Exploration of the Pregnancy-Related Health Information Seeking Behavior of Women who Gave Birth in the Past Year

Laura Kathleen Merrell

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Exploration of the Pregnancy-Related Health Information Seeking Behavior of Women who Gave Birth in the Past Year

by

Laura K. Merrell

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy Department of Community and Family Health College of Public Health University of South Florida

Major Professor: Karen Perrin, Ph.D.
Ellen Daley, Ph.D.
Russell Kirby, Ph.D.
Leisa Stanley, Ph.D.

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ABSTRACT

Background: Pregnancy is a significant period of time for individual women. Promoting optimal health behaviors and supporting individuals during critical periods of health (such as pregnancy) is an important aspect of public health research and practice. One way of supporting individuals in promoting positive health behaviors and outcomes is by increasing their health literacy. The ability to find appropriate health information is the first step in the health literacy process. This process of finding information in health contexts is called Health Information Seeking Behavior (HISB). Whereas, HISB has been extensively studied in chronic health contexts, little research has been conducted regarding maternity-related information seeking in women.

Purpose: The purpose of this study is to explore the pregnancy-related health information seeking behavior (HISB) of women while they were pregnant. This objective will be achieved through the following specific aims: (1) To describe topics sought, and (2) describe the sources of information used by women during pregnancy.

Methods: To achieve these aims, a multi-phase, descriptive, mixed methods, cross-sectional research design will be utilized. Phase I consisted of an online survey disseminated to collect HISB data on first-time mothers (N = 168) who delivered a child within the prior 12 months. Phase II consisted of in-depth individual interviews (n=26) with a sub-set of participants who completed the online survey assessment to check the consistency of the survey findings and further explore constructs related to HISB.
Findings: Using primary data collection, pregnant women seek information on numerous pregnancy and childbirth topics (average 18.7 topics). Of information they sought, women ranked the three most important topics to them. If looking at topics deemed ‘most important’ irrespective of rank positioning, the most frequently cited topics were ‘How My Baby Grew While I was Pregnant’, ‘Complications during Pregnancy’, and ‘What NOT to Eat during Pregnancy.’ If we look at only those topics ranked as being first ‘most important’, ‘What NOT to Eat during Pregnancy’ is replaced by ‘Natural Birth’. Findings from the qualitative phase of the study indicated that topics were salient for a number of reasons, including curiosity about pregnancy as a new experience, wishing to avoid poor health outcomes, and wanting to achieve maternity-related goals. Quantitative results indicated that women used multiple sources of information during pregnancy to meet their information needs (average 9.9 sources). Of information sources they used, women ranked the three used ‘most often’. If looking at sources used ‘most often’ irrespective of rank positioning, the most frequently used information sources were ‘My Doctor(s) that Took Care of Me while Pregnant,’ ‘Pregnancy and Childbirth Books,’ and ‘Pregnancy and Childbirth Mobile Applications.’ If we look only at those information sources ranked as used ‘most often’, ‘Pregnancy and Childbirth Books’ are no longer used as often, and ‘Midwife(s) Who Took Care of Me while Pregnant’ becomes important. Qualitative interviews indicate that women use information sources for a variety of reasons including ease of access, access to the lived experiences of other pregnant women, reliance on professional expertise, and anticipatory guidance.

Conclusion: This study found that pregnant women look for many different pregnancy and childbirth-related topics, using multiple sources of information to do so. There were multiple motivations driving information needs and use of information sources. Further, beliefs about the
value of information sources were different given the motivation behind using them.

Understanding pregnant women’s HISB may allow us to understand which translational practices better address individual information needs in ways that they are more likely to use. Further, if the motivation behind why women seek out information is understood and why they use certain information topics, better targeted and tailored health literate educational materials for pregnant and postpartum women may be created. Exploring health information seeking behavior of pregnant women is the first step in understanding and affecting health literacy in this priority population.
CHAPTER 1: INTRODUCTION

Background

Pregnancy proves to be an important period of time not only in the life of individual women, but also for the public health discipline. Each year, nearly 6% of women of reproductive age (or 4 million women) in the United States will give birth (Martin, Hamilton, Osterman, Curtin, & Mathews, 2013). Expenditures related to pregnancy and childbirth account for nearly half of all health care costs in the United States, of which half are paid through federally funded insurance (HCUPnet, 2005). The health and well-being of mothers, infants, children and families, has long been an important facet of public health in the United States.

Promoting optimal health behaviors and supporting individuals during critical periods of health (such as pregnancy) is an important aspect of public health research and practice. One way of supporting individuals in promoting positive health behaviors and outcomes is to increase their health literacy. Health literacy is defined as the ability to find, understand, evaluate, and use information in order to make appropriate health care related decisions, perform health related behaviors and activities, and effectively navigate the health care system (Coleman et al., 2008; Wills, 2009; Zarcadoolas, Pleasant, & Greer, 2006).

Low health literacy is correlated with a number of poor health outcomes. Among pregnant women, low health literacy has been linked to worsened symptoms of gestational diabetes; depressive symptoms; decreased likelihood of breastfeeding; and poor knowledge of family planning; effects of smoking on infants; and birth defect screening (Arnold et al., 2001; Bennett, Culhane, McCollum, Mathew, & Elo, 2007; Cho, Plunkett, Wolf, Simon, & Grobman,
The ability to access information is the first step (*find*) in the health literacy process (Coleman et al., 2008; Wills, 2009; Zarcadoolas et al., 2006). Further, someone’s skill and preferences in finding information may persist even if their knowledge (health literacy) changes (Wright, Sparks, & O'hair, 2012). This means that much like learning style across the lifetime, even though someone’s health literacy may increase, their preferences in accessing information may not. Health literacy approaches from the public health perspective increase the ability to successfully evaluate and select from competing sources and types of information (Pleasant & Kuruvilla, 2008). One perspective sees acquisition of health knowledge as an integral part of health literacy, rather than separate from it (Nutbeam, 2000; Zarcadoolas et al., 2006). However, other perspective see information gathering as a facilitator of health literacy but not an aspect of health literacy itself (Baker, 2006).

Johnson and Case suggest that improved understanding of information seeking is one way to ensure that appropriate health information gets into the hands of those that need it most, such as individuals with low health literacy and priority populations, and in the most appropriate form (2012, p. 10). Therefore, Health Information Seeking Behavior (HISB) is an important health and illness behavior in its own right *and* as the important first step in becoming health literate.

**Statement of Need**

Individuals have free access to a wealth of information, in terms of variety and sheer volume. This availability of resources coupled with reduced access to health care providers (and decreased one-on-one time during health care transactions) has forced responsibility onto
individuals to gather and act on health information on their own (Johnson & Case, 2012, p. 6). Traditionally, communication research has focused on the sender of messages of health information and how the sender can persuade receivers to act on it (Rice & Atkin, 2012). However, the information receiver brings as much to the interaction as the sender.

The purpose of this research is to explore the HISB of pregnant women. This proposed dissertation is novel for two reasons. First, people seek out health-related information to increase their knowledge for a number of reasons including making sense of a health situation, to aid in decision-making, to help communication with health providers, and/or as a coping behavior. HISB has been studied in a number of contexts over the last two decades, most notably in relation to cancer illnesses. Recently, a call has been made for HISB research in other health contexts and in different socio-demographic populations (Lambert & Loiselle, 2007). This research directly addresses that need by exploring health information-seeking behavior among pregnant women. To date, there has been little research regarding HISB among pregnant women or women who have recently given birth. The studies that have been conducted have been small qualitative studies, have only looked at one specific source of information (such as the internet) or health topic (such as medicine use), or only represent one or two questions within a larger survey regarding maternity experiences. Secondly, this research builds upon previous work by investigating both the topics that women seek information about and the information sources they use to do so. This study will explore why certain topics are more important than others and why some sources of information are used more often.

**Public Health Significance**

This study builds upon the strengths of previous studies, while at the same time attempting to improve on past weaknesses. It is relevant because it fills an important gap in the
health information seeking literature. Previous research has mostly occurred within cancer and chronic health contexts. Maternity related health is a major public health concern in terms of the incidence and prevalence of pregnancy and childbirth as well as the economic cost to individuals and the health care system. Further, maternity related health care accounts for half of all health care costs (HCUPnet, 2005). Of those births, half are paid by Medicaid government insurance (Wier et al., 2011). Therefore, increasing health literacy related to pregnancy may have direct benefits in terms of poor health outcomes and costs to the health care system.

Despite its apparent importance, there have been few studies that have looked at HISB in pregnant women (Garnweidner, Sverre Pettersen, & Mosdøl, 2013; Grimes, Forster, & Newton, 2014; Lagan, Sinclair, & Kernohan, 2011; Larsson, 2009). Those that have, were small in scope and have often only looked at one or two facets of HISB such as individual characteristics associated with one source of information (for example, the Internet). Larger, nationally representative studies of the maternity related experiences of women in the United States such as Listening to Mothers (Declercq, Sakala, Corry, Applebaum, & Herrlich, 2013) have included few information seeking questions and did not look at the health topics that women sought information on.

Knowing more about the overall HISB of pregnant women is an important factor in creating health education and health literate materials that pregnant women will utilize. Further, few studies look at a wide array of topics and information sources or why some are more important than others. This study is innovative because it identifies which factors lead a pregnant woman to finding an information topic most important and an information source used most often.
Research suggests that different sources of information are typically accessed by certain population segments. Therefore, understanding HISB can be a crucial component of dissemination and research to practice efforts. Interestingly enough, in Johnson and Case’s (2012) book on health information seeking, the context is almost entirely in relation to information specific to medical symptoms and treatment or other medical advances, and not necessarily in regards to information from a public health perspective. By doing so, we might utilize some translational practices such as social marketing to better address individuals information needs in ways that they are more likely to use.

Specific Aims and Research Questions

The long-term goal of this research is to increase health literacy among pregnant women. The purpose of this study was to explore the maternity related health information seeking behavior (HISB) of women while they were pregnant, as the first step in the health literacy process. This objective was achieved through the study aims and research questions in Table 1.

Table 1. Specific Aims and Research Questions

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<td>1. Which health topics are most important to women during pregnancy?</td>
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<td>2. What individual factors predict choice of the health topic ranked as most important to a woman?</td>
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<tr>
<td>2. Describe the sources of information women use to meet these needs.</td>
<td>1. Which information sources do women use most often during their pregnancy to meet information needs?</td>
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<td>2. How valuable do participants rate these sources in meeting their needs?</td>
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<td>3. What individual factors predict the information source used most of the time during their pregnancy?</td>
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To achieve these aims, a multi-phase, descriptive, mixed methods, cross-sectional research design was utilized. Phase I consisted of an online survey disseminated to collect HISB data from first-time mothers who delivered a child within the prior 12 months. Phase II
consisted of in-depth individual interviews with a sub-set of participants who completed the online survey assessment.

**Implications**

This study used the Comprehensive Model of Information Seeking (CMIS) as its guiding framework. This model seeks to explain the context surrounding information seeking including antecedent variables regarding the person seeking information and characteristics of the information source itself (Johnson & Meischke, 1993). Findings from this research will inform future steps in adapting this quantitative survey for a larger sample in a clinical setting to increase generalizability of the findings. In addition, future research will focus on other subpopulations of pregnant women (multiparous, multiple births, etc.).

**Definition of Key Terms**

1. Health Care Provider – Generally referring to any individual who provided medical care to a pregnant woman during and after her pregnancy. To include, but is not limited to: OBGYN, Midwife, DO, Nurse, Nurse Practitioner, etc. When specific clinicians are discussed, they are directly referred too (for example, doctor or nurse).

2. Health Information Seeking Behavior (HISB) – The actions that people use to obtain and use health related information for specific purposes

3. Health Literacy - The ability to find, understand, evaluate, and use information to make appropriate health care related decisions, perform health related behaviors and activities, and effectively navigate the health care system

4. Information Seeking Behavior – The actions that people use to obtain and use information for specific purposes
5. Information Source - Information sources (or channels as they are also referred to in the literature) are the means by which people receive and transmit information
CHAPTER 2: LITERATURE REVIEW

Pregnancy and Public Health

Pregnancy and maternity related health are important medical and public health sectors. Each year, nearly 6% of women of reproductive age (or 4 million women) will give birth (Martin et al., 2013). Expenditures related to pregnancy and childbirth account for nearly half of all health care costs in the United States, of which half are paid through federally funded insurance (HCUPnet, 2005). The health and well-being of mothers and babies has been an integral part of public health policy in the United States since its earliest days.

Health Literacy

Promoting optimal health behaviors and supporting individuals during critical periods of health (such as pregnancy) is an important aspect of public health research and practice. However, many individuals cannot understand important health information and successfully apply it to their own health needs. The ability to read and write is integral to the ability to understand subjects that are sometimes complex. This is particularly true when new information is often imparted through literate means such as books, articles, and pamphlets. In 2003, the most recent National Assessment of Adult Literacy (NAAL) found that 93 million Americans scored in the lowest two levels of a five-level scale of functional literacy (Kutner, Greenberg, & Baer, 2005). Though this assessment did not identify gendered patterns, it did find that between 21-23% of adults were not ‘able to locate information in text,’ ‘make low-level inferences using
printed materials,’ and were unable to ‘integrate easily identifiable pieces of information (Kutner et al., 2005).’

Throughout the 1990s and 2000s, research emerged that supported the idea that lowered abilities to read, write, and compute basic mathematics (numeracy) were correlated with poor health outcomes (Cutilli & Bennett, 2009; Gazmararian, Baker, et al., 1999; Williams et al., 1995). Since then, the link between literacy and health outcomes has been well-established, becoming its own area of study. Different types of literacy skills are necessary in being able to know when to seek out care when experiencing health issues, be able to effectively communicate needs with health care providers, understand health treatments and recommendations, correctly understand timing and dosage of medicines, as well as be able to understand and vote on important health-related laws and policies (Kindig, Panzer, & Nielsen-Bohlman, 2004, p. 31).

_Health literacy_ is increasingly being recognized as an integral aspect of health promotion and communication. Health literacy is defined as the ability to find, understand, evaluate, and use information in order to make appropriate health care related decisions, perform health related behaviors and activities, and effectively navigate the health care system (Coleman et al., 2008; Wills, 2009; Zarcadoolas et al., 2006). As it is understood today, health literacy, is more than just the ability to read and write, but incorporates several components on different levels of interaction with the health care system. Health literacy includes three components that build upon each other (see Figure 1): basic or functional literacy; communicative or interactive literacy, and critical literacy. Basic/functional literacy includes sufficient skills in reading, writing, and math in everyday situations (Nutbeam, 2000).
Figure 1. Levels of Health Literacy

This includes such basic skills as the ability to read and understand health-related words like ‘blood-pressure’. A number of health literacy scholars recognize this basic and functional literacy as the lowest level of health literacy (Frisch, Camerini, Diviani, & Schulz, 2012; Nutbeam, 2000; Peerson & Saunders, 2009; Sørensen et al., 2012). Communicative and interactive literacy includes more advanced cognitive and social skills than does functional literacy that are used in everyday activities to extract information and derive meaning from different forms of communication (such as speaking with a health care provider about a health issue) and apply it to an individual’s changing circumstances (Nutbeam, 2000). Communicative and interactive literacy includes the ability to build skills and act independently to address health concerns, such as reading a nutritional label or medicine dosing instructions. Finally, critical literacy is the highest level of literacy and requires even higher cognitive and social skills than interactive literacy to critically analyze information to exert greater control over life events and situations (Nutbeam, 2000). Critical health literacy empowers the individual to be their own advocate despite difficult economic or social situations. Someone with low socioeconomic status but high health literacy, may have procedural knowledge necessary to circumvent environmental and contextual barriers that they may face in living a healthy life. For example,
suppose a woman becomes pregnant, but does not have health insurance. If that woman has
higher levels of health literacy, she may know that she is eligible to receive Medicaid coverage
for her pregnancy and which steps she should take to become enrolled. In addition, suppose that
she knows that there are community-based organizations that sometimes provide assistance to
women like herself. She may then go about trying to find the information she would need to
access these community programs.

According to one study, approximately 80 million Americans have (25%) low health
literacy (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011). The National Assessment of
Adult Literacy (NAAL) found that 9 out of 10 Americans have below proficient levels of health
literacy (Kutner, Greenberg, & Baer, 2005). Low health literacy is thought to be one of the most
important factors behind health disparities. Individuals with moderate to low health literacy
skills may lack understanding of illness and wellness management behaviors, the ability to
analyze health risks and benefits, skills important to properly time correct medication dosing, the
ability to understand when higher levels of care should be sought, and communicate about their
circumstances with health care providers (Kindig et al., 2004). Poor health literacy has been
associated with numerous poor health outcomes including, high rates of hospitalization
(Berkman, Davis, & McCormack, 2010), high mortality (Cameron, Wolf, & Baker, 2011),
increased risk for chronic disease (Shaw, Huebner, Armin, Orzech, & Vivian, 2009), and sexual
health risk (Swenson et al., 2010). In relation to reproductive health, pregnancy, and childbirth,
low health literacy is associated with contraception misuse (El-Ibiary & Youmans, 2007) leading
to higher rates of unintended pregnancy (Dehlendorf, Rodriguez, Levy, Borrero, & Steinauer,
2010). Indeed, pregnancy starts with a literacy event – the ability to read and understand a
pregnancy test (Papen, 2008).
**Health Literacy and Information**

The first step in the process of becoming health literate is to desire and find information (find, understand, evaluate, and use) (See Figure 2) (Coleman et al., 2008; Wills, 2009; Zarcadoolas et al., 2006). The second step, understand, consists of being able to process the found information and services’ meaning and understand its usefulness. Though individuals may have access to health information they may not understand its meaning. Individuals often feel the pressure when asked if they understand a subject under discussion to nod and politely say ‘yes’, for fear of appearing unintelligent. Evaluation includes understanding the choices, consequences, and context of information and services and decide which meet the individual’s personal needs. Even though an individual may understand health information, they may not know how it applies to their particular set of health and personal circumstances, therefore limiting the ability to appropriately weigh the benefits and drawbacks of any action. Finally, individuals use the information or services by changing or continuing behaviors and/or communicating their needs and preferences to others (Coleman et al., 2008).

![Figure 2. The Health Literacy Process](image)
An individual’s health literacy determines the information base from which they work when confronting a health issue, and includes the skills that are essential for information seeking (Johnson & Case, 2012, p. 9). A person’s skill and preferences in finding information may persist even if their knowledge (health literacy) changes (Wright et al., 2012). Sometimes information provided by health care providers is not always understood when first conveyed, particularly when an unexpected diagnosis may require emotional processing (such as a cancer diagnosis or an unintended pregnancy) (Lee & Hawkins, 2010). Because of stigma surrounding their ignorance of certain aspects of their health and care, individuals with low health literacy may be reluctant to ask questions of their health care providers and reveal their lack of knowledge (Cameron et al., 2011). Patients only voice their concerns a quarter of the time (Post, Cegala, & Miser, 2002), perhaps in an effort to manage the provider’s impression of them by not wanting to appear ignorant (Parrott, 2011). In fact, physicians may perceive that it is easier to communicate with individuals of higher SES due in part to those patients’ higher level of verbal and numeracy skills.

Health literacy approaches from the public health perspective should include the ability to successfully evaluate and select from different sources as an important skill (Pleasant & Kuruvilla, 2008). One perspective sees acquisition of health knowledge as an integral part of health literacy, rather than separate from it (Nutbeam, 2000; Zarcadoolas et al., 2006). However, other perspectives see information gathering as a facilitator of health literacy but not health literacy itself (Baker, 2006). This difference in how health literacy is looked at has led to issues of measurement wherein only certain aspects of health literacy can be measured (such as the ability to recognize words and understand labels) but not others (such as the ability to critically
engage the health system) (Pleasant & Kuruvilla, 2008). Johnson and Case (2012, p. 10) suggest that improved understanding of information seeking is one way to ensure that appropriate health information gets into the hands of those that need it most, such as priority populations like pregnant women and individuals with low health literacy, and in the most appropriate form.

**Health Information Seeking Behavior**

Information-seeking behavior is how people search for and use information in their lives. Information seeking behavior is an area of scientific study that has developed since the late 1940s. Initially, information-seeking behavior explored how scientists sought information. The field was then further developed by the business marketing and education disciplines in the 1960s and 1970s (Heylighen, Bates, & Maack, 2008). The 1980s and early 1990s saw the beginning of the study of information-seeking within the context of health (Lenz, 1984; Loiselle, 1995; Miller, 1987). However, health information seeking as its own area of research has come more into focus since the late 1990s because of the availability of the internet and other new technologies (Brashers, Goldsmith, & Hsieh, 2002; Carlsson, 2000; Lambert & Loiselle, 2007; Navarro & Wilkins, 2000). Today, though we live in an information age, we often struggle with how to cope with and use information.

Understanding HISB, particularly in special populations that are targeted for health promotion, helps us to make sense of how information is gathered and used so that we might make it easier for a wider range of individuals to take health-related action. According to Johnson and Case (2012, p. 12), information seeking is a key facilitator for promoting, maintaining, and returning to health. Currently, there is no dominant accepted definition of HISB (Lambert & Loiselle, 2007, p. 239). Definitions range from a “strategy used as a means of coping with, and reducing stress” (Der Molem, 1999)” to “a self-regulatory strategy that patients
use to organize transactions between the self and health-related settings with the goal of balancing instrumental benefits and subjective costs stemming from information outcomes (Loiselle, 1995, pg. 134).”

For the purposes of this research, the working definition of HISB, stems from Barsevick and Johnson (1990), which defines it as “actions used to obtain knowledge of a specific event or situation” for a specific purpose. This definition tells us what HISB is and when it is utilized, in the most parsimonious manner. In HISB, ‘actions’ can relate to a number of information seeking behaviors such as reading books, asking questions of friends and family, or visiting internet websites. The ‘specific event or situation’ relates to the context of health information seeking. For example, someone may seek information about a specific medical procedure they are faced with, like a pap smear or a more general health state such as high blood pressure. The ‘purpose’ of HISB in the literature often relates to increasing individual knowledge for one of three purposes: as a coping behavior, to aid decision-making, and to facilitate patient-provider communication (Lambert & Loiselle, 2007).

The Importance of HISB

The underlying assumption of the majority of HISB research is that information seeking is a desirable activity central to most individual’s understanding of health and illness (Cutilli, 2010). Information seeking related to health encompasses a wide array of beliefs, attitudes, intentions, and behaviors. HISB may enable a person to experience less stress about their health situation, increase the knowledge necessary to make important health-related decisions when needed, and to participate and collaborate with health providers in these decisions where applicable (Dutta-Bergman, 2005). However, it should be mentioned that some individuals participate in information avoidance patterns when faced with health crises (Case, Andrews,
Johnson, & Allard, 2005). HISB research attempts to understand, explain, and predict individuals’ pursuit of information. Researchers and clinicians are interested in understanding how and why individuals obtain health information, where they go to retrieve it, what particular types of information they prefer, and how that information is then used (Lambert & Loiselle, 2007).

**Guiding Framework**

The majority of empirical studies of HISB fail to specify a formal model or theoretical framework (Lambert & Loiselle, 2007). This may come as a result of the lack of an agreed definition. Of those that do, there are six models that are most often cited (Freimuth, Stein, & Kean, 1989; Johnson & Meischke, 1993; Lazarus & Folkman, 1984; Lenz, 1984; Longo, 2005; Miller, 1987). These are primarily focused on specific activities, the formation of information fields, the stimulation of information seeking, and different styles of searching (Johnson & Case, 2012, p. 96). Few look at the context of information seeking and its moderating factors. One that does is the Comprehensive Model of Information Seeking (CMIS)(Johnson & Meischke, 1993). This model seeks to explain actions related to information seeking, the context of the approach to health, antecedent variables in the information seeker, and characteristics of the information source (or carrier as it is referred to in CMIS), and finally the outcome of these, actions of information seeking itself. See Figure 3.

![Figure 3. Comprehensive Model of Information Seeking, Johnson & Meischke, 1993](image-url)
This model is useful to the current study, as concepts that have been shown to be important to the study of HISB are often grouped into three areas (Longo et al., 2010): 1). Factors regarding the information message itself, such as the clarity of the message; 2). Characteristics of the individual seeking the information; and 3). Factors related to the source of information itself, such as ease of access or credibility. For the purposes of this study, the CMIS is modified in its use as the guiding framework to look at characteristics of the information seeker as well as characteristics of the information source (See Figure 4). Information related to constructs of the characteristics of the information seeker and characteristics of the information source will be obtained through both the quantitative survey and the qualitative interviews. How measures relate to the guiding framework is discussed in the Chapter 3.

For this study, only characteristics of the individual and information source was investigated. To effectively explore factors related to the message itself, there would need to be some measure of control over the information message(s) (such as the number of different messages, the number and length of exposures, etc.). As this study is concerned with a general exploration of HISB within a specific health context, looking at particular health messages would better be accomplished in future studies.

Figure 4. CMIS and Information Seeker and Information Source Characteristics
Characteristics of Information Seekers

Below is a summary regarding what is known of the individual characteristics related to HISB as well as factors related to specific sources of information seeking. It must be noted that these two areas often interact and overlap.

Avoidance

There are many characteristics of the information seeker that affect their seeking patterns, including preferred sources and their intent regarding the information obtained. The most important characteristic regarding HISB research is whether or not someone is an information-seeker. Successfully studying information avoidance would necessitate a different study design, wherein an investigator could longitudinally study a participant over the course of a health episode (i.e. a pregnancy). There are multiple reasons that people may avoid information seeking. However, a short summary of the major motivations for information avoidance is provided as a counterpoint for information seeking.

It is often assumed that when confronted with a severe health problem or a health issue in general, that individuals are active in their desire to seek out information. However, the literature shows that there are clear divisions between those who seek information and those that avoid it (Johnson & Case, 2012, p. 101). Information avoiders are less likely to seek out support from others, do not see the need for information beyond what is offered to them by their health care providers, and are less stressed when first diagnosed with a serious or life-threatening condition (Manfredi, Czaja, Price, Buis, & Janiszewski, 1992).

Another reason that people avoid information seeking is that it might signal future discord in a person’s life. For example, individuals with serious health issues (such as cancer) often go through a period of denial where they do not seek out information (Case et al., 2005).
Reasons for information avoidance in health contexts include not wishing to undermine their faith in their physicians (Czaja, Manfredi, & Price, 2003), as a means of shielding family members (Caughlin, Mikucki-Enyart, Middleton, Stone, & Brown, 2011), and belief that the individual has no control over events (Case et al., 2005). Indeed, information seeking and avoidance are intrinsic to some widely-used behavior change models. The Transtheoretical Model identifies the stages of change that individuals go through with respect to health behavior change. The model understands that there are different stages of readiness to make health behavior changes, starting with a stage of pre-contemplation where individuals are not ready to change, then progressing through behavior change and maintenance (DiClemente & Prochaska, 1998). One method of moving individuals from pre-contemplation (non-action) to contemplation (preparing for action) is consciousness-raising, which is based largely on information seeking and health education surrounding a specific behavior (for example, exercising and eating nutritiously) (Glanz, Rimer, & Viswanath, 2008).

Demographics

Demographic variables are often thought to impact a number of health behaviors, information seeking being no different. However, some research has shown that demographic variables may not account for great variations in information seeking. As Johnson and Case point out, “Yet, in a diverse society such as ours, striving for particular knowledge about groups is increasingly problematic because of overlapping group membership (2012, p. 47).” For example, a lesbian African American woman of Caribbean descent, who is highly educated and of high socio-economic status, that has gotten pregnant through assisted reproductive technology (ART), belongs to a number of demographic groups. Which of these groups does she affiliate most with? Which are going to have the most meaningful effect on her information seeking
during pregnancy? The low proportion of variance in information seeking (Lenz, 1984) that is explained by demographic variables and decision-making preferences may be explained by other underlying processes.

That being said, there are some patterns that we see in information seeking (at least in chronic health contexts). In general information seekers tend to be white, middle-aged women who are highly educated and of upper socio-economic status (Galarce, Ramanadhan, & Viswanath, 2011; Johnson, 1997). Women, due in part to their societal and gender roles as caretakers, are more likely than men to seek information (Kelly, Niederdeppe, & Hornik, 2009; Rutten, Arora, Bakos, Aziz, & Rowland, 2005; Rutten, Squiers, & Hesse, 2006). In addition to making 80% of health care related decisions in families, women are often the gatekeepers of information, passing it on to other family members (Luscombe, 2010). Research has shown that elderly patients are generally more compliant and less likely to challenge physicians (Rutten et al., 2005). This belief may stem from a belief that they do not have the right to such medical information (Beisecker, 1988). To what extent this belief changes with differing age cohorts, needs to be further explored. For example, the previous study was conducted with participants who were children during the depression, a cohort that is likely to be more respectful of authoritative figures. How might the millennial generation (to which the majority of women who have given birth within the previous 12 months belong), who are typified as wanting instant gratification and feel entitled (Twenge, 2006; Twenge, Campbell, & Freeman, 2012), as they approach motherhood interact impact their information seeking?

Racial and ethnic differences in information seeking mostly reflect cultural norms that directly relate to a person’s willingness to share and talk about health-related information. Though the overall disposition in the U.S. is to share and discuss health information, some
groups are less likely to do so. Perhaps as a result of distrust of the medical system, African Americans are more likely to seek information first from family and friends (Ndiaye, Krieger, Warren, Hecht, & Okuyemi, 2008). Other cultural groups (such as recent Asian, African, and some Hispanic sub-groups immigrants) may also be less likely to seek out information sources outside of close family or community ties (Dutta, 2008; Kreuter & McClure, 2004; Thomas, Fine, & Ibrahim, 2004). Therefore, the preferred type of information source that people feel most comfortable with may be influenced by ethnicity and culture, something that may be considered for educational health campaigns.

According to Johnson and Case (2012, p. 50), a person’s educational level and professional status might have the most important effect on information seeking. Those with more education seek out health content more often than those with less (Lambert & Loiselle, 2007; Tu & Cohen, 2008), are more likely to use the internet (Case, Johnson, Andrews, Allard, & Kelly, 2004), and are more likely to be aware of health-related celebrity news causing them to reflect on their own health; all of which affects their overall health knowledge (Niederdeppe, Frosch, & Hornik, 2008). In relation to education, the higher one’s social class the greater their access to information and information seeking. Lower socio-economic status is associated with barriers to securing information and health communication (Bell, 2014; Robert, 1999). The poor are also less likely to perceive a need for information or to engage in searches for it (Freimuth, 1990).

**Personal Experience**

Previous personal experience of a health state (for example, pregnancy) or illness may also be one of the most important individual characteristics that is associated with information seeking (Johnson, Meischke, Grau, & Johnson, 1992). Having previously experienced a health
state that requires information seeking may precipitate future information seeking behaviors if they were successful. Those who have a family history of cancer are more likely to search for cancer-related information for themselves (Kelly et al., 2009). Whereas most people know a close friend or family member that has been pregnant and given birth, first-time mothers have no direct personal experience with pregnancy and childbirth.

Saliency

An individual’s motivation to seek information and the specific targets of the search are affected by factors associated with the personal saliency of the health situation. People are not motivated to seek information when they believe that it has low relevance to them (either real or perceived) (Petty & Cacioppo, 1986). For example, someone may not seek information or pay attention to relevant information regarding HPV vaccination if they have already been vaccinated. Clearly, salience in relation to health information seeking behaviors fits well with other health behavior theories, such as the perceived threat construct of the Health Belief Model (HBM) (Glanz et al., 2008). HBM posits that people will perform health-related activities if they (1) believe they are susceptible to a health condition, (2) they believe the condition had potentially serious consequences, (3) they believed that a course of action available to them would be beneficial in reducing the susceptibility or severity of the condition, (4) they believe that the benefits of performing the action outweigh the barriers (Glanz et al., 2008). In this case, a pregnant woman may not look for information regarding gestational diabetes (or any other pregnancy-related health condition or behavior) if she does not believe that she is susceptible to being diagnosed with the condition during her pregnancy, and that the health outcomes would be severe if she were to be diagnosed with it. Further, even if this woman did perceive the threat of gestational diabetes as high, she may not engage in information seeking if she did not think that
information she learned doing so would help her reduce the outcomes associated with the health condition (such as diet and exercise). Finally, this pregnant woman may not engage in information seeking if she had major barriers to overcome (such as access to a health care provider or reliable internet resources) and little chance of affecting her health-state even if she did.

**Beliefs**

Though there are conflicting research findings, an individual’s beliefs about the nature of a disease, its impact on them, and their control over it play an important role in information seeking (Eheman et al., 2009). Because pregnancy is not a disease state per se, do beliefs regarding pregnancy still play an as important of a role in information-seeking? That being said, information-seeking is also related to the extent that individuals believe that they have control over events (Rosenstock, 1974). In fact, high internal locus of control has been associated with more information seeking, resulting in positive coping strategies (Sullivan, Reardon, & McLaughlin, 1985). Locus of control also related to socioeconomic status and education level. Individuals with high educational attainment and socioeconomic status may perceive their personal control over health situations to be greater than those of lower socioeconomic status (Bosma, Schrijvers, & Mackenbach, 1999). It is commonly known that due to a number of factors including the health insurance system, hospital administration policies, and the practice environment, pregnancy and maternity care is highly proscribed which may be a contextual factor in the information topics sought during pregnancy.

**Characteristics of Information Sources**

There are a number of sources or channels that individuals may utilize when seeking information. Information sources (or channels or carriers as they are also referred to in the
literature) are the means by which people receive and transmit information (Johnson & Case, 2012, p. 63). Within the CMIS, characteristics of the information source include Information carrier characteristics and information carrier utilities. Typically, information carrier characteristics relate to attributes of the content of health messages, such as the editorial tone (Johnson & Meischke, 1993). Though the characteristics of the message can impact utilities of the information source, this study as previously mentioned, does not be looking at the health message itself. Information carrier utilities relate directly to how the medium of information directly addresses the needs of the individual (Johnson & Meischke, 1993). For example, is the information relevant and topical to the purpose of the information search (valuable)? Was it easily accessible? Did the individual trust the information that they got from the information source?

To some, it may appear that there are an endless number of sources. However, most can be attributed to five overarching types: popular media, social support group members, health care providers, the internet, and others sources. The general properties of the information sources impact a person’s appraisal of them as a disseminator of information (Barsevick & Johnson, 1990, p. 63). Each of the main types of information sources are discussed below along with how characteristics of the information seeker and characteristics of the information source affect its use.

**Popular Media**

In a study of the information seeking patterns of women diagnosed with breast cancer, Rees and Bath (2000) found that most received much of their general health information from popular media (Rees & Bath, 2000). The use of popular media outlets as a general information source has led to the movement to include health messages in entertainment programming to
reach those who are not health oriented (Niederdeppe et al., 2008). Popular media encompasses a wide array of separate channels from television to books. Television is the primary source of current news for the general public followed by the internet, newspapers and other publications, then radio (Saad, 2013). However, television often sets up unrealistic or inaccurate expectation of health situations and their outcomes (Wright et al., 2012). Certain health issues often get more coverage in popular media regardless of their incidence and prevalence, (i.e. breast cancer), reinforcing negative public attitudes that might wrongly heighten fears among individuals (Clarke & Everest, 2006). Public health and medical practitioners often use brochures and pamphlets to disseminate information to targeted populations, allowing people to take evidence-based information with them. This type of information source has a positive effect on subsequent health information seeking behaviors in some instances (such as seeking out a cancer help line) (Broadstock & Hill, 1997) and a negative impact in others (particularly with respect to stigmatized health conditions like sexually transmitted infections) (Sherr & Hedge, 1990). Further, reliance on certain popular media information sources can be mediated by overall functional literacy level. The 2003 National Assessment of Adult Literacy found that individuals at the lowest literacy levels were least likely to obtain information about current events, public affairs, and government from newspapers, magazines, radio, television, family or friends, and the internet than were individuals at higher levels (Kutner et al., 2007). In short, they were less likely to obtain this information in the first place.

**Social Support Group Members**

Interpersonal communication is the standard by which all other information sources are measured because it can utilize all the senses and incorporates immediate feedback (Kiousis, 2002). Regardless of the quality of information provided, people are considered to be credible
when providing emotional support and understanding (Pettigrew, 2000). Health provider interactions are not viewed in the same manner because they often lack an important element of emotional intimacy (Johnson & Case, 2012, p. 67). Further, interpersonal communication also imports normative expectations linked to specific behaviors (Ajzen, 1991). This can also feed into homophily patterns, or the tendency to communicate with people like ourselves (Rogers, 2010). In addition, family members and friends often act on behalf of their loved ones in seeking information, becoming ‘proxy information seekers’ (Galarce et al., 2011). For example, a woman’s sister or close friend may bring her an article or tell her about a news story she saw.

On the whole, a general finding of information seeking research is that individuals prefer to use interpersonal or social support group sources of information (Case, 2007). When it comes to credibility of sources, it seems that most channels even those ‘less authoritative’ are viewed as being credible, with the exception of information regarding treatment (Johnson & Case, 2012, p. 69). However, Johnson and Case never actually discuss what is meant by ‘less authoritative’, and we are left to assume that this means any information that does not come directly from medical professionals. They clearly highlight their own bias against non-medical information sources when they state, “So, somewhat disturbingly, people who seek medically related information generally turn to family and friends first and tend to contact professionals only as a last resort. It is clear that access concerns override issues of quality and credibility of sources for most individuals for a wide range of information seeking concerns (Johnson & Case, 2012, p. 67).”

This presumes that family and friends are not credible and do not provide quality information. However, what is quality and credibility? These authors offer no evidence to suggest that any information imparted by family and friends is necessarily worse than that of
medical professionals. Medical professionals do not always practice the latest evidence-based research, as it takes somewhere between 10 to 20 years before evidence-based practice is translated into regular healthcare practice (Morris, Wooding, & Grant, 2011). That is not to suggest that family and friends do either, it is simply largely unknown. Another issue that may be at play here, is that both Johnson and Case come from a cancer research background, a discipline based in the biomedical world perspective. However, pregnancy and childbirth straddle a liminal space between a medical event and a major life event. In qualitative research regarding information sources used during pregnancy, information and advice from social support group members were absorbed and remembered differently because it is attached to real lived experiences as opposed to factual information given in the abstract (Melender, 2002). Paradoxically, this advice can prove to be both beneficial and ‘harmful’ to pregnant women, associated with both creating fear of childbirth and the ability to cope with fear (Melender, 2002).

**Health Care Providers**

Interpersonal communication can be a highly sought out and respected source of information. However, health professionals are often regarded as the most reliable source of health information (Johnson & Meischke, 1991; Worsley, 1989). Yet some studies have found that patients often do not seek information from health care providers or participate in asking questions (Cegala & Broz, 2003; Post et al., 2002). One reason this might be is that effective communication requires a shared language, common goals and agreement upon basic behaviors expected from each participant (Wanzer, Booth-Butterfield, & Gruber, 2004). By virtue of their extensive training, health professionals tend to have their own emic languages, taboos, and cultural moors (Kleinman, 1978). Further, whereas many health literacy and plain language
Interventions focus on the written word in the form (such as with discharge and medicine dosing instructions) oral/aural communication is also important. Listenability is the quality of spoken discourse that eases the cognitive burden in patients (Rubin, 2012). Health care providers may speak too fast, not allowing listeners to decode complex wording and sentence structure (Rubin, 2012). When effective communication is not present, patient dissatisfaction may drive individuals to channels other than the medical professional (Tustin, 2010). Interestingly, nurses specifically are often seen as one of the most trusted sources of information among health professions (Thompson, Parrott, & Nussbaum, 2011, pp. 69-83).

With regards to pregnancy-related information seeking, healthcare providers were seen as trusted experts and ‘unbiased’ in their opinion (Garnweidner et al., 2013; Leap, Sandall, Buckland, & Huber, 2010). Interestingly, many women deferred to the opinion of their health care provider despite evidence-based practices and the woman’s own preferences (for example, with regard to various birthing positions) (De Jonge & Lagro-Janssen, 2004). This is not surprising given that studies show that patients are more likely to leave clinical decision-making to their health care provider (Arora & McHorney, 2000). However, women and individuals with higher levels of education are more likely to be active in decision-making (Levinson, Kao, Kuby, & Thisted, 2005). Depending on the specific clinical issue at hand, patients may be more or less likely to rely solely on providers to make care-related decisions (Mansell, Poses, Kazis, & Duefield, 2000).

The Internet

The internet has increasingly become a major source of information for individuals in almost any aspect of life, increasingly supplanted other traditional sources of information. Research in the late 1990s found digital gaps between those who used the internet and those that
did not. Internet users were less likely to be older, of non-white race and ethnicity, be of lower income levels, and live in rural areas (Lenhart, 2000). Notably, these disadvantaged groups often experience poor health outcomes and are the targets of many health intervention and education efforts. More recent research has shown that while gaps still exist, they are steadily closing. Currently, the strongest negative predictors of internet use are being aged 65 or older, having an annual household income of less than $20,000, and lacking a high school diploma (Zickuhr & Smith, 2012). The main reason behind non-use of the internet is lack of interest in it (32%) rather than access issues such as not having a computer (12%) and expense (10%) (Zickuhr & Smith, 2012). Therefore, access to the internet and digital technology is growing less divided among major demographic groups.

Of Americans, 91% see the internet as an ‘important’ source of information (Cole & Suman, 2003). People can read information from authoritative and evidence-based government websites such as the Centers for Disease Control and Prevention, they may engage in discussion in web-based support groups, read and write blogs related to health issues, and watch videos about health issues on a number of websites like YouTube. The internet is an attractive source of information because of its convenience, anonymity, confidentiality, decision-making support, and the diversity of information (Berry, 2006). People use the internet to be reassured about diagnoses or treatment plans, to better understand information, and to by-pass perceived barriers of traditional sources (like having to make an appointment to see a doctor) (Powell, Inglis, Ronnie, & Large, 2011). Of pregnant women, Larsson (2009) found that of women surveyed, 91% had access to the internet and 84% used it to retrieve specific pregnancy and childbirth information. Another study found that of the 97% of pregnant women who used the internet for
information during pregnancy, it was the only source utilized for 13% of the participants (Lagan, Sinclair, & George Kernohan, 2010).

Studies in the early 2000s looking at information searches on the web and personality found that doing so required sophisticated knowledge of search engines (Das, Echambadi, McCardle, & Luckett, 2003). However, this article was published before many of the major easily accessible information sources on the web were created. Indeed, Das and colleagues (2003, p. 186) predictions seem to miss the mark when they say, “Only individuals who are socially inhibited may find the anonymity of the web particularly attractive to socialize on the Web.” As we know, individuals from all walks of life socialize on the web, and women turn to a variety of web-based social groups to find information and support related to their pregnancies. One facet of individuals who seek out information on the web that may be applicable to the current study is the concept of ‘need for cognition’ (NFC). Need for cognition is the need to structure relevant situations in meaningful and integrated ways, and when unmet results in feelings of tension and deprivation, they seek to resolve them (Haugtvedt, Petty, & Cacioppo, 1992). People with high need for cognition engage in more thorough decision-making strategies. Need for cognition has been found to have a strong direct effect on information seeking behavior (Das et al., 2003). To what extent these characteristics are seen in other disciplines cross into health contexts, is almost entirely unknown.

In addition to traditional web pages, a third of internet users, utilize an online social network (like Facebook, Twitter, and Tumblr) for a personal health issue (Thompson et al., 2011). In a poll of over 3000 people, the Pew Research Institute found that 18% of internet users have gone online to connect with others that share a similar health concern, among chronic conditions specifically, this prevalence jumps to 23% (Fox & Dugan, 2013). Such internet
support groups can be both beneficial and harmful. Groups supporting individuals living with cancer, arthritis, or fibromyalgia are seen as positive (van Uden-Kraan et al., 2008). On the other hand, other online groups support certain behaviors that are seen as harmful, such as those in support of disordered eating and (pro-ana or thinspo groups) and anti-vaccine parenting (Lewis & Arbuthnott, 2012).

However, there are drawbacks to utilizing the internet for health information. First, it is disorganized and decentralized, making determining the source of information difficult and creating doubt surrounding credibility (Hu & Sundar, 2009). Further, many health related internet sites tend to require reading abilities above a seventh grade level, which may prove a barrier to individuals with low functional literacy (Walsh & Volsko, 2008). Many studies have looked at the quality of online health information, identifying amounts of poor quality information, though less is known about how people use the information (Powell & Clarke, 2006). Though people are generally aware that the internet may be inaccurate, and people state that they consider authorship when judging credibility (Ziebland et al., 2004), they do so less frequently in actual practice (Eysenbach & Köhler, 2002). Further, few websites offer comprehensive information pertaining to a particular health topic (Bhavnani & Peck, 2010) or there is conflicting information among a constellation of websites (Gustafson et al., 2008).

**Other Sources**

There are a variety of other sources of information that people may utilize that do not cleanly fall within another area. These types of information can include community events and information directly from health insurance companies. Libraries have traditionally been centers of information for communities. In the United States, there are nearly 9,000 public community libraries (American Library Association, 2014). Many libraries offer educational classes and
workshops on a number of issues (both health and non-health related) as well as act as a gateway to other sources of information (not only print media and the internet) like support groups and direct provision of services through notices on bulletin boards. Some studies that suggest that public libraries are a preferred source of health information (Case et al., 2004), which make up between 6-20% of inquiries in libraries (Wood et al., 2000), because of the human assistance they can receive there in finding and interpreting information (Chobot, 2002).

**Health Information Seeking in Pregnant Women**

In a systematic literature review exploring information-seeking related to the maternity experience (either pregnancy, childbirth, or postpartum experience) only 27 different studies were found to have discussed either ‘information sources’ or ‘information seeking’ in any respect, including as either a finding of the study or a mediating factor. Overall, the review found that women utilized a number of different sources for information during pregnancy including: 1) childbirth education classes, 2) popular media (i.e. books, newspapers, television shows, etc.), 3) social network members (i.e. friends and family), 4) healthcare professionals, 5) internet sources, 6) mobile applications, and 7) other sources that could not be categorized (i.e. community health fairs, employers).

This systematic literature review points out several gaps in the literature that this study directly addresses. First, whereas the literature highlights the varied nature of information sources available to women during pregnancy, few look in-depth at the processes of seeking that information (Garnweidner et al., 2013; Grimes et al., 2014; Hämeen-Anttila et al., 2013; Lagan et al., 2010; Lagan et al., 2011; Larsson, 2009; Plutzer & Keirse, 2012; Youash, Campbell, Avison, Peneva, & Xie, 2012). Most studies found social network members and health care providers as top sources of information, but none provided detailed study as to why they (or any
other information source) was sought out and for what specific purposes (Barnes et al., 2008; Beebe & Humphreys, 2006; Chaudhry, Fischer, & Schaffir, 2011; De Jonge & Lagro-Janssen, 2004; Declercq et al., 2013; Garnweidner et al., 2013; Lagan et al., 2010; Melender, 2002; Plutzer & Keirse, 2012; Shieh & Halstead, 2009; Shieh, Mays, McDaniel, & Yu, 2009; Szwajcer, Hiddink, Koelen, & Van Woerkum, 2005; Youash et al., 2012). Studies merely noted that social network members and health care providers were sources of information for pregnant women and that they were on the whole trusted.

Second, very few studies looked at how information from one source was balanced against other sources (De Jonge & Lagro-Janssen, 2004; Melender, 2002; Szwajcer et al., 2005). Why would pregnant women search out and utilize information from a source over any other? What role did ‘trust’ play in that evaluation and what made a ‘trusty’ source? How did participants manage conflicting information between multiple sources? These questions fit within a more in-depth and systematic study of HISB related to pregnancy.
CHAPTER 3: METHODS

Overview

The long-term goal of this research is to increase health literacy in pregnant women. The purpose of this study is to explore the maternity related health information seeking behavior (HISB) of women while they were pregnant, as the first step in the health literacy process. This objective may be achieved through the following study aims:

1. **Describe the topics of pregnancy-related health information that women seek during pregnancy.**
   
   Primary data collection and analysis were conducted using an online survey to describe the pregnancy and childbirth-related topics that women sought information on and to determine if there was any relationship between demographic characteristics and how women ranked the importance of an information topic. Qualitative data collection and analysis was conducted to describe why such topics were salient to women.

2. **Describe the sources of information women used to meet these needs.**

   Primary data collection and analysis were conducted using an online survey to describe the information sources used pregnant women and to determine if there was any relationship between demographic characteristics and how women ranked the information sources they used most often. Qualitative data collection
and analysis was conducted to describe the beliefs regarding the use of different information sources to meet information needs.

**Timeline**

**Table 2.** Timeline for Dissertation Research Study

<table>
<thead>
<tr>
<th>Activity</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
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<tbody>
<tr>
<td>IRB approval</td>
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<tr>
<td>Survey Pilot</td>
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<tr>
<td>Develop Recruitment Materials</td>
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<tr>
<td>Recruitment &amp; Data Collection</td>
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<tr>
<td>Development of SAS Code &amp; Refinement of Data Analysis Plan</td>
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<tr>
<td>Data Analysis</td>
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<td>X</td>
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<tr>
<td>Finalize Interview Guide</td>
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<td>X</td>
<td>X</td>
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<tr>
<td>Recruitment</td>
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<tr>
<td>Data Collection</td>
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<td>X</td>
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<tr>
<td>Data Analysis</td>
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<tr>
<td>Report findings</td>
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**Population**

The target population for this study included women (1) who were between the ages of 18–45, (2) who read, speak, and understood English, (3) who resided in the United States or U.S. territory during the majority of their pregnancy (4) who are current residents of the United States or U.S. Territory, (5) who gave birth within the previous 12 months, (6) to a single, healthy child (7) of which it was their first childbirth.

These criteria were set to approximate as closely as possible, characteristics of the general population of women who give birth in the United States. In 2012, there were just under 4 million births in the United States (Martin, Hamilton, Osterman, et al., 2013). Of those births,
92% occurred to women between the ages of 18 and 45 (Martin, Hamilton, Osterman, et al., 2013). Of births, most are singleton births (96.6%) and a large percentage were first births (36%) (Martin, Hamilton, Ventura, Osterman, & Mathews, 2013). This study population was limited only to first births as information seeking is likely to be more intensive in first-time mothers. In addition, topics of interest are also likely to be different among primiparous and multiparous women. Therefore, first-time mothers are recruited for this study to ascertain the baseline information seeking behaviors. Future research may look at differences between primi- and multiparous women. To limit recall bias, only women who have given birth within the previous 12 months were recruited. All women meeting the inclusion criteria were eligible to participate in both phases of the study.

**Approach**

To achieve these aims, a multi-phase, descriptive, mixed method, cross-sectional research design was utilized (see Figures 5 & 6). Phase (1) consisted of an online survey disseminated to collect HISB data from women who delivered a child within the prior 12 months. The survey explored what information topics women sought and what information sources they used. Phase (2) consisted of in-depth individual interviews with a sub-set of women who completed the online survey assessment to triangulate findings by examining how participants interpreted what they found valuable, what was trustworthy, and what importance meant in terms of health topics and information sources.
During Phase 1, all five research questions were assessed. During Phase 2, three of the research questions were looked at more in-depth. Tables 3 and 4 show the research questions along with the section of the instrument that they are answered by, the data analysis to be conducted and expected results by study phase.
Table 3. Phase I Research Questions, Instrumentation, Data Analysis, and Expected Results

<table>
<thead>
<tr>
<th>1.1 Which health topics are most important to women during pregnancy?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survey Items</strong></td>
</tr>
<tr>
<td>• Information Topic Checklist</td>
</tr>
<tr>
<td>• ‘Other Topics’ Dialogue Box</td>
</tr>
<tr>
<td>• Rank Ordered Top Three Topics</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.2 What individual factors predict choice of the health topic ranked as most important to a woman?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survey Items</strong></td>
</tr>
<tr>
<td>• Age</td>
</tr>
<tr>
<td>• Race/Ethnicity</td>
</tr>
<tr>
<td>• Relationship Status</td>
</tr>
<tr>
<td>• Education</td>
</tr>
<tr>
<td>• Insurance Status</td>
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<tr>
<td>• Income</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.1 Which information sources do women use most often during their pregnancy to meet information needs?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survey Items</strong></td>
</tr>
<tr>
<td>• Information Sources Checklist</td>
</tr>
<tr>
<td>• ‘Other Sources’ Dialogue Box</td>
</tr>
<tr>
<td>• Rank Ordered Top Three Sources</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.2 How valuable do participants rate these sources in meeting their needs?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survey Items</strong></td>
</tr>
<tr>
<td>• Information Source Value</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.3 What individual factors predict the information source used most of the time during their pregnancy?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survey Items</strong></td>
</tr>
<tr>
<td>• Age</td>
</tr>
<tr>
<td>• Race/Ethnicity</td>
</tr>
<tr>
<td>• Relationship Status</td>
</tr>
<tr>
<td>• Education</td>
</tr>
<tr>
<td>• Insurance Status</td>
</tr>
<tr>
<td>• Income</td>
</tr>
</tbody>
</table>
Table 4. Phase II Research Questions, Instrumentation, Data Analysis, and Expected Results

### 1.2 Which health topics are most important to women during pregnancy?

<table>
<thead>
<tr>
<th>Interview Items</th>
<th>Data Analysis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>• You listed _____ as the topics that were ‘most important’ to you. What makes that topic ‘most important’?</td>
<td>Thematic Analysis</td>
<td>• What factors led to participants interpreting a pregnancy-related health topic as being ‘most important’ to them?</td>
</tr>
<tr>
<td>• What would make a topic NOT important to you?</td>
<td></td>
<td>• What factors made a pregnancy-related health topic unimportant to participants?</td>
</tr>
<tr>
<td>• In hindsight, which topics do you wish you had looked for/looked for more information about?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### a. Which information sources do women use most often during their pregnancy to meet information needs?

<table>
<thead>
<tr>
<th>Interview Items</th>
<th>Data Analysis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>• You listed that you used ______ information sources most often. Why did you use those most often?</td>
<td>Thematic Analysis</td>
<td>• What factors contributed to participants using certain information sources most often during their pregnancy?</td>
</tr>
<tr>
<td>• Why would you NOT use an information source often?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### b. How valuable do participants rate these sources in meeting their needs?

<table>
<thead>
<tr>
<th>Interview Items</th>
<th>Data Analysis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>• When I say valuable, what does that mean for you?</td>
<td>Thematic Analysis</td>
<td>• How do participants interpret the concepts of value and trust in relation to information sources used during pregnancy?</td>
</tr>
<tr>
<td>• What/Why information sources were NOT valuable to you and why?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• When I say trustworthy, what does that mean for you?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• What/Why were information sources NOT trustworthy to you?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Phase I: Quantitative, Primary Data Analysis**

**Overview**

The purpose of this research phase was to quantitate which information topics about pregnancy and childbirth women looked for during pregnancy and which topics they rated as being most important to them. In addition, information about the sources of information that women utilized was also gathered, which sources they used the most often, and how they rated the valuableness and trustworthiness of each information source.
Subjects and Setting

Initially this study proposed to collect a sample size of 635 calculated using G*Power (see Table 5) (Faul, Erdfelder, Lang, & Buchner, 2007) in order to be powered enough to perform multinomial logistic regression. The sample size analysis was based on the following criteria: an odds ratio of 1.3, proportion of women citing a maternity care provider most often as a source of information at 20% (compared to 70-76% in previous studies) (Declercq et al., 2013; Grimes et al., 2014), an alpha level of .05, a 5% margin of error, and power of 80% (which are standard within social science research).

Table 5. Proposed Sample Size

<table>
<thead>
<tr>
<th>Probability of Outcome</th>
<th>Margin of Error</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.05</td>
</tr>
<tr>
<td>0.1</td>
<td>1100</td>
</tr>
<tr>
<td>0.2</td>
<td>635</td>
</tr>
<tr>
<td>0.3</td>
<td>492</td>
</tr>
<tr>
<td>0.4</td>
<td>435</td>
</tr>
<tr>
<td>0.5</td>
<td>419</td>
</tr>
<tr>
<td>0.6</td>
<td>435</td>
</tr>
</tbody>
</table>

The study recruited from the social network sites Facebook and Reddit. Access to the internet is fairly widespread, with 74% of adults having a regular source of access (Fox, 2011). Of adults with internet access, 63% use social networking sites such as Facebook (Madden & Zickuhr, 2011). Facebook has 1.28 billion worldwide users who visit the site with regularity (equal to or greater than once a month) (Facebook Inc., 2014). Among adults who use social networking sites, Facebook is the most frequently identified site used (Dugan & Smith, 2013). These social networking sites are particularly popular among women and adults less than age 50 (demographics that align with the proposed research population), with no significant differences in race, ethnicity, income, education, and rural/urban location (Madden & Zickuhr, 2011).
Facebook has successfully been used as a recruitment strategy in a number of health related studies (Bender, Jimenez-Marroquin, & Jadad, 2011; S. S. Bull et al., 2011; Farmer, Holt, Cook, & Hearing, 2009) among various populations (Carlini, Safioti, Rue, & Miles, 2013; Fenner et al., 2012; Lohse, 2013; Lord, Brevard, & Budman, 2011; Ramo & Prochaska, 2012; Richiardi, Pivetta, & Merletti, 2012). One study regarding childbirth preferences among early pregnant women utilized Facebook advertisement as a recruitment strategy (Arcia, 2013).

Facebook recruitment occurs primarily in three different fashions. The first utilizes paid Facebook advertisements which allow individuals or organizations to create and target advertisements to specific populations based on their Facebook profile information and internet services provider (ISP) location (resulting in millions of potential participants). The second utilizes convenience sampling through individual’s personal ‘friend’ network, with those friends then sharing study information through their own networks. Finally, direct contact with Facebook interest groups willing to post study information to their group membership may be used. For this study, all three recruitment strategies were used. In addition, participants were offered the opportunity to be entered in to a raffle to win one of twenty $10 electronic gift cards to either Starbucks or Amazon. Because of low recruitment yield through Facebook, recruitment also occurred through Reddit. Reddit is an entertainment, social news networking, and news website that has 234 million unique users (Similarweb, 2016). It is the 14th most visited website in the United States (Similarweb, 2016). Similar to Facebook, posts describing the study and providing a link to the survey were made in parent and new mother related groups on the website.

Recruitment of participants yielded 168 subjects. A post hoc analysis of power showed that multinomial logistic regression conducted with that sample size would have only been
powered at 38%. However, a post-hoc power test for Pearson chi-square goodness-of-fit tests (.30 effect size, an alpha level of .05, a 5% margin of error, 5 degrees of freedom, and power level of 80%), revealed a sample size of 143 participants would be necessary. Therefore, whereas the current sample size was not adequate to power the intended multinomial logistic regression tests, it proves adequate to power chi-square difference tests.

**Data Collection Procedures**

A Facebook page with a description of the study and a link to the quantitative survey was shared through the investigator’s Facebook page inviting new moms to participate and a message to please ‘share’ the study with their friend group. Second, a direct link to the survey with a brief message describing the study was posted to several (over 30) large pregnancy and new mom interest group Facebook pages. In order to create a sample with adequate diversity, special interest groups for differing racial and ethnic mothers was also contacted. In addition, due to difficulty in recruitment a study description and survey link were also posted in several large new mother discussion boards on the social news site Reddit.

Individuals who clicked on the link to the survey were directed to a Qualtrics managed homepage that was hosted on a secure site at the University of South Florida. The homepage included a description of the study, and consent information (including participant rights, investigator contact information, and Institutional Review Board (IRB) information). Participants then clicked on an option where they signified that they had read the information provided and agreed to participate in the study, or that they did not wish to participate further, at which point they received a message thanking them for their time and were exited from the survey. Of individuals who were exposed to the Facebook recruitment page and the Reddit study description post, 464 clicked the link to be directed to the USF hosted survey, 1 declined to
participated, 76 did not meet inclusion criteria for age, residency, time since birth, and live infant status. Of the remainder, 24 participants gave birth to multiples and 123 were multiparous. Though allowed to continue with the remainder of the survey, these subjects are were not analyzed for the purposes of the current study. Of the remaining 242 subjects, 72 did not complete the survey, leaving N=168 to be included in the analysis (See Figure 7). An important consideration for any study is non-response bias, or differences between those participants that finished the survey and those that did not. However, because major demographic information was collected at the end of the survey, we cannot ascertain if there were differences between these two groups. There were no differences in participant demographics between the two recruitment platforms. Of the final analytical sample, N = 114 were recruited from Facebook and N = 54 were recruited from Reddit.

**Figure 7. Sample Strategy**
**Instrumentation**

This survey used questions related to information source use from the Listening to Mothers (L2M) survey series. Listening to Mothers is the only nationally representative survey to explore the maternity and childbearing experiences of women in the United States (National Partnership for Women and Families, 2015). Developed by nationally recognized content experts and conducted over three waves since 2002, the survey includes a number of questions related to the information sources that women utilized during their pregnancy. For the purposes of this study, measures from Listening to Mothers III (L2M3) regarding whether or not a particular information source was used, how valuable the participant found it, and how they rated its trustworthiness were adapted for use in this survey (See Appendix C). L2M3 asks two questions related to the valuableness of sources of information that post-partum women used during pregnancy. Both questions ask, “During your recent pregnancy, how valuable were the following as sources of information when you were looking for information or had questions?” However, each have different sets of answer choices: one consisting of more ‘traditional’ sources of information such as a health care provider, mass media outlets, and formal government websites and the other set of answer choices include ‘new media’ such as social media sites like Twitter and YouTube or maternity related web-logs. These questions were adapted in the following ways:

- For the information source option ‘Apps with pregnancy and childbirth information’ from L2M3, ‘for my phone or tablet’ was added for greater clarification for survey participant. Therefore, this option now reads ‘**Apps with pregnancy and childbirth information for my phone or tablet**’.
• ‘My maternity care provider’ was an original answer choice in the L2M3 survey. However, concerns about individuals with low health literacy understanding what a maternity care provider was, and the fact that some may use some health care providers as an information source more than others led to being changed to reflect three different choice options: ‘My doctor(s) that took care of me during pregnancy’; ‘My midwife(s) that took care of me during pregnancy’; ‘My nurse(s) that took care of me during pregnancy’. Further, pilot-testing feedback noted that an option for a doula or labor coach was lacking. Though not a health care provider, this answer choice was also included in the final survey instrument.

• Whereas, the second wave of the Listening to Mothers survey series included ‘friends and family’ as an information source, the third wave no longer provided this option (Declercq, Sakala, Corry, & Applebaum, 2006). However, because a number of other studies have found that interpersonal sources of information continue to be important for pregnant women (Beebe & Humphreys, 2006; Brown, Carroll, Boon, & Marmoreo, 2002; Chaudhry et al., 2011; De Jonge & Lagro-Janssen, 2004; Melender, 2002), these information sources were included in the survey instrument for this study as two separate options.

• The L2M3 survey was conducted between October of 2012 and December 2012, and was under development for some time prior to that period. During that time, a number of internet media micro blogging platforms became hugely popular among reproductive age women. In particular, Pinterest and Tumblr are very successful platforms that women access information about a number of life issues (including pregnancy and childbirth). For this reason, the following answer
choice was added as an information source option: ‘Pregnancy or childbirth related microblogs (Pinterest, Tumblr, etc.)’.

- Though L2M3 includes options for obtaining information through online forums and group discussion lists like Yahoo! and Google Groups, it does not include an answer option for the use of a large search engines as the primary way in which individuals may locate other sources of information. Therefore, added to this survey as an option was: ‘Search engines (Google, Yahoo, Bing, etc.)’.

For greater consistency all screening and demographic questions also came from L2M3. Listening to Mothers was developed by a panel of nationally recognized content experts (Childbirth Connection, 2015). Reliability and validity information for the whole L2M survey is not available. Peer-reviewed papers from survey authors have noted that portions of the survey used valid and reliable sub-scales for post-traumatic stress disorder, postpartum depression, and general patient health (Beck, Gable, Sakala, & Declercq, 2011; Mayberry, Horowitz, & Declercq, 2007). However, no similar information could be located with respect to information source questions.

In addition to these measures, several other survey items were developed specifically for this study. First, Aim 1 of this research study was to describe the topics that women sought information on during pregnancy. Because L2M3 does not assess this information at all, other peer-reviewed articles were surveyed to assess whether an existing item or items were available that would work for the purposes of this study. Of studies that looked at the topics of information that pregnant women looked for, most provided fairly broad information source categories (See Appendix E). Lagan, Sinclair, and Kernohern (2010) used a topic for ‘general
pregnancy information’ which is too broad a descriptor for the purposes of this study. In addition, these authors included information about purchasing maternity related items, which is not a focus of the proposed study. Larsson (2009) included an open-ended question in their quantitative survey that allowed participants to list the reasons for their internet-related information seeking. That study then analyzed the data and found five natural categories including: pregnancy, childbirth, the expected baby, chat forum, and personal benefit (Larsson, 2009). For the purposes of the proposed study, these categories also prove too broad. Finally, Shieh, McDaniel, and Ke (2009) provide an expanded list of topics for their participants. Though this list of topics is useful, there are areas that could be improved upon. For example, where Shieh and colleagues include ‘prenatal nutrition’ as a topic, this could mean both foods that pregnant women should eat more of for optimal health and foods that they should be avoided. Using this topic as it is would not allow one to determine whether foods that should be avoided during pregnancy are more or less important as a topic of interest than are nutritious foods.

In addition, to these published sources, the topics that are covered in the Text4Baby health campaign were also appraised. Text4Baby is a free national mobile health information service designed to promote maternal and child health through the use of informative text messages (National Healthy Mothers Healthy Babies Coalition, 2015). The National Healthy Mothers, Healthy Babies Coalition is composed of a number of local, state, and national organizations (including the American College of Obstetricians and Gynecologists, the March of Dimes, the American Academy of Pediatrics) interested in improving the quality and reach of maternal and children’s health education. The Coalition identified information topics according to evidence-informed clinical guidelines and focus groups with women, resulting in an initial list
of 117 individual messages (now 250 messages) regarding health during pregnancy, childbirth, and infant care. (National Healthy Mothers Healthy Babies Coalition, 2012; Whittaker et al., 2012). These messages fall into 15 different content categories (as listed on the Text4baby website) (National Healthy Mothers Healthy Babies Coalition, 2012) (See Appendix E).

For the purposes of this study, in order to ascertain which topics of information women looked for during pregnancy, topics from Shieh and colleagues (2009) and Text4baby (National Healthy Mothers Healthy Babies Coalition, 2012) were adapted. This study focuses exclusively on information regarding the pregnancy and childbirth experience and not at post-natal and infant care topics. Therefore, some topics that Text4baby include in their message content are not applicable to this study. In addition, a number of maternity related information topics are included that come from literature, from expert suggestion, and from instrument pilot test feedback. A total of 33 specific pregnancy and childbirth-related topics were included in the survey instrument (See Appendix A).

In recognition of the fact that participants may have utilized information sources or looked for maternity related topics that were not given as options, two items asked if there were other information topics that the participant looked for but were not listed or if there were other information sources that the participant used but was not listed. If the participant answered ‘yes’ to either of these questions, a dialogue box opens which allows the individual list additional information topics and/or sources.

Finally, this proposed study asks participants to rank which health topics were most important to them and which information sources were used most often. Pregnant women may look for information on a wide variety of issues but may be most concerned with a select few. In addition, though a pregnant woman may find one information source very valuable and very
trustworthy, this does not necessarily indicate that it is the information source that they use most often. These measures of ‘most important health topic’ and ‘most often used information source’ were used as the outcome of interest for data analysis. Differences in demographic variables by those who chose the top topic/information source choices were tested (explained below). Considering that some participants may have low levels of reading ability, the current survey was analyzed using the Flesh-Kincaid readability scale, and was found to be at an 8th grade level.

Survey Instrument and Theory Constructs

A number of constructs from the Comprehensive Model of Information Seeking (CMIS) are represented among the quantitative measures (see highlighted in Figure 8).

![Figure 8. CMIS Constructs Measured in Online Quantitative Survey](image)

First, under characteristics of the information seeker, a number of demographic measures that are thought to be important to information seeking are assessed. These demographic variables include age, race/ethnicity, education level, relationship status, income status, and
insurance status. One construct of characteristics of the information seeker relates to the individual’s direct experience with the health condition. Because inclusion criteria for the study exclude women who have had children before, this study automatically looks at women without any direct experience of pregnancy and childbirth before (see Figure 9).

![Characteristics of the Information Seeker and Information Source](image)

**Figure 9.** Measures of CMIS Constructs in Online Quantitative Survey

Finally, the survey measures characteristics of the information source utilities through measures of valuableness and trustworthiness of the information sources. Previous studies have looked at information source utilities as how useful, easy to get, and valuable an information source was on a scale. For the purposes of this study, value and trustworthiness were left undefined, allowing participants to attribute their own definitions of value to an information source. Initially, these concepts had been defined during the pilot test of the survey. However, several pilot participants discussed how they valued or trusted different information sources for different reasons, and would have preferred no definition. Participant definitions of value was explored in Phase II of the research study. In addition, other measures of this construct have
simply asked individuals to rate either how useful or valuable an information source was on a likert-scale, without any further definition (DeLorme, Huh, & Reid, 2011; Hartoonian, Ormseth, Hanson, Bantum, & Owen, 2014; Johnson, Donohue, Atkin, & Johnson, 1995).

**Instrument Pilot Test**

Because the draft survey was composed of items that come from different sources, pretesting the instrument was necessary. Pretesting occurred in two phases. First, the instrument underwent an expert review. Initial plans required at least three different content-area experts in maternal and child or reproductive health at the Ph.D. or Doctoral student level. Expert review typically requires very small samples of experts, typically 2 to 3 (Groves et al., 2011). Though plans only required three different content-area experts, seven area experts reviewed the content, survey flow, wording, and ease of use. Recommendations from the expert panel were reviewed and incorporated in to the survey instrument included. Second, after expert review and inclusion of recommendations, the draft survey was pretested among individuals (N = 18) who met study participation criteria, of which 11 gave complete feedback. This number was adequate as pilot surveys need only be between 5 and 10 people, as most people tend to have the same procedural issues when taking a survey (Dillman, Smyth, & Christian, 2014). The pilot recorded the length of time to complete the instrument and assessed the survey feasibility and participant burden. Cognitive interviews were conducted using verbal probing and think-aloud techniques to assess how participants interpret questions and if there were any issues with understanding and processing questions (Dillman et al., 2014). Most participants found the survey easy to use and understand. The survey instrument was then finalized and launched.
Data Analysis

All analysis procedures utilized SAS 9.4 procedures. Univariate descriptive statistics (frequency, measures of central tendency, standard deviations, and distribution of variables) were computed for each variable after re-categorization using frequencies. Many of the independent variable categories were collapsed due to limited numbers of responses in many of the categories. Race was dichotomized into ‘white’ or ‘non-white’. Age was recoded into three categories (19 – 26, 27 – 34, and 35 and older). In the United States, the average age at first birth is 26 and mothers of advanced maternal age are those who are aged 35 and older (Martin, Hamilton, Osterman, Curtin, & Matthews, 2015). Therefore, these three age categories represent adult mothers up to the average age of first birth, those that are slightly older than average age, and those that meet clinical criteria for advanced maternal age. The majority of survey participants had at least a four-year college degree. Therefore, the education variable was recoded into three categories, those with less than a 4-year college degree, those with a four-year college degree, and those with a graduate or professional degree. Because of few responses in categories other than married, the relationship category was dichotomized into ‘married’ and ‘unmarried’. The participant survey, initially had 10 income categories to pick from. These were collapsed in to categories that represented low, middle, and high income. Low income was categorized from $15,000 to $37,000, middle income was categorized from $37,001 to $98,200, and high income was categorized as greater than $98,201. The low-income category is one that matches 200% of the federal poverty guidelines for a household of two (United States Census Bureau, 2013). Middle-income and high-income categories ranges approximately match those for the median household income level and the top 20% of household incomes in the United States (United States Census Bureau, 2013). Finally, insurance status was computed into a
variable with three categories Medicaid insurance, employment-based or self-purchased insurance, and cash payment.

Bivariate frequencies and Pearson’s chi-square goodness-of-fit test were calculated to compare each predictor variable (demographic variables) to the outcome variables (each of the three ‘most important’ topics ‘most often used information sources’). Three separate measures of ‘most important’ and ‘most often used’ rank was created. First, one measure of rank (checklist frequency) was created that looked at whether or not participants sought a topic of interest or used an information source. Secondly, a measure of rank (ranked frequency) was used if a topic or information source was ranked among the top three ‘as most important’ or ‘most often used’, but with no consideration to placement of rank (first, second, or third). Finally, a measure of rank (first rank) which only took in to account whether or not a participant ranked a topic or information source first was created. Fisher’s exact tests was used where there were cells of less than five observations.

Phase II: Qualitative Interviews

Overview

The purpose of the second phase of the study was to triangulate the findings of the quantitative survey and explore constructs from the CMIS that are not measured within the survey. Triangulation is commonly used to check the consistency of findings in both quantitative and qualitative research (Denzin & Lincoln, 2008; Patton, 2005). Triangulation gives a detailed and a balanced picture of a situation (Altrichter, Feldman, Posch, & Somekh, 2013) by cross-checking data from multiple sources or methods.
Subjects and Setting

The second arm of the proposed consisted of taped in-depth follow-up interviews. All women who were eligible to participate in Phase I were eligible to participate in Phase II. At the conclusion of the online survey, participants were asked if they would be willing to participate in another arm of the study that consisted of a one-on-one phone or video chat interview (given participant preference). Women who indicated that they are interested in participating in a follow-up interview were asked for their phone and/or email contact information. These participants were then emailed to schedule a date and time for an interview as well as inform about other interview procedures (such as tape recording and informed consent). All interview participants received a $10 Starbucks or Amazon gift card, according to their preferences.

In order to triangulate the findings of the quantitative survey, the study employed quota sampling of participants in order to as closely mirror the population of women who took the online survey, but allow for variation in participants. These quotas ensured that the study had adequate representation of women of different age groups, race and ethnicity, education level, and insurance status. Quota sampling in qualitative research is more flexible than stratified or cell sampling, which require fixed numbers of cases in particular categories (Robinson, 2014). Quota sampling sets out a minimum number of cases required for each, ensuring that groups are represented in the sample but allowing flexibility in the final composition (Robinson, 2014). For the purposes of this study, groups are important for adequate representation in the qualitative interviews included: women of older age (35-45); women with less than a 4-year college degree; women who had Medicaid public insurance during their pregnancy; and women of non-white race/ethnicity. Table 7 shows the minimum number required of interviewees for each of these categories. The total required number of interviews for these categories accounts for over half of
the required sample for the qualitative interviews. Each of the categories are mutually exclusive, so if a woman had less than a 4-year college degree and was insured through Medicaid during her pregnancy, her interview only counted towards one interview quota category. Minimum recruitment quotas were determined to be 10% of the minimum sample (2.5 rounded up to 3). Because of the concern about the possible racial/ethnic diversity of study participants, the minimum required quota was doubled in order to adequately represent a range of opinions. All minimum recruitment quotas were met for Phase II of this study (See Table 6).

Table 6. Qualitative Interviews Quota Sampling

<table>
<thead>
<tr>
<th>Quota Category</th>
<th>Minimum Recruitment</th>
<th>Final Recruitment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Maternal Age</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>&lt; 4 Year College Education</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Medicaid Insurance Status</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Non-White Race/Ethnicity</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>21</td>
</tr>
</tbody>
</table>

Data Collection Procedures

Within quantitative study designs, sample size calculation may be fairly straightforward. However, with respect to qualitative studies, sample size is a less clear concept. According to Ulin, Robinson, and Tolley, “The investigator is guided by the degree to which incoming data adequately answer the research questions—an ambiguous rule at best (2004, p. 55).” For many qualitative researchers, the correct sample size occurs when saturation is reached. Saturation is the principle that little new information is coming from observations, interviews, or focus group discussions (Glaser & Strauss, 2009). When saturation occurs is dependent on a number of factors including: scope of the study, heterogeneity of the study participants, nature of the topic, and quality of the data (Mason, 2010). Some guidelines have been set for different qualitative methods: for ethnography, between 30-50 (Morse, 1995), for grounded theory 20-30 (Creswell, 2012; Morse, 1995), for phenomenology 5-25 (Creswell, 2012; Morse, 1995), and for all general
This study represents a phenomenological qualitative approach, in that it seeks to describe a ‘lived experience’ of a phenomenon (i.e. HISB during pregnancy). A content analysis of a PhD database in the United Kingdom conducted by Mason (2010) found wide variation in regards to qualitative sample size. He found a bi-modal (n= 20, 30) distribution of qualitative sample sizes, with the median being 28, the mean 31 and a standard deviation of 18. For this research, a sample size of at least 25 in-depth interviews was set. Had saturation of the interpretation of constructs not been met, further interviews would have been conducted until a maximum sample size of 30 participants is reached. However, saturation was met at approximately the 16th interview. However, data were collected from 26 participants.

All interviews were conducted over the telephone, which was the preference of all participants rather than using video conferencing. The participants were verbally consented at the initiation of all interviews, and their permission to digitally record the interview was received. During interview administration, field notes were written to allow the interviewer to reflect on important details of the interview at a later time which may not have been captured by reading transcripts in data analyses. Audio-recordings were then be transcribed verbatim (2 were transcribed by the researcher and 24 were transcribed using professional services from Transcription Wing). Transcriptions did not include participants’ names or any other type of identifying information. A unique participant identifying number was used to link the survey content to the interview transcript/audio file. Data management and coding was done utilizing MaxQDA 12, a qualitative analysis software (VERBI GmbH, 2015).
**Instrumentation**

The purpose of the second arm of this study is to cross-check information to produce accurate interpretation of the quantitative results. A semi-structured interview guide was developed (see Appendix B) to guide discussion of the participant interpretation of concepts found within the survey instrument. These questions cover in-depth some constructs within the CMIS (see highlighted portions of Figure 10), including how participants assessed a health topic as most important to them, why they used a particular information source most often, what made an information source valuable to them, and what made an information source trustworthy.

**CMIS and Interview Guide Measures**

The survey instrument used in this study elicited information regarding demographic, direct experience, and information source utilities related to information seeking among pregnant women. The qualitative interviews looked at the remaining information seeker characteristics of salience and beliefs, and explored more in-depth information carrier utilities.

![CMIS Constructs Measured in Qualitative Interviews](image)

**Figure 10.** CMIS Constructs Measured in Qualitative Interviews
Interviews asked participants what information sources they found *valuable*, how much they *trusted* (information carrier utilities), which information sources they used *most often* (information carrier utilities and information seeker beliefs), and which health topics were *most important* to them (information seeker salience). Saliency within the CMIS is often measured as the perceived relevance, importance, or personal significance of a health threat or state (DeLorme et al., 2011; Hartoonian et al., 2014; Johnson & Meischke, 1993). In addition, belief within the CMIS model relates to how individuals perceive using the information source or seeking information affects their being pregnant (See Figure 11). Therefore, in-depth interviews explored how participants valued and trusted certain information sources, what factors about the information sources motivated using them most often, their beliefs regarding the use of the information sources as a pregnant woman, as well as what motivated a health topic being most important to them.

![Characteristics of the Information Seeker](image)

![Characteristics of the Information Source](image)

**Figure 11.** Measures of CMIS Constructs in Qualitative Interviews
The interview guide was revised for wording and question order after the 5th interview to adequately probe themes that were raised in the first several interviews. These themes included those factors that made it easy or difficult to find and understand information in order to greater reflect information source characteristic utilities. In addition, a question regarding those topics that, in hindsight, participants wished they had looked for or spent more time looking for while pregnant to further understand information topic salience.

**Data Analysis**

Qualitative results were analyzed using applied thematic analysis. Applied thematic analysis “is a rigorous, yet inductive, set of procedures designed to identify and examine themes from textual data in a way that is transparent and credible” (Guest et al., 2011, p. 15). As with other qualitative analytic methods (such as the constant comparative method), this approach identifies key themes, but in a more systematic process utilizing some levels of quantification. Analysis of qualitative data started with the development of a codebook based upon the *a priori* constructs of ‘Salience’ and ‘Beliefs’ and ‘Valuable’ and ‘Trustworthy’ from the CMIS model. A ‘Hindsight’ code was also included to the codebook to reflect iterative changes to the interview guide. The ‘Hindsight’ question was used to collect information about what topics would have been salient to participants if they had the opportunity to perform their information seeking behavior over. Codebooks are developed to minimize ‘messiness’ and maximize coherence in code definitions by explicitly addressing three aims; examining commonalities, differences, and relationships (Guest et al., 2011, p. 53).

Initial coding was conducted to apply deductive codes to the data. After initial coding, a list of initial items from the data that have a recurring theme is generated. These items are compared to reflexive interview notes to ensure that potential themes have not been forgotten.
The next coding step involves data reduction by assigning tags and labels to data based on the research questions (Guest et al., 2011). After data reduction, categories of data are then combined into overarching themes that accurately depict the data (Braun & Clarke, 2006), focusing on broader patterns therein. Finally, themes are defined by the researcher, including a comparison of how they contribute to the overall ‘story’ of the data (Guest, MacQueen, & Namey, 2012).

**Triangulation**

The findings from Phases I and II meaningfully informed the interpretation of the overall results of this study. Phase I quantitatively described the topics of information that pregnant women sought and the information sources they utilized to do so. Phase II elicited the motivations behind seeking information and utility of using particular information sources. Together this provided an overall picture of the health information-seeking behavior of pregnant women with depth.

**Protection of Human Subjects**

This research study involved human subjects in the use of survey and interview procedures. This research received Institutional Review Board (IRB) approval prior to commencement of the study. This project was non-invasive and all participants were adult women between 18 – 45 years of age.

**Phase I**

To achieve the specific aim of Phase I, primary data collection and analysis were conducted. Survey data were collected online and were only accessible by the Principle Investigator (PI), and were password protected at all times. The vast majority of participants remained anonymous to the PI. However, participants had two chances to provide contact
information. First, any participant who completed the survey were eligible to be entered into a raffle for one of twenty $10 gift cards. To do so, they were asked to provide one piece of contact information, either an email address or their phone number. At the conclusion of data collection, 20 participants were randomly chosen through an online random-number generator and were contacted to receive their incentive. At the conclusion of the distribution of gift cards, all records of participant contact information were permanently destroyed by the PI for the protection of participant identities.

**Potential Risks**

The risks associated with this study were minimal. Threats to anonymity of responses and privacy were key issues. However, several steps previously described helped to minimize these risks. Other risks include adverse reactions to answering questions about one’s experiences during pregnancy. Though it was not anticipated that study procedures would be more than minimal risk, the nature of the survey items were fully described to participants prior to their participation and participants had the option of quitting the survey at any time. Participants were also be provided with information on how to protect their privacy upon survey completion (i.e., through clearing their web browser’s history and cache) and were given the contact information of the PI who they could contact if they had any negative reactions to any of the survey items.

**Adequacy of Protection against Risks**

Participants were recruited through convenience sampling techniques targeting pregnancy and new-mom related internet groups as well as utilizing the social network connections of the PI. Potential participants were directed to a website with more information about the study. Participants were presented with the appropriate informed consent documentation and were asked to give their consent via the electronic form. A waiver of documented consent was
requested and received since documented consent would have represented the only violation of the anonymity of participants. No identifying information was collected as part of the quantitative survey unless participants were interested in participating in Phase II of the study (see below) or in including themselves for the incentive raffle. All responses were encrypted by the survey software and were be stored on a password-protected server at the PI’s university.

Phase II

Sources and Materials

No identifying information was retained in the transcripts. The transcript’s unique ID was only linked to an individual participant’s information (e.g., email or phone number) through a spreadsheet maintained by the researcher. This information was kept in a separate password-protected file that was only accessible to the PI. At the conclusion of all data collection identifiable participant information was permanently destroyed by the PI.

Potential Risks

The risks associated with this study were minimal. One potential risk faced by interview participants were negative reactions to answering questions about information seeking and communication with their health care providers during pregnancy. However, this did not represent more than a minimal risk. At no time during data collection did participants indicate that they were uncomfortable or ask to stop the interview.

Adequacy of Protection Against Risks

Interviews were recorded but did not contain any identifiable information (e.g., full names, phone numbers). Interviews were assigned a unique identification number that was linked to the participant’s information in a separate password protected file. Only the PI had access to this file and it was destroyed after interviews were transcribed and analyzed.
Participants were informed of their human rights protections and about the measures taken to protect their confidentiality and the confidentiality of their responses. They verbally consented to participate after being read an IRB approved verbal consent. A waiver of documented consent was requested and received to eliminate any record linking the participant to the study.

Potential Benefits

Participants contributed to the understanding of health information seeking in pregnant women. The results of this study may be used to increase access to appropriate maternity related health information as well as create greater understanding surrounding health literacy among pregnant women. Moreover, all interview subjects were given a $10 electronic gift card for their participation in Phase II.

Data and Safety Monitoring Plan

To ensure the confidentiality of participants any identifying information provided by the participant in the qualitative interviews (e.g., telephone number, Skype User Name, email address) was kept separate from their interview data and secured in a password-protected file.
CHAPTER 4: RESULTS

Overview

The purpose of this study was to explore the maternity related health information seeking behavior (HISB) of women while they were pregnant. The results of this dissertation will be presented in two sections. First, the quantitative analysis examining the topics of information sought by pregnant women and the information sources they used will be presented. Second, the results of the qualitative analysis of salience, beliefs, and definitions of value and trust during maternity related health information seeking are presented.

Phase I: Quantitative Analysis

The quantitative analysis for Phase I comprised five separate research questions under two research aims to examine the online survey data.

Description of Sample

The final analytic sample from the online survey comprised 168 women. Demographic characteristics (Figures 12-19) reveal the majority of the sample was White, non-Hispanic, between the ages of 27 and 34 (mean = 29, median = 29, mode = 30, SD 4.35), were married, and had employment-based insurance coverage. In addition, most participants had at least a 4-year college degree or higher, and had annual household incomes between $52,301 and $75,300.
Figure 12. Description of Survey Sample Age (N = 168)

Figure 13. Description of Survey Sample Hispanic Ethnicity (N = 168)
Figure 14. Description of Survey Sample Race (N = 168)

Figure 15. Description of Survey Sample Educational Level (N = 168)
Figure 16. Description of Survey Sample Payment for Pregnancy and Childbirth (N = 168)

Figure 17. Description of Survey Sample Relationship at Time of Childbirth (N = 168)
Figure 18. Description of Survey Sample Income Level (N = 168)

Figure 19. Description of Survey Sample Time since Birth (N = 168)
Aim 1: Health Topics

Research Question 1.1

Of the 33 information topics listed in the survey, participants indicated that they had looked for an average of 18.75 topics, with a range between 2 and 31 topics (SD 5.84). Figure 220 shows the frequency (in descending order) of each of the topics were chosen as being of interest and the proportion of survey participants that chose that topic. Participants sought information about all of the topics included in the survey.

![Pregnancy and Childbirth Topics Sought](image)

**Figure 20.** Pregnancy and Childbirth Topics by Frequency (N = 168)

Participants also indicated additional topics for which they sought information but were not presented in the topic list provided to them. Participants were given the opportunity to list those topics. Of participants, 19.05% (n = 32) listed 68 different topics that they perceived to have sought information on but were not listed in the survey checklist. However, of those, (n=19) were related to a non-pregnancy or childbirth topic (See Table 7), such as ‘introducing pets to a new baby’ or ‘breastfeeding.'
Table 7. Non Pregnancy and Childbirth-related Topics

<table>
<thead>
<tr>
<th>Participant Topics about Topics other than Pregnancy and Childbirth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breastfeeding (5 times)</td>
</tr>
<tr>
<td>Core blood banking</td>
</tr>
<tr>
<td>Postpartum depression and anxiety (2 times)</td>
</tr>
<tr>
<td>Introducing infants to pets</td>
</tr>
<tr>
<td>Sudden Infant Death Syndrome</td>
</tr>
<tr>
<td>Purchasing infant items (i.e. nursery, car seat, stroller)</td>
</tr>
<tr>
<td>Delayed bathing</td>
</tr>
<tr>
<td>Placenta encapsulation (2 times)</td>
</tr>
<tr>
<td>Premature infant care</td>
</tr>
<tr>
<td>Childcare options (2 times)</td>
</tr>
<tr>
<td>Returning to work (2 times)</td>
</tr>
<tr>
<td>Choosing a pediatrician</td>
</tr>
</tbody>
</table>

Of the remaining, (n=22) were topics that were already listed in the survey (See Table 8), such as ‘stages of labor’ or ‘pregnancy complications’.

Table 8. Topics Already Listed in the Survey

<table>
<thead>
<tr>
<th>Participant Topics In Survey List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sciatica, hip pain, pelvic girdle pain</td>
</tr>
<tr>
<td>Placenta previa</td>
</tr>
<tr>
<td>Down’s Syndrome (2 times)</td>
</tr>
<tr>
<td>Alternative labor pain management</td>
</tr>
<tr>
<td>Insurance coverage of pregnancy</td>
</tr>
<tr>
<td>Stages of labor</td>
</tr>
<tr>
<td>Complications during pregnancy</td>
</tr>
<tr>
<td>External cephalic inversion</td>
</tr>
<tr>
<td>Epidurals</td>
</tr>
<tr>
<td>Baby positions</td>
</tr>
</tbody>
</table>

Some topics listed (n =14) by participants could be interpreted as being included as belonging to a survey topic, but were not explicitly stated as such (See Table 9). For example, ‘midwives’ could be construed as being a part of ‘choosing a health care provider’ or ‘weird pregnancy symptoms’ could be perceived as being a part of ‘how my body changed during pregnancy’.
Table 9. Topics Perceived to be Listed in the Survey

<table>
<thead>
<tr>
<th>Participant Topics Possibly in the Survey List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrahepatic Cholestatis of Pregnancy</td>
</tr>
<tr>
<td>Unassisted childbirth</td>
</tr>
<tr>
<td>Iron deficiency</td>
</tr>
<tr>
<td>Music and fetal growth</td>
</tr>
<tr>
<td>Signs of labor (2 times)</td>
</tr>
<tr>
<td>Delayed cord clamping</td>
</tr>
<tr>
<td>Immediate skin-to-skin post delivery</td>
</tr>
<tr>
<td>Doula services (3 times)</td>
</tr>
<tr>
<td>Midwives</td>
</tr>
<tr>
<td>Water birth at home</td>
</tr>
<tr>
<td>Baby positioning for easier labor</td>
</tr>
<tr>
<td>Baby movement during pregnancy</td>
</tr>
<tr>
<td>Bicornate Uterine shape</td>
</tr>
<tr>
<td>Incompetent cervix</td>
</tr>
<tr>
<td>Miscarriage (2 times)</td>
</tr>
<tr>
<td>Having a large baby</td>
</tr>
<tr>
<td>‘Weird pregnancy symptoms’</td>
</tr>
<tr>
<td>‘What baby kicks feel like’</td>
</tr>
<tr>
<td>Essential oil use during labor</td>
</tr>
<tr>
<td>Milk development</td>
</tr>
<tr>
<td>Genetic disorders</td>
</tr>
<tr>
<td>Marijuana use during pregnancy</td>
</tr>
</tbody>
</table>

The remaining 11 topics listed by participants not in the original survey included (See Table 10) topics such as ‘spiritual or religious element to labor’, ‘travel during pregnancy’, ‘sleeping positions’, ‘choosing a baby name’, and ‘how one even knew that they were pregnant’.

Table 10. Participant Topics Not Listed in the Survey

<table>
<thead>
<tr>
<th>Participant Topics Not Listed in Survey List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccinations while pregnant</td>
</tr>
<tr>
<td>Spiritual elements of labor and delivery</td>
</tr>
<tr>
<td>Sleeping positions while pregnant</td>
</tr>
<tr>
<td>Choosing a baby name</td>
</tr>
<tr>
<td>Cosmetics use during pregnancy</td>
</tr>
<tr>
<td>Natural induction of labor</td>
</tr>
<tr>
<td>Travelling during pregnancy</td>
</tr>
<tr>
<td>Brachial plexus injuries</td>
</tr>
<tr>
<td>Breech birth</td>
</tr>
<tr>
<td>Hair growth during pregnancy</td>
</tr>
<tr>
<td>Pregnancy symptoms</td>
</tr>
</tbody>
</table>

Of the topics that participants initially selected, they ranked which were most important to them, in order from first to third. Ranking of topics can be looked at in a number of ways...
including the overall frequency with which it was chosen as a topic of interest, how often it was ranked overall, or the topic that was most often ranked first. Figure 21 shows how often all topics were ranked as most important irrespective of the rank order.

Figure 21. Pregnancy and Childbirth Topics Ranked as ‘Most Important’ Irrespective of Rank Order (N = 168)

Figure 22 shows how often all topics were ranked as the number one most important topic.

Figure 22. Pregnancy and Childbirth Topics Ranked as Number One ‘Most Important’ (N = 168)
However, Figure 23 shows a comparison between the top three topics by each measure. ‘How my baby grew while I was pregnant’ was chosen as a topic of interest by 95.23% (N = 116) of all survey participants. The second most frequent topic chosen as a topic of interest was ‘What I should NOT eat during pregnancy’ (89.29%, N= 150), followed closely by ‘How my body changed’ during pregnancy (88.70%, N = 149). If we then look at whether or not a topic was ranked as being one of the top three important topics, ‘How my baby grew while I was pregnant’ remains the most frequent topic (N = 116). However, ‘Complications during pregnancy’ is now the second most frequent topic (N = 47) followed by ‘What I should NOT eat during pregnancy’ (N = 37). Finally, if we look only at topics that participants ranked as first most important, ‘How my baby grew while I was pregnancy’ (N = 71) was followed by ‘Complications during pregnancy’ (N = 16), and ‘Natural birth’ (N = 10).

Figure 23. Comparison of Measures of Rank by Topic (N=168)
How a participant’s baby grew during pregnancy was consistently the most important topic of interest across all measures. Complications that occurred during pregnancy was second most important in two of the three measures (those that chose to rank the topic and those that ranked it first) as were foods that should not be eaten during pregnancy (those that chose it as a topic of interest and those that chose to rank it, but not those that ranked it first). The topic of the changing body during pregnancy and natural birth were each third most important in one out of the three measures. ‘How my body changed during pregnancy’ was ranked third when only looking at the frequency with which it was sought as a topic of information. However, when looking at whether it was ranked at all or ranked first, this topic loses its relative importance. On the other hand, the topic of natural birth becomes the third most important topic only when we look at those topics that were ranked first.

*Research Question 1.2*

Each predictor variable was examined with the outcome variable for the measure of most important health topic during pregnancy. For the checklist measure, differences were examined between those whom sought information on that topic and those whom did not. For the ranked measure, differences were examined between those who chose to rank the topic (irrespective of rank), and those who only checked it as a topic of interest but did not rank it. Finally, for the first rank measure, differences were tested between those whom ranked the issue but did not rank it as the number one and those that did. Significant associations between each of the top three outcome variables by each of the rank measures and predictor variables are presented in Tables 11-15. Chi-square and Fisher’s exact tests were conducted to determine if there were any differences among groups within the predictor variables. However, these tests are not able to determine the strength and direction of differences.
For ‘How my baby grew while I was pregnant’, the only significant difference among predictor variables for any of the measures of importance was among income status between those that ranked the topic second and third most important and those that ranked it as most important (See Table 11).

Table 11. Differences in Demographic Characteristics and Rank of ‘How My Baby Grew While I Was Pregnant’ Topic

<table>
<thead>
<tr>
<th>Checklist</th>
<th>Checklist</th>
<th>Ranked</th>
<th>First Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>χ²</td>
<td>P-value</td>
<td>χ²</td>
</tr>
<tr>
<td>Non-White Race</td>
<td>0.600*</td>
<td>1.06</td>
<td>0.303</td>
</tr>
<tr>
<td>Hispanic Ethnicity</td>
<td>0.187*</td>
<td>0.16</td>
<td>0.682</td>
</tr>
<tr>
<td>Age</td>
<td>0.076*</td>
<td>3.22</td>
<td>0.199</td>
</tr>
<tr>
<td>Education</td>
<td>0.076*</td>
<td>1.57</td>
<td>0.455</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>0.300*</td>
<td></td>
<td>0.637*</td>
</tr>
<tr>
<td>Income Status</td>
<td>0.332*</td>
<td></td>
<td>0.877</td>
</tr>
<tr>
<td>Insurance Status</td>
<td>0.278*</td>
<td>0.76</td>
<td>0.680</td>
</tr>
</tbody>
</table>

Bold indicates a significant test at the p < 0.05 level.
- Was not one of the top three topics for this measure of rank.
* Fisher’s exact tests were performed where cell frequencies were less than five observations. Fisher exact tests do not provide a test statistic.

For ‘What I should NOT eat during pregnancy’ there were differences among age and insurance status between those that looked for information on this topic and those that did not.

When looking at differences among those that ranked it as a top information topic and those that did not, only income status is a significant predictor (See Table 12).

Table 12. Differences in Demographic Characteristics and rank of ‘What I Should NOT Eat during Pregnancy’ Topic

<table>
<thead>
<tr>
<th>Checklist</th>
<th>Checklist</th>
<th>Ranked</th>
<th>First Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>χ²</td>
<td>P-value</td>
<td>χ²</td>
</tr>
<tr>
<td>Non-White Race</td>
<td>0.472*</td>
<td>0.42</td>
<td>0.519</td>
</tr>
<tr>
<td>Hispanic Ethnicity</td>
<td>0.089*</td>
<td></td>
<td>0.259</td>
</tr>
<tr>
<td>Age</td>
<td>0.046*</td>
<td>0.01</td>
<td>0.993</td>
</tr>
<tr>
<td>Education</td>
<td>2.18</td>
<td>0.333</td>
<td>1.52</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>0.077*</td>
<td></td>
<td>0.293*</td>
</tr>
<tr>
<td>Income Status</td>
<td>3.38</td>
<td>0.184</td>
<td>6.22</td>
</tr>
<tr>
<td>Insurance Status</td>
<td>0.031*</td>
<td></td>
<td>0.095*</td>
</tr>
</tbody>
</table>

Bold indicates a significant test at the p < 0.05 level.
- Was not one of the top three topics for this measure of rank.
* Fisher’s exact tests were performed where cell frequencies were less than five observations. Fisher exact tests do not provide a test statistic.
For ‘How my body changed during pregnancy’ there were no significant differences among predictor variables between those that looked for the topic and those that did not (See Table 13).

**Table 13. Differences in Demographic Characteristics and Rank of ‘How My Body Changed during Pregnancy’ Topic**

<table>
<thead>
<tr>
<th>Checklist</th>
<th>Ranked</th>
<th>First Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$</td>
<td>P-value</td>
</tr>
<tr>
<td>Non-White Race</td>
<td>1.00*</td>
<td>-</td>
</tr>
<tr>
<td>Hispanic Ethnicity</td>
<td>0.413*</td>
<td>-</td>
</tr>
<tr>
<td>Age</td>
<td>0.166*</td>
<td>-</td>
</tr>
<tr>
<td>Education</td>
<td>0.46</td>
<td>0.795</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>0.145*</td>
<td>-</td>
</tr>
<tr>
<td>Income Status</td>
<td>0.54</td>
<td>0.763</td>
</tr>
<tr>
<td>Insurance Status</td>
<td>0.626*</td>
<td>-</td>
</tr>
</tbody>
</table>

Bold indicates a significant test at the $p < 0.05$ level.

* Was not one of the top three topics for this measure of rank.

* Fisher’s exact tests were performed where cell frequencies were less than five observations. Fisher exact tests do not provide a test statistic.

For ‘Complications during pregnancy’ there were significant differences in education and income status between those that simply looked for the issue and those that ranked it as important. When looking at the difference between those that ranked the topic second or third and first, income status remains significant (See Table 14).

**Table 14. Differences in Demographic Characteristics and Rank of ‘Pregnancy Complications’ Topic.**

<table>
<thead>
<tr>
<th>Checklist</th>
<th>Ranked</th>
<th>First Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$</td>
<td>P-value</td>
</tr>
<tr>
<td>Non-White Race</td>
<td>-</td>
<td>0.51</td>
</tr>
<tr>
<td>Hispanic Ethnicity</td>
<td>-</td>
<td>0.157*</td>
</tr>
<tr>
<td>Age</td>
<td>-</td>
<td>0.38</td>
</tr>
<tr>
<td>Education</td>
<td>-</td>
<td>7.95</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>-</td>
<td>2.17</td>
</tr>
<tr>
<td>Income Status</td>
<td>-</td>
<td>6.84</td>
</tr>
<tr>
<td>Insurance Status</td>
<td>-</td>
<td>0.384*</td>
</tr>
</tbody>
</table>

Bold indicates a significant test at the $p < 0.05$ level.

* Was not one of the top three topics for this measure of rank.

* Fisher’s exact tests were performed where cell frequencies were less than five observations. Fisher exact tests do not provide a test statistic.
There were no significant differences among predictor variables between those that ranked ‘Natural birth’ as being second or third most important topic and those that ranked it as being the first most important (See Table 15).

**Table 15.** Differences in Demographic Characteristics and Rank of ‘Natural Birth’ Topic.

<table>
<thead>
<tr>
<th>Checklist</th>
<th>Ranked</th>
<th>First Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$</td>
<td>P-value</td>
</tr>
<tr>
<td>Non-White Race</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hispanic Ethnicity</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Age</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Education</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Income Status</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Insurance Status</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Bold indicates a significant test at the p < 0.05 level.
- Was not one of the top three topics for this measure of rank.
* Fisher’s exact tests were performed where cell frequencies were less than five observations. Fisher exact tests do not provide a test statistic.

**Aim 2: Health Information Sources**

**Research Question 2.1**

Of 23 information sources listed, participants used an average of 9.97 sources, with a range between 4 and 18 information sources (SD 3.07). Figure 24 shows the frequency and proportion of all sources used among sample participants.

![Pregnancy and Childbirth Sources Used](image)

**Figure 24.** Pregnancy and Childbirth Information Sources Used by Frequency (N = 168)
Of participants, 2.95% (n = 5) indicated that there were other sources of information that they used during their pregnancy than were listed on the survey. Of those, one (Reddit) was explicitly listed as a source in the survey, and one (Up to date) is a characteristic of a source, rather than an information source in its own right. The remaining responses (n = 3) included scientific articles, MSDS (Material Data Safety Sheets) Sheets, and Childbirth/C-Section DVDs.

Participants ranked which sources they used most often, in order from first to third most important. Ranking of topics can be looked at in a number of ways including the overall frequency with which it was chosen as a source that was used, if it was ranked as either first, second, or third most used information source, or how often a source was ranked first most often. Figure 25 shows how all of the information sources were ranked as most often used irrespective of the rank order.

![Pregnancy and Childbirth Information Sources Ranked](image)

**Figure 25.** Pregnancy and Childbirth Information Sources Ranked as ‘Used Most Often’ Irrespective of Rank Order (N=168)

Figure 26 shows all of the information sources ranked as the most often used.
Figure 26. Pregnancy and Childbirth Information Sources Ranked as Number One ‘Most Often Used’ (N = 168)

Figure 27 shows a comparison between the top three sources by each measure. If we look at the frequency at which an information source was utilized, ‘Pregnancy and childbirth websites’ was chosen most often (N = 155), followed by ‘Mobile applications’ (N = 143), and ‘Doctors’ (N = 143). If one looks at information sources that were ranked as most important, irrespective of the order of the rank, ‘Doctors’ were ranked most frequently (N = 106), followed by ‘Pregnancy and childbirth Books’ (N = 58), and then ‘Mobile applications’ (N = 55). Finally, if one looks at those information sources that were ranked as the as the most used (number one), ‘Doctors’ remain most frequent (N = 57), followed by ‘Mobile applications’ (N = 18), and then ‘Midwives’ (N = 33).
‘Mobile applications’ and ‘Doctors’ were the only information sources that remained consistent across all three measures of most often used, though their positioning did change. ‘Pregnancy and childbirth websites’ was frequently checked information source across the entire sample, it does not remain among the other two measures of rank. Further, ‘Pregnancy and childbirth books’ and ‘Midwives’ only appear in one measure of rank.

**Research Question 2.2**

Participants were asked to rate how valuable they perceived each information source to be on a five-point Likert scale from ‘not valuable at all’ to ‘most valuable’. Participants rated all information sources, regardless of whether or not they indicated that they had used that source during their pregnancy. Table 16 shows how each information source was rated for value. The mean (4.09, SD 1.00) rating for doctors was the highest rating of all information sources, indicating that overall it was ‘very valuable’.

---

*Figure 27. Comparison of Measures of Most Often Used by Information Source (N=168)*
Other top valued information sources include childbirth education classes (3.76, SD 1.05), Midwives (3.62, SD 1.26), general medical websites (for example, WebMD) (3.62, SD 1.05), and pregnancy and childbirth-related books (3.35, SD 0.87). The lowest valued source was other social media (Twitter, Instagram, etc.). The mean rating for this source was 1.58 (SD 0.76), indicating that it was not valuable at all. Other sources that were not highly valued included Facebook (1.73, SD 0.77), information from the insurance company (1.97, SD 1.02), pregnancy and childbirth microblogs (1.99, SD 0.87), and search engines such as Google, Bing, Yahoo (1.99, SD 0.96). A table showing the proportion breakdown of value answer choices may be found in Appendix E.

Table 16. Information Source Mean Rated Value (N = 168)

<table>
<thead>
<tr>
<th>Information Source Mean Rated Value</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor(s)</td>
<td>4.09 (1.00)</td>
</tr>
<tr>
<td>Childbirth Education Classes</td>
<td>3.76 (1.05)</td>
</tr>
<tr>
<td>Midwife(s)</td>
<td>3.62 (1.26)</td>
</tr>
<tr>
<td>General Medical Websites</td>
<td>3.62 (1.05)</td>
</tr>
<tr>
<td>Books</td>
<td>3.35 (0.87)</td>
</tr>
<tr>
<td>Discussion Forums, Chat Rooms, Listservs</td>
<td>3.24 (1.05)</td>
</tr>
<tr>
<td>State of Federal Agency Websites</td>
<td>3.18 (0.81)</td>
</tr>
<tr>
<td>Social News Sites</td>
<td>3.15 (0.92)</td>
</tr>
<tr>
<td>Doula(s)</td>
<td>3.12 (1.37)</td>
</tr>
<tr>
<td>Friends</td>
<td>2.99 (0.83)</td>
</tr>
<tr>
<td>Nurse(s)</td>
<td>2.95 (1.02)</td>
</tr>
<tr>
<td>Pregnancy and Childbirth Websites</td>
<td>2.86 (0.88)</td>
</tr>
<tr>
<td>Mobile Applications</td>
<td>2.61 (1.00)</td>
</tr>
<tr>
<td>Online Video Sites</td>
<td>2.52 (0.81)</td>
</tr>
<tr>
<td>Mass Media (TV, Radio, Newspapers, Magazines)</td>
<td>2.41 (0.87)</td>
</tr>
<tr>
<td>Pregnancy or Childbirth Personal Blogs</td>
<td>2.30 (0.91)</td>
</tr>
<tr>
<td>Family</td>
<td>2.08 (0.83)</td>
</tr>
<tr>
<td>Employer</td>
<td>2.08 (0.88)</td>
</tr>
<tr>
<td>Search Engines</td>
<td>1.99 (0.96)</td>
</tr>
<tr>
<td>Pregnancy or Childbirth Microblogs</td>
<td>1.99 (0.87)</td>
</tr>
<tr>
<td>Insurance Company</td>
<td>1.97 (1.02)</td>
</tr>
<tr>
<td>Facebook</td>
<td>1.73 (0.77)</td>
</tr>
<tr>
<td>Other Social Media</td>
<td>1.58 (0.76)</td>
</tr>
</tbody>
</table>
**Research Question 2.3**

Each predictor variable was examined with the outcome variable for the measure each measure of ‘most often used’ information source. For the checklist measure, differences were examined between those whom used an information source, and those whom did not. For the ranked measure, differences were examined between those who chose to rank the information source as one of the top three most often used, and those who only checked it as an information source they used but did not rank it. Finally, for the first rank measure, differences were tested between those whom ranked the information source but did not rank it as the most often used and those that did. Significant associations between each of the top three outcome variables by each of the rank measures and predictor variables are presented in Tables 17 to 21.

When looking at pregnancy and childbirth websites, there were no significant differences among predictor variables between those that used the information source and those that did not. Between those that used the source but did not rank it and those that did, only income status was significant. Between those that ranked pregnancy and childbirth websites as being either second or third most often used and the most often used source, only insurance status was significantly different (See Table 17).

**Table 17. Differences in Demographic Characteristics and ‘Pregnancy and Childbirth Websites’ Information Sources Used Most Often**

<table>
<thead>
<tr>
<th></th>
<th>Checklist</th>
<th>Ranked</th>
<th>First Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$</td>
<td>P-value</td>
<td>$\chi^2$</td>
</tr>
<tr>
<td>Non-White Race</td>
<td>0.391*</td>
<td>0.33</td>
<td>0.563</td>
</tr>
<tr>
<td>Hispanic Ethnicity</td>
<td>0.624*</td>
<td></td>
<td>1.123*</td>
</tr>
<tr>
<td>Age</td>
<td>0.563*</td>
<td>1.60</td>
<td>0.449</td>
</tr>
<tr>
<td>Education</td>
<td>0.155*</td>
<td>0.05</td>
<td>0.975</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>0.391*</td>
<td></td>
<td>0.787*</td>
</tr>
<tr>
<td>Income Status</td>
<td>0.331*</td>
<td>9.77</td>
<td>0.007</td>
</tr>
<tr>
<td>Insurance Status</td>
<td>0.078*</td>
<td>0.320*</td>
<td></td>
</tr>
</tbody>
</table>

Bold indicates a significant test at the $p < 0.05$ level.
- Was not one of the top three topics for this measure of rank.
* Fisher’s exact tests were performed where cell frequencies were less than five observations. Fisher exact tests do not provide a test statistic.
For pregnancy and childbirth mobile applications, there were no differences among those that used the source and those that did not. There were no differences among those that used the source but did not rank it as being among the top three most often used, and those that did. Only Non-White race was significantly different between those that ranked mobile applications as being the most frequently used information source and those that listed it as being used second or third most often (See Table 18).

**Table 18. Differences in Demographic Characteristics and ‘Pregnancy and Childbirth Mobile Application’ Information Sources Used Most Often**

<table>
<thead>
<tr>
<th></th>
<th>Checklist</th>
<th></th>
<th>Ranked</th>
<th></th>
<th>First Rank</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>χ²</td>
<td>P-value</td>
<td>χ²</td>
<td>P-value</td>
<td>χ²</td>
<td>P-value</td>
</tr>
<tr>
<td>Non-White Race</td>
<td>0.533*</td>
<td>0.05</td>
<td>0.822</td>
<td>0.401*</td>
<td>0.040*</td>
<td></td>
</tr>
<tr>
<td>Hispanic Ethnicity</td>
<td>1.00*</td>
<td>0.61</td>
<td>0.434</td>
<td>0.348*</td>
<td>0.84</td>
<td>0.642</td>
</tr>
<tr>
<td>Age</td>
<td>1.71</td>
<td>0.426</td>
<td>2.32</td>
<td>0.314</td>
<td>0.91</td>
<td>0.635</td>
</tr>
<tr>
<td>Education</td>
<td>0.07</td>
<td>0.996</td>
<td>0.61</td>
<td>0.735</td>
<td>0.91</td>
<td>0.635</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>0.345*</td>
<td>0.06</td>
<td>0.80</td>
<td>1.00*</td>
<td>1.00*</td>
<td></td>
</tr>
<tr>
<td>Income Status</td>
<td>1.27</td>
<td>0.529</td>
<td>0.37</td>
<td>0.831</td>
<td>2.85</td>
<td>0.240</td>
</tr>
<tr>
<td>Insurance Status</td>
<td>0.348*</td>
<td>0.84</td>
<td>0.642</td>
<td>0.725*</td>
<td>0.725*</td>
<td></td>
</tr>
</tbody>
</table>

Bold indicates a significant test at the p < 0.05 level.
- Was not one of the top three topics for this measure of rank.
* Fisher’s exact tests were performed where cell frequencies were less than five observations. Fisher exact tests do not provide a test statistic.

When looking at doctors as an information source, the only significant predictor between those that used them and those that did not was insurance status. Both non-white race and Hispanic ethnicity were significant predictors of whether someone who used a doctor as an information source ranked it as being one of the top three most often used sources. When looking at differences between those that ranked doctors as their second and third most often used information source and those that ranked them as first, age was significantly different (See Table 19).
Table 19. Differences in Demographic Characteristics and ‘Doctor(s)’ Information Sources Used Most Often

<table>
<thead>
<tr>
<th>Checklist</th>
<th>Ranked</th>
<th>First Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$</td>
<td>P-value</td>
</tr>
<tr>
<td>Non-White Race</td>
<td>0.209*</td>
<td>4.36</td>
</tr>
<tr>
<td>Hispanic Ethnicity</td>
<td>1.00*</td>
<td>5.13</td>
</tr>
<tr>
<td>Age</td>
<td>1.17</td>
<td>0.555</td>
</tr>
<tr>
<td>Education</td>
<td>3.92</td>
<td>0.141</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>0.535*</td>
<td>0.819*</td>
</tr>
<tr>
<td>Income Status</td>
<td>1.16</td>
<td>0.559</td>
</tr>
<tr>
<td>Insurance Status</td>
<td>0.0005*</td>
<td>5.92</td>
</tr>
</tbody>
</table>

Bold indicates a significant test at the p < 0.05 level.
* Was not one of the top three topics for this measure of rank.
* Fisher’s exact tests were performed where cell frequencies were less than five observations. Fisher exact tests do not provide a test statistic.

When looking at differences between those that used books but did not rank them as being the most frequently used and those that did, non-white race and income status were significantly different (See Table 20).

Table 20. Differences in Demographic Characteristics and ‘Books’ Information Sources Used Most

<table>
<thead>
<tr>
<th>Checklist</th>
<th>Ranked</th>
<th>First Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$</td>
<td>P-value</td>
</tr>
<tr>
<td>Non-White Race</td>
<td>-</td>
<td>14.05</td>
</tr>
<tr>
<td>Hispanic Ethnicity</td>
<td>-</td>
<td>0.21</td>
</tr>
<tr>
<td>Age</td>
<td>-</td>
<td>2.66</td>
</tr>
<tr>
<td>Education</td>
<td>-</td>
<td>3.88</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>-</td>
<td>0.814*</td>
</tr>
<tr>
<td>Income Status</td>
<td>-</td>
<td>7.26</td>
</tr>
<tr>
<td>Insurance Status</td>
<td>-</td>
<td>1.05</td>
</tr>
</tbody>
</table>

Bold indicates a significant test at the p < 0.05 level.
* Was not one of the top three topics for this measure of rank.
* Fisher’s exact tests were performed where cell frequencies were less than five observations. Fisher exact tests do not provide a test statistic.

Finally, there were no significant differences among predictor variables between those that ranked midwives as their second or third most used information source and those that ranked them as the most often used source of information (See Table 21).
Table 21. Differences in Demographic Characteristics and ‘Midwife(s)’ Information Sources Used Most Often

<table>
<thead>
<tr>
<th>Category</th>
<th>Checklist</th>
<th>Ranked</th>
<th>First Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>P-value</td>
<td>χ²</td>
</tr>
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<tr>
<td>Insurance Status</td>
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<td>-</td>
<td>0.831*</td>
</tr>
</tbody>
</table>

Bold indicates a significant test at the p < 0.05 level.
- Was not one of the top three topics for this measure of rank.
* Fisher’s exact tests were performed where cell frequencies were less than five observations. Fisher exact tests do not provide a test statistic.

Phase II: Qualitative Analysis

The qualitative analysis for Phase II comprised of three separate research questions under two research aims to examine the interview data.

Description of Sample

Of women who completed the online survey, N = 79 agreed to be contacted regarding participation in the second phase of the study, of which N = 37 women were initially contacted for interviews. The final analytic sample from the in-depth individual interviews comprised N = 26 women. Demographic characteristics (Figures 28-35) reveal the majority of the sample was non-Hispanic, White, between the ages of 27 and 34, were married, and had employment-based insurance coverage. In addition, most participants had at least a 4-year college degree or higher, and had an annual household income $37,001- $98,200
Figure 28. Description of Interview Participants Age (N = 26)

Figure 29. Description of Interview Participants Hispanic Ethnicity (N = 26)
Figure 30. Description of Interview Participants Race (N = 26)

Figure 31. Description of Interview Participants Educational Level (N = 26)
Figure 32. Description of Interview Participants Insurance Status (N = 26)

- Medicaid: 15%
- Employment-based Insurance: 62%
- Paid Cash: 23%

Figure 33. Description of Interview Participants Relationship Status (N = 26)

- Unmarried: 19%
- Married: 81%
**Figure 34.** Description of Interview Participants Income Status (N = 26)

**Figure 35.** Description of Interview Participants Time since Childbirth (N = 26)
Aim 1: Health Topics

Research Question 1.1

Participants in this sample gave many reasons why topics of information that they sought were important (salient) to them. However, there were four clear themes that emerged from the data: ‘Am I normal? When should I escalate?’; ‘Curiosity and fun’; ‘Avoiding poor outcomes and achieving goals’; and ‘Pre-existing conditions and medical changes’.

Am I Normal? When Should I Escalate?

The most commonly discussed theme (N = 13) surrounding the motivation for information seeking was that of trying to determine if particular types of pregnancy symptoms or the level at which they were being experienced was ‘normal’. Not all women experience the same symptoms during pregnancy. Further, because these were women who were pregnant for the first-time, many did not have previous experience to rely on to understand if their experiences were in line with what was to be expected.

“You look to see what is happening with your body, which in the same time you know what’s going on with your baby. So, any little weird thing that happens to you throughout the day you have a tendency to look up to see what’s going on.” (Participant 22)

“I think when you have a topic like morning sickness, I think that’s something that I look up because you know, this is my first child and my first pregnancy. I was pretty sick in the beginning and it’s totally bad. So you kind of like trying to find out information about it
to first of all make sure that it’s normal, but also I think it is trying to see if other people felt the same way.” – (Participant 6)

Further, participants gaged their experiences against others in order to determine whether or not they should escalate questions to a health care provider or potentially seek out medical attention.

“…any little sore, anything I had, I thought something was wrong. Before I could rush to the hospital, I kind of try to figure out if it was a normal thing to feel. My feet would swell and apparently that was normal according to everybody, everybody that’s a mom. So, I would always just wonder.” – (Participant 9)

“It’s just something that like, ‘There are the symptoms of that.’ Okay. For example, heartburn – which I never had, but I’m just saying thought that I’ll be like. If I was experiencing heartburn, ‘Okay. Should I call the doctor? Is this something that I need to rush to the ER about or is this a normal type of thing?’” – (Participant 11)

Curiosity and Fun

The second most common reason (N = 12) that information topics were salient to participants was because pregnancy was a new and exciting experience. Many were curious about what was happening, particularly with respect to how their babies were developing. For participants, even though there were many unknowns surrounding what was taking place, it was a fun and exciting time in their lives.
“I think that I was more interested in finding out about what my baby was doing. Just because that was the most exciting thing about the pregnancy as it’s my first baby and it’s my first pregnancy and really I was just curious on what we’re talking, obviously. I knew my body was changing but I was really just more interested in her, what she was doing this week – did she grow eyes out this week, did she discover herself, what was she doing? And really because it made the pregnancy fun, I guess.” - (Participant 4)

“The growth part was the most important because that was what’s going on, on a daily basis. It was both beneficial in part, like learning. And it was also just very interesting and kind of exciting to learn about, so that’s definitely what captured my attention the most and held it the longest.” - (Participant 21)

Avoiding Poor Outcomes, Achieving Goals

The next most salient reason (N = 8) for seeking out information topics was to avoid poor health outcomes and achieve maternity related goals. Though these seem to be contradictory concepts, participants saw them as being two sides of the same coin. Throughout the interviews, women discussed that they understood the complicated and unpredictable nature of pregnancy and childbirth. However, to avoid poor health outcomes (such as pre-term birth) or to achieve pregnancy or birth-related goals (such as an un-medicated labor), they wanted to do those things (either specific health behaviors or just overall knowledge) that were in their power that might affect those outcomes.

“I was really concerned about that [weight gain]. I wanted to have a healthy pregnancy, I wanted to have a healthy baby, and I knew that my weight during pregnancy would
affect both of those things….I just made sure that I was always just seeing what I should be eating, where I should be at. Just to stay healthy, mostly.” (Participant 4)

“Oh, that’s just because I don’t want to eat anything that’s going to be harmful to the baby, and like so much salty things like hotdogs and things like that. I mean, mostly what’s going to- I don’t remember the term for that harmful bacteria, I think it was salmonella…and that will be in meat and hotdogs and things of that nature. The appropriate cook times and things to make sure that it’s not harmful to the baby, because I didn’t want to be anything…I don’t want to be the cause of any malnourishment or any kind of defects because of something I eat, you know?” - (Participant 14)

“While I was listening to things that the doctor was saying, I got a funny feeling that I didn’t really necessarily want to do a typical, hospital birth and be hooked to everything and be given medication. That’s why I started doing research on it to find out the pros and cons of using medication and not using medication.” - (Participant 16)

“I really wanted to try for an un-medicated birth. I really wanted to, like I said, stay health through my pregnancy. I was interested in being aware of how to avoid interventions during birth and stuffs like that.” - (Participant 4)

Pre-existing Medical Condition

The final major theme regarding why topics were salient to participants was due to either pre-existing medical condition or one that developed suddenly developed during pregnancy (N =
8). Some participants (N = 6) had prior chronic health conditions that they were concerned would be affected by their pregnancy or would affect the health of their children. These concerns primarily revolved around taking medication for chronic health issues such as high blood pressure, anxiety and depression, severe seasonal allergies, or to prevent transmission of an inheritable condition.

“I have a medical condition and in order not to pass it down to my daughter I have to be on medication. So, it was important for me to know what type I should take and I also have high blood pressure and I found out during pregnancy that I shouldn’t take the high blood pressure medicine because it could harm my baby. So, being someone who takes the medicine every day, it was kind of important for me to make sure I could still keep myself healthy and ensure that should would be born healthy as well.” - (Participant 7)

“I was taking a daily medication whenever I found out I was pregnant because we were not trying to become pregnant. I was taking a birth control as well as an anxiety medication and was very concerned about any effects that it would have, having conceived on those medications. And also researching the pros and cons of staying on anxiety medication versus just cutting it out completely for the length of the pregnancy. So, I think that was my top one because it was the one that caused me the most anxiety [Laughter].” - (Participant 24)

In addition to pre-existing medical concerns, a few participants (N = 2) experienced a change in their pregnancies that caused a sudden change in their information seeking. One
participant learned late in her pregnancy that her child was diagnosed with a congenital anomaly and another had irregular bloodwork. Both of these participants recalled that prior to this change in their pregnancy, these issues had not been a concern, and that other information topics had taken precedence.

Aim 2: Health Information Sources

Research Question 2.1

Participants in this sample gave many reasons why they used certain information sources more than others. However, there were five clear themes that emerged from the data: ‘Lived experiences of other women’; ‘Ease of access’, ‘Applicability to one’s personal circumstances’, ‘Professional expertise’, and ‘Anticipatory guidance’.

Lived Experiences of Other Women

Two themes were equally as common among participants. First, one reason (N = 17) given for using information resources was to learn the lived experiences of other women who were currently or recently pregnant. Participants sought this information from friends and family, online discussion forums, social media groups, and mobile applications. For participants, pregnancy and childbirth was a situation that few had any real experience with. Therefore, they relied on other women to really ‘tell them like it was’. They wanted to know what pregnancy symptoms were like, how they managed them, what could be expected to happen, and how others made decisions. For some, they wanted to hear the range of experiences or decisions that were possible.

“It was interesting to me to hear what certain people went through, like personally as opposed to the scientific version of it. The friend I was talking to, she could....and I know
I wasn’t going to be the same as her necessarily, but she could give me like a more, I guess, layman’s terms version of what she went through. [Laughter]. And like stuff to look out for, and stuff they warn you about, but really it’s not that bad, and it doesn’t hurt that much…just simple stuff like that.”- (Participant 8)

“Even though you don’t know necessarily who’s responding in those forums, it’s good to see you get lots of different answers from all the other people that have been pregnant before and see, ‘Okay, yes that’s a normal thing’ and ‘That’s not a normal thing’. So I did use forums a lot. I tried using those Bump app and they had a forum for August – the ones that were giving birth in August- that was good that I was into it. And that was a good point where people would go and ask questions, ‘This is happening to me, what happened with you guys?’ or ‘What are you doing about this?’ and that was good that you know what people were saying.”- (Participant 16)

“Then I have a friend who was pregnant at the same time I was and then she just had a baby. Been there before, so now she has two kids. Seeing as though she just went through a process of a pregnancy and she was going through it a second time, I trusted her advice so, - what I should do about whatever issue I was having at the moment: backaches, swollen feet, whatever. [Laughter]”- (Participant 7)

Whereas, belief in the value of the lived experiences of others was common, not all participants felt the same. Some participants felt that listening to other women’s experiences without receiving actionable steps was a waste of time. Whereas other participants felt that
comparing one’s own experiences to another’s was not constructive and could possibly have negative emotional outcomes.

“I think that sometimes if it seems like it’s subjective, then I don’t feel like it’s valuable. If it’s subjective, I don’t feel like there’s a lot of value in it. So that’s why I didn’t really care for a lot of the pregnancy blogs. I mean, if they were informative things like, ‘Hey, this is what you need to be checking on right now, or at this point if you’re going back to work, you might want to research daycares or these are the kinds of questions and things that you’d want to look for in a daycare.’ That type of stuff is what’s important to men but anything that was just like, ‘Oh my gosh, I can’t ever get any sleep and I’ve not been able to take a shower for five days and my life is totally, completely changed.’ I just feel like those were negatively impactful and not helpful for someone to read.” - (Participant 1)

“I really wasn’t interested in trying to like watching – like comparing to other women. So really looking at some of their experiences, and go look at an example of how much weight they were gaining or something that can make you feel good or bad about how your pregnancy was going. So, I mean, personal stories, I guess was information I wasn’t really interested in.” - (Participant 2)

Ease of Access

The other most common reason (N = 17) for using particular information sources was related to their ease of access when gathering information. First, participants wanted to be able
to find information instantly whenever a need arose, or ‘popped into their heads.’ Many participants discussed this in relation to making appropriate food choices. When out in a public situation, such as a restaurant, participants wanted to be able to instantly find out if a food or drink item was safe to be consumed. Participants often discussed utilizing pregnancy and childbirth mobile applications or internet search engines (often on their mobile phones) for this purpose.

“I had a couple of apps on my phone that I would track the pregnancy week by week and it had different pointers and helpful information that would be easy to access. So it was right on my fingertips if something came across my mind that I was concerned about it, I could just go right on the app.” - (Participant 13)

“So I think mostly it has to do with stuff that I was experiencing or stuff – I found myself looking for information specifically like almost right on the spot for stuff that I wanted to do like right then, like, ‘Can I eat this cheese?’ Life if you would be in front of me and I’d be like, ‘Can I eat this?’ ‘I don’t know. Let me ask Dr. Google?’. Or text my cousin or something like that.” - (Participant 6)

In addition, participants recognized health care providers as being open to answering questions, doing so promptly, and going to additional lengths for the patient when an answer wasn’t immediately available.
“The nurses at my doctor’s office. I called several times about my pregnancy questions and just always from the answers that they gave me back and knew that if they didn’t have the answers, that they would call me back. I mean, they call me back very quickly, very promptly after seeking out the right resources to answer my question. I just felt that they touched all bases whenever they were looking for answers.” - (Participant 10)

“Then also for the doctor, being able to call her and get an appointment when I necessarily didn’t have one.” - (Participant 2)

Two participants discussed having either a doula or a midwife that they could contact directly through email, text message, or phone.

“You can also email or call her anytime in between [prenatal visits] or if you have any questions. So that was helpful for me. You had a thought pop into your head, you can give her a call.” - (Participant 22)

Several participants discussed the fact that they would use an online or mobile application information source to get information quickly, and then follow-up with a health care provider if they were still not able to find enough information or if they wanted to verify the information that they found.

“I mean, I only went to the actual doctor’s office every month or so, and then every two weeks or whatever. But if I ever had a question, I could just Google it, and find out then.
And if I didn’t get the answer I was looking for, I then could ask them. So they’re kind of a good back-up, to have a person-to-person answer.” - (Participant 8)

“Well, because those [internet sources] are available 24/7, so anytime I will be up with a question or something, I would go with Google and look it up online and then double-check with my doctors, because my doctor is extremely hands-on with me. Any time I needed anything, I just send her an email and she responded.” - (Participant 7)

Applicability to One’s Personal Circumstances

Another major theme (N = 12) among participants for why they used some information sources more frequently than others was how applicable an information source was to their personal circumstances. For some participants, applicable advice and information came as a result of a personal relationship with an interpersonal information source such as a health care provider or friend and family members. Health care providers, in this respect, tailor information to meet participant’s personal medical needs.

“Then of course, my doctor, I trust her with knowing my personal case so that was a more personalized information to specifically what was going on with me.” - (Participant 2)

“For example, childbirth class, I knew that they were giving information that would likely apply in my case when I went into birth. You can read about how they do things in the UK, but that’s not going to be relevant here. Even if it ended up that it would be
relevant in the US, that's not my hospital and those are the nurses who are going to be treating me during my birth and everything like that.” - (Participant 4)

Professional Expertise

Participants (N = 10) in this study also used health care providers because of their professional expertise and experience. Participants recognized that doctors have specialized training that enabled them to provide a ‘definitive’ answer. Indeed, many participants discussed using their health care provider as the ‘second opinion’ for information that was found elsewhere.

“My doctors and nurses? I used them first and foremost because I felt like they were going to give me the best, most straightforward information or direct resources for places to go to look for my questions – or my answers to my questions.” - (Participant 1)

“Then, doctors, because I mean, you see that they know what they’re doing and when they’re talking about stuff so when I was going to the check-ups, I always talk to them to make sure that things are going well and everything is on point.” - (Participant 14)

“Especially the doctors and nurses- they were most closely involved in the process. They have seen it all. Like you said, they see thousands of patients.” - (Participant 19)

“My doctors were valuable because that’s their job. They should know what’s going on.” - (Participants 17)
Sometimes, both reliance on a health care provider’s expertise overlapped with trust gained through a personal relationship. For example, one participant’s midwife was also a friend:

“First, I went to the doctor and midwife because I thought that they had a lot of knowledge about it, experience. They’re professionals that I trusted, because at least the midwife is not only a professional, but she’s also a friend that I’ve known for years. So, she inspired a lot of trust and I knew that she wasn’t going to tell me anything that wasn’t right. The doctor, as I got to know him, I felt the same way. So, I chose those two sources first because of that.” - (Participant 20)

Anticipatory Guidance

The final major theme related to the reasons that participants used information sources was that of anticipatory guidance. Participants wanted information sources that could provide preparation for an anticipated development, situation, or health state as well as information that would be necessary to them in order to navigate those events. Further, participants were able to return this help to other women in their turn.

“I have two friends that were due two and a half months before me and so they were ahead of men in the pregnancy. So I’m like, ‘Okay. What’s going to happen next?’ and ‘What can I expect?’ That was really helpful. At the same time, I had a friend that was a month behind me that was due – she actually had a baby five weeks after I did, so I passed on information that way. So it’s kind of a comfortable easy source to access.” - (Participant 10)
“I had downloaded a couple of apps that I really liked....Because they just kind of outlined what was going on with how the baby was growing, what my body should be experiencing. So it’s kind of good for me, nice for me to kind of anticipate like, ‘Okay. This is going to happen. This might happen this coming trimester or next month. This is what’s going on with the baby at this point.’ They did have like different trackers so you could track your – like what was going on, how hard the belly was, it’ll kick or stuff like that.” - (Participant 11)

**Research Question 2.2**

Participants had many different reasons that they valued information sources. Indeed, different information sources were valued for different reasons. As discussed above, some information sources (such as online discussion forums and blogs) were valued because they provide an understanding of an experience, whereas others (such as health care providers) were valued for their medical knowledge. Though there were different understandings of ‘value’, they did not necessarily compete with each other, but worked parallel to each other. One could value an information source that provided lived experience at the same time that they valued an information that provided medical information. Participants valued information sources for the reasons they sought them in the first place, as with ease of access or anticipatory guidance. However, when asked what value in an information source meant to them, participants noted other characteristics. These themes included being straightforward (N = 8), providing links to other valuable information sources (N = 7), having up-to-date information (N = 6), were evidence or research-based (N = 5), or provided alternative points of view (N = 4).
Straightforward

Straightforwardness was admired in health care providers who came right out and said what should be done or what to expect.

“Well I thought the benefit of going to them [doctors] as opposed to sifting through information on the web, it can be one of those things where you’re sucked into a black hole and then you just get inundated with a lot of different scenarios or different things and it might either not answer your question or it may be something that you would just go down that path that it’s like, ‘This is not where your problem is.’” - (Participant 1)

“To have someone that’s going to be honest about possible outcomes that could happen. ‘This is what might happen.’ One thing that – was my midwife I remember I did gain a decent amount of weight and she was like, ‘Okay. You’re getting towards the high end. If you don’t watch what you eat, you very well could at the very end up being too big to do a home birth. You could get too tired or it could cause complications. If you don’t want to watch what you’re eating, that’s fine. I can’t make you. But this is what could happen. So just try and do a bit more exercise and watch what you eat.’ So, I was good in terms of trust because she wasn’t telling me what I wanted to hear. She told me what I needed to hear.” - (Participant 22)

Linking to Other Sources

Some information sources that may not have been used as often as others, were still helpful in linking participants to other sources that they used much more frequently. Most often, search engines were cited as a linking source (though not highly ranked). However, on one
occasion, the participant noted that her health care provider linked her to an online discussion forum to connect with other pregnant or recently delivered mothers.

“Even though I used Google, it brought me straight to either those blogs or those pregnancy sites primarily.” - (Participant 5)

“Google was like my best friend throughout my pregnancy. Yes, I pretty much googled most of everything. And then from Google, I’ll find pages and then if I like the page, then I would continue going through those specific pages.” - (Participant 9)

“Basically, if I have a question or concern, then I have information or I have a source that can answer that information and that’s valuable to me, or if it would lead me into the proper, correct answer, then that would be, to me, valuable.” - (Participant 14)

Current Information

Participants also noted that they wanted their information sources (both health care providers and online sources) to have current information. However, very few participants noted what ‘up-to-date’ information was.

“So, the highest value would be the most useful to me, which one has the most information and the most current information.” - (Participant 24)

“I think something that was up-to-date, I consider more valuable. So like, even if I was Googling a question or something, it’s the article or the responses had – were dated
within the last year or two, that was a lot more valuable to me than something that was posted or responded to back in like 2007.” - (Participant 21)

“I think that there are so many changes that happen on an ongoing basis. I would like to think that my doctor is staying up on studies that are published and what they’re reporting is stuff that’s timely just because the nature of what they’re doing and their jobs, things are ever changing. I think that it is important.” - (Participant 1)

**Research-based**

Participants noted that they also valued ‘research-based’ or ‘medically accurate’ informational content.

“If you don’t have a citation for it, I don’t believe you.” - (Participant 13)

“They [Facebook Group] talk about a lot of different topics and it’s a lot of different moms – and it’s some people that I know and a lot of people that I don’t know – and I like read their opinions on certain topics, but I might not trust it as much as if I saw what the actual recommendation from the World Health Organization or something, the American Academy of Pediatrics.” - (Participant 6)

“And with the pregnancy books, too. I felt like a few of the book that I’ve read did give a long list of their sources and where they had researched and how they had gotten all the information. I felt like I could trust the books that I looked at as well. (Participant 3)”
However, participants often could not fully articulate what that meant. For some participants name recognition of some organizations was important. For others, they recognized ‘research-based’ or ‘medically accurate’ information if the source cited other sources, was authored by someone with a medical degree, or referred to scientific studies:

“Participant 16: When I read an article or something, I wanted to make sure that there were reputable sources, it wasn’t just their opinion?

Interviewer: So what makes a source reputable to you?

Participant 16: It’s just having studies done, being able to tell that it wasn’t just maybe a – I don’t know, I’m not very good at saying what I mean. I just wanted to make sure that they have a lot of background information.”

Perspectives and Philosophies

Participants also valued the ability to access a variety of information that had different perspectives on a number of pregnancy and childbirth-related issues. For example, some women wanted to hear different opinions related to issues such as natural birth. Others, had specific philosophy related to the maternity experience, and sought out information sources that aligned with those perspectives.

“I think different perspectives, so I don’t know, maybe birthing at home as an example. Like, ‘These are the pros and these are the cons.’ So it’s a pretty objective perspective on whatever topic you’re researching. I find a lot of value in that, so you’re free to make your own decision, it’s not really leaning one way or the other.” - (Participant 2)
“Because my childbirth education classes were presented in the hospital I was going to deliver at, but also just what the philosophy I had. And the thing is I wanted to achieve in during my birth and during my pregnancy is the source of information I was seeking would match that philosophy. I would find it more valuable than if it was just something else.” - (Participant 4)

Trustworthiness

Another theme that was salient when asking about what made information sources valuable, was being able to trust them (N = 7). After being asked about valuable characteristics of an information source, all participants were asked what made an information source trustworthy to them. Interestingly, it appeared as if there were parallel types of trust. Participants trusted (N = 10) in the information and actions of their health care providers or other established medical information sources.

“I fully trust my doctor and so decided not to pursue [a labor and delivery class] and he knew what I wanted, my doctor knew what I wanted. So I really didn’t pursue any other ways.” - (Participant 10)

“Then of course my doctor, I trust her with knowing my personal case so that was just a more personalized information to specifically what was going on with me.” - (Participant 2)
Participants also trusted in others’ experiences as pregnant women or mothers (N = 8). These two themes were not mutually exclusive, with participants seeing them as complimentary to each other.

“…My mom, she’s my go-to source for almost everything. [Laughter]. So it was only natural that, you know, she birthed three kids. So I’d ask her like, ‘Okay. Mom. What do I do? What’s going on? Blah, blah, blah.’ So, my mom, and then I have an older brother whose wife gave birth about a year ago. She was my other go-to person…. So between those two people, they kind of provided me with the information. I felt like I could trust them more because they’re my family and, of course, because they’ve done this from personal experience.”- (Participant 11)

However, not all participants trusted in or found value in the experiences of others.

“…Like the personal blogs, the Facebook stuff, so like social media things and again, personal experiences. Yes, I trust that that was their personal experience. Because I know that my personal experience would be really different and I don’t necessarily want to go down that road.”- (Participant 2)

Even for participants who found value in another’s personal lived experience, this was tempered with an understanding that it was one person’s experience, and their own experience may be vastly different. Several participants often referred to reading these experiences with ‘a grain of salt’.
“If it’s just this person’s personal experience, you could see a lot of the times, online I would read a blog or read whatever post and it would be someone’s personal experience. Which might be interesting for me, but I’m going to take that with a grain of salt, because that’s either their personal experience or that’s just their viewpoint on a topic, and I don’t know how much of an expert they are on the topic.”- (Participant 3)

There were two characteristics that added to a participant’s ability to trust a source of information (either medical or personal). First, was objectivity in the presentation (N = 3). Participants wanted to understand both sides of an issue, or at the very least, have the bias in an information source be freely acknowledged.

“I think that again, it’s important to see that or be able to read that, ‘Here are things that are presented objectively, here are things that show and also present a spectrum of here to here.’”- (Participant 1)

“For me, a lot of it is about where they’re getting this information from, are they looking at all sides of the matter, a lot of – I’m a pharmacist, so I come from a scientific background as well, so a lot of it is like, ‘Are they gathering these and showing all the sides of the story?’”- (Participant 3)

“So I guess I’d like to have information that will present the case for both sides, if you’re trying to make a decision, ‘Here are the pros, here are the cons. You make your decision.’....Yes, and again like everyone – just being totally objective is really hard so
just making it very clear that you probably are biased so here’s this slightly biased information for you to make your decision on.” -(Participant 2)

Further, they measured trustworthiness by how consistent information was across multiple sources of information (N = 7).

“Accurate, consistent – basically. I mean, if something is trustworthy, they’re consistent with their responses and their answers…. I can ask or look to any other source and it would say the same thing.” -(Participant 14)

“I think for me, personally, it comes to consistency. If you post a question, say for instance on this forum, and how people respond to it, 95% of them say one thing and then 5% say the other. In my opinion it makes me think, okay, 95 out of 100 people say that’s normal then it makes me feel like, ‘Okay. You know what, it is normal.’ Or if it matches up with an article that I have read – so consistency and hearing information more than once or from more than one source.” -(Participant 21)

Participants trusted different information sources for different reasons and evaluated that information with respect to the source it came from and how it applied to their personal circumstances. Participants discussed how they had a hierarchy of trust, and how they evaluated the credibility of the content.

“I know on the list is says something about social media. I don’t really go to social media for my information because I just feel it’s a bunch of people who probably don’t know
any more than I do giving their opinion. And I’d rather have what has been tested and what is known for sure. So, I’ll go straight either to medical websites from my doctor, or like I said before, my friend who just went through a pregnancy. So, I know I was getting information that came from someone reliable.”- (Participant 7)

“I get to depend on the source and I trust the source. Like CDC, I really trust them. The information they put out and stuff that is based on research, I guess. I know you can pretty much find anything to support any opinion. You just have to pick and choose people that you trust, I guess. Like my Mom, I really valued hers. It just depends. You pick and choose from lots of different sources. For example my Mom, she had really good advice and she will say, ‘I feel for you and I really wanted the best for you.’”- (Participant 12)
CHAPTER 5: DISCUSSION

Overview

Pregnancy and childbirth is an important period of time not only in the life of individual women, but also for the public health discipline. Each year, nearly 6% of women of reproductive age (or 4 million women) in the United States will give birth (Martin et al., 2013). Expenditures related to pregnancy and childbirth account for nearly half of all health care costs in the United States, of which half are paid through federally funded insurance (HCUPnet, 2005).

Promoting optimal health behaviors and supporting individuals during critical periods of health (such as pregnancy) is an important aspect of public health research and practice. One way of supporting individuals in promoting positive health behaviors and outcomes is to increase their health literacy. Low health literacy is correlated with a number of poor health outcomes. Among pregnant women, low health literacy has been linked to worsened symptoms of gestational diabetes; depressive symptoms; decreased likelihood of breastfeeding; and poor knowledge of family planning; effects of smoking on infants; and birth defect screening (Arnold et al., 2001; Bennett et al., 2007; Cho et al., 2007; Endres et al., 2004; Gazmararian, Parker, et al., 1999; Kaufman et al., 2001). Though often correlated with low functional literacy (the ability to read and write), low health literacy is a different concept. It is important to understand how health literacy operates within a population of pregnant women, as functional literacy may not be a direct indicator of health literacy. Indeed, the National Assessment of Adult Literacy which measures function and health literacy found that 9 out of 10 Americans had below
proficient health literacy, including those with high functional literacy (Kutner, Greenberg, & Baer, 2005). Therefore, it is important to understand the health literacy process among all groups of pregnant women, and not those with low educational attainment.

The ability to access information is the first step (find) in the health literacy process (Coleman et al., 2008; Wills, 2009; Zarcadoolas et al., 2006). Health literacy approaches from the public health perspective increase the ability to successfully evaluate and select from competing sources and types of information (Pleasant & Kuruvilla, 2008). Johnson and Case suggest that improved understanding of information seeking is one way to ensure that appropriate health information gets into the hands of those that need it most, such as individuals with low health literacy and priority populations, and in the most appropriate form (2012, p. 10). Therefore, Health Information Seeking Behavior (HISB) is an important health and illness behavior in its own right and as the important first step in becoming health literate.

The purpose of this study was to explore the HISB of pregnant women. To achieve this goal a multi-phase, descriptive, mixed methods, cross-sectional research design was utilized. Phase I consisted of an online survey disseminated to collect HISB data on first time mothers who delivered a child within the prior 12 months. Phase II consisted of in-depth individual interviews with a sub-set of participants who completed the online survey assessment to explore more in-depth motivations behind information seeking.

Due to recruitment difficulties (discussed below), the sample population for this study was particularly homogenous. Compared to the general population of women giving birth in the United States, the sample was mostly white, non-Hispanic, between the ages of 27 and 34, college educated, married, insured, and upper middle-class. See Table 22 for a comparison between the sample population and the population of women who give birth in the United States.

Table 22. Comparison between Sample Population and Population of Women Who Give Birth in the United States

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Sample Population</th>
<th>US Women Who Give Birth</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>13.7%</td>
<td>25.0%</td>
<td>26.3 (&lt;0.0001)*</td>
</tr>
<tr>
<td>25-29</td>
<td>37.5%</td>
<td>27.0%</td>
<td></td>
</tr>
<tr>
<td>30-34</td>
<td>38.1%</td>
<td>29.0%</td>
<td></td>
</tr>
<tr>
<td>35-44</td>
<td>10.7%</td>
<td>19.0%</td>
<td></td>
</tr>
<tr>
<td><strong>Hispanic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10.1%</td>
<td>22.9%</td>
<td>15.7 (&lt;.001)*</td>
</tr>
<tr>
<td>No</td>
<td>89.9%</td>
<td>77.1%</td>
<td></td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>86.3%</td>
<td>76.4%</td>
<td></td>
</tr>
<tr>
<td>Non White</td>
<td>13.7%</td>
<td>23.6%</td>
<td></td>
</tr>
<tr>
<td><strong>Relationship Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>86.3%</td>
<td>59.3%</td>
<td>51.8 (&lt;.0001)*</td>
</tr>
<tr>
<td>Unmarried</td>
<td>13.7%</td>
<td>40.7%</td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School or Less</td>
<td>4.0%</td>
<td>19.0%</td>
<td>91.9 (&lt;.0001)*</td>
</tr>
<tr>
<td>Some College</td>
<td>21.5%</td>
<td>37.0%</td>
<td></td>
</tr>
<tr>
<td>College Graduate</td>
<td>40.6%</td>
<td>31.0%</td>
<td></td>
</tr>
<tr>
<td>Graduate or Professional</td>
<td>33.9%</td>
<td>13.0%</td>
<td></td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$29,400 or less</td>
<td>10.7%</td>
<td>21.0%</td>
<td>34.0 (&lt;.0001)*</td>
</tr>
<tr>
<td>$29,401 - $37,000</td>
<td>4.8%</td>
<td>7.0%</td>
<td></td>
</tr>
<tr>
<td>$37,001 - $52,300</td>
<td>13.7%</td>
<td>17.0%</td>
<td></td>
</tr>
<tr>
<td>$52,301 - $75,300</td>
<td>17.3%</td>
<td>22.0%</td>
<td></td>
</tr>
<tr>
<td>$75,201 or more</td>
<td>53.5%</td>
<td>33.0%</td>
<td></td>
</tr>
<tr>
<td>Medicaid Funded Pregnancy and/or Childbirth</td>
<td>7.0%</td>
<td>52.8%***</td>
<td>120.7 (&lt;.0001)*</td>
</tr>
</tbody>
</table>

Data for US women who gave birth comes from Martin, Hamilton, Osterman, Curtin and Mathews (2015) and Data for US women who gave birth includes data from all women who gave birth in the US, not just primiparous women.

* Chi-square goodness-of-fit test of proportions significant at p = 0.05.

The study sample had less young women (18-24) and older women (35-44) and more women aged 25-34 than the national population. The study sample also had less women of Hispanic ethnicity or non-white race than the national sample. There were significantly less unmarried women in the survey sample than in the overall US population of women who give birth. With respect to income, this study had fewer participants of low and middle income than the national population, but an over representation of women of upper income levels. In
addition, the survey had an over representation of women with graduate and professional degrees and slightly fewer with less than a college degree. Finally, there was a significant underrepresentation of women whose pregnancy or childbirth was paid through federal insurance. However, this is in line with previous studies that found that information seekers tended to be white, educated, upper socio-economic women (Galarce et al., 2011; Johnson, 1997).

This study had two aims. Aim 1 described the topics of information sought by women during pregnancy. Aim 2 described the sources of information used by women to meet their information needs. Each of the aim’s research questions were addressed through quantitative and qualitative methods.

**Aim 1: Describe the Topics of Information**

*Research Question 1.1*

Using primary data collection, this study found that women sought many topics related to pregnancy and childbirth. Of the 33 topics provided to participants, women searched for an average of 18.75 topics. Further, all of the topics were search for by at least one participant. Previous studies included fewer, broader topics for women to search for. Lagan, Sinclair, and Kernohern (2011) only include broad categories such as ‘general pregnancy information;’ ‘information on a pregnancy product;’ ‘information about a specific pregnancy condition’; and ‘information about a treatment proscribed.’ Larsson (2009) also provides broad information categories such as ‘pregnancy’, ‘childbirth’, ‘the expected baby’, and ‘parental benefit.’ Shieh, McDaniel, and Ke (2009) provide a list of 20 specific topics, two of which were post-partum topics (breastfeeding and birth control). Shieh and colleagues (2009) include several topics that were not included in the current survey: dealing with stress during pregnancy, emotional changes
during pregnancy, how to balance rest and activity, HIV testing and how to keep from getting it, proper use of a seatbelt during pregnancy, illegal drugs during pregnancy, and physical abuse to women during pregnancy. None of these topics, with the exception of illegal drugs during pregnancy, were noted as being absent from this study’s topic list by study participants when given the chance to list any topic they sought that had not been included. One participant listed ‘marijuana use during pregnancy’. Overall, the number of topics chosen by participants shows that information seeking is much more refined than other studies have envisioned. This study showed that pregnant look for detailed information topics, not just broad categories such as ‘pregnancy’ or ‘childbirth’.

Whereas women in this study looked for many topics, there were some topics that were less often searched for, and may indicate either avoidance of these issues or a lack of awareness of them as being of importance. For example, less than half of the sample population sought information about bleeding and spotting during pregnancy (47%), preterm birth and low birthweight (46.4%), birth defects (39.3%), smoking cigarettes during pregnancy (26.2%), and drinking alcohol during pregnancy (26.2%). Smoking and alcohol may be less sought as an information as tobacco use among reproductive age women has decreased over several decades (Centers for Disease Control and Prevention, 2015a, 2015b), and the poor health outcomes of alcohol use during pregnancy (including fetal alcohol syndrome) are becoming more widely known. However, information regarding smoking and alcohol during pregnancy may also be a function of the make-up of the sample population. Smoking during pregnancy is less likely among older women and women with at least a college degree, but is more likely among white women (Department of Health and Human Services, 2014). Alcohol consumption during pregnancy is less likely among women of mid-range age (25-34) and white race (Department of
However, alcohol consumption during pregnancy is actually more likely in women with college educations, perhaps due to increased discretionary income or social acceptance. With respect to information seeking regarding birth defects, avoidance of information seeking is often associated in the case of severe health problems (Johnson & Case, 2012, p. 101), which some of the less sought maternity related topics may indicate.

Other information topics that were less sought, were those related to choosing a hospital to give birth at (36.3%) and choosing a health care provider (36.3%). These findings are similar to those of the Listening to Mothers III survey that finds that only about 40% of mothers using information to choose a health care provider and 41% to choose a hospital (Declercq et al., 2013). However, as Declercq and colleagues (2013) note, some of the reasons that women give for not using available information to make these choices may be related to having no choice in health care providers (12%) or hospital (21%) due to insurance or geographical limitations. Further, pregnant women may not know how to find important information related to making these choices or how to interpret important quality-of-care measures. Therefore, this may be one area that the health literacy of pregnant women may warrant further investigated.

Women in this survey were asked to rank which pregnancy and childbirth-related information topics were most important to them. Currently, there are no known studies that have done the same. This study looked at three different measures of how important a topic was to a participant. The first measure of importance looked at how frequently a topic was checked by participants. This measure can show how widely sought an information topic may be, but not its relative importance to other topics. The second measure of importance looked at how frequently a participant ranked a topic as being one of the three which were most important
to them, irrespective of rank position. This measure can show the relative importance of an
information topic compared to those that are casually sought. The final measure looked at those
information topics that are most important (ranked as number one) compared to other important
topics (ranked as second or third). Having three different measures allows us to have a more
sophisticated understanding of the salience of information topics.

In this study, only one topic ‘How my baby grew while I was pregnant’ was consistently
found across all three measures of importance. Further this topic was ranked as the most
important across all measures. If we look at where other topics fall, we see some important
changes in ranking. For the measure looking at information topics that were chosen versus those
that were not, the second most frequently chosen topic was ‘What I should NOT eat during
pregnancy’ followed by ‘How my body changed during pregnancy’. However, if we look at
topics that were sought during pregnancy and were ranked as being in the top three most
important, we see that ‘Complications during pregnancy’ is the second most frequent topic,
followed by ‘What I should NOT eat during pregnancy’. Though frequently sought as an
information topic, ‘How my body changed during pregnancy’ is not as important compared to a
number of other issues. Finally, one looks at those topics that were ranked as being the most
important (ranked number one), we see another change in the topics. ‘Complications during
pregnancy’ remains the second most frequent topic ranked as number one following ‘How my
baby grew while pregnancy.’ However, natural birth is now the third most frequently ranked
topic as most important. This is significant because, by the other measures, natural birth was
much lower placed. It was the 16th out of 33 topics sought, and the 6th out of 31 topics ranked.
Therefore, because it is the 3rd topic out of 25 ranked as the most important, this indicates that
when it was chosen as a topic of interest, it was most likely to be very important to participants.
During the qualitative phase of this study, women discussed the salience (or motivation) behind why certain topics were most important to them during their information seeking. With respect to the most important topic across all three measures, ‘How my baby grew while I was pregnant,’ women in this sample discussed how they sought this information in order to connect with their unborn child and pregnancy (Alhusen, Hayat, & Gross, 2013; Salisbury, Law, LaGasse, & Lester, 2003). Doing so brought a sense of fun and excitement to the maternity period. Women discussed wanting to know what was new and different with their developing child every week. Indeed, weekly gestational updates and pregnancy trackers were often mentioned as being a particularly useful way of understanding the information that was presented to them.

Motivation to avoid poor outcomes may account for ‘What NOT to eat during pregnancy’ and ‘Complications during pregnancy’ being ranked as most important in two of the three measures. Whereas, women in the sample discussed understanding that many outcomes related to pregnancy and childbirth were out of their control, they also discussed wanting to do anything that was remotely within their control that may impact these outcomes. Women discussed modifying behaviors such as sleep, exercise, and medication use to assure themselves that if something adverse should happen with respect to maternity related health outcomes, they had done their very best to prevent it. The belief that the individual may manipulate health outcomes is a major facet of the biomedical health belief model and a high locus of control (which is common in the United States) (Wade & Halligan, 2004).

Interestingly, study participants rated ‘What NOT to eat during pregnancy’ as important rather than ‘What I SHOULD eat during pregnancy.’ Why is there less of an emphasis on behaviors that overall support the well-being of the mother and the baby? This outcome may
relate to both health literacy and societal pressure on expectant mothers. First, with respect to what women should NOT eat, there is readily available and clearly stated information about those foods and beverages that may expose pregnant women to harmful pathogens or toxins (such as fish, deli meat, and soft cheeses). Further, women do not have to evaluate whether or not this information applies to their personal and health circumstances. The evaluation is done for them when information says, ‘If you are pregnant, do not eat XXX.’ However, when it comes to those foods that should be eaten, understanding overall nutrition can be a complicated process. In addition, women must then evaluate their own nutritional status and be able to balance a number of complicated issues such as weight, blood pressure, glucose levels, and exercise. Further, mothers (and by extension, pregnant women) are often blamed for their children’s poor health outcomes, regardless of any extenuating circumstances. Because understanding overall nutrition is more complicated, it is much easier for women to be stigmatized for failing to avoid specific food and beverages, rather than eating a nationally balanced meal overall (Jackson & Mannix, 2004; Richardson et al., 2014). Therefore, pregnant women may value and follow the rules regarding those topics that they are more likely to face social stigma about (Eggertson, 2013). Regardless of those foods that women should or should not eat, the epigenetics of nutrition during pregnancy and lifetime health outcomes has become an increasingly important issue (Dolinoy, 2008; Hoyo et al., 2011; Ladd-Acosta et al., 2014; Perkins et al., 2012).

When looking at those information topics that were ranked as the most important (i.e. ranked number one), ‘Natural birth’ was ranked third most frequently (behind How my baby grew during pregnancy and Complications during pregnancy). This is interesting in that, as a topic, it had not been ranked as high if looking at the frequency at which it was sought or the
frequency with which it was ranked in the top-three. Because it was ranked highly among those topics that participants saw as being the most important, we may interpret that when information regarding natural birth was sought, it was very important to participants than other topics. Qualitative interviews showed that one of the major reasons that information topics were salient was an effort to achieve pregnancy and childbirth-related outcomes important to women. In qualitative interviews, women often discussed wanting to achieve an un-medicated childbirth birth with respect to this motivation. Often avoiding poor health outcomes and achieving specific goals were opposite sides of the same coin. For some women not achieving an un-medicated or natural birth was the same as having a poor health outcome. However, even when these goals could not be met, the process of information seeking provided understanding about what may be expected. Studies show that for pregnant women who had knowledge about pregnancy complications but were unable to avoid them had better birth satisfaction than those that had not sought information (Christiaens & Bracke, 2007; Goodman, Mackey, & Tavakoli, 2004; Green, Coupland, & Kitzinger, 1998). Therefore, pregnant women may seek information in an attempt to avoid poor health outcomes or achieve specific goals. However, when health such outcomes or goals cannot be met, they had overall better satisfaction with their pregnancy and birth, because information seeking allowed them to understand these possibilities, not be surprised by them, and enact coping mechanisms when they occurred (Green, Coupland & Kitzinger, 1998; Green, Coupland & Kitzinger, 1990; Green, 1993; Green & Baston, 2003).

Another salient reason for seeking specific information topics was to understand if a woman’s experience was ‘normal’ related to other women’s experiences. This reason may explain why the topic ‘How my body changed during pregnancy’ was one of the most frequently sought topics. Women often discussed a poor understanding of what symptoms were ‘normal’
and which were not. This is probably in large-part due to the vague way in which much pregnancy information is provided. For example, stomach pains may be an indication of a serious medical issue, or it might simply be a sign of gas. Therefore, women must remain hypervigilant at all times as to how their body is reacting to the pregnancy state (Côté-Arsenault & Mahlangu, 1999; Lewallen & Côté-Arsenault, 2014). This also relates to why ‘pregnancy complications’ was also ranked as a highly important issue. Pregnant women wanted to monitor their own health, often utilizing other women’s experiences to evaluate when they should seek out a health care provider’s opinion. This experience was further related to achieving maternity related goals and avoiding poor health outcomes.

**Research Question 1.2**

When looking at demographic differences among survey participants related to how salient topics were to them, there were few differences. For the topic ‘How my baby grew while I was pregnant’ there was only an associated between income status ($\chi^2 = 6.3, p = 0.042$) among those that ranked this as the most important topic compared to those who only selected it as the second or third most important topic. For the topic ‘What I should NOT eat during pregnancy’ there were differences with respect to age ($p = 0.046$) and insurance status ($p = 0.031$) among those that sought information about this topic and those that did not. Further, there were differences income level ($\chi^2 = 6.22, p = 0.045$) between those that only sought this information and those that ranked it as being among the top three most important topics. For ‘Complications during pregnancy’ there were differences in education level ($\chi^2 = 7.95, p = 0.018$) and income status ($\chi^2 = 6.84, p = 0.032$) between those that sought information about this topic and those that ranked it among the top three most important. Differences in income ($p = 0.038$) remain between those that ranked pregnancy complications as either the second or third most important
issue and those that ranked it as their most important topic overall. There were no differences among participant characteristics in how they ranked the topics ‘How my body changed during pregnancy’ and ‘Natural birth’. Chi-square tests can only test for differences among the groups represented, and not provide additional details regarding the exact nature (positive or negative) of that relationship, and between which categories. In order to understand this information, a larger sample size with greater variability among participants is required. However, as Case and Johnson point out, demographic variables may not account for much variation in information seeking (Johnson & Case, 2012, p. 47). Other latent characteristics such as locus of control may and personal values may hold greater significance when looking at whether or not a topic is sought or considered important by pregnant women.

**Aim 2: Describe the Information Sources**

**Research Question 2.1**

Using primary data collection, this study found that women used many sources of information when seeking pregnancy and childbirth-related topics. Of the 23 information sources that participants could select from, an average of 9.97 topics per woman was searched for, indicating that women used multiple information sources during pregnancy. Further, there was no information source that had not been used by at least one participant. The least frequently used information source was an employer (N = 3, 1.79%).

Previous studies of information seeking among pregnant women provided fewer, but broader, types of information sources for participants to pick. Often times, broader categories of information sources are given to study participants. For example, health care providers were often given as a single information source (Beebe & Humphreys, 2006; Brown, Carroll, Boon, & Marmoreo, 2002; De Jonge & Lagro-Janssen, 2004; Declercq et al., 2013; Garnweidner et al.,
2013; Lagan et al., 2011). However, pregnant women may not view all health care providers as equal in the hierarchy of sources of information (Fairborther, Stoll, Carty, & Schummers, 2012; Fairbrother, Stoll, Schummers, & Carty, 2012; Stoll, Hauck, & Hall, 2015; Wilson & Sirois, 2010).

For the purposes of this study doctors, nurses, midwives, and doulas were given separate categories. Though doulas are not considered a health care provider, they are trained professionals in providing physical, emotional, and informational support, and for the purposes of this survey were grouped with clinicians. Only Chaudhry and colleagues (2011) spoke specifically about one type of health care provider (nurses) a part from a generalized ‘health care provider’ label. This is important, as participants in this study indicated different frequencies at which they used health care providers. Of the sample, doctors were used by 84.52% (N = 142), nurses by 38.69% (N = 65%), midwives by 27.38% (N = 46), and doulas by 9.52% (N = 16). Though it is not surprising that women used midwives and doulas at lower frequencies that doctors and nurses, it is somewhat surprising that nurses were not utilized as an informational source more often. This finding is contrary to previous research that has established that patients either had no preference or a slight preference for nursing staff for receipt of health education (Laurant et al., 2008). However, one study found that the perceived severity of the health issue matters. Patients preferred to consult with general medical practitioners for those perceived as severe, and with nurses for those perceived as minor (Redsell, Stokes, Jackson, Hastings, & Baker, 2007).

In previous studies define social support group members broadly as those individuals that a person sought information from or provided information to a pregnant women other than clinical health care provider. Often times, several types of social support group members
including family, friends, co-workers, and neighbors are categorized together (Brown et al., 2002; De Jonge & Lagro-Janssen, 2004; Garnweidner et al., 2013; Melender, 2002). However, there is a possibility that a pregnant woman may be more inclined to use information from certain social support group members over others. Beebe and Humphreys (2006) combine family and friends into one group, whereas Chaudry (2011) separates them, and McKenzie (2006) categorizes only friends. One notable absence with relation to social support group members, is the only nationally representative survey about the pregnancy-related experiences of mothers in the United States. The Listening to Mothers III survey (Declercq et al., 2013) asks participants to rate the value and trustworthiness of a number of information sources, omitting both family and friends. For the purposes of this survey, family and friends were kept as separate information sources, but were utilized by similar proportions of the sample (64.29% and 61.31%, respectively).

Childbirth education classes were often cited as an information source for pregnant women in the literature (Barnes et al., 2008; Bayes, Fenwick, & Hauck, 2008; Beebe & Humphreys, 2006; Carlton, Callister, & Stoneman, 2005; De Jonge & Lagro-Janssen, 2004; Declercq et al., 2013; Garnweidner et al., 2013; Leap et al., 2010; McKenzie, 2006; Melender, 2002). In this study, just over half (55.95%) of women utilized a childbirth education class, similar to what was reported (59%) in the Listening to Mothers survey (Declercq et al., 2013). Childbirth education classes were the fourth (N = 49) most commonly chosen information source that participants ranked as being most often used irrespective of order. However, when it came to being the most often used information source, they were less often used (N = 7).

In this study, television, radio, newspapers, and magazines were combined in to one ‘mass media’ category, similar to other studies (Chaudhry et al., 2011; De Jonge & Lagro-
Melender (2002), Szwajcer (2005), Shieh (2009), and Lagan (2011) include magazines as a separate category, while Shieh (2009) includes a category for television and radio combined. Mass media was relatively less utilized that many other information sources in this study with just 19.05% (N = 32) of participants using it. Further, no participant ranked

As with this study, pregnancy and childbirth books were also an information source in studies by Szwajcer (2005), Lagan (2011), and Shieh (2009). Further, with the passage of the Affordable Care Act, and its focus on increased preventive care through health navigation through both work sites and health insurance companies, only the Listening 2 Mothers III survey included health plans or employers as information sources. Of participants, 19.64% (N = 33) utilized their insurance company as a resource and only 1.79% (N = 3) used employer information resources.

Perhaps the largest difference between the current study and previous studies regarding information seeking among pregnant women, is the treatment of digital or internet-based information sources. The vast majority of studies simply listed the ‘Internet’ as a source of information (Chaudhry et al., 2011; De Santis et al., 2010; Garnweidner et al., 2013; Lagan et al., 2010; Lagan et al., 2011; Larsson, 2009; Shieh, McDaniel, et al., 2009; Spink et al., 2004; Szwajcer et al., 2005). However, it is important to cease thinking of the ‘Internet’ as a monolithic entity that has one set of characteristics and utilities that affect information seeking. The Internet provides a vast array of information opportunities that are vastly different from each other in terms of their quality, accessibility, and function. These sources are constantly changing. It is for this reason that there was a wider variety of internet or digital-based information sources were provided to survey participants.
Only the Listening to Mothers survey offers different types of internet sources including pregnancy and childbirth specific websites, general medical websites, and websites from state, federal, or nonprofit agencies. This study also included these information sources for participants. Pregnancy and childbirth specific websites was the most frequently checked information source, with 92.26% (N = 155) of participants utilizing them, followed by general medical websites (66.07%, N = 111), and state or federal agency websites (30.95%, N = 111). Participants were not limited to the number of information sources they could indicate that they used. Therefore, the most frequently checked information sources are not mutually exclusive.

There were nine information sources that were available for survey participants to choose from that no previous study has discussed as an information source for pregnant women. All of these sources are internet or digital-based. Whereas, two studies (Declercq et al., 2013; Song et al., 2013) looked at the use of text-based information sources, none looked at digital mobile applications. There are numerous such applications available for download on smart phones or tablets. In this survey, this information source was highly used with 85.12% (N = 143) of participants reported having used at least one such application during pregnancy. Other information sources that participants utilized in this study were search engines (such as Google or Yahoo!), online discussion forums, chat rooms, and discussion lists (such as Yahoo! Groups), online video sites (such as YouTube and Vimeo), social news sites (such as Digg and Reddit), personal pregnancy and childbirth blogs, microblogs (such as Pinterest and Tumblr), Facebook groups, and other social media (Twitter, Instagram, Vine). Of participants, 75.6% (N = 127) utilized a search engine, 53.57% (N = 90) used discussion forums, 23.81% (N = 40) used video sites, 17.8% (N = 30) used social news sites, 20.24% (N = 34) used microblogs, 22.62% used Facebook groups (N = 38), and only 4.76% (N = 8) used other social media.
Though women in this study used many information sources during the course of their pregnancy, it is important to know which were used most often. Women ranked (first, second, and third) the three information sources that they used the most during their pregnancy. If we look at the frequency with which participants used an information source, websites, mobile, applications, and doctors were checked the most frequently. However, if we look at those information sources that participants ranked as being one of the top three most used information sources, books become an important source and pregnancy and childbirth websites are no longer ranked. In qualitative interviews women noted the reasons they used some information sources more often than others. One of the most common reasons behind was the ease of access to information at a moment’s notice. Women could use their internet capable phones and tablets to access both mobile applications and pregnancy and childbirth-related websites. Use of mobile applications among the millennial generation of women (who are typified as wanting instant gratification) (Twenge, 2006; Twenge et al., 2012) may be another reason for high use of mobile applications in this sample. Of individuals aged 18-49, smart phone ownership is almost universal (97-98%). Over 85% of the survey sample can be considered a millennial (born after 1982) (Pew Research Center, 2014).

Another reason why these sites were used often (though not a common theme) was that they were specific to pregnancy and childbirth, preventing women from having to sift through information on general medical websites (such as WebMD). Further, pregnancy and childbirth websites and mobile applications often had topical areas that further narrowed down information (such as what to eat). In addition, mobile applications and pregnancy websites provided anticipatory guidance to women. They often arranged information by trimester or gestational week, letting them know what important milestones were upcoming. This allowed women to
focus on what information was most important to them at the time and avoid being overwhelmed by the wealth of information available to them. Several participants discussed other valued utilities, particularly in mobile applications, such the ability to track weight, food, and medical appointments.

Doctors were ranked as being highly utilized among all measures of use. The most common reason that participants cited was trust in the doctor’s specialized training and professional experience. Participants discussed using their health care providers the ‘final say’ when it came to questions raised in outside information seeking. Doctors were expected to give pregnant women, honest and straightforward answers that were specific to their particular medical history and health concerns. Women in this study viewed health care providers as being best positioned to provide them information that was most applicable to their situation (a major qualitative finding). Midwives, which were ranked as being among the top three information sources listed as most often used, were used in the same manner. It makes logical sense that women would value these health care providers as an information source, not only for their expertise and experience, but because women typically have regularly scheduled prenatal visits. Therefore, there is scheduled time for information gathering communication built in to the prenatal care process. However, not all women in the qualitative survey value these health care providers in the same manner. A few interview participants noted that the doctors they were either dismissive of their questions or provided contradictory information from other providers at the same practice. General disorganization at the clinic front desk and repeated late or cancelled appointments led one participant to distrust the capabilities and quality of information provided by her health care provider, prompting her find another doctor.
Among those information sources that women used and ranked as used most often (irrespective of the order of rank) Pregnancy and childbirth books was second most frequently ranked. During qualitative interviews women discussed how books were seen as credible sources of research-based information. Interview participants discussed the value of research-based or medically factual information during their information search. Though not a commonly discussed theme, participants also noted that books tended to be easy to understand and utilized visuals more often. Further, similar to mobile applications, books were also often formatted by trimester or gestational week, allowing for anticipatory guidance regarding the next steps that women could expect during her pregnancy. Another format that one interview participant valued was in the form of easy to read and understand questions and answers grouped by topic.

Finally, in addition to ease of access, the other most commonly noted reason for using an information source most often was to read other pregnant women’s lived experiences. However, information sources that we might associate with this activity such as pregnancy blogs, online discussion boards, and Facebook groups were not ranked as being information sources that were used more often than others. However, through qualitative interviews it became apparent that both mobile applications and pregnancy and childbirth websites often have discussion forum functions. Therefore, many women utilized this functions on their cell phones or other internet-ready devices to seek out these lived experiences.

**Research Question 2.2**

When looking at demographic differences among survey participants related to which information sources they used most often, there were few differences. For pregnancy and childbirth-related websites there were differences in income status related between those that used this source and those that used it often. Whereas there were differences in insurance status
between those that used it often, and those who used it the most often. With respect to mobile applications, only differences between white and non-white participants were found among those that ranked mobile applications as their most often used information source and those that ranked it as the second or third most often used source. There were several differences among participants with respect to their use of doctors as an information source. Between those that used a doctor and those that did not, only insurance status was significant. Among those that used a doctor as an information source but did not rank it as being in the top three most used, non-white race and Hispanic ethnicity were significantly different. Age was significantly different among those that used doctors often and those that said it was their most used information source. With respect to those that used books as an information source in general and those that used them often, only non-white race was significant. Finally, there were no differences among participants who used midwives as one of their top three information sources and those whom used them most often. Chi-square tests can only test for differences among the groups represented, and not provide additional details regarding the exact nature (positive or negative) of that relationship, and between which categories. In order to understand this information, a larger sample size with greater variability among participants is required.

Though there were demographic differences in the information topics that were most important to participants and the information sources that they used most frequently, drawing a clear associations between the two may be unwise. Because of the small sample size of this study and the limited variability in participants it cannot be determined if and to what extent demographic factors affect information seekers understanding of the salience of information need motivation or the beliefs regarding the information sources that are utilized. Further, differences in salience of topics and beliefs regarding information sources may not be related to
measurable demographic differences, but to other latent characteristics (for example, locus of control).

With respect to direct experience of people, because inclusion criteria for the study exclude women who have had children before, this study automatically looks at women whom lacked direct experience of pregnancy and childbirth. However, interviews revealed that the reason that some issues were salient to them (particularly the themes related to curiosity and fun) was because of their lack of experience with the health state (pregnancy). Therefore, multiparous women may have different motivation or salience related to information seeking than do primiparous women. However, no direct link in the model is made between the experience of information seekers and salience of information need. This may be one way that this model may be adapted for future use.

Further, with respect to beliefs regarding the information source or information seeking, the CMIS shows a single, directional arrow from belief to information carrier utilities. For example belief or understanding regarding information seeking or an information source impacts perceptions about its utilities. However, from interviews with study participants, this relationship may be more bidirectional that shown within the model. For example, participants in this study used certain information sources (such as mobile applications) because of their ability to provide immediate answers to information needs. This impacted how valuable an information source was overall. However, how trustworthy or research-based an information source was could also impact the positive or negative belief in that information source. Therefore, future research regarding these relationships are warranted.

**Strengths and Limitations**
For any research project, the strengths and limitations of the study design must be evaluated in context of the results reported. For this study, these were be assessed by phase of the study due to the mixed method design.

**Phase I: Reliability and Validity**

Collecting primary data has both its advantages and disadvantages. External validity, classically defined by Campbell, Stanley, and Gage (1963), is defined as the extent to which the results of a study are true beyond the controlled limits of the study. No study is perfectly generalizable. However, certain research methods improves the generalizability of a study. Study population, recruitment procedures, and the sampling frame are important aspects when maximizing external generalizability against replicable study design. Unfortunately, recruitment for phase I of this study was difficult. Whereas, the target sample size of 63 subjects was set, only 168 participants were recruited. There were several reasons for this difficult recruitment. Initially, it was intended that new mother groups would be contacted through Facebook and invited to take part in the study. The Facebook study information page link and an invitation message was sent to over 30 Facebook interest pages and groups, with total membership of 72,618 and nearly two million ‘likes’. However, prior to recruitment of subjects, Facebook changed their privacy and communication settings which impacted recruitment. This new change required that one be a ‘friend’ or a ‘friend of a friend’ for the recruitment message to be sent directly to their regular inbox. Otherwise, recruitment messages went in to what amounted to a ‘junk mail’ folder within an individual’s Facebook settings, which may not be checked by the owner of the page. Despite this, permission was gained from several groups with memberships totaling 3570 persons.
In addition, Facebook advertisements were purchased to show up on the Facebook pages of women who met age and location criteria, whose Facebook activity strongly suggested them to be mothers of young children. This advertisement resulted in 76,362 ‘impressions’ to Facebook accounts, which resulted in 633 ‘clicks’ to the study Facebook page. In addition to purchasing Facebook advertisement, an incentive was added to the study that allowed anyone who completed the study to be entered in a drawing for one of twenty $10 gift cards. Despite these efforts, recruitment for participation in this study remained low. Finally, the principle investigator of the study reached out to their network of Facebook friends asking them share information about the study on their own Facebook pages and ask their own friends to share the study information and link. It was through this mechanism that the majority of participants become recruited in to the study.

Due to recruitment difficulties and the resultant reliance on convenience sampling, the generalizability of this sample to the population of women who give birth in the United States is low. This sample was overwhelmingly white, non-Hispanic, married, insured, educated and middle to high-income. Though an explorative study, conclusions regarding information seeking among pregnant women made from this sample cannot be extrapolated to other populations of women who do not meet these criteria.

In order to accomplish the long-term goal of increasing health literacy in pregnant women, we need to ensure that the tools that we use are actually doing the jobs that we want them to do relate to the expected outcomes. To do so, it is important to understand reliability and validity in terms of the data collection instruments used in this study. Reliability refers to the consistency or repeatability of a data collection instrument (Streiner & Norman, 2008). Validity refers to an instrument’s accuracy in measuring a concept. Whereas external validity of the study
is limited, the study exhibited good internal validity and consistency due to survey creation and piloting measures.

Reliability is the extent to which data are reproducible. Do questions on a survey produce the same answers regardless of when the survey was given or who the respondents were? For example, this survey should result in the same types of answers for questions regarding a respondent’s demographic variables regardless of whether or not they took it in the morning versus the evening or whether the respondent was a woman living in the northeast versus the southwest. Validity on the other hand, refers to the extent that we are measuring what we hope to measure. Validity of a data collection instrument is assessed in four different manners: face validity, content validity, criterion-related validity, and construct validity. A valid measure should satisfy all four types of validity. Face validity is the most basic measure of validity, and suggests whether a question or measure appears to measure what it is supposed to. Does it make sense? If a measure does not have face validity, then it cannot satisfy the other levels of validity. To ensure face validity, advice of area experts was solicited during pilot testing and appropriate changes were made. Content validity was ensured through a solid extensive literature and content expert review. Pilot testing with individuals who meet study inclusion criteria also showed that participants understood the survey questions and had no trouble understanding what was being asked of them. Criterion-related validity applies to instruments that have been created as an indicator of a specific trait or behavior one currently has now, or in the future. An example would be a test that correlates an eye exam with someone’s visual abilities. Criterion-related validity will not be a significant concern for this study, as we do not want to measure someone’s current or future HISB, but rather explore what their past behaviors were. When individuals do not have a criterion that they wish to measure, they often
use construct validity in its place. Construct validity is the extent to which a measure correlates to other measures that are known to relate to the underlying factor we are trying to measure as specified by a theory or previous research. Construct validity is often evaluated using higher-level statistical methodology such as factor analysis and structural equation modeling SEM (Westen & Rosenthal, 2003). Because of the small pilot sample, a factor analysis or SEM would need a much larger sample of at least twenty participants per each parameter (Jackson, 2003). Creating construct validity is a continual process of evaluation and refinement; we can further refine the construct validity of this survey after initial analysis of the survey results.

Finally, the statistical analysis must be considered. This study initially intended to utilize multinomial logistic regression in order to assess the influence of predictor variables on nominal response variables (Bull & Donner, 1987; Hedeker, 2003). Further, multinomial logistic regression was considered to be an appropriate tool for the purposes of this study because it does not assume normality, linearity, or homoscedasticity (Starkweather & Moske, 2011). However, statistical analysis of this variety require a large sample in order to adequately power the test, which the limited sample size precluded. A post hoc power analysis showed that multinomial logical regression would only have been 38% powered for this test, and therefore would not have been reliable. Further, the sample size was also not large enough to adequately power logistic regression. Therefore, Pearson chi-square goodness-of-fit tests were utilized to tests differences in outcome variables given demographic predictor variables. Whereas, chi square statistical tests may show if there is a difference among predictor categories, they are unable to show in what direction and among which specific groups those difference occurs. In addition, because of low cell frequencies for a number of responses, a number of response categories were collapsed.
Despite this change, there were many cell frequencies that had below five observations, requiring the use of Fisher’s exact tests.

Despite the limitations noted above, this proposed study exhibited a number of strengths. Previous quantitative studies have either looked at one topic issue (i.e. like nutrition, medicine use during pregnancy) or have studied one or two information sources at a time (such as the internet and/or health care providers). Of two known studies with large samples that looked at a wider variety of information sources used during pregnancy, neither looked at what specific topics were sought in conjunction with the sources that were used (Declercq et al., 2013; Grimes et al., 2014). Both studies, simply asked which, of a variety of information sources, participants used during pregnancy which helped them prepare to care for their new baby and themselves. The Listening to Mothers III survey took the added step of asking how valuable information sources were and how trustworthy they were (Declercq et al., 2013). Both studies only looked at descriptive statistics surrounding information use, and did not investigate differences between demographic groups in information source use. Finally, a limitation noted in Grimes et. al. (2014) was that qualitative research would have enabled them to understand their results more in-depth, a strength of the current study.

Phase II: Trustworthiness of Data

With regards to qualitative research, reliability and validity can take on different meanings than seen within quantitative methodology. With respect to validity, a number of alternate terms are used, such as trustworthiness, relevance, plausibility, and representativeness (Greg Guest et al., 2011). Trustworthiness of data are assessed in their credibility, dependability, confirmability, and transferability.
Credibility in qualitative work, as defined by Ulin, Robinson, & Tolley is “confidence in the truth of findings, including accurate understanding of the context” (2004, p. 25). Therefore, the word ‘credibility’ is often used in place of the term validity, even though they approximately mean the same thing. With respect to reliability, terms such as stability, consistency, predictability, and accuracy have also been used (Greg Guest et al., 2011). Validity, or credibility, in qualitative work is evaluated similarly to how it is done in quantitative research. Face validity is critical to qualitative credibility. According to Creswell and Clark, “validity [in qualitative research] comes from the analysis procedures of the researcher, based on information gleaned while visiting with participants and from external reviewers” (Creswell & Clark, 2007, p. 211). The credibility of a qualitative data collection instrument can be enhanced using the following methods: brainstorming interview questions with a small but diverse group of experts; critical analysis of how questions are phrased and sequenced; revision based on feedback from others; and testing the questions (Krueger & Casey, 2009). Credibility for this study was established by review of content and methodology experts during interview guide creation. In addition, the interview guide creation is an iterative process. The researcher monitored how well interview subjects understood questions and made adjustments to the wording and interview structure accordingly. In addition, questions that were consistently used to probe for additional information were formally added to the interview guide. In this way, the interview guide was revised by the fifth interview, and did not need to be changed for the remainder of the interviews.

Dependability refers to “whether the research process is consistent and carried out with careful attention to the rules and conventions of qualitative methodology” (Ulin et al., 2004, p. 26). With regards to reliability, or dependability, replication of results between interviews or focus groups is not necessarily the goal of qualitative inquiry (Greg Guest et al., 2011). Rather,
the structure within those research procedures should be flexible yet dependable. Creating explicit procedure instructions (particularly when there are more than one data collectors) is critical to creating dependability, as well as providing constructive feedback regarding the performance of the procedure (Greg Guest et al., 2011). For this study, a reflective approach was employed, taking notes and keeping a research journal during data collection and analysis as well as debriefing with committee members and colleagues.

Confirmability of the results was achieved by utilizing an audit trail for all research processes by keeping raw data, notes on the data analysis process, and all coding memos. Finally, transferability is the degree to which the results can be applied or transferred to groups of people beyond this project, or generalizability. Results are more likely to be transferable when utilizing a theoretical framework to guide the research, making it more likely to be adaptable to other populations (Ulin et al., 2004). To assist in the transferability of the results, the CMIS framework was used as a guiding theoretical framework. To assist in the evaluation of the transferability of the results, the characteristics of the final sample was assessed to allow for comparison with other types of populations (Denscombe, 2010). The qualitative sample for study interviews was not meant to exactly match the demographic proportions of survey participants, but rather, provide a range of responses. In this manner, the interview sample was more varied in characteristics, and therefore, more generalizable to other populations.

Using qualitative methods to answer the proposed research questions was an appropriate scientific approach. The research question asked “why” women sought information regarding topics during pregnancy and “why” they used certain information sources to do so. This qualitative methodology permits a greater level of detail and depth compared to quantitative methodology (Hennink, Hutter, & Bailey, 2011). Further, this approach was an extension of what
has been previously documented using survey-based research, by allowing for a more in-depth and nuanced understanding of the relationship between the data. Further, the less-restrictive form of data collected allowed for participants to add additional information that may not have been explicitly sought.

Additionally, previous qualitative studies of information seeking in pregnant women have often only looked information seeking for one purpose (such as childbirth positions) or explored information seeking from one specific source (such as online support groups). To the author’s knowledge, no other study has explored the information topics and sources sought by women during pregnancy in such a broad manner. This study is further strengthened by utilizing qualitative information to explore how women interpret important concepts to HISB such as value and trust. The use of both qualitative and quantitative research approaches in this study will provide a more holistic understanding of some facets of health information-seeking in pregnant women than has been explored in the extant literature.

Implications

Individuals have access to a wealth of information, in terms of variety and sheer volume. This availability of resources coupled with reduced access to health care providers (and decreased one-on-one time during health care transactions between patients and providers) has forced responsibility onto individuals to gather and act on health information on their own (Johnson & Case, 2012, p. 6). Traditionally, communication research has focused on the sender of messages of health information and how the sender can persuade receivers to act on it (Rice & Atkin, 2012). However, the information receiver brings as much to the interaction as the sender.

The purpose of this research was to explore the HISB of pregnant women, as the first step in the health literacy process. This dissertation was novel for two reasons. First, people seek out
health-related information to increase their knowledge for a number of reasons including making sense of a health situation, to aid in decision-making, to help communication with health providers, and/or as a coping behavior. HISB has been studied in a number of contexts over the last two decades, most notably in relation to cancer illnesses. A call was made for HISB research in other health contexts and in different socio-demographic populations (Lambert & Loiselle, 2007). This research directly addresses that need by exploring health information-seeking behavior among pregnant women. Secondly, this research built upon previous work by investigating both the topics that women seek information about and the information sources they use to do so. This study further explored why topics were salient to pregnant women and why some sources of information are used more often.

This study is relevant as it fills an important gap in the health information seeking literature. Maternity related health is a major public health concern in terms of the incidence and prevalence of pregnancy and childbirth as well as the economic cost to individuals and the health care system. Further, maternity related health care accounts for half of all health care costs (HCUPnet, 2005). Of births, half are paid by Medicaid government insurance (Wier et al., 2011). Yet understanding of important pregnancy-related health conditions remains low and ability to access the health care system without employment-based insurance is difficult. Though pregnant women may enroll in Medicaid, complicated and delayed enrollment processes, varied eligibility from state-to-state, and the end to presumptive eligibility in some states may delay or prevent women from accessing high-quality prenatal care (Centers for Medicare & Medicaid Services, 2016; Hogan et. al., 2009; Ranji, Salganicoff, Stewart, Cox, & Doameknor, 2010; Kaiser Health News, 2009). Therefore, increasing health literacy related to pregnancy may have direct benefits in terms of poor health outcomes and costs to the health care system. Though
increasing overall literacy functional literacy remains an integral part of some initiatives, health literacy initiatives should be more holistic in their approaches, incorporating different types of literacy.

Despite its apparent importance, there have been few studies that have looked at HISB in pregnant women (Garnweidner et al., 2013; Grimes et al., 2014; Lagan et al., 2011; Larsson, 2009). Those that have, were small in scope and have often only looked at one or two facets of HISB such as individual characteristics associated with one source of information. Larger, nationally representative studies of the maternity related experiences of women in the United States such as Listening to Mothers (Declercq et al., 2013) have included few information seeking questions and did not look at the health topics about which women sought information.

Knowing more about the overall HISB of pregnant women is an important factor in creating health education and health literate materials that pregnant women will utilize. Further, few studies look at a wide array of topics and information sources or why some are more important than others. This study was innovative because it will attempt to identify which factors lead a pregnant woman to finding an information topic most important and an information source used most often. Women in the qualitative interviews stated that one of the motivating factors behind their most important health topics was to be aware of poor health outcomes, prevent them from occurring, and achieve other related maternity goals. However, when looking at those information topics that were sought most frequently or were ranked as most important, relatively few were in relation to poor health outcomes such as pre-term birth or low birth weight. Therefore, there appears to be a disconnect between what women perceive are their motivations for information seeking and what they actually search for. This gap in information seeking may be due to wanting to avoid anxiety producing information and focus on
more positive aspects of their maternity experience. However, health belief theories posit that in order for individuals to make changes to their health behaviors they must be aware of the severity and susceptibility of particular health states (DiClemente & Prochaska, 1998; Glanz et al., 2008). Therefore, how we communicate regarding messages related to maternity related poor health outcomes may be essential. For example, poor dental health during pregnancy is associated with poor infant health outcomes such as pre-term birth and gestational diabetes. However, many prenatal care providers do not discuss oral health with their patients. If they do, it is often to tell them that they can visit the dentist while pregnant and not that they should (Vamos, Merrell, Le, Detman, & Daley, 2016). Changing the emphasis and wording of pregnancy-related health care messages may have significant impacts on health literacy during pregnancy.

Further, women in this study discussed those topics that in hindsight they wished they had looked for information about or had spent more time researching. These themes represent ‘missed salience’. With respect to information seeking itself, several interview participants (N = 4) discussed the fact that timing of information seeking plays an important role. Waiting until later in the pregnancy to seek information on certain topics in order to facilitate decision-making, may in affect limit the options available to women. For example, should a pregnant woman become interested in information regarding alternative birthing locations or certain birth practices or using a different type of health care provider, she may be too far along in gestation to feasibly address these desires. Therefore, future HISB and health literacy research should look at the timing of the introduction of topics of information for pregnant women.

This study did not specifically ask about postpartum issues either in the quantitative survey and qualitative interviews. However, this study was responsive to participants by
identifying additional topics of health information seeking need. When asked about what topics of information that they should have looked for in hindsight, breastfeeding and the postpartum period were very salient to participants. With breastfeeding, several participants discussed how (N = 6) they valued the ability to exclusively breastfeed after giving birth, but were unaware of the difficulties that they may face in doing so. Some women either had no idea where they could turn to for information or support for breastfeeding, or they expended considerable effort to locate lactation consultants, peer support groups, or breastfeeding classes. In addition, women in this study noted that they were unprepared for the postpartum period (N = 5). Having a new baby is a major life change, and participants discussed how they didn’t ‘really know how it was going to be’. One participant wished that someone (such as her doctor) had really told her what it was going to be like afterwards. Several women discussed not having information or support to deal with their ‘baby blues’ (only one participant referred to it as postpartum depression) and having to navigate that process largely alone. Further research regarding breastfeeding and postpartum depression health literacy is warranted.

Research suggests that different sources of information are typically accessed by certain population segments. Whereas this study does not conclusively draw a connection between demographic characteristics and the use different information sources, further research in to this area is still warranted. The sample population for this study was particularly homogenous, which may be one of the factors related to few demographic differences in information seeking among this population. Because findings were drawn from such a population, they cannot be generalized in a blanket manner to other populations (such as women of lower sociodemographic groups and women or women of color). For example, disadvantaged populations may rely more or internet-based information sources of information. Women of different cultural and ethnic
populations may rely more upon tight-knit communities of family and friends than do women of this study sample. Therefore, future research regarding the HISB of pregnant women should utilize both clinical and community settings to address issues of limited sample size and lack of variation.

This study did elucidate why women utilize certain information sources. They were motivated by wanting to understand the lived experiences of other women, need for credible research-based medical information, and instant access when needed. Women still highly value health care providers for their training and knowledge. However, women in this study did discuss an awareness of the limited time spent with health care providers and the desire only to address ‘serious’ concerns with them, saving ‘silly’ questions for other modes of information seeking. This then, is why other sources of information such as mobile applications and pregnancy and childbirth-related websites were highly utilized. Therefore, can we bridge this gap between health care providers and digital resources? How might public health practice bring home-based and clinic-based health education services two priority populations through innovative and cost-effective means?

Finally, future studies that look at any aspect related to information seeking should take a refined approach to digital and information-based information sources. Researchers, regardless of discipline, must stop thinking of the internet as ‘The Internet’. Though traditional public health practitioners and medical clinicians may be weary of its place in the lives of individual patients and the public; the internet is here to stay. However, researchers and practitioners tend to think of it as a stationary, unchanging structure. The ways in which people use these types of platforms constantly grow and change, much like a living organism. Therefore, health literacy research should be reflective of this, and attempt to have a sophisticated understanding of the
many ways in which individuals use web and digitally-based information sources to ‘find’ health related information.

Conclusion

This study found that pregnant women look for many different pregnancy and childbirth-related topics, and that they use multiple sources of information to do so. In addition, there are multiple motivations driving information needs, including curiosity about an unknown experience, desire to avoid poor health outcomes, and efforts to understand if one’s own experiences are normal or if they should be escalated to the attention of a health care provider. Women use different information sources to meet their needs for different reasons. These reasons include wanting to use other women’s lived experiences in order to evaluate whether their own are ‘normal’, rely health care provider training and expertise as the ‘final say’ with respect to information needs, and gain access to information instantly. Beliefs about the value of information sources were different given the motivation behind using them.

Understanding pregnant women’s HISB allows us to understand which translational practices better address individual information needs in ways that they are more likely to use. For example, because many pregnant women utilize mobile phone applications, are there ways to incorporate these in to evidence-based practice? Further, if we understand why women seek out information and why they use certain information sources, we are better able to create targeted and tailored health literate educational materials for pregnant and postpartum women. Further, understanding these health information seeking behaviors may highlight areas of pregnancy and childbirth-related health deemed important by the public health and medical disciplines, but which women themselves do not seek information about (for example, pregnancy complications). Understanding why this occurs may enable researchers to create awareness
among this population about these important issues. Exploring health information seeking behavior of pregnant women is the first step in understanding and affecting health literacy in this priority population.
CHAPTER 6: REFERENCES


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APPENDIX A: FINAL SURVEY INSTRUMENT

Congratulations! You are eligible to participate in the full survey. All of your responses will be confidential.

Next are some questions about information you may have looked for during pregnancy and where you looked for that information.

Please answer as best you can remember. There are no right or wrong answers.

**Pregnancy Topic Questions**

1. Below is a list of topics about pregnancy and childbirth. Please check all of the topics that you looked for information or asked other people about.

   - How my baby grew while I was pregnant
   - My changing body during pregnancy
   - Changes in my skin during pregnancy
   - Food cravings during pregnancy
   - Gaining weight during pregnancy
   - Tests during pregnancy (for example, blood tests, glucose test, amniocentesis, etc.)
   - Medical procedures during pregnancy (x-rays, sonograms, etc.)
   - Having dental work done during pregnancy
   - Morning sickness
   - Being tired during pregnancy
   - Muscle cramps and swelling during pregnancy
   - Bleeding and spotting during pregnancy
   - Pregnancy complications during pregnancy (Diabetes, high blood pressure, preeclampsia, etc.)
   - Exercising during pregnancy
   - What I should eat during pregnancy
   - What I should NOT eat during pregnancy
   - Medications I can take during pregnancy
   - Herbal medicines during pregnancy
   - Drinking caffeine during pregnancy
   - Drinking alcohol during pregnancy
   - Smoking cigarettes during pregnancy
   - Sex during pregnancy
   - Stages of birth (what happens to my body during childbirth)
   - Procedures during birth (for example, fetal monitoring, induction, pain medication)
   - Cesarean section birth (c-section)
   - Natural birth (not using most pain medications)
   - How my workplace affects me and my baby during pregnancy
   - Having a baby too early, or a baby that is too small
   - Birth defects
   - Choosing a health care provider for pregnancy
   - Choosing a hospital for delivery
   - Alternate birth settings (for example, birth center or home birth)
   - How to pay for the pregnancy and childbirth
2. Was there a topic related to your *pregnancy and childbirth* that was not listed above that you sought information on?
   a. Yes
   b. No

3. If yes, Please list any other topics that you sought information on related to your pregnancy. (dialogue box)

4. From the topics that you selected, which three topics were MOST important to you during your pregnancy? List the one that was most important to you as the first one, followed by second and third (1, 2, 3).
   You can drag and drop the topics that were most important to you into the box on the right (under 'Items'), and then arrange them in the order that you want them.

**Information Sourced During Pregnancy**

5. Below is a list of different information sources. Please check all of the information sources that you used when you were looking for information or had questions during your recent pregnancy?

   My doctor(s) that took care of me during pregnancy
   My midwife(s) that took care of me during pregnancy
   My nurse(s) that took care of me during pregnancy
   My doula (certified birth attendant) that took care of me during pregnancy and childbirth
   My family members
   My friends
   Books about pregnancy and childbirth
   Mass media (for example, T.V., Radio, Newspapers, Magazines)
   Childbirth education classes
   My health insurance plan (plan website, leaflets, videos, etc.)
   My employer (company website, leaflets, educational programs, etc.)
   "Apps" with pregnancy and childbirth information for my phone or tablet
   Websites about pregnancy and childbirth for pregnant women
   General medical websites (for example, WebMD.com, MayoClinic.com, Healthline.com, etc.)
   State or federal government agency websites (for example, the Department of Health, Health.gov, CDC.gov, etc.)
   Search engines (for example, Google, Yahoo, Bing, etc.)
   Online discussion forums, chat rooms, and group discussion lists (for example, Yahoo! Groups, Google Groups, etc.)
   Social News Sites (for example, Digg, Reddit, Del.icio.us, RSS, etc.)
   Online video sites (for example, YouTube, Vimeo, etc.)
   Pregnancy and childbirth related personal blogs
   Pregnancy or childbirth related microblogs (for example, Pinterest, Tumblr, etc.)
   Facebook
   Other social media (for example, Twitter, Instagram, Google Plus, etc.)

6. For the topics that you selected earlier, how valuable were the following as sources when you were looking for information or had questions?
   Even if you did not use the information source, how valuable do you think it generally would be?
<table>
<thead>
<tr>
<th>Resource</th>
<th>Not valuable at all</th>
<th>Somewhat Valuable</th>
<th>Moderately Valuable</th>
<th>Very valuable</th>
<th>Most valuable</th>
</tr>
</thead>
<tbody>
<tr>
<td>My doctor(s) that took care of me during pregnancy</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>My midwife(s) that took care of me during pregnancy</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>My nurse(s) that took care of me during pregnancy</td>
<td>[\text{value}]</td>
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<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>My doula (certified birth attendant) that took care of me during pregnancy and childbirth</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>My family members</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>My friends</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>Books about pregnancy and childbirth</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>Mass Media (for example, T.V., Radio, Newspapers, Magazines)</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>Childbirth education classes</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
</tr>
<tr>
<td>My health insurance plan (plan website, leaflets, videos, etc.)</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>My employer (company website, leaflets, educational programs, etc.)</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>“Apps” with pregnancy and childbirth information for my phone or tablet</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>Websites about pregnancy and childbirth for pregnant women</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>General medical websites (WebMD.com, MayoClinic.com, Healthline.com, etc.)</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>State or federal government agencies (Department of Health, health.gov, CDC.gov, etc.)</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>Search engines (Google, Yahoo, Bing, etc.)</td>
<td>[\text{value}]</td>
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<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>Online forums, chat rooms, and group discussion lists (Yahoo! Groups, Google Groups, etc.)</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
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<tr>
<td>Social News Sites (Digg, Reddit, del.icio.us, RSS, etc.)</td>
<td>[\text{value}]</td>
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<tr>
<td>Online video sites (YouTube, Vimeo, etc.)</td>
<td>[\text{value}]</td>
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<td>[\text{value}]</td>
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<tr>
<td>Pregnancy and childbirth related blogs</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
<td>[\text{value}]</td>
</tr>
</tbody>
</table>
Pregnancy or childbirth related microblogs (Pinterest, Tumblr, etc.)
Facebook
Other social media (Twitter, Google Plus, etc.)

7. Was there an information source that you used that was not listed?
   c. Yes
   d. No

8. If yes, Please list any other sources of information you used during pregnancy. (dialogue box)

9. In general, how much do you trust each of the following sources of information on pregnancy and childbirth?

   Even if you did not use the information source, how much in general would you trust it?

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Somewhat</th>
<th>Moderately</th>
<th>Very Much</th>
<th>Completely</th>
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</thead>
<tbody>
<tr>
<td>My doctor(s) that took care of me during pregnancy</td>
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<tr>
<td>My midwife(s) that took care of me during pregnancy</td>
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<td>My nurse(s) that took care of me during pregnancy</td>
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<tr>
<td>My doula (certified birth attendant) that took care of me during pregnancy and childbirth</td>
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<tr>
<td>My family members</td>
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<td>My friends</td>
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<td>Books about pregnancy and childbirth</td>
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<td>Mass media (for example, T.V., Radio, Newspapers, Magazines)</td>
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<tr>
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<td>My health insurance plan (plan website, leaflets, videos, etc.)</td>
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<td>My employer (company website, leaflets, educational programs, etc.)</td>
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<tr>
<td>“Apps” with pregnancy and childbirth information for my phone or tablet</td>
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<td>Websites about pregnancy and childbirth for pregnant women</td>
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<tr>
<td>General medical websites (for example, WebMD.com)</td>
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<tr>
<td>Information Sources</td>
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<td>----------------------------------------------------------</td>
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<tr>
<td>Mayo Clinic.com, Healthline.com, etc.</td>
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<td>State or federal government agency websites (for example, the Department of Health, Health.gov, CDC.gov, etc.)</td>
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<td>Online video sites (for example, YouTube, Vimeo, etc.)</td>
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<td>Pregnancy and childbirth related personal blogs</td>
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<tr>
<td>Pregnancy or childbirth related microblogs (for example, Pinterest, Tumblr, etc.)</td>
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<tr>
<td>Facebook</td>
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<tr>
<td>Other social media (for example, Twitter, Instagram, Google Plus, etc.)</td>
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</tbody>
</table>

10. From the information sources that you used during your pregnancy, which three did you USE THE MOST OFTEN during your pregnancy? List the one you used most often as the first one, followed by second and third (1, 2, and 3).

   You can drag and drop the information sources that you used most into the box on the right (under 'Items'), and then arrange them in the order that you want them.

**Demographic Questions**

11. How long ago did you give birth?
   a. Less than one month ago
   b. 1 to 3 months ago
   c. 4 to 6 months ago
   d. 7 to 12 months ago
   e. More than 12 months ago

12. Are you of Hispanic, Latino, or Spanish origin? We are asking about race/ethnicity because we want to be sure that everyone’s perspectives are included in this survey?
   a. Yes
   b. No

13. Do you consider yourself…? (Please check all that apply)
a. White  
b. Black  
c. Asian  
d. American Indian  
e. Alaskan Native  
f. Native Hawaiian or Pacific Islander  
g. Some other race

14. At the time you gave birth, were you …?  
a. Unmarried with a partner  
b. Unmarried with no partner  
c. Married, but separated  
d. Married  
e. Widowed  
f. Decline to answer

15. What is the highest level of education you have completed or the highest degree you have received?  
a. Less than high school  
b. Some high school  
c. High school or equivalent (e.g., GED)  
d. Some college, but no degree  
e. Associate’s degree or a technical degree  
f. College (e.g., B.A., B.S.)  
g. Some graduate school, but no degree  
h. Graduate school (e.g., M.S., M.D., Ph.D.)

16. What was the primary source of payment for all of your maternity care services (provider and hospital bills, lab tests, etc.)? Was it …?  
a. Medicaid, CHIP, or insurance you got from the State government during pregnancy  
b. Other government program (such as TriCare, Federal Employees Health Benefits, Veteran’s Affairs, etc.)  
c. Insurance through my or my partner’s job  
d. Insurance I paid for it myself/ourselves (out-of pocket)  
e. Obamacare, Affordable Care Act, or Healthcare.gov  
f. I paid cash or was billed after my delivery  
g. Not Sure

17. Which of the following income categories best describes your total 2014 household income before taxes?  
h. $15,000 or less  
i. $15,001-$29,400  
j. $29,401-$37,000  
k. $37,001-$52,300  
l. $52,301-$75,300  
m. $75,301-$98,200  
n. $98,201 - $121,100  
o. $121,101 – $143,999  
p. $144,000 - $166,899  
q. $166,900 or more  
r. Decline to answer

End Survey
Participants in this study are eligible for a raffle for one of ten $10 gift cards to either Amazon or Starbucks. If you would like to be considered for this raffle, please provide at least one form of contact information below. If you are selected for a gift card, you will be contacted by one of these methods by a study investigator.

Email address: ____________________________
Phone number: ___________________________

You’re Done!

Thank you for taking part in this survey. We would also like to have short phone interviews with people who took this survey to talk a little bit more about what topics they looked for and information sources they used during pregnancy.

If you are interested in participating, all interviews will be conducted over the phone and will take between 15 and 30 minutes. If chosen for a phone interview, you will receive a $10 gift card for your time.

Are you interested in participating in an interview?
Yes
No

If interested we will need additional contact information (Fill-in boxes):
First name, Last name
Phone number
Email address
Time zone
APPENDIX B: INTERVIEW GUIDE

Interview Guide

Characteristics of the Information Seeker

Salience – Perceived importance, relevance, or significance

So to start, when you took the survey online, you were given a whole list of topics that someone could look for information for during pregnancy. You chose a number of those topics that you looked for. You said that __________________________, __________________________, __________________________were the topics that were most important to you.

Why were these topics most important to you?
  -   Embarrassment?
  -   Hindsight?

Probe: What did you do with that information? How did it help you?

Beliefs – Perception about how information sources/information seeking affects the health state (being pregnant)?

Ok, switching gears a little bit, you also completed a check list information sources you might have used to find that information while you were pregnant. You said that you used __________________________, __________________________, __________________________as information sources most often.

Why did you use those sources of information the most?

Probe: What were some that you wouldn’t want to use? Why?

What made it easy/difficult to find and use information?

Characteristics of the Information Source – Information Utilities

Valuable

When you completed the check list of information sources, you rated each of those information sources whether it was very valuable, somewhat valuable, not valuable at all.
When I say valuable, what does that mean for you?

Did you ever get different information from different sources? If so, what did you do? How did you decide to go with one over the other?

**Probe:** What/Why information sources were NOT valuable to you and why?

**Trustworthy**

You also rated how trustworthy each of the information sources was.

When you think about a trustworthy information source, what does that mean to you?

**Probe:** What would make you NOT trust an information source? (what are some sources that you think are not trustworthy)?

Can you tell me anything else about the topics of information you were looking for or needed while you were pregnant, how you got them, and the information sources you used that you think is important for me to know.

That’s all I have. I’ve asked you a lot of questions. Do YOU have any questions for ME?
**APPENDIX C: SURVEY CONTENT**
(Gray shading indicates modified questions)

<table>
<thead>
<tr>
<th>Description</th>
<th>Question</th>
<th>Response Categories</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information Questions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Sources of Information</td>
<td>During your recent pregnancy, how valuable were the following as sources of information when you were looking for information or had questions?</td>
<td>Likert Scale: Very Valuable, Somewhat Valuable, Not Valuable, Did Not Use.</td>
<td>The original question only listed ‘Maternity care providers.’ However some individuals with low health literacy might not know what maternity care or prenatal care means. Doctor, midwife, and nurse were then each separately named. ‘For my phone or tablet’ was added to the end of the pregnancy app information source for greater clarity.</td>
</tr>
<tr>
<td>My doctor(s) that took care of me during pregnancy</td>
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<tr>
<td>My midwife(s) that took care of me during pregnancy</td>
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<tr>
<td>My nurse(s) that took care of me during pregnancy</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Friends and/or Family</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Books about pregnancy and childbirth</td>
<td></td>
<td></td>
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<tr>
<td>Mass Media (T.V., Radio, Newspapers)</td>
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<tr>
<td>My health plan (plan website, leaflets, videos, etc.)</td>
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<tr>
<td>My employer (company website, leaflets, educational programs, etc.)</td>
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<td>Websites about pregnancy and childbirth for pregnant women</td>
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<td>General medical websites (WebMD.com, MayoClinic.com, Healthline.com, etc.)</td>
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<td>State or federal government agencies (Department of Health, health.gov, CDC.gov, etc.)</td>
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<tr>
<td>Childbirth education class</td>
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</tr>
<tr>
<td>“Apps” with pregnancy and childbirth information for my phone or tablet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Internet Sources of Information</strong></td>
<td>During your recent pregnancy, how valuable were the following to you as sources of information when you were looking for information or had questions?</td>
<td>Calibri (Body)</td>
<td>Pregnancy microblogs like Pinterest and Tumblr were added, as they have become very popular in the time since L2M3 was developed. In addition, general search</td>
</tr>
</tbody>
</table>
Social News Sites (Digg, Reddit, del.icio.us, RSS, etc.)
Other social media (Twitter, Google Plus, etc.)
Online video sites (YouTube, Vimeo, etc.)
Wikipedia
Online forums, chat rooms, and group discussion lists (Yahoo! Groups, Google Groups, etc.)
Pregnancy and childbirth related blogs
Pregnancy or childbirth related microblogs (Pinterest, Tumblr, etc.)
Search engines (Google, Yahoo, Bing, etc.)

<p>| Screener and Demographic Questions |  |
|-----------------------------------|  |
| <strong>Sex</strong>                           | <strong>What is your sex?</strong> | <strong>Yes</strong> | <strong>No</strong> |
| <strong>Birth in past year</strong>            | <strong>Did you give birth within the past year?</strong> | <strong>Yes</strong> | <strong>No</strong> |
| <strong>Singleton</strong>                     | <strong>When you gave birth, did you give birth to a single baby or more than one?</strong> | One | More than one |
| <strong>Living Child</strong>                  | <strong>Is your baby still living?</strong> | <strong>Yes</strong> | <strong>No</strong> |
| <strong>US Residence</strong>                  | <strong>Is your baby still living?</strong> | <strong>Yes</strong> | <strong>No</strong> |
| <strong>Pregnancy Residence</strong>           | <strong>During the majority of your pregnancy did you live in the United States?</strong> | <strong>Yes</strong> | <strong>No</strong> |
| <strong>Parity</strong>                        | <strong>Including your recent pregnancy, how many living children do you have?</strong> | 1 | 2 | 3 | 4 or more |
| <strong>Age</strong>                           | <strong>What is the year of your birth?</strong> | Drop-down menu with years 1960 - 2000 |
| <strong>Hispanic Ethnicity</strong>            | <strong>Are you of Hispanic, Latino or Spanish origin? We are asking about race/ethnicity because we want to be sure that everyone’s perspectives are included in this survey?</strong> | <strong>Yes</strong> | <strong>No</strong> |
| <strong>Race</strong>                          | <strong>Do you consider yourself...? (Please check all that apply)</strong> | White | Black | Asian | American Indian | Alaskan Native | Native Hawaiian or Pacific Islander |</p>
<table>
<thead>
<tr>
<th>Relationship Status</th>
<th>At the time you gave birth, were you …?</th>
<th>Some other race</th>
<th>Answer choices were included to reflect a married, but separated and widowed relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unmarried with a partner</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unmarried with no partner</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Married, but separated</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Widowed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Decline to answer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>What is the highest level of education you have completed or the highest degree you have received?</td>
<td>Less than high school</td>
<td>The original question had an option for ‘Private Insurance’ and ‘Paid for it myself.’ However, some participants may not understand that insurance they receive through their employment is private insurance. In addition, though insurance purchased through the healthcare exchange is bought out of pocket, some respondents may not understand this.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Some high school</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>High school or equivalent (e.g., GED)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Some college, but no degree Associate’s degree or a technical degree</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>College (e.g., B.A., B.S.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Some graduate school, but no degree</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Graduate school (e.g., M.S., M.D., Ph.D.)</td>
<td></td>
</tr>
<tr>
<td>Health Insurance</td>
<td>What was the primary source of payment for all of your maternity care services (provider and hospital bills, lab tests, etc.)? Was it …?</td>
<td>Medicaid or CHIP</td>
<td>The original question included 28 income categories. Some categories were collapsed for the purposes of this survey.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other government program (such as TriCare, Federal Employees Health Benefits, Veteran’s Affairs)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Through my or my partner’s job</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paid for it myself/ourselves (out-of-pocket)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Obamacare, Affordable Care Act, or Healthcare.gov</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>Which of the following income categories best describes your total 2014 household income before taxes</td>
<td>$15,000 or less</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$15,001-$29,400</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$29,401-$37,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$37,001-$52,300</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$52,301-$75,300</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$75,301-$98,200</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$98,201 - $121,100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$121,101 – $143,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$144,000 - $166,899</td>
<td></td>
</tr>
</tbody>
</table>
**New Items**

<table>
<thead>
<tr>
<th>Description</th>
<th>Question</th>
<th>Response Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy Topic</td>
<td>Below is a list of topics about pregnancy. Please check all of the topics</td>
<td>How my baby grew while I was pregnant (fetal development)</td>
</tr>
<tr>
<td></td>
<td>that you looked for information or asked other people about.</td>
<td>My changing body during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tests during pregnancy (Glucose test, amniocentesis, Chorionic Villus Sampling, Blood tests, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Morning sickness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Muscle cramps and swelling during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Being tired during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exercising during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Food cravings during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What I should eat during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What I should not eat during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weight gain during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medical procedures during pregnancy (x-rays, dental work, sonograms, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medications I can take during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sex during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin changes during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Caffeine during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alcohol during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cigarettes during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Birth defects (Spina bifida, Down Syndrome, Heart defects, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pregnancy complications during pregnancy (Diabetes, high blood pressure, preeclampsia, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bleeding and spotting during pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stages of birth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Procedures during birth (fetal monitoring, induction, pain medication)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cesarean section birth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Natural birth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Choosing a health care provider for pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Choosing a hospital for delivery</td>
</tr>
</tbody>
</table>
| Other Topic | Was there a topic related to your pregnancy that was not listed above that you sought information on? | Yes  
No |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Topic</td>
<td>If yes, Please list any other topics that you sought information on related to your pregnancy.</td>
<td>(dialogue box)</td>
</tr>
<tr>
<td>Rank Topics</td>
<td>From the topics that you selected, which three topics were MOST important to you during your pregnancy? List the most important as number one, followed by second and third.</td>
<td>Qualtrics Ranking</td>
</tr>
</tbody>
</table>
| Other Information | Was there an information source that you used that was not listed? | Yes  
No |
| Other Information | If yes, Please list any other sources of information you used during pregnancy. | (dialogue box) |
| Information Rank | From the information sources that you used during your pregnancy, which three did you use the MOST during your pregnancy? List the one you used most as number one, followed by second and third. | Qualtrics Ranking |
APPENDIX D: INFANT LOSS SCREENER

Thank you for your interest in this survey. We are very sorry that you have experienced the loss of a child. You may be interested in contacting First Candle or the National SHARE Office which provide Pregnancy and Infant Loss support.

Another national organization, Compassionate Friends, helps families grieving from the death of a child at any age. These groups have printed and online resources, local chapters, and toll-free numbers. The March of Dimes also offers resources to help parents and others deal with the loss of an infant.

First Candle — http://www.firstcandle.org
National SHARE Office — http://www.nationalshare.org
Compassionate Friends http://www.compassionatefriends.org
## APPENDIX E: ADDITIONAL TABLES AND FIGURES

### Table A1. Maternity-related Topics in the Literature

<table>
<thead>
<tr>
<th>Author</th>
<th>Topic Choices or Purpose</th>
</tr>
</thead>
</table>
| **Lagan, Sinclair, & Kernohern (2010)** | Search for general pregnancy information  
Search for information on pregnancy product  
Search for information about a specific pregnancy condition  
Participate in a pregnancy discussion group  
Purchase items for pregnancy  
Participate in online support group  
Seek second opinion  
Search for information about a treatment proscribed  
Bring information to a health professional |
| **Larsson (2007)**                    | What information do you look for? (open-ended quantitative survey question)  
- Pregnancy  
- Childbirth  
- The expected baby  
- Chat forum  
- Parental benefit |
| **Shieh, McDaniel, and Ke (2009)**    | What to do if labor starts early  
Danger signs during pregnancy  
How my baby grows and develops  
Medications during pregnancy  
Deal with stress during pregnancy  
Exercise during pregnancy  
Emotional changes during pregnancy  
Birth control  
How to balance rest and activity  
How much weight I should gain  
Breastfeeding  
Safe sex during pregnancy  
Prenatal nutrition  
Prenatal vitamins  
HIV test and how to keep from getting it  
Proper use of seatbelt during pregnancy  
Smoking and pregnancy  
Alcohol use and pregnancy  
Illegal drugs and pregnancy  
Physical abuse to women during pregnancy |
**Table A2.** Current Text4Baby Topics

<table>
<thead>
<tr>
<th>Current Text4baby Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prenatal Care</td>
</tr>
<tr>
<td>Safe Sleep**</td>
</tr>
<tr>
<td>Immunization *</td>
</tr>
<tr>
<td>Breastfeeding **</td>
</tr>
<tr>
<td>Nutrition *</td>
</tr>
<tr>
<td>Oral Health *</td>
</tr>
<tr>
<td>Family Violence *</td>
</tr>
<tr>
<td>Physical Activity</td>
</tr>
<tr>
<td>Safety *</td>
</tr>
<tr>
<td>Injury Prevention *</td>
</tr>
<tr>
<td>Mental Health *</td>
</tr>
<tr>
<td>Substance Abuse</td>
</tr>
<tr>
<td>Developmental Milestones *</td>
</tr>
<tr>
<td>Labor and Delivery</td>
</tr>
<tr>
<td>Car Seat Safety **</td>
</tr>
</tbody>
</table>

* Depending on specific message content may be related to post-natal period  
** Related to post-natal period
<table>
<thead>
<tr>
<th>Information Source Rating (N = 168)</th>
<th>Not valuable at all</th>
<th>Somewhat Valuable</th>
<th>Moderately Valuable</th>
<th>Very valuable</th>
<th>Most valuable</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor(s)</td>
<td>5 (2.98%)</td>
<td>13 (7.74%)</td>
<td>19 (11.31%)</td>
<td>58 (34.52%)</td>
<td>73 (43.45%)</td>
<td>4.09 (1.00)</td>
</tr>
<tr>
<td>Midwife(s)</td>
<td>25 (14.88%)</td>
<td>14 (8.33%)</td>
<td>19 (11.31%)</td>
<td>65 (38.69%)</td>
<td>45 (26.79%)</td>
<td>3.62 (1.26)</td>
</tr>
<tr>
<td>Nurse(s)</td>
<td>14 (8.33%)</td>
<td>9 (5.36%)</td>
<td>36 (21.43%)</td>
<td>82 (48.81%)</td>
<td>27 (16.07%)</td>
<td>3.76 (1.05)</td>
</tr>
<tr>
<td>Doula(s)</td>
<td>39 (23.21%)</td>
<td>8 (4.76%)</td>
<td>35 (20.83%)</td>
<td>56 (33.33%)</td>
<td>30 (17.86%)</td>
<td>3.12 (1.37)</td>
</tr>
<tr>
<td>Family</td>
<td>9 (5.36%)</td>
<td>40 (23.81%)</td>
<td>72 (42.86%)</td>
<td>34 (20.24%)</td>
<td>13 (7.74%)</td>
<td>2.95 (1.02)</td>
</tr>
<tr>
<td>Friends</td>
<td>8 (4.76%)</td>
<td>44 (26.19%)</td>
<td>67 (39.88%)</td>
<td>38 (22.62%)</td>
<td>11 (6.55%)</td>
<td>2.86 (0.88)</td>
</tr>
<tr>
<td>Books</td>
<td>6 (3.57%)</td>
<td>17 (10.12%)</td>
<td>55 (32.74%)</td>
<td>72 (42.86%)</td>
<td>18 (10.71%)</td>
<td>3.35 (0.87)</td>
</tr>
<tr>
<td>Mass Media (TV, Radio, Newspapers, Magazines)</td>
<td>44 (26.19%)</td>
<td>76 (45.24%)</td>
<td>43 (25.60%)</td>
<td>5 (2.98%)</td>
<td>0</td>
<td>2.08 (0.83)</td>
</tr>
<tr>
<td>Childbirth Education Classes</td>
<td>13 (7.74%)</td>
<td>19 (11.31%)</td>
<td>30 (17.86%)</td>
<td>75 (44.64%)</td>
<td>31 (18.45%)</td>
<td>3.62 (1.05)</td>
</tr>
<tr>
<td>Insurance Company</td>
<td>42 (25.00%)</td>
<td>53 (34.55%)</td>
<td>52 (30.95%)</td>
<td>19 (11.31%)</td>
<td>2 (1.19%)</td>
<td>2.61 (1.00)</td>
</tr>
<tr>
<td>Employer</td>
<td>88 (52.38%)</td>
<td>46 (27.83%)</td>
<td>26 (15.48%)</td>
<td>8 (4.76%)</td>
<td>0</td>
<td>1.99 (0.96)</td>
</tr>
<tr>
<td>Mobile Apps</td>
<td>10 (5.95%)</td>
<td>20 (11.90%)</td>
<td>66 (39.29%)</td>
<td>61 (36.31%)</td>
<td>11 (6.55%)</td>
<td>2.99 (0.83)</td>
</tr>
<tr>
<td>Pregnancy and Childbirth Websites</td>
<td>2 (1.19%)</td>
<td>18 (10.71%)</td>
<td>54 (32.14%)</td>
<td>71 (42.26%)</td>
<td>23 (13.69%)</td>
<td>3.18 (0.81)</td>
</tr>
<tr>
<td>General Medical Websites</td>
<td>11 (6.55%)</td>
<td>25 (14.88%)</td>
<td>67 (39.88%)</td>
<td>53 (31.55%)</td>
<td>12 (7.14%)</td>
<td>3.15 (0.92)</td>
</tr>
<tr>
<td>State or Federal Agency Websites</td>
<td>24 (14.29%)</td>
<td>32 (19.05%)</td>
<td>62 (36.90%)</td>
<td>42 (25.00%)</td>
<td>8 (4.76%)</td>
<td>3.24 (1.05)</td>
</tr>
<tr>
<td>Search Engines</td>
<td>9 (5.36%)</td>
<td>48 (28.57%)</td>
<td>67 (39.88%)</td>
<td>33 (19.64%)</td>
<td>11 (6.55%)</td>
<td>2.52 (0.81)</td>
</tr>
<tr>
<td>Discussion Forums, Chat Rooms, Listservs</td>
<td>29 (17.26%)</td>
<td>56 (33.33%)</td>
<td>49 (29.17%)</td>
<td>29 (17.26%)</td>
<td>5 (2.98%)</td>
<td>2.30 (0.91)</td>
</tr>
<tr>
<td>Social News Sites</td>
<td>73 (43.45%)</td>
<td>47 (27.98%)</td>
<td>26 (15.48%)</td>
<td>16 (9.52%)</td>
<td>6 (3.57%)</td>
<td>1.97 (1.02)</td>
</tr>
<tr>
<td>Online Video Sites</td>
<td>42 (25.00%)</td>
<td>68 (40.48%)</td>
<td>44 (26.19%)</td>
<td>11 (6.55%)</td>
<td>3 (1.79%)</td>
<td>2.08 (0.88)</td>
</tr>
<tr>
<td>Pregnancy or Childbirth Personal Blogs</td>
<td>23 (13.69%)</td>
<td>60 (35.71%)</td>
<td>60 (35.71%)</td>
<td>22 (13.10%)</td>
<td>3 (1.79%)</td>
<td>2.41 (0.87)</td>
</tr>
<tr>
<td>Pregnancy or Childbirth Microblogs</td>
<td>47 (27.98%)</td>
<td>77 (45.83%)</td>
<td>33 (19.64%)</td>
<td>7 (4.17%)</td>
<td>4 (2.38%)</td>
<td>1.99 (0.87)</td>
</tr>
<tr>
<td>Facebook</td>
<td>67 (39.88%)</td>
<td>64 (38.10%)</td>
<td>20 (11.90%)</td>
<td>12 (7.14%)</td>
<td>5 (2.98%)</td>
<td>1.73 (0.77)</td>
</tr>
<tr>
<td>Other Social Media</td>
<td>98 (58.33%)</td>
<td>56 (33.33%)</td>
<td>11 (6.55%)</td>
<td>2 (1.19%)</td>
<td>1 (0.60%)</td>
<td>1.58 (0.76)</td>
</tr>
</tbody>
</table>
APPENDIX F: IRB APPROVAL

June 9, 2015

Laura Merrell
Community and Family Health
13201 Bruce B. Downs Blvd. MDC 56
Tampa, FL 33612

RE: Expedited Approval for Initial Review
IRB#: Pro00022379
Title: Information Seeking and Pregnancy


Dear Ms. Merrell:

On 6/8/2015, the Institutional Review Board (IRB) reviewed and APPROVED the above application and all documents outlined below.

Approved Item(s):
Protocol Document(s):
Protocol 5-20-15.docx

Consent/Assent Document(s)*:
Informed Consent - Online Survey 6-5-15.docx **granted a waiver
Informed Consent - Verbal Interviews 6-5-15.docx **granted a waiver

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s). **Waivers are not stamped.

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45 CFR 46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:
(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your study qualifies for a waiver of the requirements for the documentation of informed consent as outlined in the federal regulations at 45CFR46.117(c) which states that an IRB may waive the requirement for the investigator to obtain a signed consent form for some or all subjects if it finds either: (1) That the only record linking the subject and the research would be the consent document and the principal risk would be potential harm resulting from a breach of confidentiality. Each subject will be asked whether the subject wants documentation linking the subject with the research, and the subject's wishes will govern; or (2) That the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

[Signature]

John Schinka, Ph.D., Chairperson
USF Institutional Review Board