

A Case Study of Prenatal Education and Online Environments

by

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE IN NURSING

in

The College of Graduate Studies

(Nursing)

THE UNIVERSITY OF BRITISH COLUMBIA

(Okanagan)

December 2011

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Abstract

Current prenatal education literature is health care focused and does not incorporate the lived experiences of prenatal families or how consumers access prenatal information online. A literature review of online environments highlighted consumers' use of the internet and desirable website design. The intent of this study was to understand prenatal families' perspectives of their pregnancy needs and the contextual environment of online prenatal websites. In this respect the study differed from the narrow focus of previous research. The use of a multi-embedded case study design provided the flexibility and complexity required to address the research questions. A total of 69 websites were examined with each website situated in one of three case types - alternative, general or health care internet site. Each site was examined for website characteristics and nutrition articles. Conversations from two alternative and general chat-rooms were analyzed for site dynamics and prenatal learning needs. Client consent or ethical clearance was not required as the websites chosen were considered public domains and the researcher had no involvement with site participants.

It was found both the general and the alternative websites are owned by businesses and dominate search engine results. Corporate sites are easier to navigate, offer more features and have higher visual appeal in comparison to government sites. Government sites make formal and broad recommendations for a healthy pregnancy. Corporate sites use informal styles to present focused information. Online consumers have difficulty accessing information and incorporating healthcare recommendations into their everyday lives. The two corporate chat-rooms highlight that each site has their own philosophies and norms of behaviour but both sites are affirming to site participants. Recommendations from this study highlight the importance of language tone in the creation of teaching materials, and using affirmation as a bridge between

health care providers and consumers. Further recommendations follow on how to support front line prenatal educators in expanding their scope of knowledge to meet consumer needs through the development of a diverse and dynamic health care website.

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Glossary

Alternative Prenatal Websites: A website that has a non-mainstream philosophy such as Mother Nature is best and medical interventions are unwarranted.

Blog: A portion of a Web site that contains an online personal journal for others to view.

Charity Health Care Website: A charity or foundation not for profit website that provides prenatal support and markets to online participants for financial sponsorship.

Commercial Website: All website types owned by a corporation or charity with the goal of marketing to consumers.

Commercial-Chat Websites: A website owned by a corporation or charity with the goal of marketing to consumers that offers only advertising and prenatal chat-rooms.

Consumerism: A movement where by consumers advocates their stance in relation to products and services thus influencing marketers and corporations to respond.

Corporate Health: A website owned by a corporation or charity that provides health or prenatal health information with the goal of marketing to consumers.

Cross Case Embedded Case Study: Is a type of case study that has multiple cases and has multiple units of analysis which are examined across cases.

Cyber-bullying: The practice of hostile online behavior intended to intimidate or harm others.

e-Links: Embedded website links to other information or sites with an article of content or webpage.

Flaming: An online argument that use derisive language.

General Prenatal Websites: A website that has a mainstream philosophy.

Healthcare Prenatal Websites: A nonrevenue generating professional association (one website sold education materials but was still considered a health prenatal website) or government website.

Hit Rank Algorithms: The process of increasing a site's page rank placement by creating many search terms and other variables to increase a site's online presence.

Lurker: A person who reads interactive discussions online but does not participate.

Mixed Content Commercial-Chat Website: A website owned by a corporation or charity with the goal of marketing to consumers yet offers prenatal content, advertising and chat-rooms.

MUDD: A term used in online environments when individuals lie or give misleading information.

Non-Commercial Website: A nonrevenue generating professional association (one website sold education materials but was still considered a health prenatal website) or government website.

Page Rank: Search engines present online sites in rank of the utilization, search terms and other factors such as previous searches by the user.

Posting: The individual messages with in a thread (topic).

Professional Health Care Website: A nonrevenue generating professional association (one website sold education materials but was still considered a health prenatal website) or government website.

Stealth Marketing: Is a marketing strategy where consumers do not realize they are being targeted by marketers. For example, a marketing company might pay an individual to go onto online chat-rooms and promote a product in the context of conversation.

Theoretical Proposition/Hypothesis: A statement of what the research expects to find.

Theoretical Replication Model: A model is replicated if upon completion of cross case analysis similarities are seen between the cases.

Theoretical Rival Proposition/Hypothesis: A statement that offers an alternative explanation of a result to the theoretical proposition.

Thread: The group of individual messages (posts) about a particular topic.

TROLL: Is someone who posts inflammatory comments to provoke emotional response from others with the goal of disrupting the discussion.

Website Stickiness: Refers to a practice of keeping web participants within a web circle of information by only providing links with in a particular site limiting the access the individual has to other sites.

Wordle: An online tool that generates word clouds of most frequently used words.

Acknowledgements

I offer my thanks to my committee members Dr. Penny Cash, Dr. Diane Gamble and Dr. Kathy Rush for helping create this document and the countless hours you invested in making this possible. Dr. Penny Cash, Thank You for believing in me and being who you are, words cannot begin to express my gratitude. Dr. Diane Gamble, I really appreciated the personal time you made for me, your sense of humor and mostly importantly your patience in teaching me how to write. Dr. Kathy Rush, I valued your ability to be able to see through complex problems and you're sharing of solutions that were easily understood.

I would like to acknowledge and thank Dr. Christopher Schneider from the Faculty of Sociology for sharing his expertise about online environments over the course of this study.

To my fellow students Sharon Lockie, Lorrienne Topf and Rhonda Croft, I offer my gratitude to each of you and want you to know that each of you provided key support in the creation of this thesis.

Specials thanks to my two friends Angela Bearman and Mark Stickler, who not only supported me through countless discussions of this project but also provided tangible support in making this happen.

Introduction

Historically, giving birth was a familial experience. The onset of the industrial revolution saw family structures change and advances in technology moved the birthing experience from the family to a bio-medical experience (Gagnon & Sandall, 2007; Nolan, 1997; Temkin, 1999). As with the industrial revolution, the information age is, and will, continue to transform society. Consumerism, corporate health, and access to information have become the new drivers in health care rather than the physician control (Barker, R., 2008; Chuang & Yang, 2010; Donelle & Hoffman-Goetz, 2008a). Consistent with this health care focus, prenatal education remains strongly biomedical (Gagnon & Sandall, 2007). With the changes in information sharing, health care providers need to understand, and be aware of client needs, the new online environment, and current prenatal education practices. Minimal client voice currently exists in prenatal education and in the online literature. The literature lacks client driven information that comes from women themselves directing healthcare on their needs and wants. Few studies are available that examine prenatal websites and prenatal chat-rooms. For this reason a case study approach was seen as a method to provide foundational work for prenatal educators. In particular it informs health care providers on approaches to assess client information needs and sharing knowledge with women, and the role of consumerism in the online environment.

One of the draw backs of using case study work is that generalizability of findings can be limited. Nevertheless case studies are a valuable tool to examine phenomena from a broader perspective. Therefore the goal of this study was to find out what online environments were like in terms of the types of discussions women have and the prenatal information they seek. In turn the findings from this case study give health care providers a foundation for further research and

additional information to consider when they are teaching prenatal classes or developing online prenatal education sites.

Background

The perinatal period is an expected life milestone that occurs within a social context. Historically women gave birth in the home environment and received support for the childbirth experience from their families. With the onset of the industrial revolution family structures changed from an extended family structure to a nuclear family model (Temkin, 1999). Since the 1940's improvements in technology facilitated the move from the home to the institution for the child birthing (Nolan, 1997; Temkin, 1999). One of the consequences of this shift was that women no longer had the family support and information they needed to guide them through the process of pregnancy and delivery. In 1912 The Women's League for Health and Beauty started to assist isolated women by offering prenatal classes. These classes are credited as the beginnings of prenatal education (Nolan, 1997). Due to pressures on the health care system prenatal education classes were redesigned by health professionals to teach mothers what to expect through a hospital delivery and how to care for their infant at home, to facilitate an efficient use of the health care system (Temkin, 1999). Changes in delivery of care have not been led by the expectant mother but rather by pressures on the health care system such as technological control over birth, financial restraint limiting resources, lack of space and shortages of health care providers (Lagan, Sinclair & Kernohan, 2007; Nolan, 1997; Temkin, 1999; Zwelling & Phillips, 2001).

Two literature searches were undertaken to gain a broad understanding of prenatal education and the online environment. Prenatal literature from the period of 1990-2011 was

categorized into five broad areas: *Program Delivery, Information Giving, Marginalized Groups, Strategies and Client Assessment* (See Appendix A). It is commonly known that outcomes from research interventions differ between countries with and without universal health care. As such prenatal research literature was carefully assessed. Studies that involved program evaluation or interventions were generally excluded from countries without universal health care, whereas studies were included if they involved understanding a client perspective. An exception to this guideline was when no other research on a particular topic was available from a country with universal health care. A lack of research on low risk prenatal attendees and multiparous women was noted in the literature (Dumas, 2002). Research on the direct impact of prenatal education is limited and the general assumption is that knowledge acquisition or participation in a prenatal program will facilitate positive behaviour changes (Bailey, Maciejewski, & Koren, 1993; Boggess & Edelstein, 2006; Dasanayake, Gennaro, & Munoz, 2008; Dyson, McCormick, & Renfrew, 2008; Ernzen, 1997; Griese, 1996; Griffith, Sorenson, Bowling, & Jennings-Grant, 2005; Schachman, Lee, & Lederman, 2004; Walden, Still, Zinn, & Larsen, 1996).

Systematic reviews indicate clients want their education to be realistic, individualized and they want quality answers to their questions (Gagnon & Sandall, 2007; Nolan, 1999). While client centered research was found, it was identified that more in-depth research on client expectations and their views is needed (Dowswell, Renfrew, Hewison, & Gregson, 2001; Gagnon & Sandall, 2007; Nolan, 1999). The incorporation of client centered research has not been applied to prenatal education at this time (Alexander & Kotelchuck, 2001). An assumption made in the literature was that prenatal education is valuable due to the large number of parents attending prenatal classes but information on attendance rates were generally not presented and one study in Newfoundland states a 31% participation rate (Hoskin et al., 2000). A study by

Kingston and Chalmers (2009) finds 65.6% of primiparous women report attending prenatal classes in Canada. Overall 32.7% of Canadian women attended prenatal classes (Kingston & Chalmers, 2009). According to Kingston and Chalmers (2009) 19.4% of women who attend prenatal classes believe the classes were their most useful information source. Women report difficulties in applying what they learned in prenatal education classes to the hospital environment (Gagnon & Sandall, 2007).

Application of research findings to the provision of services was not found in the literature between 1990 and 2010. In some instances research findings were difficult to compare due to the failure of research building upon previous studies and because the studies were methodologically weak (Baldwin & Chen, 1989; Dowswell et al., 2001; Enkin, 1995; Gagnon & Sandall, 2007). Most of the research in health care had a focus on explanation or justification of policies and programs (Gagnon & Sandall, 2007). Missing from this body of literature was the client in their “Natural Environment”, client directed research, and the impact or role of the internet on the pregnant family. Due to these limited findings a second broader literature review was conducted about the online environment to help identify other influencing factors outside of health.

This second literature review examined the *Internet and Social Context*, *Internet and Health*, *Internet and Parenting*, and *Internet and Prenatal* (See Appendix B). The breadth of this topic and the rapidly changing online environment, led to limitations in the search criteria. The literature review on the *Internet* for both *Social Context* and *Health* was limited to a 2005-2011 time period, and provided a snapshot or a cross section of the types of literature found under each search term. Studies were chosen from a broad range of health conditions, different types of studies and different focus areas (See Appendix C for examples Health Care Chat-

rooms). No limitations were set for the literature review on *Internet* for both *Parenting* and *Prenatal* search terms. Most research in this domain has occurred since 2005. The findings from this second search indicate health care and prenatal online research are once again biomedical, focusing on client assessment, quality of online resources, and evaluation of pilot sites. Systematic reviews and meta-analysis of online health care studies suggest a need for more robust studies and more standardized use of terms to help facilitate analysis (Åkesson, Saveman, & Nilsson, 2007; Crutzen et al., 2011; Gentles, Lokker, & McKibbin, 2010; Griffiths, Calear, & Banfield, 2009; Mishna, Cook, Saini, Meng-Jia, & MacFadden, 2011; Samoocha, Bruinvels, Elbers, Anema, & van der Beek, 2010; van den Berg, Schoones, & Vliet Vlienland, 2007; Webb, Joseph, Yardley, & Michie, 2010). Research about the online environment within the social and parenting context, acknowledges other factors such as marketing, consumerism, corporate health, cultural and societal norms, client driven information needs, and the impact of changing societal structures (Barker, R., 2008; Brady & Guerin, 2010; Chan, 2008; Chuang & Yang, 2010; Donelle & Hoffman-Goetz, 2008a; Drentea & Moren- Cross, 2005; Hall & Irvine, 2009; Madge & O'Connor, 2006; Plantin & Daneback, 2009; Rashley, 2005; Sarkadi & Bremberg, 2005). Research on these factors was lacking for prenatal education. It is clear that gaps in this research exist.

Significance

Prenatal education research indicates women rank health care providers, books and family, consistently higher than prenatal education and the internet (Kingston & Chalmers, 2009; Lowe, Powell, Griffiths, Thorogood, & Locock, 2009). General consensus in the prenatal education literature is that internet use is on the increase, and prenatal women consider it a complementary source of information (Lowe et al., 2009; Romano, 2007), which is not reflective

of online research outcomes. Prenatal online research indicates that online use and access is between 71% and 91% (De Santis, et al., 2010; Lagan, Sinclair, & Kernohan, 2010; Larsson, 2009; Wareham, 2005, paragraph 4). In the United States 7 out of 10 babies born in 2009 used the prenatal/parenting BabyCenter website (Freeman, 2010, paragraph 15). Online literature shows women found the information online to be more comprehensive and realistic than health care provider information (Brady & Guerin, 2010; Drentea & Moren-Cross, 2005; Hall & Irvine, 2009; O'Connor & Madge, 2004; Plantin & Daneback, 2009; Rashley, 2005; Sarkadi & Bremberg, 2005). Women value the currency of parenting information and indicate with a rapidly changing society sometimes traditional sources of information (e.g. grandmother of baby) could be dated (Plantin & Daneback, 2009).

In conclusion there is a substantial difference between prenatal education research indicating online resources are complementary to traditional information sources, whereas both online prenatal and parenting literature indicates it is considered a key resource. Lemire, Pare, Sicotte, and Harvey (2008) comment that most health studies have a narrow focus and it would be useful to understand why the general public is accessing health care on line.

The shortcomings of previous research examined reflect a heavy emphasis on perinatal program evaluation studies that are deemed methodologically weak and lacked client centered studies. Therefore a clear understanding of the contextual environment and what prenatal women need requires a closer examination. A case study approach provides the opportunity to examine the online environment which will enable health care providers to update their prenatal education practices and support the development of online websites.

Purpose

The purpose of this case study was to examine online prenatal website characteristics and online chat-rooms to inform current prenatal education about current social contexts and client driven interests. Three different types of websites were examined (alternative, general and health care sites) and a definition of each website type is found in the glossary. The following questions guided the case study approach:

1. What are the characteristics of alternative, general and health care prenatal websites?
2. What information occurs in these alternative and general prenatal internet chat-rooms that can inform health care providers on client needs?
3. What types of conversations are occurring in alternative and general prenatal chat-rooms that could increase health care providers' awareness of the role of the internet during the perinatal period?

Merriam (1988, p. 32) argues that “[t]he case study offers a means of investigating complex social units consisting of multiple variables of potential importance in understanding a phenomenon”. Yin (2003, p. 2) states a “distinctive need for case studies arises out of the desire to understand complex social phenomena. In brief, the case study method allows the investigator to retain the holistic and meaningful characteristics of real-life events”. Stake (1995, p. 1) concurs, claiming that case study is a way of looking at both the ordinary and uniqueness of a situation and being willing to learn and understand it. Therefore the case study method is an appropriate way to grapple with the above questions.

The literature review (Chapter 2) will set out the various perspectives in the research about perinatal education and the online environment. There is a lack of research in perinatal online environments, a gap which this research begins to address using a case study approach. In chapter 3, the rationale and methods of this case study are outlined and a critique of this process is reviewed. The results follow in chapter 4, and a discussion of these findings (Chapter 5) conclude the thesis.

Literature Review

Two literature reviews were conducted. The first addressed the current research on prenatal education, and the second explored internet (online) literature using the headings society, health care, parenting and prenatal. The online literature contradicts current prenatal literature that states online resources are a complement to traditional sources of information. The literature review chapter concludes that prenatal education and online health research are bio-medically focused and lack the interface between the person's everyday reality and health care.

Prenatal Literature Review

Categories of literature. The prenatal literature review was undertaken from 1990-2011, it indicates that most research is bio-medically focused failing to foreground the issues and concerns of perinatal women. Indeed the impression gained was that the purpose of most research was to facilitate health care management. A review of the literature using various search terms and data bases was undertaken for prenatal education. Appendix D outlines the searches and the data bases utilized. From this search five broad categories of research were identified: Program Delivery, Information Giving, Marginalized Groups, Strategies and Client Assessments (For a listing of the types of research in each category see Appendix A). Across categories, two common themes emerged. The first theme was support, which was examined from a variety of perspectives such as types of support (e.g. professional versus family) and the impact of support (e.g. decreased risk behaviours). The second key theme identified was an assessment of client qualities (such as stress and gestational learning needs) that impacted learning. Each area will now be discussed.

Program delivery. Program Delivery research focused on the evaluation of a particular program and the impact this program had on the client or the health care system. Examples of the types of programs that were evaluated considered home visiting (Tough et al., 2006), computer based learning (Griffiths, Sorenson, Bowling & Jennings-Grant, 2005) and midwifery care (Janssen & Wieggers). The program delivery research evaluated physical outcomes, knowledge acquisition, access to prenatal care, and cost savings. Results were variable and inconclusive as outlined in Appendix E. Most studies include an evaluation component for maternal satisfaction with either the program or the service they received from the program for example Watson-Blasioli (2000). The literature reviewed did not address what women's learning needs were or how prenatal education programming could be improved to meet perinatal women's expectations.

Information sharing. Explicit across the prenatal literature was the intention of information sharing with prenatal families to enhance decision making and improve coping skills. Most prenatal literature reports inconclusive outcomes of direct content teaching but reveal the provision of support as significant (See Appendix F). Advocacy for teaching or creating strategies for additional educational topics such as car seats, dental care, preterm labour and toxoplasmosis is found in the literature (Boggess & Edelstein, 2006; Dasanayake et al., 2008; Davies et al., 1998; Ernzen, 1997; Heaman, Sprague & Stewart, 2001; Robinson, Reitan, Jones, & Gist, 2002; Tiedje, 2004; Walker, 2005). The information sharing literature starts to identify characteristics of pregnant women in order to facilitate teaching clients. Examples of this are assessing how to maximize the timing of information giving (Gross & Bee, 2004; Serafine & Broom, 1998; Sullivan, 1993) and how pregnant families access information to support effective use of teaching materials (Serafine & Broome, 1998). Client evaluation data

solicited reports about the types of messaging needed from health care providers; differences in what information health care providers and clients value; client's feelings about parenting; and the need for realistic expectations information (Coleman, Nelson, & Sundre, 1999; Dzakpasu & Chalmers, 2005; Freda, Andersen, Damus, & Merkatz, 1993; Gross & Bee, 2004; McLeod, Pullon, & Cookson, 2002; McVeigh, 1997, Tiller, 1995). It is evident this research remains health care provider focused rather than client driven. Health care focused research occurred within Marginalized Groups literature but concepts of grassroots philosophy in guiding care were introduced as potential ways for service provision.

Marginalized groups. Marginalized group literature examines different population groups who were disenfranchised in some way such as: young mothers, lesbian women, minority groups and low income women. Appendix G provides an overview of the studies reviewed. The literature identifies barriers to accessing care due to such social determinants of health criterion such as housing, income and education. Common barriers seen in the literature include transportation, cultural differences, language barriers, lack of child care, access to computers and a lack of targeted information (Berman, 2006; Dhari et al., 1997; Edwards, 1994; Kulig, Brett, & Stilwell, 1992; Shieh, McDaniel & Ke, 2009). Community development processes using emancipatory approaches and the provision of support are identified as possible strategies for working with marginalized women. Although often regarded as marginalized, the research on lesbian couples focuses on the examination of health care providers and health care systems versus the client characteristics or needs (Harvey, Carr, & Bernheine, 1989; Renaud, 2007; Røndahl, Bruhner & Lindhe, 2009; Wilton & Kaufmann, 2001). The literature makes recommendations to improve both the system and health care providers' capacity to work with lesbian families. Recommendations encompass reviewing heterosexual language practices,

policy development and education training for health care providers (Harvey et al., 1989; Renaud, 2007; Røndahl et al., 2009; Wilton & Kaufmann, 2001). Other research with marginalized populations focuses on the client outside the context of their interactions with the health care system, and how that system, might impact the client.

Two themes in the literature associated with marginalized women were that one, support could not occur without trust and two, basic survival requirements need to be met before women would access prenatal care (Lapierre, Perreault & Goulet, 1995; Pagnini & Reichman, 2000; Schaffer, 2002). There were no specific recommendations on how to deliver care with the exception of one study by Dhari et al. (1997), who talked about factors to make prenatal classes culturally accessible. The possibility of using models of empowerment as potential ways of working with marginalized groups was explored. Only one study tested these proposed models (Van Wagner, Epoo, Nastapoka, & Harney, 2007). The majority of the literature is theoretical research that proposes the use of models and frameworks and therefore lacks client voice and practice implementation in the delivery of prenatal education programs.

Strategies. The Strategies literature addresses approaches to prenatal education and is mainly theoretical. It expands current thinking about antenatal education by looking at the underpinnings of power and considers new ways of delivering prenatal education. These theoretical discussions advocate shifting the power from a health care model to one of empowerment, thus creating client voice (Fleming, 1992; Renkert & Nutbeam, 2001). Stances taken in the literature consider philosophical changes such as a dialogical approach in the interaction between clients and health care providers (Dumas, 2002), to system concerns using a socially critical approach around policy development (Fleming, 1992), and how to work with groups such as adolescent mothers using empowerment (Klima, 2003). Research on power and

control indicate prenatal education is controlled by the system (political, institutional, health care) rather than the client (Gagnon & Sandall, 2007; Nolan, 1999; Zwelling & Phillips, 2001). It appears that research on power inequities is mainly conceptual and often overlooked in prenatal education practice.

Community development models using grassroots philosophy and concepts of empowerment as potential ways to deliver prenatal education are promoted in this body of literature. For example Fleming (1992) writes about how antenatal education could move from its current health care focus to a more power sharing arrangement. She uses the theoretical works of Rogers and Gramsci (Medical Model with Power and Control) as foundations for her work and then continues to envision a future of care for clients using Friere and Shor's Liberatory Process Curriculum. Fleming (1992) identifies client's resistance to this type of change in health care delivery and uses the theories of resistance outlined by Lather to support her position. One program tried to implement an empowerment model using Friere's conscientisation process within an existing Healthy Start program template which was not successful (Lugo, 1996).

Empowerment strategies were commonly reported in the literature and examined client perspectives from dialogical and learning interactions. The intent of this approach is to facilitate understanding between health care providers and clients with resultant change. No research was found on implementing these models. While the strategic approach to prenatal education literature is primarily theoretical, client assessment literature is more evaluative and constructed around the client's perspective.

Client assessment. Client assessment literature provides information on client content learning needs (Collins, 2007; Freda et al., 1993; Risica & Phipps, 2006; Singh, Newburn, Smith, & Wiggins, 2002; Soltani & Dickinson, 2005). A study by Stamler (1998) found prenatal classes met some content needs but clients want more debriefing, individualized answers and increased interaction time with each other. Sullivan (1993) for example argues that women would appreciate access to educational materials prior to teaching sessions, so they are able to review the content before the session in order to discuss it during class time. At times information is presented too late in pregnancy (Sullivan, 1993).

The importance placed on content covered in prenatal classes varies between health care professionals and pregnant women suggesting the reconsideration of information giving practices (Bondas, 2002; Collins, 2007; Freda et al., 1993; Risica & Phipps, 2006; Singh et al., 2002; Sullivan, 1993). Due to the standardized practice of teaching content which does not always take into account women's differences and their individualized learning needs, literature suggests health promoting behaviour might not always occur (Singh et al., 2002; Soltani & Dickinson, 2005; Sullivan; 1993). While there are similarities between Information Sharing and Client Assessment they were separated because Information Sharing comprised as a distinct body of literature whereas Client Assessment was embedded across the studies examined.

Themes. Recommendations given for prenatal education acknowledges the importance of clients' perspective. The provision of consistent, accurate and realistic information supports women's expectations (Beaton & Gupton 1990; Gibbins & Thomson, 2001; Green, Renfrew, & Curtis, 2000; Hallgren, Kihlgren, Norberg, & Forslin, 1995; Hart & Foster, 1997; Smedley, 1999). Two consistent themes, support and client qualities, emerged from the prenatal education literature. Both themes have overarching similarities across categories. Throughout the prenatal

education literature it is clear the research was not cumulative but has expanded thinking about support and client qualities.

Support. Support is the most common concept in this body of research and is examined from different vantage points such as social support, professional support, client perspectives, and support provision. When women feel supported they report greater satisfaction with care and access more services (Dieterich, 1997; Hundley et al., 1997; James, 1997; Janssen & Wiegers, 2006; Kemp et al., 2006; Schachman et al., 2004; Watson-Blasioli, 2000). Support is seen as a mechanism to increase a client's ability to process knowledge and implement life changes (Bryan, 2002; Hudson, Campbell-Grossman, Fleck, Elek, & Shipman, 2003; MacLellan, Bradley & Brimacombe, 2001; Matich & Sims, 1992; McLeod et al., 2002; McVeigh, 1997; Spiby, Slade, Escott, Henderson & Fraser, 2003). A decrease in "risky behaviour", less postpartum depression, compliance with medical follow up, less low birth weight infants and strong partner relationships are associated with strong social supports (Enkin, 1995; Gagnon & Sandall, 2007). Professional support literature reveals improved maternal and infant outcomes but the measures vary between studies (Logsdon & Davis, 2003). As a result comparisons between studies become difficult with no clear definition for the support. Support is dependent on building relationships between health care providers and prenatal women as Hallgren, Norberg, and Kihlgren (1994) claim.

In a study by Hallgren, Norberg, and Kihlgren (1994) four key interactional patterns were identified in teaching perinatal classes:

- Health care driven interactions focusing on hospital policy and procedures.
- Parental wishes are elicited but outcomes remain health care focused.

- Parental input is considered important but interactions are controlled by the health care provider.
- Relational interactions occur and space is created for strong reflective conversations between all participants.

The outcome of this study recommends consistent use of relational interactions.

Recommendations are made that programs be structured to include support persons and encourage the use of relational interactional communication (Coffman, Levitt, & Brown, 1994; Hallgren, Kihlgren, Forslin & Norberg, 1999; Logsdon & Davis, 2003). Moreover women will seek support family, friends and partners first, which reinforces the importance of relational interactional communication (Blackwell, 2002; Cronin, 2003; Logsdon & Davis, 2003).

In the absence of her own social support systems women will accept professional support (Logsdon & Davis, 2003). Factors that impact women's choice of support are someone whom they trust, meets their needs, and who does not have extreme expectations in return (Logsdon & Davis, 2003). Women will leave their support needs unmet rather than seek support elsewhere if these factors are not fulfilled by the person from whom they want support (Logsdon & Davis, 2003). Women will accept support and access prenatal care if their basic survival needs such as shelter, food and safety are met (Pagnini & Reichman, 2000). It is recommended that health care providers respect and understand the uniqueness of each woman and provide individualized care (Blackwell, 2002; Bondas, 2002; Bylund, 2005; Green et al., 2000; Stamler, 1998; Wilcock, Kobayashi, & Murray, 1997). When individualized care is offered in a relaxed environment it enables effective communication (Biro, Waldenström, Brown, & Pannifex, 2003).

While support is credited for many positive perinatal outcomes by health care providers a clear understanding of what support is and what its role is in perinatal care remains unclear. Nagey (1989) states “the most likely candidate for some intangible yet important component of prenatal care is caring itself. Just as touching is an important part of human interaction;...just as pregnancy outcome has been correlated with degree of social support” (p. 525). Therefore the notion of support requires ongoing development to clarify meaning and implications for perinatal care. In particular unraveling the ideas contained in client qualities could potentially add to the body of literature on client support.

Client qualities. Client qualities are factors for health care professionals to consider when providing prenatal education. Learning needs are assessed along with gauging women’s ability to learn during the perinatal period. Factors impacting learning are stress, support, expectations and social determinant of health (Logsdon & Davis, 2003). Prenatal clients embrace adult learning principles and want their education to be timely and relevant (Bliss-Holtz, 1991). Anticipatory teaching such as infant care is not valued by participants due to pregnancy priorities (Bliss-Holtz, 1991; Renkert & Nutbeam, 2001). Interestingly, learning needs were the highest in the third trimester, followed by the first trimester, with the lowest interest during the second trimester (Bliss-Holtz, 1991). Clients access information from a variety of sources depending on the type of knowledge they are looking for. A women’s demographic background impacts her information choices.

Technical information, such as fetal growth and development, is sought from written materials and health care providers but if clients want validation of their feelings or concerns they are more apt to access family, friends and coworkers (Sullivan, 1993). Parents with higher socio-demographic status tend to find information from books, media and health care providers

compared to women of lower socio-demographic status (Aaronson, Mural & Pfoutz, 1988). Lower educated, ethnic minorities, young and working class women have more informational needs not met than their counterparts, and use information from informal sources such as family (Cliff & Deery, 1997; Fabian, Rådestad, & Waldenström, 2005; Lumley & Brown, 1993; Singh et al., 2002). Ranking sources of information varied between studies. Health care providers, written materials and family consistently ranked higher followed by audio-visual material, prenatal classes and the internet (Kingston & Chalmers, 2009; Risica & Phipps, 2006; Singh et al., 2002; Soltani & Dickinson, 2005). It is noted that perinatal classes were not in the top three sources of information for clients, yet health care providers perceive prenatal education as a key milestone for the childbearing couple.

Reasons for attending prenatal classes were: increasing knowledge, supporting spousal concerns, sharing, classes are free, learning about infant concerns, expected by society and the time was convenient to attend (Cliff & Deery, 1997; Fabian, Radestad & Waldenstrom, 2004; Nichols, Roux & Harris, 2007). Clients who did not attend prenatal education state the time did not work, too busy, and the classes are not useful or necessary (Cliff & Deery, 1997).

Socio-demographics factors such as age, education, marital status and income are identified as variables affecting client choice to attend prenatal education classes (Cliff & Deery, 1997; Lumley & Brown, 1993). Health behaviours such as smoking, missing appointments, not breastfeeding, drinking during pregnancy, having an unplanned pregnancy and poor mental health are associated with clients being less likely to attend education sessions (Lumley & Brown, 1993; Fabian et al., 2004). Another body of literature highlighted, the “Not Like Me” (Cliff & Deery, 1997) factor as a reason for not attending prenatal classes. Clients felt the classes were not for them because they did not fit the prescribed stereotypical attendee (Cliff &

Deery, 1997; Fogel, 1993; Howie & Carlisle, 2005). Immigrant clients also expressed a need for classes that considered their unique cultural needs (Berman, 2006; Dhari et al., 1997; Kulig et al., 1992). This body of literature also assesses women's ability to learn.

Emotional wellbeing is identified as a factor in women's ability to learn. Emotional factors include mental fatigue, stress, anxiety and conflict which impacts information seeking behaviors, knowledge acquisition and satisfaction (Hallgren et al., 1995; Stark, 2001; Stark, 2006; Tough et al., 2006). Women most likely to report poor emotional health and have poor outcomes are young, single, First Nations; they have a low level of formal education, low income; they have a history of depression; and experience stress; and often the pregnancy is unplanned (Tough et al., 2006). The literature suggests distressed clients receive a lower standard of care, less social conversation and experience more emotional negativity from health care providers (Tough et al., 2006; Zadoroznyj, 1996). Clients who were well informed and actively participated in information seeking behaviours reported better childbirth experiences (Gibbins & Thomson, 2001; Hart & Foster, 1997; Shieh, Broome & Stump, 2010; Wilcock et al., 1997). Having non-realistic expectations (romanticized or high fear factor) about childbirth, shows that satisfaction and bonding are diminished (Beaton & Gupton, 1990; Coleman et al., 1999; Gibbins & Thomson, 2001; Hallgren et al., 1995). This finding highlights the importance of expectations in the perinatal period.

Pregnancy is viewed as a time of personal reflection about impending life changes for women, adolescents and men. According to Blackwell (2002, p. 564) the prenatal experience for women comprises five main elements including changing self; caring for oneself; shared responsibility for care of pregnancy; taking time to care; and changing life. Pregnant adolescent women envision adjusting to self as a responsible mother, wanting respect and acceptance from

others, and focusing on reparation of past relationships (Lesser, Anderson & Koniak-Griffin, 1998; Rentschler, 2003). However men feel a sense of unreality, ambivalence and exclusion because they do not have any physical evidence of pregnancy. Men also feel excluded by health care providers. Due to the pregnancy and impending changes men experience a decreased sense of independence, power and control (Finnbogadóttir, Svalenius & Persson, 2003; Genesoni & Tallandini, 2009). The key factors influencing men in making the transition to fatherhood are his partner and the support men receive to participate in the pregnancy (Finnbogadóttir et al., 2003; Genesoni & Tallandini, 2009). Chapman (1991) and Hart and Foster (1997) recommend health care providers consider men's role in the child birth experience. The coach role does not fit all childbearing-families hence; it is important to identify the family's expectations to ensure they are congruent with the roles they will enact. While research about prenatal education highlights ways to effectively support the educational needs of the perinatal family, the literature lacks information about the online environment and its potential to support the education of perinatal couples. Due to this absence of online information in the prenatal education research, a second literature review was conducted.

Internet Literature Review

The internet literature was searched using the categories of societal, health care, health care chat, parenting and prenatal (See Appendix B for a complete listing). The themes that emerged from this second literature search were consumerism, online participation practices, sharing experience, access to information and desirable website features. Evolving over the last two decades, the online environment is a new dynamic and changing phenomenon.

Consequently research about the internet is starting to develop. Literature is moving from a starting point of theorization about the possible impacts of the internet as outlined in Society

Online – The Internet in Context to more research based findings on the actual impacts of the internet within society (Howard & Jones, 2004). As with the industrial revolution the information age is transforming society. Social media such as Twitter and Facebook played a key role in the political uprisings in both Egypt and Tunisia, whereas in Iran social network media is now used to track dissident behaviour (Morozov, 2011; Quinn, 2011; Sedra, 2011; Tapscott, 2011). From the broader global perspective of political utility, the internet has changed everyday life in how services are rendered, how people interact, and how policy is enacted (Bargh & McKenna, 2004; Dimmick, Ramirez, Wang & Shu-Fang Lin, 2007; Hall, DeRoure & Shadbolt, 2009; Hendler & Hall, 2009; Mann & Stewart, 2000; McMillan & Morrison, 2006).

Themes. The literature about the online environment and understanding its social context is in its early days and limited. Current literature tends to have a narrow discipline focus for example health care online research will focus on a specific disease or issue. Another focus area is the examination of website features that are appealing to consumers (online configuration practices/characteristics). Health care research has a specific focus and is not inclusive of the overall online environment or for that matter in everyday life (Lintonen, Konu, & Seedhouse, 2008; Renahy & Chauvin, 2006). Most online literature pertaining to health care is about assessing pilot programs, client preferences and online use patterns (Gentles et al., 2010; Lintonen et al., 2008; Renahy & Chauvin, 2006). Systematic reviews and meta-analysis about online research indicate a need for more robust studies and more standard use of terms to help facilitate analysis (Åkesson et al., 2007; Crutzen et al., 2011; Gentles et al., 2010; Griffiths et al., 2009; Mishna et al., 2011; Samoocha et al., 2010; van den Berg et al., 2007; Webb et al., 2010). Most health care online research appears to be topic focused. Few studies examine the contextual environment therefore a decision was made to select a few studies from a broad range

of health care research to identify phenomena that might be observed within perinatal online environment, a total of 63 articles were selected (Appendix C provides an example of health care chat-room studies). From this broad literature review four key themes emerged these are the role of consumerism in the online environment, reasons for consumer use, desirable features of design and outcomes from online use. A presentation of these four key themes will now follow.

Role of consumerism. Consumerism, corporate health and information have become the new drivers in health care rather than the physician (Barker, K, 2008). A number of authors such as Du Plessis (2010) and Sprague and Wells (2010) consider online environments to be a place for marketers to access consumers. Online search results present corporate sites preferentially over other site types, reinforcing literature that marketer use tools which influence search engine results (Du Plessis, 2010; Hara & Estrada, 2005; Hendler & Hall, 2009; Mayzlin, 2009; Sprague & Wells, 2010). Holding consumers on their sites by providing many internal links are common strategies to engage consumers' attention, along with mechanisms to promote prolonged site usage which supports marketing outcomes. Social chat-rooms and blogs for mothers are particularly targeted (Sprague & Wells, 2010). These strategies appear to be successfully demonstrated by the rapid increase of parents using mixed commercial sites, which are favoured over academic, non-commercial sites (government), and purely commercial ones (Plantin & Daneback, 2009). The use of the internet has continued to increase. It is easy to appreciate why the internet is so popular, it is easy to use and cheap, it's convenient and it fills the gap of other technologies for information and communication (Castells, 2002; Lee & Lee, 2010; Mann & Stewart, 2006; McMillan & Morrison, 2006).

Reasons for consumer use. Online participants appreciate the currency of information found on the internet and they find it to be more comprehensive and realistic than health care provider information. Consumers triangulated online information with other information sources (Brady & Guerin, 2010; Drentea & Moren-Cross, 2005; Hall & Irvine, 2009; Lowe et al., 2009; O'Connor & Madge, 2004; Plantin & Daneback, 2009; Rashley, 2005; Sarkadi & Bremberg, 2005). The literature reports consumers feel their health knowledge needs encompass many aspects of their lives, which includes more than the current biomedical model, and therefore they went online to meet their information needs (Barker, K, 2008; Donelle & Hoffman-Goetz, 2008a; Donelle & Hoffman-Goetz, 2008b; Lagan et al., 2010; Lowe et al., 2009; Strong & Gilmour, 2009; Szwajcer, Hiddink, Maas, Koelen, & van Woerkum, 2008). Research on social reasons why women went online are: isolation due to increased mobility of society; medicalization of parenting; women's lack of time and access to other mothers due to her work responsibilities; and changes in the definition of family due to many blended families (Brady & Guerin, 2010; Chan, 2008; Drentea & Moren-Cross, 2005; Hall & Irvine, 2009; Plantin & Daneback, 2009; Rashley, 2005). The internet is appealing to consumers because they have the ability to control the access and pace of information gathering. They also have anonymity which decreases self-consciousness in discussing private matters and they have access to many individuals from different geographic locations (Brady & Guerin, 2010; De Santis et al., 2010; Drentea & Moren-Cross, 2005; Dunham et al., 1998; Herman, Mock, Blackwell, & Hulsey, 2005; Lagan et al., 2010; Lowe et al., 2009; Qian & Mao, 2010; Romano, 2007; Valaitis & Sword, 2005).

Use patterns of perinatal websites indicates heaviest use in the first trimester, followed by the second and third trimesters respectively (Larsson, 2009; Szwajcer et al., 2008). This finding

is in contrast to prenatal literature, which states learning needs are highest in the third trimester and the lowest in the second trimester (Bliss-Holtz, 1991; Gross & Bee, 2004). Physicians are considered the most trusted source of information but the internet plays a key role in client decision making (Akkesson et al., 2007; Ayantunde, Welch, & Parsons, 2007; Caiata-Zufferey, Abraham, Sommerhalder, & Schulz, 2010; Dickerson, 2006; Hesse et al., 2005; Renahy & Chauvin, 2006). Physicians report if the client is adept in doing online searches, appointments become more detailed and individualized because the client has already learned the basic information (Dickerson, 2006; Imes, Bylund, Sabee, Routsong, & Sanford, 2008; Rahmqvist & Bara, 2007; Rice & Katz, 2006; Sillence, Briggs, Harris, & Fishwick, 2007). Contrary findings note clients can be overwhelmed by the amount of content online resulting in the appointment being one of clarifying online information (Holmes, 2006; Jofesson, 2006; Rasmussen, Dunning & O'Connell, 2007; Renahy & Chauvin, 2006). The ability to apply parenting information gained from the internet can be limited for women given her values, societal expectations and her offline communities (Madge & O'Connor, 2005; O'Connor & Madge, 2004). The research indicates women initially go online for specific information on a health or parenting concerns which act as the gateway to parenting chat-rooms and to covert marketers (Plantin & Daneback, 2009; Rashley, 2005).

Outcomes of online use. Being able to talk with other women about an issue or concern is validating and supportive to prenatal women (Adler & Zarchin, 2002; Lagan, Sinclair, & Kernohan, 2006; Lowe et al., 2009). Empowerment and autonomy are identified as key outcomes for many online participants (Kernisan, Sudore, & Knight, 2010; Rasmussen et al., 2007; Schrank, Sibitz, Unger, & Amering, 2010). Overall online users perceive other users as trustworthy, fair and helpful. This trust is not extended to specific individuals as is seen in

everyday social settings and this impacts the relational depth of the conversations (Lee & Lee, 2010). Online communities tend to describe themselves as being nonjudgmental and a place where individuals represent themselves honestly, fostering a socio-emotional safe space and therefore practices such as flaming are rare (Brady & Guerin, 2010; Drentea & Moren-Cross, 2005; Madge & O'Connor, 2006; O'Connor & Madge, 2004; Plantin & Daneback, 2009; Rashley, 2005). Chat-room users provide many responses to posted questions and provide emotional support if needed (Chuang & Yang, 2010; Donelle & Hoffman-Goetz, 2008b; Dunham et al., 1998, Griffiths et al., 2009; Hudson et al., 2009; Hudson, Elek, Westfall, Grabau, & Fleck, 1999; Qian & Mao, 2010). Typically the request for emotional support is the smallest support activity noted in online chat-rooms (Bond, 2009; Chuang & Yang, 2010). Online communities are found to have particular ways of engagement (Hallett, Brown, Maycock, & Langdon, 2007). While the internet is touted as a domain that can expand thinking other research indicates it may impede diverse thinking (Aakhus & Rumsey, 2010; Beyers, 2004; Gerhards & Schäfer, 2010). The ability to access marginalized communities creates a false impression about the commonness of these marginalized activities (Gavin, Rodham & Poyer, 2008; Hara & Estrada, 2005; Holt, Blevins & Burker, 2010; Mulveen & Hepworth, 2006). Creating an environment for like-minded individuals to legitimize their feelings, actively support their behaviours, and discuss how to avoid discovery of their activities (Gavin et al., 2008; Hara & Estrada, 2005; Holt et al., 2010; Mulveen & Hepworth, 2006).

Another legitimizing activity seen online is the process of reverse consent, in which clients look for information to support their decision and use this information to justify their stance (Munro, Kornelsen, & Hutton, 2009). A further concern expressed about the internet is the accuracy of content users. Eysenbach, Powell, Kuss and Sa (2002) indicate through their

meta-analysis of health websites 70% of the studies identified problems with web information, which raises questions about clients' ability to judge the content in which they are engaging.

Access to other information. Despite health professionals concerns about the quality of online information, consumers feel the information is good quality and trustworthy. Most users state they have accessed sites with poor quality information (Ayantunde et al., 2007; Hesse et al., 2005; Imes et al., 2008; Lemire et al., 2008; Macias & McMillan, 2008; O'Connor & Madge, 2004; Renahy & Chauvin, 2006; Rice & Katz, 2006). The research indicates that consumers search online information prudently and efficiently if they are experienced in the online environment (Dickerson, 2006; Imes et al., 2008; Lemire et al., 2008; O'Connor & Madge, 2004; Renahy & Chauvin, 2006; Sillence et al., 2007). A number of authors (Dickerson, 2006; Lemire et al., 2008; Macias & McMillan, 2008; Rains & Karmikel, 2009; Renahy & Chauvin, 2006; Sillence et al., 2007) found consumers assess website quality:

- For information that is in line with information they received from health care providers.
- By the type of site, commercial sites are not as valued as sites by health professionals, not for profit and educational institutions but these sites may not necessarily be accessed more due to the lack personalization on these sites.
- If the information being researched is congruent between sites.
- For information that is up to date, nonbiased and does not appear to provide cures or miracles.

- That contact information and site owner intentions are clearly defined and easily accessed.
- The information provided on the site matches the query and philosophy of the consumer (Like me Factor).
- If the site has a support and a frequently asked questions component to it.

It could be suggested that assessing the reliability of online content indicates that site features and characteristics, impact user website choices.

Desirable features of design. Prior to assessing the content online, consumers first use a search engine and then assess results superficially before selecting a specific site (Dickerson, 2006; Renahy & Chauvin, 2006; Sillence et al., 2007). In using search engines, most women do a superficial navigation and access the first links of information presented (Renahy & Chauvin, 2006). Visual appeal, ease of use, personalized and nonbiased information, photos, reputable sources, professional lay out and easy navigation links all contributed to why a site would be accessed. If initial site impressions are favourable clients then investigate the site content further (Rains & Karmikel, 2009; Sillence et al., 2007). Poor visuals, pop ups and low density information are factors for clients to quickly reject a site even if information on the site is considered reputable and good (Sillence et al., 2007). Upon entering a site, features that are appealing to online users are many different interactive tools, personalized features, bulletin boards, daily tips, tailored messaging, self-monitoring tools, motivational centers, interactive polls, email prompts, an information center with reliable resources, and the site is continually updated to keep the content new (Crutzen et al., 2011; Wanner, Martin-Diener, Bauer, Braun-Fahrland, & Martin, 2010; Webb et al., 2010). Website qualities such as multimedia features,

frequently asked questions, online support, user friendliness, visually appeal and informative content are discussed in the literature as key components in designing online resources (Brouwer et al., 2011; Lemire et al., 2008; Sillence et al., 2007). Clients appreciate clear and simple information which uses unbiased language and has relevant illustrations to highlight content (Sillence et al., 2007). Overall, websites should be created with consumer feedback and sites should be dynamic in presentation and less medicalized (Aakhus & Rumsey, 2010; Funk et al., 2010; Ravert & Crowell, 2008; Strong & Gilmour, 2009).

Summary

Two literature reviews (prenatal education and internet) were completed to gain a broad contextual understanding of previous research in these areas. The literature review began by focusing on prenatal education. Outcomes from this literature search highlight five main areas (Program Delivery, Information Giving, Marginalized, Strategies and Client Assessment) of research, with two resultant themes (Support and Client Qualities). What became evident was studies did not build on previous research and were narrowly focused in particular areas, resulting in gaps. These gaps included minimal online research and a failure to consider the contemporary context of women's every day realities. A decision to undertake a second literature review looking at the online contextual environment was completed because of the limited amount of prenatal online research. Consumerism, reasons for use, outcomes of online use, access to information and desirable website features were highlighted in this body of literature. Most online health care research had a very specific disease or issue focus and little research is available on the broad context of the prenatal online environment. For these reasons the case study method provides an appropriate approach to understand the broader context for prenatal education.

Methods

Highlighted in this section are a description of the case study used in this research, a discussion of the ethical concerns and unique considerations for doing online research. The description of the case study outlines:

- The details of the case study design.
- The case study framework.
- The process for website and chat-room choices.
- The data collection process.
- The lessons learned in the implementation of this case study plan.

The case study design describes the multi-embedded case study; the types of evidence collected and how it was analyzed in relation to the Case Study Map/Protocol (see Appendix H). The case study framework helps situate this case study in relation to the research questions. An explanation of the process for selecting websites and chat-rooms and the selection adaptations that were needed are also outlined. The data collection describes the process of how evidence was maintained to enhance rigor and reliability (Yin, 2003, p. 105). Ethical considerations in doing online research examine whether chat-rooms are considered private or public domains and what steps researchers need to consider in protecting those they study. The meaning of the online environment in relation to everyday and subsequently how research about this environment could then be interpreted is discussed in the online research considerations section. An in-depth discussion of each section follows.

Case Study Design

The research design was an embedded case study. An embedded case study according to Yin's (2003, p. 40) contains the following dimensions:

- Multiple individual cases (alternative, general and health care sites).
- Multiple embedded units of analysis in each case (website characteristic, content analysis and chat-room conversations)
- The multiple embedded units of analysis were applied across cases for consistency with the exception of the health care site, which had no chat-room.
- The three individual cases (alternative, general and health care sites) were then cross-case examined.

The figure below illustrates an overview of this multi-embedded case study and outlines the three cases with their embedded units of analysis.

Figure 1

Multi-Embedded Case Study Design



A case study design is the process of outlining the plan of how the research is going to be approached and links the data collected with the study questions (Yin, 2003, p. 19). Features identified in the literature which enhance construct validity and reliability of one's case study

were included in the design: considering types of evidence and the methods used to analyze them, creating a case study protocol (see Appendix H); having a case study database and maintaining a chain of evidence (Yin, 2003, p. 97). The process of how the prenatal websites framework was adapted will be discussed under Choosing Websites and Chat-rooms for Analysis. The case study database and maintaining a chain of evidence will be discussed in the next section under Data Collection. Next follows an outline of the details of the case study protocol describing the types of evidence and methods used.

This case study had a total of 69 websites with each website situated in one of the three case types - an alternative, general or health care website. In this case study the multiple types of evidence for 69 prenatal websites were website characteristics, a nutrition article and two chat-rooms conversations which supported construct validity by clearly identifying the measures used in relation to the research question (Yin, 2003, p.34). No chat-rooms were found in the health care websites and analysis of chat-rooms occurred for one alternative and one general prenatal site. Predefined tables that assessed website characteristic were undertaken by looking at number of hits/search term, number of hits/site, website stickiness (Yahoo only), advertising, shopping, interactive locations (i.e. blogs), informative content, frequently asked questions, clear and simple language, visual appeal, user friendly, individually tailored information, chat, site owner, country of origin and other summary comment/impressions. The rationale for this decision was based on literature outlining what consumers valued (Brouwer et al., 2011; Crutzen et al., 2011; Griffith et al., 2005; Lemire et al., 2008; Sillence et al., 2007; Wanner et al., 2010; Webb et al., 2010). Content analysis word tables examined - the accuracy of content, the inclusion of portion size information and the prenatal vitamin recommendations, literacy levels

and the presentation of content for a selected nutrition article from each website. The use of predefined units of analysis for the websites characteristics and content analysis supported a consistent approach across the three case types. For the chat rooms a process of thematic analysis was used which included: data familiarization, generating codes, searching for themes, reviewing themes, and defining and naming themes, which then formed the basis of the word tables (Braun & Clarke, 2006; Merriam, 1988). The created chat-room word tables were then assessed using an online tool that generates word clouds of the most frequently used words (Wordle). This process helped support the rigor of this study. Key words presented by Wordle were reflective of the word tables and understandings gained in this study.

Initial analysis for each case type (alternative, general and health care) was done by analyzing chat-room conversations (with the exception of health care) and the multitude of word tables from each website within the case type. Upon completion of the individual case analysis, the next analytic step completed was a cross-case synthesis (or categorical aggregation). In this step the created chat room, site characteristics and nutritional content word tables for each site type were compared and contrasted across the entire case study. Cross-case synthesis or categorical aggregation of this case study demonstrated external validity and presented a consistent picture addressing the research questions and supported the rival theoretical proposition (Yin, 2003, p. 34; Yin, 2009, p. 265; Stake, 1995, p. 74). The rival theoretical proposition was the alternative and general sites would be similar (theoretical replication logic) due to the influences of being corporately owned and the health care site would have a biomedical focus. This process of cross-case analysis brings the data together to potentially highlight similarities and differences between cases and as Stake (1995, p. 169 & 173) suggests triangulation substantiates or clarifies these findings. According to Merriam (1998, p. 169)

triangulation is the process of using multiple sources of data and multiple methods as a way to confirm emerging findings. In this case study data source triangulation (using different sets of data sources - website characteristics, article content analysis and chat-rooms) and methodological triangulation (using different analysis methods - prescribed word tables and thematic analysis) were used (Stake, 1995, p. 114; Yin, 2003; p. 98). Therefore in this case study, 3 cases were examined (health care, general and alternative prenatal sites) and each case had multiple units of analysis using three different data sources (website structures, content analysis and chat-rooms) and two different methods (analysis of prescribed word tables and coding of online conversations). This part of the methods section outlined the case study design in relation to the types of evidence assessed and the methods used to analyze the data. Next, the Case Study Framework outlines the research questions and the propositions that were used to frame this study.

Case Study Framework

A case study can arise out of a desire to understand complex social phenomena and unlike other research approaches case study requires the researcher to define how the study will be conducted and as such a clear understanding and presentation of the research design is needed (Yin, 2003, p. 2). The intent of this case study was to understand womens' perspectives of their prenatal needs and the contextual environment of online prenatal websites. The following questions guided the case study approach:

1. What are the characteristics of alternative, general and health care prenatal websites?

2. What information occurs in these alternative and general prenatal internet chat-rooms that can inform health care providers on client needs?
3. What types of conversations occur in alternative and general prenatal chat-rooms that could increase health care providers' awareness of the role of the internet during the perinatal period?

According to Stake (1995, p. 3), an instrumental case study is research that tries to gain an understanding of phenomena, whereas Yin (2003, p. 6) would define this as an exploratory case study. But both Yin (2003, p. 111) and Stake (1995, p. 17) encourage researchers to provide additional statements or research strategies that give structure to organizing the study. Yin (2003, p. 22) describes these statements as propositions and also introduces the concept of theoretical replication logic as the mechanism which proves or disproves a proposition. An explanation of these concepts follows:

- a. The theoretical proposition is a statement of what the researcher expects to find.
- b. The rival proposition offers an alternative explanation to the theoretical proposition.
- c. Theoretical replication logic occurs upon the completion the case study and the similarities seen between cases prove or disprove the proposed propositions.

This case study was designed based on the theoretical proposition that the health care online sites would differ in characteristics, information and conversations from the general and alternative sites which were assumed to be similar. In this case study the assumed similarities between the alternative and general prenatal website were that these sites would be client driven (Yin, 2003, p. 47). The alternative and general prenatal websites would exert a sense of theoretical replication logic. The health care site would not replicate this logic because of its bio-medical

stance. The rival explanation for this phenomenon was that the alternative and generic prenatal websites would be similar because they are owned by corporations (Yin, 2003, p. 112). It should be noted, sites owned by corporations appear client focused but the underlying rationale for the client centeredness site remains a marketing strategy (Rashley, 2005). Definitions used for this case study to define an alternative, general and health care website were:

1. **Alternative Prenatal Website:** A website that has a non-mainstream philosophy such as Mother Nature is best and medical interventions are unwarranted.
2. **General Prenatal Website:** A website that has a mainstream philosophy.
3. **Healthcare Prenatal Website:** A nonrevenue generating professional association (one website sold education materials but was still considered a health prenatal website) or government website.

Selection of websites that met inclusion criteria for each case study type (alternative, general and health care) was strategically chosen.

Choosing Websites and Chat-Rooms for Analysis

Selection of websites to analyze was carefully considered for this case study and followed the Prenatal Websites Framework and Parameters which specifies the specific search terms used for each website type and how the sites were picked (See Appendix I). Initial web-site selection included any prenatal sites that were referenced in the literature review and the use of three search engines (Google, MSN and Yahoo) (See Appendix I for search term criteria for the categories of health, alternative and general websites.). Ten websites were picked from each search engine for a total of 90 sites with 30 from each category type.

The inclusion criteria were:

- Frequency found online or in the literature.
- Page Rank (Search engines present online sites in rank of utilization, search terms and other factors such a previous searches by the user.).
- Site has multimedia choices.
- Site has prenatal chat-rooms.

While this case study followed the outline as prescribed, changes were needed to meet the selection criteria as the original word choices did not yield the desired 30 sites per category search. The number of results per search dropped dramatically after the first 30 results, possibly indicating that online users accessed only the first few pages of presented results (Dickerson, 2006; Renahy & Chauvin, 2006). Additional search terms (Found in Appendix J) were used for each website type to try and reach the goal of 30 sites per category and a limit of 40 results was set per search as a means of assessing sites most online users would access. Reasons found for the difficulty in obtaining enough sites to analyze were:

- Yahoo and MSN presented identical results which decreased the number of search engine results.
- Some alternative websites had registration only chat-rooms.
- The repetition of sites presented was high.

A total of 69 sites met inclusion criteria with the new limits and additional searches. It was expected that chat-rooms would be limited within the health care prenatal sites, necessitating selection of sites without chat-rooms and this occurred.

No chat-rooms were found on the professional, government or charity web sites. This left a general and an alternative chat-room available for analysis. Like website selection the two chat-rooms were strategically chosen. Criteria for chat-room selection included active and current chat participation within the past 24 hours, substantive chat-room size (had more than 10 forums and had greater than 10,000 posts), diverse prenatal topics, and researcher purposive choice/sampling of a site that answered the research questions most fully (Stake, 2000, p. 446). Due to the vast amount of data found in prenatal chat-rooms, all conversations were chosen by the investigator for inclusion based on relevancy to the research questions with a focus on prenatal education and health (Mulveen & Hepworth, 2006; Sade-Beck, 2004). Inclusion criteria for the posting were based on a minimum of five threads in a conversation, the conversation had occurred within the past day, and the researcher's judgment of purposive sampling (Braun & Clarke, 2006, p. 86; Stake, 2000, p. 446). Postings that were excluded were conversations that were not analyzable, such as sharing babies due date or not directly relevant to the research questions, such as maternity fashions (Mulveen & Hepworth, 2006). Data collection was limited by the researcher based on saturation, meaning no new themes emerged from the inclusion of more chat-room data.

The alternative chat site activity indicated most threads had active participation on them for a week or longer. Postings were lengthy and interactive between participants. A decision was made to set limits of a minimum of 5 threads to a maximum of 20 for analysis on the alternative site, with the exception of two posts. These two posts contained additional content on the risk of alcohol during pregnancy and the other post had a conflict occur. In the general prenatal chat-room the online postings did not have longevity (meaning a thread would have a lot of activity for a short period of time of about 24 to 48 hours) and responses tended to be short in

length. Therefore the maximum limit was increased to 29 threads in order to get enough data to analyze. The period of data gathering for both sites occurred over two different days for each chat-room for a total of four days of data collection.

Case Study Data Collection

A case study data base and field notes of observations were maintained during the entire process. The case study data base supported the creation of a chain of evidence by including the following data:

- All online search methods.
- Copies of website characteristics.
- Tables on website characteristics.
- Copies of chat-room conversations.
- Word tables examining the types of conversations and information for two prenatal chat-rooms.
- Wordle results of chat-room word tables
- Case study notes.
- Copies of all case study documents.

This database and all supporting documentation has been filed and stored in a manner so that the information will be available in a clear logical and transparent manner. All steps taken through the research process were documented to ensure construct validity and overall case study reliability (Merriam, 1988, p. 173; Yin, 2003, p. 102).

Ethical Considerations

Online research has introduced new ethical concerns regarding the use of public domains and the perception of privacy in these domains (Capitulo, 2004; Dias, 2010; Eysenbach & Till, 2001; Flicker, Haans, & Skinner, 2004; King, 1996; Mann & Stewart, p. 20, 2000; Robinson, 2001; Seale & Abbot, 2007; Whiteman, 2007). General consensus within the research community is that if online domains are open access for all to view, they are considered within the public domain and informed consent is not required but protecting the names of posters and sites should be maintained (Ahern, 2005; Barker, K, 2008; Capitulo, 2004; Dias, 2010; Eysenbach & Watt, 2002; Gavin et al., 2008; Kitchin, 2007, p. 55; Mulveen & Hepworth, 2006; Robinson, 2001; Seale, Charteris-Black, MacFarlane, & McPherson, 2010). Decisions on whether consent is needed should be informed by an assessment of the public or private nature of the site, the site sensitivity, the degree of interaction with the researcher, and the level of vulnerability of participants (McKee & Porter, 2009, p. 88). If sites are public, with discussions low in sensitivity, where there is no researcher involvement, and participants are not vulnerable, McKee and Porter (2009) believe informed consent is not needed. Given that this study met all these criteria informed consent was not sought. In conversations with Dr. Penny Cash and in consultation with Dr. Christopher Schneider a sociology researcher familiar with online research and Dr. Daniel Salhani Chair of Ethics REB Okanagan in November 2010, ethical clearance was deemed unnecessary as the researcher acted as an observer in a public space.

It is recognized that others do not agree with this position. Authors such as Ahern (2005), Flicker et al. (2004), and Gaiser and Schreiner (2009, p. 154) state that while sites are open to the public, the online posters who use these sites perceive their posts to be in a private sharing domain with others who are having similar experiences. Therefore they would argue the

use of this data contravenes the intent of the site and therefore is unavailable to researchers without consent. If the site is then studied without informed consent, this practice is considered unethical (Ahern, 2005; Flicker et al., 2004; Gaiser & Schreiner, 2009, p.154). Other researchers contend that by asking for consent to observe a site, it disrupts the site which may not be supportive to either the site participant or the researcher (Barker, K, 2008; Gavin et al., 2008; Eysenbach & Till, 2004; Eysenbach & Watt, 2002; King, 1996; Mulveen & Hepworth, 2006; Whiteman, 2007). Currently The Tri-Council Policy states (TCPS) “[f]or the time being, however, researchers, according to a closer reading of the TCPS may, within reason, exploit NG [newsgroups] texts and conduct non-intrusive analyses without having to go through the rigors of formal REB review” (Kitchin, 2007, p. 58).

While no definitive rules are in place around online research an ‘ethic of care’ must be maintained and as such researchers should be socially responsible to protect the people they are researching (Denissen, Neumann, & van Zalk, 2010; Eynon, Fry, & Schroeder, 2008, p. 32; Kitchin, 2007, p. 26; Mulveen & Hepworth, 2006; Seal & Abbot, 2007, p. 190). Therefore this study protected group and individual’s identity for the two chat-room websites. Group identity was protected by giving examples of only six sites (2 general, 2 alternative and 2 health care sites) for readers to refer to should they chose to go on-line to cross reference this study’s findings about website structures and chat-room analysis. The provision of only six websites protects the two chat-rooms websites by making it difficult for others to find these sites within the online environment. Google search engine searches were undertaken to protect individual identity on any chat-room evidence presented in the findings to ensure it was not traceable to the website used (Mulveen & Hepworth, 2006). Data collection dates were not published as a

further mechanism of protection. Paraphrasing was also used as a protective measure to address any further concerns about identifiable evidence.

A common occurrence in search engine use is the same search terms can result in different responses depending on the servers used. The global environment of queries continually changes the web environment. The history of the searching computer guides the server to present information based on historical searches (Hendler, Shadbolt, Hall, Berners & Weitzner, 2008). But protection of online data still have special considerations due to the nature of electronic communication in transit which the researcher has no control over and the archival nature of the online records (Duffy, 2002; Eynon et al., 2008, p. 35; Garcia, Standlee, Bechkoff, & Cui, 2009; Mann & Stewart, 2000).

Protection of online data was maintained at a local level by the use of a password protected computer and an encrypted off-site storage facility was used during the process of the study. Upon completion of the research the information was deleted from these sites (Duffy, 2002; Garcia et al., 2009). A hardcopy of the data and a memory stick is stored in a locked cabinet in the researcher's home. Copyright considerations of accessing online data were assessed (Bruns, 2010, p. 128; Gaiser & Schreiner, 2009, p. 106; Kitchin, 2007 p. 44; Mann & Stewart, 2000; McKee & Porter, 2009, p. 54 & 63).

An ethical concern of doing online observational research is the steps to be taken if an event of potential harm (to the poster, baby or other) arises during the research process. If this situation occurred where no one else identified the potential risks, the researcher would have engaged with the online population and identified herself as a nurse with expertise in this area. She would have offered the appropriate support but would not have disclosed the research project in order to protect group integrity. After the disclosure, research on this site would have ceased as the

researcher was no longer an observer. If enough data had been gathered prior to engagement the data would be used. On the other hand if there was insufficient data to be analyzed, another site would have been chosen. While information on drinking alcohol was promoted as being safe in one chat thread, an individual on the site highlighted the FAS risk, so the decision was made by the researcher to continue on as an observer.

Online Research Considerations

Due to the uniqueness of the online environment special considerations need to be taken into account when studying online environments. These special considerations when doing online research include:

- The pros and cons of anonymity.
- The lack of other cues to inform the research on client responses.
- Sample representativeness.
- The dichotomy between offline and online worlds.

The cons of anonymity are clients may falsify information or self-representation (Duffy, 2002). Others researchers (Ahern, 2005; Denissen et al., 2010; Mann & Stewart, 2000, p. 212) note no difference in the falsification of information between traditional research methods or online research and find online individuals generally present truthfully. Garcia et al., (2009, p. 68) point out that the mere possibility or presence of deception does not necessarily mean that data is not useful because people tend to lie in everyday life. Other research has shown that anonymity increases participant control and equality, therefore individuals feel liberated to disclose more information as they are not constrained by the reprisals of face to face interactions (Barker, R, 2008; Fox, Morris, & Rumsey, 2007; Lakeman, 1997; Madge & O'Connor, 2002; Seale et al., 2010).

Online research lacks nonverbal cues as seen in face to face interviews (Barker, R, 2008) but this concern is also noted in survey type research (Lakeman, 1997). Online communication has adapted to this nonverbal environment by the use of emoticons and abbreviations (i.e. lol- laugh out loud), which build online culture and rapport (Fox et al., 2007; Garcia et al., 2009; Lakeman, 1997; Madge & O'Connor, 2002; Sade-Beck, 2004; Seale et al., 2010).

Concerns that online populations may not be representative of the whole population have also been expressed (Duffy, 2000; Eysenbach & Watt, 2002; Lakeman, 1997; Madge & O'Connor, 2002). Ahern (2005) argues that despite these concerns no differences in results between traditional research methods and online methods have been noted. Denissen et al. (2010, p. 566) claims internet samples are often more representative than convenience samples used in traditional research. Authors such as Ahern (2005), Denissen et al. (2010), Seale et al. (2010), Slater and Yani-de-Soriano (2010) have found that online research has the ability to more clearly target and access specific populations.

There are two perspectives about how researchers view the underlying assumptions with regard to the nature of the online world:

1. Individuals present and interact differently in the online environment and as such research needs to be aware of this (Barker, R, 2008; Sade-Beck, 2004; Seale et al., 2010).
2. A false dichotomy between virtual world and real world exists. Online and offline interactions are influential on each other and therefore are part of culture and society (Barker, K, 2008; Denissen et al., 2010; Garcia et al., 2009; Sade-Beck, 2004).

Differences noted between the real and virtual world research were that interactions online tended to be in the here and now, whereas real world research responses were more a reconstruction of past events (Seale et al., 2010). Information in the online environment were often more technical, frank and supportive, rather than real world interviews where there is an opportunity to explore issues and gain greater meaning about the situation (Seale et al., 2010). Online responses allow participants to reflect on their answers and this reflection time may differ from a face to face environment (Denissen et al., 2010; Sade-Beck, 2004). While differences do exist between online and offline contexts it is also recognized that these environments are not mutually exclusive and the online world can provide clues to how the world is being defined and perceived (Sade-Beck, 2004; Seale et al., 2010).

Consensus about passive online research is that this type of research fits with qualitative research methodologies in that samples are not intended to be representative but it may help build understanding about people, society and cultural contexts outside experimental settings with an emphasis on the views of 'real world' people (Eyesenbach & Wyatt, 2002; Slater & Yani-de-Soriano, 2010). Case study research may provide insights into otherwise unattainable phenomena and contribute to the development of expanded prenatal education practices.

Summary

The case study method enabled the exploration of prenatal clients' health beliefs, interests, issues, needs, concerns, desires and motives in a broader contextual environment. This chapter described how the case study was designed and the adaptations that were needed in choosing appropriate websites for analysis. The chapter outlines how websites were chosen for study by describing the parameters for the search engine results and also included websites mentioned in the literature. A description of data sources (using different sets of data sources:

website characteristics and chat-rooms) and method triangulation (using different analysis methods: website characteristics, content analysis, and a thematic analysis of chat-room) defined what was to be studied. Lessons learned from this process were also shared. Furthermore considerations of the ethical practices and special considerations needed for doing online research were explored. The choice of three online sites (alternative, general and health care) provided an opportunity to examine a broader contextual grouping of information and conversations available to inform this body of prenatal education research.

This study provides significant findings for health care workers involved in prenatal education. Dissemination plans will include presentations, publications in academic and professional journals and workshops for perinatal families.

Findings and Discussion

This section of the thesis reports on the results of the case-study highlighting search engine results, site configuration, article content, and differences and commonalities between chat-rooms. Search engine results investigated ownership, country of origin and marketing practices seen on the online environment to try and build an online context. Site configuration highlighted differences between commercial and non-commercial sites in terms of the availability of shopping, advertising, ease of use and online features. A nutrition article was assessed on each website in terms of, inclusion of portion sizes and prenatal vitamin recommendations, accuracy of content and presentation styles as a means of assessing how content was managed between the different website types. Analysis of two chat-rooms highlighted use patterns, underlying philosophies, conflict management, perceptions of health care providers and how information was managed between chat participants to help inform health care providers of client driven needs. Affirmation was proposed as an underpinning of these chat-rooms and the approach used by commercial website developers. If literature was available in relation to a case study finding it is presented as a mechanism for creating a broader contextual environment. New phenomena of the high presence of multiparous women online and the practice of embedding social media links within articles was also found. An in-depth discussion of each of the above sections follows.

Search Engine Results

Search Engine results for each site type that met inclusion criteria and were chosen for analysis are as follows:

- Twenty six alternative prenatal sites (25 alternative sites and 1 charity site)

- Fifteen general prenatal web pages and the inclusion of four additional sites identified in the literature for a total of 19 sites
- Eighteen health care prenatal web sites and six additional sites identified in the literature and from professional knowledge were added for a total of 24 sites (15 health care sites, 7 charities and 2 professional associations).

Six examples of the types of websites assessed were:

Health Canada- <http://www.hc-sc.gc.ca/hl-vs/preg-gros/index-eng.php>

The Society of Obstetricians and Gynecologists of Canada- http://www.sogc.org/index_e.asp

Nickelodeon Parents Connect- <http://www.parentsconnect.com/>

March of Dimes- <http://www.marchofdimes.com/>

HiPP Organic- <http://www.hipp.co.uk/>

Netmums- <http://www.netmums.com/>

As outlined in the methods section, limits were set to support the analysis of sites that most consumers would access if they were searching online. The results of this search yielded 1040 sites available for analysis of which 547 (53%) were repeated sites. An example of the level of repetition is 15 general sites represented 43% of all the repeated sites. This level of repetition reinforces prior research indicating the high corporate presence online (Barker, K, 2008; Madge & O'Connor, 2006; Plantin & Daneback, 2009).

To inform and ensure a broad context for this case study, an assessment of the country of origin and ownership was sought for each site. This assessment indicated most sites originated in the United States of America, followed by the United Kingdom and Canada respectively. Most nongovernment sites were corporately owned. Appendices K and L outline the specifics of

origin and ownership. A decision was made in this study to include sites from nations that did not have universal health care for two reasons; first, online users would access this information most commonly and second there were limited availability of options.

Ownership of these alternative and general sites was mainly dominated by business based companies. Of the 36 sites that were transparent in their ownership, 35 of them were owned by either marketing firms or corporations. The results of this case study reflect findings from prior research demonstrating the prevalence of high ranking search engine results being commercial websites. This supports the literature indicating strategies such as Hit Rank Algorithms, which is the process of increasing one's page rank placement by creating many search terms and using other variables to increase one's web presence, and corporate purchasing of links to influence page rank results (Hara & Estrada, 2005; Mayzlin, 2009; Sprague & Wells, 2010). Rashley (2005) contends these sites use the following strategies to get consumers to return to their site: individualizing content for example "Your baby this week", providing excellent information on a broad variety of topics, having social networking components, and using technology that tailors the site to the consumer as they search.

Strategies are also used to hold consumers on a site by providing site generated links which keeps the consumer in a particular circle of information. This practice has been termed "stickiness" (Gerhards & Shafer, 2010; Hara & Estrada, 2005). A study by Hara and Estrada (2005) examines website stickiness by assessing whether site links are internally or externally generated as a measure of the credibility of a site. Credibility of a site is considered to be in how many other sites endorse or provide links to a site, whereas sites that generate many internal links are not considered as credible. When this researcher tried to replicate Hara and Estrada

(2005) methods of checking the website credibility of each site the Yahoo search engine blocked this practice, citing privacy concerns.

This case study found that if an individual went on line and searched for prenatal information the first search engine results presented for their choosing would be exclusively a business based company. Structural features of the websites examined showed all three site types had similar layouts but additional features and ease of use were limited with the health care websites. These additional features will be described in the next section.

Site Features

Most sites were relatively alike in formatting or lay out. Online shopping was common on commercial sites. Government websites did not offer shopping and one professional site sold textbooks and pamphlets for professionals. Online shopping was available on the following web page types: general (11/19), alternative (18/26), charity (2/8) and one professional site (1/2) for an average of 64% (32 out 55 sites) with a mechanism of either direct sales from the site or the provision of e-links to other companies.

Differences between the commercial and non-commercial sites were seen in membership and advertising. Advertising was not found on any government or professional association sites. Sites intent on engaging the consumer for donations or marketing strongly promoted memberships. Membership was offered on the general web pages (18/19), the alternative sites (24/25) and the charity groups (8/8) whereas membership to health care pages (1/15) and professional associations (0/2) were not typically available.

On the alternative and general prenatal web pages, advertising was very common (42 out of 44 sites), whereas half the not-for-profit groups (4 out of 8 sites) had advertisers and minimal

advertising was seen on these charity sites. Charity sites generally had one to two advertisers and examples of the advertisers seen were: Huggies, Pampers, Weight Watchers and Clear Blue pregnancy tests. The general and alternative internet sites were heavily laden with advertising and this occurred by rotating different advertisers on the webpage sidebar. The types of advertising found were for products, services, charities and health promotion. A listing of examples of advertisers can be found in Appendix M.

Visual differences were noted between governmental and nongovernmental sites in terms of movement on the sites and content presentation. Four out of eight charities featured slideshows of different topics available on their sites. Few governmental (2 out of 15 sites) and no professional association sites featured moving content on their sites. Charities, alternative and general prenatal web pages were visually more appealing and had greater density of photos interspersed within the content, whereas governmental and professional associations relied heavily on written presentation and were less visually appealing.

Literature indicates online clients appreciate sites that are visually appealing, easy to use, offer nonbiased and informative content, have continually updated content, are easy to navigate, can be personalized, and have many multimedia options (Brouwer et al., 2011; Crutzen et al., 2011; Funk et al., 2010; Lemire et al., 2008; Rains & Karmikel, 2009; Sillence et al., 2007; Wanner et al., 2010; Webb et al., 2010). An assessment of site features (toolboxes, videos, blogs and social media links) was undertaken. The numbers of site features for the alternative sites are lower due to how the alternative sites were initially grouped. On reflection the alternative sites should have been split into two data sets of commercial-chat only sites and mixed content commercial-chat sites. The mixed content commercial-chat sites results would have reflected the general website as they were very similar in lay out presentation and tone. Commercial and

charity sites offered more features than professional and government sites. Table 1 highlights this trend.

Table 1

Overview of Site Features Available on Different Prenatal Websites

	Alternative Sites (25)	General Sites (19)	Charities (8)	Professional Associations (2)	Government Sites (15)
Blogs	6	12	1	0	0
Videos	13	15	2	1	4
Toolboxes	16	18	5	0	6
Total	35/75	45/57	8/24	1/6	10/45
Percentage of Features	47%	79%	33%	17%	22%

Appendix N outlines the different types of tools offered by the three different web providers. Differences were noted in the diversity and number of tools offered by the various web providers with the commercial sites offering many different tools and fun options. Only six health care sites offered a few toolbox options and those offered focused on health promotion. Not for profit sites provided the fewest toolbox options.

Videos were more commonly available on commercial sites rather than non-commercial web pages. A full examination of the videos was beyond the scope of this study and future study of the influence of this media would be warranted. Blogs were not a commonly offered feature on any site. Additional features found on commercial sites such as community directories, product reviews, games, celebrity news, buy and sell pages, photo galleries, personal diary options, fashion news, mobile apps and pod cast, were not found on government or professional

association sites. Links to social media such as Facebook were more consistently offered by all service providers as outlined below in table 2.

Table 2

Social Media Options Available by Service Provider

	Alternative Site (25)	General Site (19)	Charity (8)	Professional Association (2)	Government (15)
Social Media Available	16	13	7	0	7
Percentage	64%	68%	88%	0%	47%

While advertising, shopping and membership were clearly site generated means of marketing; the offering of multimedia features was a less visible strategy of marketing. Seckin (2010) identifies that,

It is not how long a person has been using a computer-provided cancer-related medical information or how many different cancer web-sites they use, but rather it is how often patients use computer-based information resources and how much time they spend at these sites that are crucial variable that increase self-reported information and decision-making benefits (p. 1698).

Other research indicates the holding of consumers on a website is considered an effective marketing strategy (Rashley, 2005). One wonders if the offering of multimedia options is another mechanism of holding consumers on these commercial sites. According to Dickerson (2006), online consumers have expressed an interest in communicating via the internet with health care providers. Indications from this study are that an interest does exist.

Examination of the *Ask an Expert* feature considered interest in communicating with health care providers online and the types of services provided. As outlined in Table 3, utilization rates were displayed for three alternative sites situated in the forums section of the website. All questions were answered by a professional and other forum members could contribute. While these forums were not as busy as other chat-room sites, this indicated an interest from consumers for Ask an Expert service.

Table 3

Ask an Expert Professionals and Utilization

	Professionals	Time Period	# of Threads (Questions)	# of Posts (Replies)
Site 1	<ul style="list-style-type: none"> • Midwife • Home Visitor • Nutritionist 	2 months	161	350
Site 2	<ul style="list-style-type: none"> • Midwife 	6 months	10,000	Unable to count
Site 3	<ul style="list-style-type: none"> • Naturopath • Midwife • Chinese Medicine • Breastfeeding 	Unknown (Had to Log on to access this area of the site)	126	657

The three sites identified in Table 3 were the only ones that provided direct access to an expert of the 16 sites offering free Ask an Expert service. The remaining thirteen sites either provided site generated Ask an Expert content or answered limited questions on expert moderated forums. No nurses or obstetricians moderated any forums or answered any questions. Two physicians provided site generated expert answers. Appendix O outlines the services provided, the type of experts responding, and how one accessed these professionals. This study

did not assess the Ask an Expert conversations and such an assessment may have provided additional information for health care providers on how to develop online support services.

When an Ask an Expert query or site search was completed, links to forums and social media such as Facebook and Twitter were a common result. When reading online articles, participants could choose to add comments on the articles and/or link to a social media provider about the chosen article. Macias, Lewis, and Smith (2005) found online discussions generate more product exposure than market internet generated strategies. Social chat-rooms are targeted by marketers to use strategies of promotional chat (Du Plessis, 2010; Mayzlin, 2006; Pickles & Thornton, 2009; Sprague & Wells, 2010). An analysis of promotional chat was beyond the scope of this research but it would add to the body of understanding of the online environment in the future.

While most charity and government sites did not offer Ask an Expert online service, seven government agencies and three charities offered personalized services where individuals could either call or email in their questions privately. This level of individual service was not seen with any other site providers. The provision of individualized service versus interactive services seen in forum environments is reflective of prior research. The literature indicates that health care professionals do not provide online service because of liability concerns, confidentiality, limited resources and the lack of online skills (Dickerson, 2006; O'Connor & Madge, 2004; Plantin & Daneback, 2009).

The targeting of consumers using both direct (advertising and shopping) and indirect (tool boxes, videos and social media) marketing strategies provide opportunities for assessing consumers response and interests by holding consumers within their sites (Freeman, 2010;

Plantin & Daneback, 2009; Rashley, 2005). These strategies result in ongoing, multifaceted, iterative feedback loops for corporate businesses to create appealing sites that effectively attract and keep consumers. Most consumers access online content by using search engines and mixed commercial websites are favoured over academic, non-commercial and purely commercial sites (Lagan et al., 2010; Plantin & Daneback, 2009; Rashley, 2005). One reason for this may be health websites are often too scientific and difficult to use for prenatal women (Lagan, Sinclair & Kernohan, 2006) and feedback of a Dutch health care program indicates the site did not provide any new information (van Zutphen, Milder & Bemelmans, 2009).

Navigation

The examination of the organization and ability to navigate sites suggests health care sites were not as organized and were more difficult to navigate in comparison to the counterpart commercial and charity sites. Sites were assessed for ease of use by seeing the availability of roll over options, intuitiveness of navigational tool bars, and the types of results presented when the search button was used for the search terms “leg cramps”, “toxoplasmosis” and “nutrition”. When using roll over options, one hovers over a navigational tool bar and content is dropped down and displayed without clicking on the tool bar. This feature was more common on commercial (24 out of 44 sites) and professional sites (2 out of 2 sites) than on health care (3 out of 15 sites) and charity sites (3 out of 8 sites). Results indicated commercial and charity sites had effective tool bars and search buttons. Accessing content on professional and government sites was more labour intensive and time consuming due to poor search button results and non-standardized navigational tool bar topic headings. Search button queries yielded too many irrelevant results such as government site ministry announcements, research papers, professional

guidelines, social marketing tool kits, First Nations content, specific initiatives and government programs.

Navigational tool bars topic headings were not standardized in governmental and professional association sites, but consistencies were noted between commercial and charities. The provision of consistent topic headings supported navigation because when one learned where content was situated under each heading, navigation of other commercial and charity sites was easy. Consumers needed to learn to navigate each health care or professional site independently. Appendix P outlines the navigational patterns for alternative, general, charity, professional association and health care websites.

An assessment of whether topic headings were reflective of research on women's interests was undertaken initially as a way of outlining how topic heading help support navigation. Prior research on the types of information women accessed were foetal development, stages of labour, pregnancy, chat forums, parental benefits, complications, social supports, test done in pregnancy and home remedies (Dickerson, 2006; Herman et al., 2005; Lagan et al., 2006; Larsson, 2009; Mankuta, Vinker, Shapira, Laufer, & Shveiky, 2007; Plantin & Daneback, 2009). Topic headings from commercial and charity sites aligned with most of these themes with the exception of tests during pregnancy and social support. Government and professional association aligned with fewer of these themes and did not provide information on parental benefits, home remedies, social support and access to chat- rooms. A few health care sites gave information on testing done in pregnancy but most content focused on maintaining a healthy lifestyle (nutrition, exercise, medications, smoking, alcohol and dental health). Commercial and charity sites were generally easy to navigate and had standard topic headings that were consumer orientated. Government and professional sites required additional effort to

access a content query, had non-standardized topic headings and content priorities were not consumer orientated.

Content

As an everyday example to assess content, a comprehensive nutritional article from each website was examined for the quality and type of content. A total of 47 articles (12 alternative, 12 general and 23 health care sites) were reviewed. Specific evaluation criteria were:

- If prenatal vitamin recommendations were in line with its originating countries recommendations.
- If information on portion sizes was given.
- If content was accurate.

Most articles did not provide these three key pieces of information. Content presentation on most sites used an article type format which did not give all relevant information on the one page but had links embedded within the articles to other content, and a full examination of the links provided was beyond the scope of this study. Consequently the results about most articles lacking vitamin recommendations and portion sizes means the results were not readily available but the content may have been available through the embedded links. If online users spent considerable time on a site they may have accessed the provided links and obtained all the relevant information needed around portion sizes and multivitamin recommendations. No literature was found on how consumers move through embedded links within articles and this warrants further research. The results of this case study showed differences between commercial and non-commercial sites in content focus.

Commercial sites tended to pick a small section of content that required little interpretation, whereas government sites attempted to cover a broader range of information that might make it difficult to incorporate into everyday life. Prenatal vitamin information in many commercial and charity articles provided limited content and focused on a specific interest. Information on this specific interest gave many examples and ideas. For example “Increasing your Vitamin A”, “A Healthy Latino Pregnancy Diet” or making better food choices such as swapping yogurt for ice-cream all provided a multitude of different ideas on this focus area. The Healthy Latino Pregnancy article provided detailed lists of Latino foods and the portion sizes for an expectant mom. No information was available on prenatal vitamin recommendations or other topics such as food safety. The researcher found content was correct but lacked details to help fully inform clients on overall pregnancy nutrition. Content accuracy was assessed from professional knowledge and cross-checking content with each countries prenatal vitamin and portion size recommendations.

Government and professional sites provided broader overarching content information but lacked details on how to implement these recommendations. For example “eat foods that are high in fibre”, “keep your fluids up by drinking plenty of water and fruit juices”, “choose fish low in mercury, such as salmon, rainbow trout...sole. Do not have more than two servings per month of...shark, marlin or swordfish” and “your body needs a little extra protein during pregnancy...foods high in iron and calcium are good sources of protein”. These websites touched on more topics but the topics were not fully explained. For example the statement “choose fish low in mercury” did not include cod or information on how consumers can identify which type of fish would have higher mercury content. Most information provided on the government sites was directive of what women needed to do to ensure a healthy pregnancy and manage labour.

Prenatal vitamin recommendations that promoted their originating countries stance were found in 25 of the 43 articles (58%). Appendix Q outlines site coherence with the country's prenatal supplementation guidelines. Despite the lack of clear online information about prenatal vitamin recommendations, 89.7% of Canadian women took a multivitamin containing folic acid during their first three months of pregnancy between 2006 and 2007 (Kaczorowski, 2009, p. 61). This may support prior online research that consumers access online information prudently and make appropriate decisions with the information they read (Dickerson, 2006; Imes et al., 2008; Lemire et al., 2008; O'Connor & Madge, 2004; Rahmqvist & Bara, 2007; Renahy & Chauvin, 2006; Sillence et al., 2007).

Portion size recommendations were generally absent in the online environment. Appendix R summarizes the 47 articles. Nine sites gave information on portion sizes. Embedded links to other sites such as Health Canada's Healthy Eating Guidelines which outlined information on portion sizes, prenatal vitamin information and eating the appropriate number of food groups was a practice seen in this prenatal online environment. A full assessment of the linked content was not undertaken and the absence of portion size recommendations may be reflective of how content was presented in the online environment and not that the content was missing.

Obesity has become a priority in most first world countries. One mechanism to help monitor weight gain is defining a portion size to help individuals ascertain if their intake is adequate and appropriate. Many government prenatal sites focused on the importance of appropriate weight gain but did not give readily available information on portion sizes and strategies to maintain weight. Few nongovernment sites discussed appropriate weight gain.

Presentation Style

Commercial and non-commercial websites had very different writing styles and tones. Most commercial and charity sites took on a magazine style of writing that tended to be less in-depth; it created interest but did not fully encompass the topic. The writing style tended to be informal (e.g. “I leak when I laugh” and “I sweat like a pig”) and seemed to build a sense of camaraderie. In the government and professional association sites the writing style was more formal (such as “This topic outlines”) with the focus on presenting recommendations and the consequences of not following the recommendations. Examples of this were:

- “Folic acid is a vitamin that has been proven to prevent neural tube defects, including defects involving abnormal development of a baby’s spinal cord or brain-spina bifida”.
- “Folic acid lessens the risk of having a baby with neural tube defects, such as spina bifida”.

One health care web site differed and presented information in a strength based and positive manner as seen below.

“Folic acid is needed for:

- The normal growth of all cells
- The formation of haemoglobin (carries oxygen in the blood)
- Brain and neural tube development”

Literature on the presentation of online content found positive approaches (for example non-blaming language) were supportive in influencing client behaviours and outcomes (Harris,

Sillence, & Briggs, 2009; Jeong et al., 2008; Lange & Ruwaard, 2010; Ravert & Crowell, 2009; Van't Riet, Crutzen, & De Vries, 2010). For example Harris et al. (2009), found negative approaches were remembered by site participants but positive approaches supported a greater reduction in alcohol consumption in women who were drinking during pregnancy. Comparing the impact of different types of health care messages and the use of language in health care warrants future research.

Content Accuracy

Another factor that could potentially impact client behaviours and outcomes is content accuracy. The accuracy of content on prenatal websites is estimated to be 60% (De Santis et al., 2010). Most women state they had been on misleading websites but still considered online information to be reliable and helpful (Ayantunde et al., 2007; Hesse et al., 2005; Imes et al., 2008; Lagan, Sinclair & Kernohan, 2009; Lagan et al. 2010; Larsson, 2009; Lemire et al., 2008; Lowe et al. 2009; O'Connor & Madge, 2004; Renahy & Chauvin, 2006; Rice & Katz, 2006; Romano, 2007). According to Dickerson (2006) there are several studies on the accuracy of health information on the Internet. In only rare cases has it been determined that a patient was harmed by information obtained on the Web in contrast to the large number of patients harmed from medical error (p. 153). Overall content was correct but inaccuracies were observed on two general websites and in two articles from the alternative sites based on the researcher's clinical expertise in this area. The inaccuracies noted were alcohol does not impact foetal development, substitution of artificial sweeteners for sugar, weight gain recommendations of one pound per week in the first trimester, and recommendations for using the Brewer's diet in pregnancy. Dated content was found on two health care sites that recommended sunshine as a source of vitamin D in Northern Hemispheres and one health site had a copyright date from 2010, which in

the fast pace of change seen online would be considered dated. Due to the archival nature of online environments and some sites not being updated, health care professionals may want to encourage clients to assess content currency.

Online Environments

An assessment of online chat-rooms identified differences in participation patterns of use, philosophical underpinning, approaches to conflict and perceptions of health care personnel between site providers. Similarities between the two sites were difficulties accessing information and participants affirming the group norms. Access to chat-rooms were a “snapshot” and therefore ongoing outcomes were not assessed and while it is believed the results of this case study would be maintained it must be acknowledged that the results may have differed if a longer assessment period had been completed.

Participation Patterns

Research about online forums indicates most individuals are lurkers, which means these individuals read online information but do not participate in online discussions, and online participation is dominated by a few posters (Barker, R., 2008; Beyers, 2004; Dickerson, 2006; Nielson, 2001; Hesse et al., 2005; Jofesson, 2006). The results from this case study confirmed lurking was common but participation was not dominated by a few posters.

For both chat-rooms of the 47 threads examined a total of 856 postings were viewed by 16,670 individuals. Of these 856 postings, 672 were examined with 496 users contributing to these 47 postings. Between the two chat-rooms 64 women posted to more than one thread. Of these 64 individuals (24 alternative users and 40 general users), 51 posted twice, eight women participated three times, three moms shared on four posts and two individuals contributed five

times, with an overall average of 74% of different user participation. Appendix S outlines the specifics of user data profiles for each chat-room.

A finding that differed from the literature was the duration of online participation. Parenting literature indicates women actively participate in chat-rooms during the child's first three years of life and then participation declines (Drentea & Moren-Cross, 2005). One explanation for this phenomenon is the online environment gives these women an opportunity to explore different ideas of being a mother but as her identity of motherhood solidifies, online activity decreases (Hall & Irvine, 2009; Madge & O'Connor, 2005). In this study a snapshot of the 64 users who participated in more than one posting indicated 44 users had registered in the past three years and the remaining 20 had participated for greater than three years. Findings indicated participation declined with time but impressions from reading the threads from both chat-rooms indicated many of the women were not primiparous but rather were pregnant with another child, a finding not articulated in prior research. A clear understanding of registration patterns and gravida of online users would be beneficial. This phenomenon might provide a mechanism to assess multiparous women's educational needs. Two studies indicate multigravida women have different learning needs than primiparous women, but clarity of their learning needs and how to share information with these women was lacking in the research (Risica & Phipps, 2006; Sullivan, 1993). This study aligned with parenting chat-room research indicating prenatal chat-rooms are a mothering only domain (Brady & Guerin, 2010; Chan, 2008; Drentea & Moren-Cross, 2005; Hall & Irvine, 2009; Madge & O'Connor, 2006; Plantin & Daneback, 2009; Rashley, 2005; Sarkadi & Bremberg, 2005).

Women actively seek online information due to their caregiving role in society and their main responsibility for pregnancy (Blackwell, 2002b; Rahmqvist & Bara, 2007; Renahy &

Chauvin, 2006). Appendix T provides examples of conversations which indicated, women were actively seeking out and making decisions on information, whilst their partners were in agreement and recipients of the information women found. While the alternative and general chat-room sites were mainly a mothering domain these two sites differed in relation to online cultures, approaches to conflict, and perceptions of healthcare providers. This case study supported prior research that individual chat sites attract like-minded individuals and create their own online culture and norms of interaction (Aakhus & Rumsey, 2010; Drentea & Moren-Cross, 2005; Hallett et al., 2007; Madge & O'Connor, 2006; O'Connor & Madge, 2004; Plantin & Daneback, 2009; Rashley, 2005; Romano, 2007).

Differences between Chat-Rooms

While both sites were dominated by women the approach and interactions were different. In-depth and interactive discussions were generally found in the alternative chat-rooms, whereas interactions in the general chat-rooms were individually based opinions or information was presented sequentially with little interaction or comment about other postings. Research about online conflict indicates women-only chat-rooms typically do not engage in the practice of flaming or writing derisive comments (Aakhus & Rumsey, 2010; Brady & Guerin, 2010; Madge & O'Connor, 2006; O'Connor & Madge, 2004; Plantin & Daneback, 2009; Rashley, 2005). In this study, alternative sites participants did not engage in flaming whereas general site participants did. Health care providers were considered a key information source for women in the general chat-rooms. Alternative chat-room participants viewed health care providers as either being non-supportive of their requirements and if they were supportive, the healthcare system immobilized these professionals. According to Hallett et al. (2007) online chat-room cultures and behaviours can vary between sites and clients. This case study found differences in

women's underlying ideologies and interaction patterns. Research on the dynamics of women's chat-room interactions and their meanings were not fully examined but it is recognized that this is a potential area of significant research.

General Chat-Room Culture and Behaviour

The underlying philosophy in the general chat-room tended to be very individualist with a 'do no harm to other' philosophy and respondents were clear to state that the stance or information they provided was their own opinion and minimal comments occurred on other's thoughts and opinions. Examples of do no harm were evidenced by statements such as "The baby gets to choose stuff...b/c in it together", "not vaccinating your baby/child...puts them at risk and also other kids/people", and " I was a Nazi Natural Birther...until...the...risk was to great for me, esp just to stand on principle". Misrepresentation, outdated information, judgments, imposing one's view or evoking and blatantly providing information that could cause harm was not tolerated on this site and an outcome could be flaming. Examples of when a poster contravened these group norms and subsequent responses were: "You sound a little judgey mcjudgerson to me"; "Your friend sounds like a genius!!"; "Your friend is a complete moron" and "Responding to a pregnant teenager in a negative way is 'irresponsible'? Oh the staggering irony". This site had five different incidents of these sorts of inflammatory comments from the 25 postings examined, contradicting current research on the rarity of flaming in women's chat-rooms (Madge & O'Connor, 2006). Appendix U highlights the incidents that lead to these situations.

As stated earlier diverse information sharing of mainstream ideas was seen but posters were clear the ideas were solely theirs. Another phenomenon noted was when a poster

specifically asked for a specific type of information, this request was respected. Two clear examples of this were when one poster who was having spotting and was worrying about a miscarriage stated she was “looking for HOPE...so who had spotting early in pregnancy...and went on without miscarriage” and another poster asked for good stories to ease her mind about epidurals. Forum members honoured these wishes and responded as requested.

Health care providers were typically referenced in the general chat-room. When forum members had queries, fellow chat-room users typically encouraged consulting an obstetrician. While health care providers were viewed as an important source of information, acknowledgements were made that system flaws existed (medical system is capitalist or needless interventions are pushed) but at the same time posters felt there were individual consumers who also abused the health care system (wanting elective C-sections). They stated some recipients took services because they were the norm, without taking responsibility to fully understand the rationale for an intervention. In the general chat-room, the underlying ideology was a high respect for individual choice as long as one’s choices did not harm others and individuals were responsible for making informed decisions. Online philosophy and behaviors of the alternative room also focused on individual choice but differed from general site participants.

Alternative Chat-Room Culture and Behavior

These alternative website participants’ stance was pregnancy is a natural life process and interventions increased risk. Site participants believed when one accepted an intervention more would be needed. As stated by one participant “OBs are immersed...medical model...teaches them be on the offensive...excessive use of unnecessary interventions...”. The stance taken by this group of participants was to refuse prophylactic measures because the risk for problems was

very low and therefore these measures were not warranted. Another forum member indicated the reason for prophylactic measures was monetary gain. This ideology created a higher level of risk tolerance, which created tensions between healthcare providers and this group of women.

Consequently many of the online conversations centered on the health care system (hospital) and on the providers (obstetrician) within this system.

Underlying this chat-room was that health care professionals did not affirm their choices but rather they imposed their own ideologies. Narratives that describe this phenomenon are shown in Appendix V. Consequently these individuals felt, they had to either be prepared to defend their stance, or be armed with information to get what they wanted. Illustrations of comments found in the postings are highlighted in Appendix W. These clients recognized mainstream health care providers were uncomfortable with their choices and indicated if a health care provider supported their choices legal consequences might occur. An example of this was: “they have insurance and legal considerations that can sway their decisions” and another statement was made about an Obstetrician who was supportive of home births but due to the legal implications did not document the birth plan. This chat-room highlighted an interesting tension that health care professionals navigate in their practice, between their professional standards and the legal system.

The other key finding was that participants felt health care providers overstepped their professional boundaries by discussing personal and private matters such as their relationships and decision making. Examples of statements were: “marriage...or other issues...keep visits to what they are.... trained in” and another situation discussed the fear of being reported to child protection for refusing to take prophylactic medications. As with prenatal education literature, these online participants wanted their care to be individualized and their choices respected (Biro

et al., 2003; Enkin, 1995; Gagnon & Sandall, 2007; Green et al., 2000; Nolan, 1999; Stamler, 1998; Wilcock et al., 1997). Other research by Gavin et al. (2008), Gerhard and Schafer (2010), Hara and Estrada (2005), Holt et al. (2010), Mulveen and Hepworth (2006) indicates online chat-rooms can be supportive of marginalized thoughts and one wonders if this phenomenon occurred with this group. An interesting dichotomy noted in this alternative chat-room was how vocal and adamant participants were about advocating their belief systems with health care providers. But when an idea was introduced in the chat-rooms that contravened the group ideology, it was dealt with by ignoring the comment, carefully couching noncommittal responses, or the subtle reinforcement of the group norms. Examples of how participants communicated when comments were not in line with group ideology are outlined in Appendix X. It is proposed these behaviors contributed to the lack of open conflict or flaming observed in this chat-room.

Only one incident of flaming occurred on this site and is in line with prior research indicating women's sites rarely experience flaming behavior (Madge & O'Connor, 2006). This conflict occurred when two individuals had different ideological stances about birth pain being a natural experience versus Mother Nature being very cruel and pain interventions were indeed acceptable. In this situation both posters responded to each other once and two other members intervened. One member mentioned that she appreciated both stances and the other member refocused the conversation from a pain focus to how one must avoid fatigue during the birth experience. Both posters who were in disagreement quickly came on board with this refocus and made amends to each other and the group by either apologizing or reinforcing the other's stance. Resolution between the two differing parties did not occur but rather the conflict was deflected.

While differences were noted between the alternative and general chat-room sites one commonality was seen in relation to informational needs. The need for current evidence based and balanced information was voiced consistently.

Information Management

Current literature (Caiata-Zuffery et al., 2010; Dickerson, 2006; Lemire et al., 2008; Lowe et al., 2009; Rahmvquist & Bara, 2007; Rasmussen et al., 2007) indicates the reasons clients seek health information online is to gain a more in-depth understanding and perspective, to decrease uncertainty, to seek a second opinion, to check out alternative treatments, to assess if they need medical attention and to explore technical information. It has been argued by Hall and Irvine (2009) that women found online information more encompassing and realistic than what they received from health care providers. If the online information was congruent with other information sources, the information was used (Brady & Guerin, 2010; Drentea & Moren-Cross, 2005; O'Connor & Madge, 2004; Plantin & Daneback, 2009; Rashley, 2005; Sarkadi & Bremberg, 2005). Women valued the currency of online information and acknowledged in quickly changing society sometimes traditional sources of information could be dated (Plantin & Daneback, 2009). The variety and amount of information on the web was viewed as more diverse than traditional sources and was valued by prenatal clients (Lowe et al., 2009). Online information was easy to find and perinatal women almost always found the content they were looking for (Lagan et al., 2010).

In this study it was interesting to note women in both chat-rooms did not support prior research about information being easy to access, being able to find what they were looking for, and being able to find current information. Many forum users could not find specific content.

One comment by an individual experiencing a health concern stated “[i]t is very hard to find any really good information...online or in print”. Forum members provided experiential information or shared information they learned from other sources, such as their health care provider because the specific content sought was not available online. The phenomenon of looking for more comprehensive details on a particular query and not finding it was common in these alternative and general online chat-rooms. The types of questions asked covered a broad range of topics from the relative risks of air transmission of toxoplasmosis to seeking research about ultrasound safety. Further examples of the types of questions participants asked are outlined in Appendix Y. Each of these questions was then Googled by the researcher and no clear answers were provided on any health based sites.

Kernisan et al. (2010) and Rasmussen et al. (2007) suggest online consumers have difficulties incorporating health care information into their lives and the participants went online to further their information needs. In this case study one example was the recommendation for women to wear a mask when cleaning out a litter box and no rationale was given for this recommendation, as toxoplasmosis is only transmitted through touch. Online consumers wanted to know the relative risks of air transmission of toxoplasmosis because many users had litter boxes in their laundry rooms. No other information was available about the relative risks of air transmission from any online or print material for clients and resources used by health professionals (Chin, 2000). Consumers went online looking for information about the rationale for certain health care practices (Rhogam being given early) and their relative risks of outcomes for follow up testing (Fasting Glucose Test). The researcher noted minimal online information and print material was available about the types of services provided in the perinatal period and when information was provided the content depth and breadth did not meet these clients’ needs.

Of interest was the diversity of the questions and it was recognized that one single health care provider could not possibly answer all these questions and many of the questions crossed over many health care “departments” (Dunham et al., 1998; Plantin & Daneback, 2009).

A meta-analysis of health websites indicates 70% of the studies concluded literature on online information was not high quality (Eysenbach et al., 2002). The provision of incorrect information or dated information occurred in both chat-rooms but was corrected by other chat-room members. Two examples of incorrect information were to decrease ketones in your urine one needs to increase their protein intake and Hep Locks contained contaminated heparin from Chinese suppliers. Both of these fallacies were corrected by other participants in subsequent comments, but the approaches taken differed between chat-room types.

Noted also, were differences between the alternative and general chat-rooms on how they discussed content. Respondents from the general sites tended to answer questions from personal experience and when a professional body such as the Food and Drug Administration (FDA) or Centers for Disease Control and Prevention (CDC) was mentioned, links or details on how to access the content was not provided. Alternative sites tended to use more references. Examples of the types of information referred to were: www.preeclampsia.org, <http://vbacfacts.com>, <http://givingbirthwithconfidence.org>, www.news.medical.net, and www.midwiferytoday.com. Conversations in both chat-room types could be very complex and in-depth, indicating a need for different levels of information for consumers. Appendix Z highlights examples of the complexity of the conversations seen in these chat-rooms.

Research data interpretation discussions were found in both sites. Participants felt research studies could be skewed or represented in ways to support a particular interest and

caution needed to be exercised when looking at data. If data were unavailable general chat-room users would seek further information from their health care providers. When alternative online participants could not find conclusive evidence to their question, they moved to find solutions independent of the health care system.

Two examples of this were

- due to unclear evidence about the safety ultrasound technology, participants discussed how to mitigate the perceived risks and proposed the use of a fetoscope instead; and
- a woman with severe swelling without high blood pressure did not understand the reasons for her prescribed bed-rest. She looked for compromises such as decreasing her activities and putting up her feet. Other online chat participants while they were in agreement with her about her situation, advised her to use caution in her situation.

This study shows many fundamental differences between revenue generating (charity and commercial) and nonrevenue generating (government and professional association) web pages. Overall commercial and charity sites offered more site features, were easy to navigate and content presentation was upbeat and had an angle such as “your Latino pregnancy” creating a fun positive experience. These practices appealed to consumer desire for affirmation because the sites created a sense of closeness, were visually appealing, easy to navigate and positive in language tone whereas governmental sites were bio-medically orientated, formal and distant in presentation. Government and professional association web sites offered limited features, were not as easy to navigate and, had formal overarching content which did not offer any new

information. In comparison to commercial sites, the non-commercial websites were not as visually appealing, user friendly and interactive. Most content was on health promotion recommendations and preparing for the labour process of childbirth. This biomedical presentation of content was in contrast to the underpinning of affirmation (Penny Cash personal communication) found in both chat-rooms and revenue generating websites.

Affirmation

According the Webster's Ninth New Collegiate Dictionary the term, affirm means to state positively and to validate or confirm. Commercial and charity sites used chatty magazine like content, had a positive tone and built a sense of camaraderie with consumers thus creating an affirming environment for the individual. Affirmation occurred at both the individual and chat-group level. Consequences of not affirming cultural group norms in chat-rooms were seen by practices of flaming, ignoring and subtle pressure were instituted to reinforce these cultural norms. This case study confirmed prior literature about the online environment for individual and group phenomena:

- Reinforcement and legitimization of marginalized thoughts (Gavin et al., 2008; Hara & Estrada, 2005; Holt et al., 2010; Mulveen & Hepworth, 2006).
- Provided an environment for reverse consent, which is a process where individuals go online to find evidence to support their philosophical stance or decision (Munro et al., 2009).
- Offered information and emotional support (Åkesson et al., 2007; Donelle & Hoffman-Goetz, 2008b; Dunham et al., 1998; Griffiths et al., 2009; Hudson et al., 2009; Lee & Lee, 2010; Lowe et al., 2009; Qian & Mao, 2010).

- Engaged individuals in self-empowerment (Åkesson et al., 2007; Caiata-Zufferey et al., 2010; Kelly, Pomerantz, & Currie, 2006; Kral, 2006; Kernisan et al., 2010; Rasmussen et al., 2007; Renahy & Chauvin, 2006; Samoocha et al., 2010; Schrank et al., 2010; Seçkin, 2010; Sillence et al., 2007; Strong & Gilmour, 2009).

While reinforcement of marginalized thoughts, reverse consent, support (informational and emotional), empowerment and culture were observed, this study proposes affirmation underpins all of these concepts. While affirmation is considered an overarching concept that pertains to the online environment this study also highlighted a need for health care providers to be aware of site values and attending to those beliefs would be beneficial for both the client and the provider.

A search using the EBSCO data base revealed the following results for: Affirmation and Prenatal (16), Affirmation and Healthcare (249), and Affirmation and Internet (99). Affirmation literature on prenatal, healthcare and internet results in relation to clients focused on: self-affirmation; affirmation of the person, a program or stance; and was defined as part of a strategy for patient engagement such as motivational interviewing. Examples from 2008 highlighting the findings for affirmation literature are: Chang et al., 2008; Clark, 2010; Miller, 2010; Hotelling, 2008; Kim & Jong-Eun, 2011; Klein et al., 2010; Kylma, Duggleby, Cooper & Moander, 2009; Melrose & Gorgon, 2008; Napierkowski & Pacquiao, 2010 and; van Koningsbruggen, 2009. One health care study and two internet studies discussed affirmation in relation to support and interpersonal connections (Amichai-Hamburger, 2007; Barnfather, Stewart, Magill-Evans, Ray & Letourneau, 2011; Kemp, Perkins, Hollingsworth & Lepore, 2009). Further research on how to create an affirming online environment would be advantageous.

New Phenomena

Before moving into the summary, phenomena outside the parameters of this case study emerged that need to be explored further. This case study found two phenomena not reported in the literature. These phenomena were:

- The high presence of multiparous women in both the alternative and general prenatal websites.
- The practice of embedding social media such as on-line forums or Facebook within articles on the general prenatal websites.

While not fully examined, it appeared many participants were multiparous women and this has not been documented in prior research. This level of participation indicates multiparous women have information needs. Little research exists on the learning needs of multiparous women (Risica & Phipps, 2006; Sullivan, 1993).

Articles found on the general websites were linked to the site's chat-rooms or Facebook type social media networks. Prior online research indicates social media and online chat-rooms are promoted as options for online users when they do a topic search. The literature review indicates that many companies promote online chat-rooms because forums are effective ways for manufactures to listen in on conversations and actively participate with consumers (Du Plessis, 2010; Mayzlin, 2006). This phenomenon of creating links in articles may be another strategy to encourage consumer participation in online chat-rooms. Further research on this might highlight other reasons for this practice.

Summary

Generalizability of case study research needs to be confirmed in follow up studies therefore the interpretation of this case study cannot be extrapolated to the whole but it does highlight many new avenues of exploration and research for perinatal women (Eysenbach & Wyatt, 2002; Slater & Yani-de-Soriano, 2010). Findings from this study indicate search engine results were dominated by corporations; differences in structural characteristics were seen between health care sites versus general and alternative prenatal sites; and gaps exist in health care provider information.

Presentation tone differed between health care and commercial sites with health care sites having a formal approach whereas commercial sites tended to build a sense of camaraderie. Commercial sites presented positive and niche content whereas health care tended to focus on overarching health promoting information. This study questions the impact of embedded links or the nonlinear online style of content presentation on clients being fully informed in a topic area. Chat-room discussions highlighted different ideological perspectives that can be embedded within corporate run websites and might offer health care providers information on targeting different consumer groups. Awareness of these different ideological perspectives and ways of being could help inform health care providers on client driven learning needs. Affirmation is proposed as a potential underpinning to commercial websites, whereas health care sites were biomedical. New phenomena surfaced in this case study not found in prior literature warranting further research, the high presence of multiparous women in online chat rooms and the embedding of social media need further exploration. The implications of these findings for health care providers will be discussed in the following chapter.

Limitations

In some instances case studies that use an empirical approach lend themselves to generalizability and prediction, in this instance however the findings from this case study are preliminary and require further research. Outlined in this section is a discussion on:

- Lessons learned from the methods process.
- The limitations of this case study and online research.
- Potential areas of future research.

In implementing the case study protocol and moving through the analysis of the data realizations are made about approaches that would be taken if this study was redone. Lessons learned from the methods process were:

- Conducting a pilot test of the site characteristics would have supported a more efficient process by the researcher learning how to set up the word tables in a manner that was reflective of navigating the websites. This would have diminished the amount of moving in and out of both the websites and word tables.
- Testing the word tables would have identified the need for clear definitions on what each term represented prior to commencing the study.

While a pilot study and clear definitions may have been beneficial, a recognizable drawback in the process, it should be acknowledged the online environment is so fluid that any attempt to capture consistent definitions of characteristics across sites may not be possible. The research entailed defining and creating clarity as the study progressed and while this helped the researcher immerse in the content, it is felt other details may not have been assessed due to this refinement process.

Due to the lack of prior research on multiple prenatal websites from a client perspective, an exploratory multi-embedded case study design was used to begin to highlight perinatal women's education needs and the prenatal online environment. While case study design provides the flexibility to examine phenomena from many dimensions, the complexity of doing this type of research can create challenges for design replication. It is also recognized that replication of the findings may not be possible due to other researcher's interpretation of different conversations found in other prenatal chat-rooms. Although this case study was not designed to take a feminist perspective in particular and therefore a look at women's participation is an area for future study. Assumptions from this study need to be explored particularly the notion of affirmation and whether women desire an affirming environment. It could be assumed this notion of affirmation reflects women's way of being in the world. As with the assumed notion of affirmation, the newness of this research will need follow up studies to confirm and expand this body of knowledge. A limitation of this study was the inability of the researcher to confirm these findings with site participants and assess how online participants translated their online discussions into real world interactions and behaviours.

The field of online research is a relatively new domain and further research of how online research and its applicability in the lived experience of the consumer is needed. Follow up research on how women incorporate both online and health care information would be beneficial. Additional research and input from perinatal consumers on the applicability of health care information will contribute to the creation of more diverse and client centered materials. Research on websites that require participant registration may also provide further insight for healthcare providers on consumer needs.

Recommendations

This case study highlights the importance of health care providers increasing their awareness of the overall on-line environment, paying attention to philosophical stances and client group niches in-order to align their teaching methods to meet the needs of those they serve. Recommendations from this case study incorporate affirmation as a potential philosophy when working with clients and examine the tensions surrounding consumer choice. The creation of mechanisms to support clients in incorporating information into their everyday lives could create a relational environment, which shifts the focus from a health care focused model to a client centered one. Of particular importance is the consideration of language tone and prenatal website development by using other disciplines' scopes of knowledge to broaden current health care teaching and health marketing strategies.

Affirmation

The concept of affirmation is proposed as a potential commonality seen between all commercial sites. Corporations have created sites that are user friendly, have a positive underlying tone and they are able to cater to consumers with different ideological perspectives in their quest for being able to market to these individuals. It is recommended an examination of corporate sites might stimulate new ways of delivering online health care information from an affirmation perspective. It is also recommended that health care educators tap into these strategies when creating education materials or prenatal websites in order to align closer to client needs. Drawing on affirmation literature will support the creation of affirming online environments with a resultant shift away from the current biomedical models.

Tensions with Consumer Choice

An awareness of ideological differences needs to be considered in how prenatal education and online content presentation are provided by health care organizations. This was highlighted in the alternative chat-rooms where many discussions focused on health care providers not being supportive of these clients' choices. When a client made a choice that was different from recommended practices, it created tension for health care providers in terms of their ethical practices, legal obligations and standards of practice. While guidelines do exist to support client choice, it is believed few institutions have clear policies and procedures on how to manage these situations leaving the frontline health care worker with a sense of liability, as identified by the alternative chat participants. Pressure is placed on health care providers to approach clients who decline recommended services by encouraging health care providers to have a "persistent approach to educate clients" and to engage in practices such as having parents sign waivers or document discussions as mechanisms to reduce legal risk (Lyren & Leonard, 2006; p. 402 & 403). This tactic might create the tension outlined in the alternative chat-room, where health care providers are perceived as bullies. It is recommended support to frontline care givers in terms of clear procedures, access to legal counsel and new education strategies that target particular groups might be beneficial in defusing this current perception of an adversarial situation between health care providers and alternative clients.

Incorporating Information into Everyday Life

While the difference in philosophy of acceptance of care practices was noted between alternative and general chat-room participants, commonalities of information needs were seen for both groups. All online participants engaged in practices to incorporate recommendations into

their everyday lives, they engaged in very complex health conversations, and they had difficulty accessing current information. First it is recommended that consideration of the creation of mechanisms to solicit client feedback about how clients incorporate this information into real life would be beneficial for health care professionals developing educational materials that meet the everyday needs of consumers. Another consideration is the development of diverse materials that meet different prenatal families' needs.

Online consumer discussions indicated participants could engage in very complex health conversations and impressions gained from these conversations was that there is a need for different levels of information sharing. Consumers attempted to share information but expressed frustration with being unable to access details that were current. One example was about the safety of ultrasound technologies and all the references provided by online users were dated from the 1980's and 1990's. A Google search on this topic yielded the same results. A search of ultrasound safety using a university index and database (EBSCO-Medline) was undertaken and quickly produced a systematic review by WHO, that indicated exposure during pregnancy appears safe (Torloni et al., 2009). It is recommended increasing access to current research and the provision of more complex information would be beneficial and supportive to both frontline health care providers and online clients. The offering of stratified layers of information complexity may better meet individual learning needs.

During the investigation, site participants discussed their concerns about research being unduly influenced or skewed to meet agendas. Attention to this skewed data is warranted. It is recommended that a stance of transparency about the rationale for recommendations might help alleviate these skewed data concerns and increase trust. For example group B streptococcus testing decreases infant illness and decreases health care costs. Caution would be needed in

instituting a more transparent health care system as consumers with different ideological beliefs could potentially create media sensation on this content as has been seen with many anti-immunization websites claiming vaccines contain mercury which is dangerous to human health. There is also a risk of overwhelming clients with too much information (De Santis et al., 2010; Holmes, 2006; Jofesson, 2006; Rasmussen et al., 2007; Renahy & Chauvin, 2006; Romano, 2007).

Language Tone

Consideration of language tone and mechanisms to assess the impact of knowledge sharing for all prenatal education initiatives would support a move from a biomedical model of care to one of inclusion and affirmation. It is recommended that attention to positive language tone in the creation of education materials should be used. Literature on consumer preference indicates consumers prefer a positive stance versus guilt provoking or negative content (Harris et al., 2009; Jeong et al., 2008; Lange & Ruwaard, 2010; Ravert & Crowell, 2008; Van't Riet et al., 2010). As stated earlier in this case study, commercial sites were chatty and attempted to build camaraderie and the health care sites provided more directive information and the possible consequences of not following through on recommendations. It is also recommended that considerations of the various differences between groups and the type of messaging that align with these groups are warranted. A further recommendation is that literature from other disciplines such as Min (2011) and Vintean (2010) advocate strength based approaches and the use of positive word tone might help inform health care providers on strategies that may be supportive of client learning needs. Finally it is recommended studying other online environments for ideas on how to create materials with a positive language tone for prenatal

websites and prenatal classes. The creation of such material may create the opportunity for more communication between clients and health care providers.

Prenatal Website Development

Both consumers and frontline prenatal health care providers would benefit from the creation of mechanisms that evaluate and respond to client feedback on prenatal content. As mentioned previously, it became apparent in this case study that consumers have questions about incorporating health care education recommendations into their everyday lives and answers to these questions were not easily accessible to either the client or the frontline health care provider. The diversity of the questions asked crossed over many health care “departments” in this case study and concurred with prior research that no individual health care provider could possibly answer all consumer questions (Dunham et al., 1998; Plantin & Daneback, 2009). For example, a study by Houston, Allsworth and Macones (2011), identifies that obstetrical and gynaecology residents’ knowledge of ultrasound safety was low. Although a physician or nurse may not have the scientific knowledge of a particular test, laboratory personnel or researchers might.

Historically, health care providers were challenged on how to meet these needs due to time limitations and identifying the appropriate experts who could answer client questions. Mechanisms for consumers to get clarity from health care providers on how to incorporate health care information into their lives, needs to be easily accessible, timely, responsive and transparent. The online superhighway now creates an opportunity for a client centered website with contributions from different care providers and researchers that can meet client educational needs more easily than traditional methods. Such a website could act like clearinghouse of information for clients and front line health care providers and increase access for all interested

parties to one central location. It is recommended a central prenatal website be created and the following outlines some factors that need to be considered when creating such a site.

A Canadian Prenatal Website could create a hub that increases capacity by sharing the workload between many providers on one central site. Longevity of this site will be dependent on commitments that can withstand ongoing changes in government structures and policies at federal, provincial and local government levels. The consolidation of resources used for current independent site development by various government bodies may support the ability to strategically promote this website. One central site rather than multiple health care sites could potentially increase competition of page rank placement due to the unified promotion of this site. Another promotion strategy for search engine result placement within the first ten results could be paid advertising. This consolidation of resources may facilitate the site keeping pace with the fast changing online environments by having appropriate financial, technical and research support (Hallett et al., 2007). It is clear that sites should be less medicalized and created with consumer feedback (Aakhus & Rumsey, 2010; Ravert & Crowell, 2008; Strong & Gilmour, 2009). Hallett et al. (2007) recommend providers have an awareness of the online culture, have the ability to shift quickly with site usage patterns, and be able to keep up with new technologies if they are to be effective in this domain. Rains and Karmikel (2006) feel health care providers should pay attention to both structural and message characteristics in developing web pages that will effectively target population groups. Schiavo (2008) further recommends health care providers need to:

- Understand the situations and needs of audience characteristics and literacy levels.
- Present high quality, scientific information.

- Develop well defined goals and objectives for online communication interventions.
- Use a behaviour orientated mindset to prompt the kind of on-line communications sought.
- Have visually appealing content.
- Be culturally competent and have tools to reach across many audiences (p. 12).

Consumers feel visual appeal and ease of use impacts their site choices (Brouwer et al., 2011; Lemire et al., 2008; Rains & Karmikel, 2009; Sillence et al., 2007). This case study contributes additional knowledge about utilization of tools and site navigation.

Overall commercial and charity sites offered more features, were more visually appealing, and were easier to navigate. Online features such as tool boxes were routinely offered on commercial sites. The fun orientated (baby's horoscopes) on line tools would not be appropriate for health care sites but ideas could be gained from corporate sites on the development of more tools for health care sites. Increasing features that move beyond a health promotion perspective and are more inclusive of the perinatal family could include budgeting for baby, hospital packing lists, safety guides for products such as car seats, and client checklists of health care provider services during the perinatal period. In addition, the provision of links to sites that impact the perinatal family such as accessing forms for maternity benefits would be advantageous. The provision of links to other government sectors outside healthcare would enable a move towards client centered care within the context of their life needs and decrease the silo like nature of current health prenatal sites. Considerations for future research might be to assess how links within sites work in the provision of information and how clients prefer to move through online content.

Women are interested in fetal development, stages of labour, pregnancy, chat forums, parental benefits, complications, social support, tests done in pregnancy and home remedies (Dickerson, 2006; Herman et al., 2005; Lagan et al., 2006; Larsson, 2009; Mankuta et al., 2007; Plantin & Daneback, 2009). Government and professional association sites did not have standardized topic headings and most topic headings did not intuitively accommodate women's interest areas. Creating intuitive and commonly understood topic headings for all government sites would meet women's interests and support their abilities to navigate easily between many government sites. Accessing different government sites would become easier for women because after they have learned the one format they could move between sites and know how to locate content quickly. Site navigation was limited within government web pages due to limited search button abilities. Search button results for business based sites provided accurate content reflective of the search query. It could be argued that business based sites had a smaller focus than government sites and as such easily displayed more targeted results. But when one looks at other sites such as Wikipedia, this extensive site is able to provide targeted responses for search queries and offers an example of the potential available to government sites.

While Government sites offered large amounts of content from within the website searches, the content was not easily accessible. Consideration of strategies to better manage this content could include:

- Creating two search buttons on the site where one search button accessed all areas of the site and the other button would only yield results within a particular domain of the site.
- Categorize search button results such as: Programs, Policies and Guidelines, Government Announcements, Parent Education, Professional Education, First

Nations et cetera, to enable the consumer to quickly access the appropriate category.

- Standardize and provide site maps on all government sites.
- Purchase technology and engage in ongoing research that will enable easier site navigation and accurate content results.

Sites that are client focused, visually appealing, having personalized features, offering many feature/tools, being easy to navigate, and continually updating a site with new content, supports client participation (Funk et al., 2010).

The online environment is known for being fast paced and changing quickly. Therefore, health care will need to be proactive in this evolving environment. Creating a prenatal on-line site will need to consider developmental and evaluation strategies to keep current with consumer trends. A quick online database search (EBSCO and IEEEExplore) using the search terms ‘health marketing online’ indicates the health care literature was focused on specific diseases or conditions. As a starting point, an extensive literature review about the online environment would be needed and website developers could utilize current health care and consumer marketing research to guide the development of more parent friendly education websites. The incorporation of client input and using other discipline information would support expanding this body of research from a narrow bio-medical health care perspective. Ongoing site evaluation and responsiveness to the impact of information sharing on a client’s lived experience could lead to the creation of effective and innovative health marketing strategies.

Expanding the Scopes of Knowledge Using Other Disciplines

It is recommended that incorporating other disciplines' scopes of knowledge would be beneficial in the development of prenatal education. The goal of prenatal education and prenatal online websites is to educate prenatal families about pregnancy. Part of this education is the provision of information and the process in which it becomes client driven knowledge, meaning how people incorporate information into something meaningful for them. Literature on knowledge transfer examines this phenomenon. Knowledge transfer literature crosses many different fields such as education, health care, marketing and business but common to all this literature is the need to gain an understanding of how knowledge acquisition occurs. This research is approached from three different perspectives: intervention assessments, understanding the underlying factors or influences, and the development of models or processes that influence knowledge transfer. Intervention assessments are when researchers develop something such as a pamphlets, program or website features and assess the impact of knowledge gained by consumers (Hansen, 2008; Lou, Shi-Jer, Ru-Chu, Kuo-Hung, Diez & Huei-Yin, 2010).

In relation to this case study, the research confirms that diverse website features are desirable to support knowledge acquisition (Lee, Goh & Chua, 2010; Muench, Mahoney & White, 2010; Rogers & Negash, 2007). While this case study highlighted affirmation as an underlying principle found in the two online chat rooms examined, knowledge transfer information helps inform health care providers of other factors such as joint reflection and interpretation of information, trust, values and social norms as potentially important considerations in developing online websites (Ho & Kyung, 2010; Househ, Kushniruk, Carelton & Cloutier & Fisher, 2011; Millar & Choi, 2009; Sosale, 2011; Rogers & Negash, 2007). Additional knowledge transfer literature on face to face education practices could support

prenatal educators (Thompson, Estabrooks & Degner, 2006). Models and conceptual frameworks are also valuable tools when developing education and online programs as they tend to assess the needs and the processes of knowledge transfer and propose ways of approaching the development of programs or online websites (Househ, Kushniruk, Cloutier-Fisher & Carleton, 2011; Ivanova & Alam, 2010; Muench et al., 2010; Pilla, 2011). As with the prenatal and internet literature most of the knowledge transfer literature had a specific focus area.

Narrowly focused literature does not support front line health care practitioners in being able to easily access research information to incorporate into their everyday practice. Front line health care practitioners do not have the time to do lengthy literature reviews of studies to gain a full understanding of the literature. Lemire et al., (2008) commented that most studies are very narrowly focused and it would be useful to understand why the general public is accessing health care on-line. The literature has not combined these focused studies in ways to create a contextual environment of what is known overall about prenatal education and the online environment. Future studies doing this will help practitioners working with clients. While a need exists for focused research, society and life do not exist in these limited spaces and therefore methods such as case studies create opportunity to meld science and life.

Within the online environment a move to develop a new technology called the Semantic Web, will facilitate new types of collaborative research and may create the ability to study the web as whole due to the web interfacing and operating in more multidisciplinary ways (Cardon et al., 2009; Dimmick et al., 2007; Hall et al., 2009; Hendler et al., 2008). These new approaches of interfacing online create exciting opportunities for new types of research that could potentially move beyond the current specific and focused practices reported in the literature. With the rapid changes in online technology, most research is not client driven and more responsiveness by

health care providers is needed, in the development of prenatal websites. Including users as co-developers, creating mechanism for feedback from consumers and timely responses and evaluation, would move current practices from outside the client to one of inclusion.

Summary

The initial goal of this research project was to assess health care prenatal education and prenatal websites from a client perspective (chat-room analysis) and from other prenatal website providers (website features/characteristics). A review of the literature highlighted prenatal education and online health studies focused on a specific issue and failed to consider the everyday lived experience of prenatal women. The method of a multi-embedded case study design was chosen to examine this broad contextual online environment for three different website categories (alternative, general and health care). This embedded multi-case study used a case study protocol, maintained a case study database, triangulated the data to ensure reliability, rigour and validity were met. This case study also took into consideration the uniqueness of the online environment and the resultant ethical concerns involved with online research.

Findings of this case study identified that the online environment is largely corporately controlled and these commercial sites have many site features and present positively written niche content whereas health care sites had less features and content was presented in a formal and overarching manner. Ideological differences, practices of flaming, managing information needs and ways of dealing with conflict were different between the general and alternative chat rooms highlighting a need for health care providers to consider these factors when working with different clients. Affirmation is proposed as a potential underpinning for the online environment. Internet users identified the multiple tensions (health care provider and health system) that occur

as a consequence of their decision making not aligning with recommended practices. This phenomenon reinforces the need for clearer policies and procedures, legal advice, and education for front line health care providers in how to support and work with clients who have different ideological beliefs.

It is clear that the online environment is here to stay. It offers new ways for health educators to share information that extends beyond the scope of traditional approaches. Careful considerations for online website development will need to include improving website features and looking at strategies to manage search engine results. Mechanisms to answer consumer questions about prenatal teaching and online materials require a feedback loop to improve and clarify prenatal content to align with the clients lived experience. Further research is needed on:

- How consumers use and learn the nonlinear presentation of online content.
- The notion of Ask an Expert to help inform health care providers on consumer information needs as well as the provision of more client centered service.
- The ways consumers move through embedded content links with in articles.
- Online prenatal chat-room postings to help inform health care providers about multiparous women's participation patterns and information requirements.
- The impact of moving online content and videos on consumers.
- Assessing multiparous on line registration and online participations patterns.
- The different dynamics of women's interaction in different chat-room environments is needed.

- The ways consumers utilize the embedded social media links on pregnancy websites and within articles.
- Language tone using underlying principles of affirmation to inform content and design would be critical to shifting health approaches.
- How to create input mechanisms for clients about education materials and adapting these resources in a timely manner.
- The ways in which corporations engage in promotional chat with online participants.

Prenatal education and online development should consider broader research methodologies and the incorporation of other discipline information. Due to the fluidity of the online environment and easier access for both consumers and health care providers, new ways of approaching prenatal research would be beneficial for the development of both the online environment and traditional prenatal education methods. The incorporation of life and science together, creates an exciting opportunity for innovative teaching strategies and the development of an encompassing multilayered online presence. The reason a case study method was chosen was because of the lack of client driven research and the abundance of multiple focused studies that did not build on each other. This case study has brought together a large body of literature aimed at figuring out what was known about prenatal research to help inform health care providers in the provision of prenatal education and online prenatal web development. What has come to light is a need for larger interdisciplinary research; studies that builds on, and connects to, existing knowledge; and client driven research. In addition to this research studies such as meta-analysis and meta-

synthesis are needed to inform health care providers and researchers. This case study provides a beginning point on which to build further knowledge on the prenatal contextual environment.

Next Steps

In reviewing these recommendations it is clear that foundations exist with current government structures to create a central Canadian website through Health Canada. This website would be clearing house for multiple disciplines, multiple perspective (i.e. Lamaze) and multiple users. It would be up to date, easily accessible and intuitive. The construction of the site would incorporate ideas from a wide range of stakeholders and appeal to both consumers and frontline care providers. The benefits of such a site would be client driven and allow clients to access prenatal information on their terms. The underlying philosophy of maintaining this site would be an iterative process of ongoing feedback and evaluation. This site would have significant impact for all those who chose to use it particularly for perinatal women.

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Appendices

Appendix A: Template for Prenatal Literature Categories

Program Delivery

Home Visiting
Military
School Nurse
Computer
Midwife/Doula
Early Classes
Multiple Birth
Combined Care
Peer Groups
Materials
Individual/Groups

Marginalized

Minority/Immigrant
Disability
Adolescent
Prison
Other Parents
Low Income
High Risk
Aboriginal
Lesbian/Gay

Systematic Reviews

Strategies

Humor
Empowerment
Support

Client Assessment

Satisfaction
Knowledge
Non-Attendees
Developmental Changes
Fathers

Information Giving

SAR
Drug and Alcohol
Mother Adaptation
Vaccination
L&D Experience/Outcome
Infant Care
Parenting
Preterm Labor
Breastfeeding
Smoking
Nutrition
Rural/Urban
Dental
Toxoplasmosis

Appendix B: Template for Internet Literature Categories

1. Internet and Social Context
2. Internet and Health/Health Care Provider Research
 - a. Health & Internet
 - b. Health Program Evaluation & Internet
 - c. Health Questionnaires & Internet
 - d. Health Chat & Internet
3. Internet and Parenting
4. Internet and Prenatal

Appendix C: Health Chat-Room Studies

Table 4

Results of Chat-Room Studies

Paper	Focus	Area	Method	Outcome
Aakhus & Rumsey, 2010	Chat-room Observation	Online Conflict Cancer Support	Ethnographic Grounded Theory	Online groups might have higher need for clarity of values and norms.
Barker, K., 2008	Chat-room Observation	Fibromyalgia	Coded Posting	Online can be empowering to clients but health care system can limit them.
Chuang & Yang, 2010	Chat-room Observation	Alcoholism	Coded Postings	Informational support more common than emotional support.
Donelle & Hoffman-Goetz, 2008a	Chat-room Observation	Canadian Aboriginal	Mixed Methods Coded Postings	Site provides health information, coaching, political action and community building
Donelle & Hoffman-Goetz, 2008b	Chat-room Observation	North American Black Women	Nutbeam's Health Literacy Coded Postings	Provides informational and emotional support.
Funk et al., 2010	Program Evaluation	Weight Loss Program	Control Group versus Trial Group	Online group more effective in sustaining weight loss
Gavin et al., 2008	Chat-room Observation	Proanorexia	Interpretive Phenomenological Posting Analysis	Normalization of Anorexic behavior
Harris et al., 2009	Program Evaluation	Web Design Cues impact on clients (Breast Cancer and Alcohol use)	Visual and Time Tracking Post Program Questionnaire	Clients had better content recall with negative cues but defensive reaction whereas positive cues supported observed behavior changes
Holmes, 2006	Client Study	Quality of Life	Qualitative Descriptive Survey	Access to information impacts quality of life
Holt et al., 2010	Chat-room Observation	Pedophiles	Grounded Theory Coded Postings	Normalization of pedophile behavior
Jeong et al., 2008	Program Evaluation	Breast Cancer Support	Pre and Post Program Surveys Message Analysis	Greater psychological benefits

Paper	Focus	Area	Method	Outcome
Jones, 2009	Chat-room Observations	Rejection in Gay Chat-room	Client Interview Posting Analysis	Different medias have different standards of social politeness
Kernisan et al., 2010	Client Study	Caregivers	Survey	Types of information clients seek: Health information, practical caregiving information and support
Kral, 2006	Client Study	Eating Disorders and Suicide Self Help	Questionnaires	Sites were supportive to clients and help clients to move to more positive focuses
La Porta et al., 2007	Program Evaluation	Cancer Information	Survey	Online users were younger, more education and reported high satisfaction
Lange & Ruwaard, 2010	Program Evaluation	Sexually Abused Teens	Pre and Post Questionnaires	Strong decrease in post-traumatic stress and depression symptoms.
Macias et al., 2005	Chat-room Observation	Pharmaceutical Sponsoring Chat-room	Coded Posting	Medications are commonly discussed. Message boards are a source of informational and emotional support.
Mulveen & Hepworth, 2006	Chat-room Observation	Proanorexia	Phenomenological Analysis of Postings	Normalization of anorexia thoughts and behaviors.
Postel, de Haan, ter Huurne, Becker, & de Jong, 2010	Program Evaluation	Problem Drinking	Open Random Control Trial Questionnaires	Clients decreased their drinking
Rasmussen et al., 2007	Client Study	Diabetic Young Women	Grounded Theory Interview	Women use online to have autonomy and support.
Ravert & Crowell, 2008	Chat-room Observation	Cystic Fibrosis	Qualitative Content of Postings Analysis	Chat-rooms follow Erikson's Lifespan Theory
Schrank et al., 2010	Client Study	Schizophrenia	Semi structured Interviews using Theory Saturation	Online provides support and information but client can have negative reaction to medication management info

Paper	Focus	Area	Method	Outcome
Strong & Gilmour, 2009	Chat-room Observation	Heart Failure	Critical Discourse Analyze Postings	Living with heart failure and biomedical were the most common discourses
Van der Zanden, Speetjens, Arntz, & Onrust, 2010	Program Evaluation	Parent with Mental Health Issues	Pre and Post Screening	Had increase of parenting skills and sense of competency
Van't Riet et al., 2010	Program Evaluation	Physical Activity	Questionnaire	Participants with stronger health motivation would use site
Wanner et al., 2010	Program Evaluation	Physical Activity Attrition Rates in a non-study environments	Analyzed Online Activity	Non study environments were not as effective in keeping clients with methods seen effective in study environment such as email reminders
Winters, Cudney, Sullivan, & Thuesen, 2006	Program Evaluation	Rural Context in Chronic Health	Analyzed Postings	Qualities that impacted women's ability to self-manage: physical setting, social, cultural, economic, access and women's type of work
Young, 2010	Client Study	Online Sex Addiction	Case Study Interviews	Online addiction is an escape from life and found others like me

Appendix D: Literature Search Data Bases and Overview of Terms Used

Databases:

- Academic Search Complete
- Business Source Complete
- Canadian Reference Centre
- CINAHL with Full Text
- Cochrane
- Communication & Mass Media Complete
- ERIC
- Humanities International Index
- IEEEExplore
- Medline with Full Text
- Sage Online Journals
- SocINDEX with Full text
- Web of Science
- Women's Studies International

Search Terms:

1. The Prenatal template as outlined in Appendix A used each term with the following terms for the prenatal literature review: Prenatal, Prenatal Education, Prenatal and Education Internet, Chat-rooms, Internet and Chat-rooms.
2. Additional terms used for the prenatal literature review were: Prenatal Programs, Prenatal Classes, Prenatal Education, Childbirth Education, Health Promotion and Prenatal,

Pregnant Women and Information Needs, Statistics and Prenatal Classes and Canada, Consumer Prenatal Education, Consumer Choice Prenatal, Marketing and Prenatal.

3. Search terms used in the internet literature review were: Chat-rooms and Health, Internet and Chat and Health, Health Care Providers and Internet, Internet and Chat-rooms and Parent, Internet and Chat and Parents, Parenting and Online, Parenting and Online and Chat, Parents and Chat-room, Women and Internet, Internet and Chat and Women, Internet Communication and Parenting, Internet Communication and Pregnancy, Prenatal and Internet, Prenatal and Internet and Chat, Internet and Prenatal and Education, Message Boards and Prenatal, Blogs and Prenatal, Virtual Communities and Social Life, Internet Chat-room and Society.
4. Search terms used in online marketing literature review were: Buzz Marketing and Internet, Marketing and Internet, Viral Marketing and Internet
5. Search terms used in methodological review: Internet Chat-room and Health and Case Study, Methodological Issues and Internet, Ethical Issues and Internet, Case Study and Prenatal and Education, Internet and Chat-room and Case Study.

Appendix E: Program Delivery

Table 5

Findings of Program Delivery Studies

Outcome	Study	Focus	Method	Finding
Physical (L&D/InfantOutcomes)	1. Blackwell, 2002 (US-Study)	Private/Public Prenatal	Interview	Inconclusive
	2. Campbell, Scott, Klaus, & Falk, 2007	Family Support	Random Control Trial	Significant
	3. Desjardin & Hardwick, 1999	Additional Prenatal Support	Program Evaluation	Significant
	4. Langer, Campero, Garcia, & Reynoso, 1998	Psychosocial Support	Random Control Trial	Inconclusive
	5. Walden, et al., 1996 (US-Study)	Workplace Prenatal Program	Quasi-Experimental	Inconclusive
Access	1. Johnston, Tough, & Siever, 2006	Additional Prenatal Support	Comparative Study	Inconclusive
	2. Tough, et al., 2006	Additional Prenatal Support	Random Control Trial	Inconclusive
	3. Watson-Blasioli, 2000	Prenatal Program Feedback	Survey	Inconclusive
Knowledge/Behavior	1. Bailey, et al., 1993	Combined Care	Interview	Inconclusive
	2. Griffith, et al., 2005 (US-Study)	Computer-Based Information	Program Evaluation	Significant
	3. Schachman, et al., 2004 (US-Study)	Military Prenatal Program	Program Evaluation	Inconclusive
Savings	1. Au, Shiell, van der Pol, Johnston & Tough, 2006	Additional Prenatal Support	Random Control Trial	Inconclusive

Appendix F: Information Sharing

Table 6

Findings of Information Sharing Studies

Strategy	Topic	Study	Method	Outcome	
Content	Breastfeeding	1. Gill, Reifsnider & Lucke, 2007 (US-Study)	Quasi-Experimental	Inconclusive	
		2. Olenick, 2006	Random Control Trial	Significant	
		3. Renfrew et al., 2006	Systematic Review	Inconclusive	
	Infant Care	1. Lahr et al., 2005 (US-Study)	Questionnaire	Significant	
		2. Moran, Holt & Martin, 1997 (US-Study)	Survey	Inconclusive	
		3. Tiller, 1995 (US-Study)	Nonrandomized Descriptive Study	Significant	
	Labor & Delivery		1. Bernat, Woolridge, Marecki & Snell, 1992 (US-Study)	Convenience Sample Questionnaire	Inconclusive
			2. Jackson, 1995 (US-Study)	Quasi-Experimental	Inconclusive
			3. Maestas, 2003	Survey	Significant
			4. Slade, Escott, Spiby, Henderson, & Fraser, 2000	Questionnaire	Inconclusive
5. Spiby, Henderson, Slade, Escott & Fraser, 1999			Exploratory Research Design	Inconclusive	
Preterm Birth	1. White, Lee, Tough & Cook, 2006	Interview Questionnaire	Inconclusive		
Smoking Knowledge	1. Stacy, Greer, Hass & Hellbusch, 1994 (US-Study)	Questionnaire	Inconclusive		
Support	Breastfeeding	1. Matich & Sims, 1992 (US-Study)	Comparative Study	Significant	
		2. McLeod, Pullon & Cookson, 2002	Questionnaire	Significant	
	Infant Care	1. Broussard & Rich, 1990 (US Study)	Program Evaluation	Significant	
		2. Bryan, 2002 (US-Study)	Quasi-Experimental	Significant	

Strategy	Topic	Study	Method	Outcome
	Labor & Delivery	1. Maestas, 2003 2. Spiby et al., 2003	Survey Exploratory Research Design	Significant Significant
Support	Mothering	1. McVeigh, 1997	Convenience Sample Questionnaire	Significant
	Fathering	1. Diemer, 1997 (US-Study)	Quasi-Experimental	Inconclusive
		2. Hudson, et al., 2003 3. Tiller, 1995 (US-Study)	Quasi-Experimental Nonrandomized Descriptive Study	Significant Significant
Nutrition		1. Desjardin & Hardwick, 1999	Program Evaluation	Significant
		2. MacLellan et al., 2001	Cross-Sectional Survey	Significant
		3. Polley et al. 2002 (US-Study)	Random Control Trial	Significant

Appendix G: Marginalized Groups

Table 7

Types of Marginalized Groups Studies

Research Focus	Study	Method	Risk Group
Barriers to Access and/or Social Health Determinants	1. Berman, 2006 (US-Study)	Questionnaire	Immigrant
	2. Fogel, 1993 (US-Study)	Descriptive Correlational Study	Incarcerated
	3. Howie & Carlise, 2005	Questionnaire & Interview	Adolescent
Community Development and/or Emancipatory Approach	1. Bhagat et al., 2002	Mobilization Project-Program Description	Immigrant
	2. Blackford, Richardson, & Grieves, 2000	Interview-Exploratory Research	Disabilities
	3. Loos, Morton, & Meekis, 1999	Conceptual Model-Evaluation	Aboriginal
	4. Smith & Davies, 2006	Feedback on Models of Knowledge Transfer	Aboriginal
	5. Van Wagner et al., 2007	Interdisciplinary Model-Evaluation	Aboriginal
	6. Lapierre, Perreault, & Goulet, 1995	Provide a Theoretical Framework	Low Income
Client Qualities	1. Howie & Carlisle, 2005	Questionnaire & Interview	Adolescent
	2. Lesser et al., 1998	Ethnographic	Adolescent
	3. McVeigh, 2002	Questionnaire-Convenience Sample	Adolescent
	4. Michels, 2000	Interview	Adolescent
	5. Rentschler, 2003 (US-Study)	Interview-Grounded Theory	Adolescent
	6. Stark, 2006 (US-Study)	Descriptive Comparative Design	High Risk

Research Focus	Study	Method	Risk Group
Support	1. Lesser et al., 1998 (US-Study)	Ethnographic	Adolescent
	2. Martinez-Schallmoser et al., 2005 (US-Study)	Information Giving Paper	Immigrant
	3. Michels, 2000 (US-Study)	Interview	Adolescent
	4. Rentschler, 2003	Interview-Grounded Theory	Adolescent
	5. Schaffer, 2002	Survey	High Risk
	6. Wuest, 1990 (US-Study)	Participant Observation-Grounded Theory	Adolescent

Appendix H: Prenatal Case Study Map

Issue Statement: Prenatal education is health care driven lacking the client voice

Issue Question: What are prenatal clients interested in to support a more inclusive prenatal education program?

Case Study Guiding Questions:

1. What are the characteristics of prenatal and health care prenatal websites?
2. What information occurs in these prenatal internet chat-rooms that can inform health care providers on client needs?
3. What types of conversations are occurring in prenatal chat-rooms that could increase health care providers' awareness of the role of the internet during the perinatal period?

Case Study Protocol/Process

Step 1

Consider Rival Explanation when doing Data Analysis

Possible rival explanation for this study is: Prenatal websites are driven by corporate health bodies and client voice is lacking.

Step 2

Triangulation of Individual Case Studies (Data and Methodological Triangulation)

1. Use characteristic and content word tables to examine each site of the 69 sites (19 general, 26 alternative and 24 health care sites) and create three characteristic and content category (general, alternative and health care) word tables.
2. Examine individual chat-rooms per website type (general and alternative site).
3. Create word table analysis of chat-room conversations and information content per website type (general and alternative site).

Step 3

Cross-Case Synthesis/Categorical Aggregation of Overarching Case Study

1. Examine cross case website characteristics word tables for three website categories (general, alternative and health care).
2. Examine cross case chat-rooms (1 general and 1 alternative site).
3. Examine cross case word tables of analysis of chat-room conversations and information between the two websites (1 general and 1 alternative site).

Case Study Database

The case study database included information on: all online search methods; copies of website characteristics; tables on website characteristics; copies of chat-room conversations; word tables examining types of conversations and information for three prenatal chat-rooms; case study notes and copies of all case study documents.

Results

The above process helped guide the research process in answering the research questions.

Reporting of this study followed UBC thesis dissertation guidelines.

Appendix I: Prenatal Websites Framework and Parameters

Health Care Website: Searches included search engine results, literature review references and professional knowledge of sites. Pregnant Health Professionals and Pregnant Health Profession were the two online search terms used for the generic search, with results being limited to the first ten for the 2 search terms between the three search engines for a minimum of 60 sites. Thirty websites that best fit inclusion criteria were to be assessed further, but 24 sites met the modified inclusion criteria.

Alternative Website: Literature review references and the following search terms were used: Holistic Pregnancy Chat, Natural Birth Chat, Alternative Pregnancy Chat, Organic Pregnancy Chat and Natural Pregnancy Chat. Rationale for this process is to ensure a broad representation of alternative sites as most searches results included many main stream sites with an alternative component to the site and hits on actual alternative sites was limited. Therefore results were limited to the first four sites which are moderated by an individual or corporation that focus on alternative choices and had open access to chat-rooms for a minimum of 60 sites between the three search engines and literature review references. Thirty websites that best fit inclusion criteria were to be assessed further, but 26 sites met the modified inclusion criteria.

General Website: Literature review references and the two search terms Pregnant and Pregnancy were used for a generic search, with results being limited to the first ten for a minimum of 60 results from the three search engines and literature review references. Thirty websites that best fit inclusion criteria were to be assessed further, but 19 sites met the modified inclusion criteria.

Inclusion Criteria: frequency found online or in the literature, page rank, site with multimedia options and prenatal chat-rooms.

Appendix J: Summary of Search Terms Used

Table 8

Summary of Search Terms Used

	Alternative Site	General Site	Health Care Site
Original Terms	<ul style="list-style-type: none"> • Holistic Pregnancy Chat • Natural Childbirth Chat • Alternative Pregnancy Chat • Organic Pregnancy Chat • Natural Pregnancy Chat 	<ul style="list-style-type: none"> • Pregnancy • Pregnant 	<ul style="list-style-type: none"> • Pregnant health Profession • Pregnant Health Professional
Additional Terms	<ul style="list-style-type: none"> • Numerical limit of search engine results only, no additional terms 	<ul style="list-style-type: none"> • Pregnancy Chat • Pregnant Chat • Pregnancy Information 	<ul style="list-style-type: none"> • Health Care Provider Pregnancy • Health Care Provider Pregnant • Health Care Professional Pregnancy • Health Care Professional Pregnant

Appendix K: Originating Country for Prenatal Websites

Table 9

Summary of Website Countries

	Alternative	General	Health Care	Total
Africa	1	0	0	1
Australia	3	2	2	7
Canada	1	2	13	16
New Zealand	0	1	0	1
Scotland	0	0	1	1
United Kingdom	7	2	2	11
United States	6	11	6	23
Unknown	8	1	0	9
Total	26	19	24	69

Appendix L: Ownership of Prenatal Sites

Table 10

Summary of Website Ownership

	Alternative	General	Health Care	Total
Mass Media or Marketing Company	7	12	0	17
Product Sales Company	4	1	0	5
Individual Based Marketing Company	2	2	0	6
Conglomerate	4	3	0	7
Not for Profit	1	0	7	8
Undisclosed	8	1	0	9
Government	0	0	13	13
Government Contract	0	0	2	2
Professional Association	0	0	2	2
Total	26	19	24	69

Appendix M: Examples of Online Advertisers

Products: Huggies, Pampers, Similac, Nestle, iTunes, Samsung, Mazda, Chatelaine, Aveeno, Airwick, PolySporin, Aquafresh, Graco, Enfamil, Dimetapp, Kleenex, Microsoft, Medela, Fruit Loops, Avent and Ford

Companies/Services: Sears, Holiday Inn, Babys R Us, Disney, Canadian Tire, American Express, Fortis, McDonalds, Rogers, InvestSmart, Wells Fargo, Shoppers Drug Mart, Scotiabank, Disneyland, Kellogg's and Home Depot

Charities: BC Cancer Agency and Red Cross

Health Promotion: Participaction and HealthLinkBC

Appendix N: Tool Kit Offerings by Website Provider

Table 11

Tool Kit Offerings by Website Provider

	Commercial	Government	Charity
	baby budget calculator baby name generator baby sex predictor birth plans budget calculator car-seat buying guide contraction counter sheet crib buying guide due date calculator emergency information sheet fitness planner hospital packing bag list maternity leave to do list maternity pay calculator meal planner nursery planning guide ovulation calendar pregnancy calendar pregnancy ticker pregnancy to do list quit smoking calculator weight gain calculator	basal temperature chart body mass index calculator due date calculator food guide tracker hospital packing list quit smoking calculator weight gain calculator	due date calculator pregnancy calendar pregnancy ticker

Appendix O: Ask an Expert Site Provider Results

Table 12

Summary of Ask an Expert Services

	Alternative (9/25)	General (10/19)	Charity (1/8)	Government (1/15)
Free Site Based Service	5	10	1	1
Links to Other Providers	2			
Fee For Service	2			
Types of Experts	<ul style="list-style-type: none"> • Midwife • Nutritionist • Health Visitor • Sex Expert – Physician • Acupuncturist • Naturopath • Chinese Medicine • Breastfeeding 	<ul style="list-style-type: none"> • Physician • Lactation Consultant • Speech Therapist • Dentist • Sleep Expert • Child Birth Educator • Nutritionist • Book Author 	Physician	Unknown
Total- Free Site Service	5	10	1	1
No Clear Access to Expert- Site Generated Content	1	4	1	1
Situated in a Forum- Moderator Answers Select Questions	1	5		
Situated in a Forum- Moderator Answers All Questions	3			
Inactive Site		1		

Appendix P: Navigational Trends for Site Specific Providers

Table 13

Ease of Use by Site Specific Providers

	Alternative Site (25)	General Site (19)	Charity (8)	Professional Association (2)	Healthcare Site (15)
Easy to Use (Tool Bar and Search Button)	18 (72%)	9 (47%)	4 (50%)	0 (0%)	4 (27%)
Moderate to Use (Mainly use Search Button)	5 (20%)	5 (26%)	2 (25%)	1 (50%)	0 (0%)
Total	92%	73%	75%	50%	27%
Time consuming (Search Button poor, rely on tool bar-not as intuitive tool bar)	2 (8%)	5 (26%)	2 (25%)	1 (50%)	11 (73%)

Appendix Q: Recommendations for Prenatal Vitamins of Articles by Country of Origin

Table 14

Specific Country Prenatal Supplement Recommendations

Australia- Does not Recommend Prenatal Supplement

	Website Promoted Recommendation	Website Did Not Promote Recommendation
Alternative Site	2	
Charity Site		
General Site	1	
Governmental Site	2	
Professional Association Site		

Canada- Endorses Prenatal Supplements

	Website Promoted Recommendation	Website Did Not Promote Recommendation
Alternative Site		
Charity Site	1	
General Site	1	1
Governmental Site	7	3-See Provider
Professional Association Site	1	

United Kingdom-Endorses Prenatal Supplements

	Website Promoted Recommendation	Website Did Not Promote Recommendation
Alternative Site	2	2
Charity Site	1	
General Site		2
Governmental Site		
Professional Association Site		

United States-Endorses Prenatal Supplements

	Website Promoted Recommendation	Website Did Not Promote Recommendation
Alternative Site	2	2
Charity Site	1	4-See Provider
General Site	3	3
Governmental Site		1-See Provider
Professional Association Site	1	

*New Zealand recommends only folate supplementation and the general prenatal site promoted this recommendation.

* Scotland recommends Vitamin D Supplementation only and the government site promoted this recommendation.

Appendix R: Portion Size Recommendations for Food Groups

Table 15

Summary of Portion Size Recommendations

	Portion Size Information Given	Portion Size Information <u>NOT</u> Given
Alternative Sites	0	12
Charity Sites	3	4
General Sites	2	10
Governmental Sites	3	11
Professional Associations	1	1

Appendix S: Chat-Room User Data

Table 16

Summary of Chat-Room User Data

	Number of Users	Number of Threads	Percentage of Different Users per Posting
Alternative Site	193	306	63%
General Site	303	366	83%
Total	496	672	74%

Appendix T: Examples of Women Being Decision Makers

A few examples of statements found were:

- *“...it will be just me and my husband and I don’t see the need for gloves”.*
- *“I am this close to making one so dear hubby can drink the whole thing but I can have a sip”.*
- *“...figure I could just plan to do it alone...my husband is okay with it”.*
- *“My husband gained more from the classes than I did...I’m the one who has done all of the reading...”.*

Appendix U: Flaming Incidents

These five posts where flaming occurred where:

1. Helping a friend with issues of pregnancy (other's perceived her help as judgmental).
2. Using diet pills in pregnancy to maintain weight (Angry responses due to safety of unborn child).
3. "I get that it's the mother's choice on whether or not to BF...if it wasn't natural your body won't produce it, idiot (comment was perceived as judgmental).
4. A pregnant fifteen year old was asking for pregnancy advice (It was discovered to be "MUDD" or a lie and chat-room participants were not only displeased with this individual but they had also been inflamed by the "TROLL" or an individual who specifically tries to provoke and emotional response and upset the dynamics with in an online conversation).
5. Ultrasound safety (Information was biased towards it not being safe and data being skewed).

Appendix V: Health Care Providers Bullying

Examples of comments made by online posters include:

- “...doctor tentatively agreed”.
- “Nurses would not let me have my epidural”.
- “...face more challenges and interventions...”.
- “was bullied by the doc & nurse...”.
- “...put them off until ultimatum...”.
- “Making OB nervous...”.
- “Trying to keep the peace”.

Appendix W: Being Armed and Ready to Advocate for Self

Examples of comments made by online posters include:

- “...you’ll need to decline.....stand up”.
- “...being informed...your best chance”.
- “Be confident...stand up”; “Nurses give...sigh.. when I walk in..”.
- “...midwife present....OB...catches...baby”.
- “My stop and start labours not tolerated in a hospital”.
- “...can easily convince you...later regret”.

Appendix X: Communication Patterns in Alternative Chat-Rooms

1. In one thread about Group B Streptococcus, the consensus of the group was that Group B Streptococcus was a minimal risk to infants and the focus of the group was to figure out ways “*to fix a negative test*”. One individual stated that she had felt the same as the current group but after talking with a paediatrician the mother decided if she needed, she would take the prophylaxis. She couched this information into her thread by stating she was engaging in all the practices everyone else had to achieve the desired negative test result. No one acknowledged her introduction that there might be risks and consequences of a Group B infection to the infant.
2. In another posting, a mother was craving an alcoholic drink and of the eighteen replies, seven stated they drank during pregnancy and saw no concerns; five agreed they had cravings and did not comment on their stance about drinking in pregnancy; three commented they would not drink despite their cravings; and only one statement was made in reference to alcohol and Fetal Alcohol Syndrome (FAS). The poster who commented on FAS stated she understood the craving to give in. No acknowledgement was made about the potential of FAS.
3. A poster who had decided on doing a repeat caesarean was looking for information on potential risk to baby did not receive the information she was looking for but instead was subtly encouraged to attempt a VBAC. Examples of responses to this poster were: “*Your story is classic...since my C-section...and being involved with ICAN...*”; “*I am sorry you’re feeling so much fear...there are risks...at least considering...VBAC*”; “*definitely a personal decision....some things to consider...this is a new pregnancy...nothing to do with your last*”; “*You know, I thought this too....*”, which reinforced the natural birth philosophy and did not support this women’s query.

Appendix Y: Questions Asked by Chat-Room Participants

1. The risks of cord traction and what others knew about it because the client had differing literature and opinions.
2. Specifics and significance in blood sugar testing 1 or 2 hours after eating a meal.
3. What the implications of the client's severely swollen feet were since she did not have high blood pressure.
4. A client measuring small for her fundal height wanted to know what the "normal" range for fundal heights was and at what point would it be of concern.
5. A soon to be mom queried about the safety of ultrasound during pregnancy.
6. When one fails the initial diabetes screening, what are the risks of them failing the second test?
7. A client received Rhogam at 6 weeks in pregnancy and wanted to know why she received it early.
8. If clients needed to wear a mask while changing the litter box, what are the risks of being beside a litter box in say a laundry room?

Appendix Z: Complex Conversations Online

As seen in the following examples participants discussed content with great detail and complexity:

- *“... this rate is inflated.... included women who had.... stillbirths”.*
- *“The risk of losing your baby for CVS is...” .*
- *“Fasting is still...and postprandials are...”.*
- *“...you can get a positive test as soon as you hit 10 HCG on a beta test”.*
- *“I understand statistics....an outrageous study correlation”.*
- *“I understand the numbers behind the report....It is a lot of careful wording that.... gets common person to fall into believing whatever they want”.*