended by a friend	31	23	69	23.2
Recommended by a midwife	29	22	44	14.8
Respected authors	19	14	26	8.8
Well written language	15	11	69	23.2
Recommended by media	13	10	6	2.0
Professional lay out	11	8	15	5.1
Many visitors	8	6	101	34.0
Run by a commercial company	6	5	0	0
Run by an individual	0	0	0	0

Impact on decision making

Information-seeking is described as a *'holistic learning process to seek meaning'*, but also appears to be a very important part of the decision making process (Kuhlthau 1993). Two main themes associated with the increased use of the internet during the antenatal period were identified in all of the studies: the irregular and inconsistent nature of antenatal appointments and how limited and restricted the time allowed for these appointments can be (Larsson 2009, Lagan *et al* 2010, 2011a, 2011b, Lima-Pereira *et al* 2012, Evans *et al* 2012, Gao *et al* 2012). These studies concluded that the infrequency of antenatal visits and time constraints at appointments appeared to have an influence on internet use. The internet fulfilled information needs between appointments and provided support and

reassurance. Lasker *et al* (2005) suggest that one benefit of the internet is that it can provide health information on even the most rare of issues and, providing the client has easy access, the information is available 24 hours a day, every day. Although different studies identified different 'most interesting topics for search', it appears that fetal development, nutrition during the pregnancy and pregnancy complications are the most searched for topics and the most influential on mothers' decisions. Pregnant women repeatedly used the internet to validate information, aid empowerment, and assist decision making but also to build up network connectivity. The online discussion forums were used to gain support from other pregnant women and as an opportunity to share experiences and gain confirmation regarding specific symptoms. Lagan *et al* (2011b) reports that many women revealed that the information they acquired made them feel 'empowered', 'in control' and 'informed' and gave them strength and confidence to speak to health professionals as 'an equal'. It also increased the women's ability to become engaged in decisions relevant to their pregnancy by giving them a greater understanding of available choices. For some choices in antenatal care, such as mode of birth after a previous caesarean section and management of breech position, decision aid interventions could potentially improve a women's knowledge and provide opportunities for her to feel supported in an attempt to achieve vaginal birth as an alternative to elective caesarean surgery (Dugas *et al* 2012). It is therefore probable that information retrieved from online sources has an impact on women's final choices about their preferred mode of birth and their plans for their postnatal care.

Implications for practice

It is important for the health care professional to acknowledge that women access the internet to gain support and information in order to systematise their decisions. The role of midwives in this process is of significant importance as they can initiate as much dialogue as possible, early in pregnancy, directing women to accurate, comprehensive, and understandable online information and embracing the concept of shared decision making. Both practitioners and women need to recognise the necessity of evaluating and using online information so that women can make informed choices about their care.

The professional perception of the subject by midwives and other health care professionals has also been identified as a limitation and closely related to the way mothers are affected by the information they have retrieved from the internet (Larsson 2009, Schneider & Whitehead 2013, Gao *et al* 2013). Lagan *et al* (2011a) report that, although 69% of the midwives interviewed for the study agreed that they had the confidence to appraise health information on the internet, only 22% of them were aware of any of the quality indicators for evaluating web-based information and just 13% had any formal teaching in internet use as part of their midwifery training. Although most of the midwives were aware of the increase in internet use among pregnant women, it came as a surprise that neither women nor midwives had any meaningful discussion about the significance of the accurate approach to this important source of information (Woolf *et al* 2005, Larsson 2009, Lagan 2011b). According to Larsson (2009) and Gao *et al* (2012), 70–75% of the women who took part in the studies did not feel confident enough to discuss information that they had found through electronic sources with their midwife or obstetrician. This suggests that pregnant women may perceive practitioners as lacking confidence when dealing with electronic databases. Whether due to infrequent antenatal appointments or the need for extra information, it is now a fact that women are assessing electronic sources of information more than ever; this not only affects their choices and decisions, but also has an impact on the trust and relationship with their health care providers. Antenatal care providers, and in particular midwives, should develop and implement a care model compatible with modern information technology in order to build trust and be in a position to guide the expectant mothers towards evidence-based information on the internet. Routine antenatal visits with the midwife should include discussions about the information retrieved from the internet to ensure that the knowledge engenders understanding and empowerment when decisions are formed. Even though the balance between computer technology and holistic midwifery care is still not fully established, it is evident that in the future it will be an essential element of appropriate antenatal, intrapartum and postpartum care (Posmontier 2002).

Conclusion

Based on the evidence in the literature, that a significant percentage of women in United Kingdom are using the internet as one of their main sources of information, it is crucial that maternity service providers accept the internet as a factor in the decision making process during pregnancy. Key conclusions from the literature appear to be that mothers now are more exposed than ever to a significant amount of different information: online forums, videos, medical websites and scholarly literature, effectively compelling them to develop decisions based only on the information they have accessed online. Maternal confidence is challenged, not only by the demands of motherhood, but by commercial organisations targeting new and prospective parents and creating false expectations, which can lead to dissatisfaction and frustration (McVeigh & Smith 2000, Romano 2007, LHS-U 2008, Velson *et al* 2013). The overall analysis indicates that the internet is having a visible impact on women's decision making in regards to all aspects of their pregnancy. The key emergent theme is the great need for accurate and timely information available at all times (Lagan *et al* 2011b).

With nearly 136 million websites disseminating unregulated pregnancy-related information within the

past year (Sacks & Abenhaim 2013), practitioners will need to develop quality indicators and local guidelines in order to allow health care professionals, and midwives in particular, to deal effectively with the client's new behaviour and demands.

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Conflict of interest

There is no financial, personal or academic conflict of interest.

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