EVALUATION OF HEALTH INFORMATION WEBSITES ON LABOR AND BIRTH

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ABSTRACT

Cara Lynn English: Evaluation of Health Information Websites on Labor and Birth
(Under the direction of Kathy Alden)

The Internet is a leading source of information for women during pregnancy with 99% of pregnant women accessing web-based health information related to pregnancy and birth weekly (Declercq, Sakala, Corry, Applebaum, & Herrlich, 2013b). A plethora of information on birth is available through the Internet (Daniels & Welder, 2015; Jolivet & Corry, 2010; Lothian, 2008), yet there are no guidelines or recommendations to direct women to credible websites to prepare for an in-hospital birth. In general, providers are unaware of the health sites their patients access (Martin & Robb, 2013; Weston & Anderson, 2014).

There is a need for evidence to inform providers regarding websites they can confidently recommend to patients. The literature is lacking studies that have evaluated health information websites, specifically those related to women's health. The purpose of this DNP project was to critically evaluate websites pregnant women commonly used for labor and birth information, identify areas in which websites are deficient, and provide information to fill the gap.

Websites were evaluated using Health Information Technology Institute (HITI) criteria, Flesch reading ease scale, and Flesch-Kincaid grade level. Content on induction of labor (IOL) and pain management was evaluated based on current, evidence-based information. Although government websites met the majority of the criteria, no website met all target criteria. Therefore, I created a model website using HITI and readability criteria with evidence-based content on IOL and pain management during labor and birth. Feedback on the website by a sample of stakeholders (n = 9) was positive.

The project adds to the literature by providing evaluative information about health information websites used by pregnant women seeking information about labor and birth. Providers can utilize the results of the project to formulate recommendations about the most credible websites for their patients. While there is currently no perfect website, this evaluation notes that government websites provided the highest quality information. This project highlights the need for additional evaluation of websites used by pregnant women and the need for discussions between women and providers on Internet use in order for providers to confidently guide patients to accurate and complete information.

To my love, my parents, and my sisters—thank you for your constant encouragement, support, and love. I could not have done this without you.

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LIST OF ABBREVIATIONS

AI	Amnesty International
ACOG	American College of Obstetrics and Gynecology
AWHONN	Association of Women's Health, Obstetrical, and Neonatal Nursing
CNM	Certified Nurse Midwives
CLT	Cognitive load theory
HITI	Health Information Technology Institute
FKGL	Flesch-Kincaid grade level
FRES	Flesch reading ease scale
IOL	Induction of labor
OB/GYN	Obstetrics and gynecology
U.S.	United States
USDHHS	United States Department of Health and Human Services

CHAPTER 1: BACKGROUND AND SIGNIFICANCE

Introduction

Increasingly, women are turning to the Internet for information on labor and birth (Declercq, Sakala, Corry, Applebaum, & Herrlich, 2013b). Women have transitioned from obtaining labor and birth information from books (Declercq, Sakala, Corry, & Applebaum, 2006) to the Internet and other electronic applications (Declercq et al., 2013b). It has been reported that 99% of pregnant women (n = 2400) access web-based health information related to pregnancy and birth at least once a week (Declercq et al., 2013b). This is not surprising as a large proportion of women of childbearing age belong to the Millennial generation (born between 1980 and 1997) (Frazer, Hussey, Bosch, & Squire, 2015; Keeter & Taylor, 2010) and commonly use technology for information seeking (Frazer et al., 2015; Moore, 2012). Millennials came of age at the same time as the tech era and the Internet, which has, in turn, shaped their lives (Frazer et al., 2015; Keeter & Taylor, 2010).

The Internet provides access to information, ranging from blogs to government websites, on a variety of health topics at the click of a button. With the Internet, women have control over what they learn, when they learn, and how they learn (Buultjens, Robinson, & Milgrom, 2012; Narasimhulu, Karakash, Weedon, & Minkoff, 2016). Ninety-nine percent of primiparas, or first time mothers, (n = 977) and 96% of multiparas (n = 1423) used the Internet as a source of prenatal information (Declercq et al., 2013b). Ninety-seven percent of White, non-Hispanic women (n = 1279), 96% of Black, non-Hispanic women (n = 356), and 98% of Hispanic women (n = 532) used the Internet to obtain information on pregnancy and birth (Declercq et al., 2013b).

Of these cohorts only 53%, 62%, and 57%, respectively, reported that the pregnancy and birth websites were a very valuable information source (Declercq et al., 2013b). Women are looking for trustworthy and credible childbirth information that empowers and prepares them for informed decision making during their intrapartum time in the hospital (Walker, Visger, & Rossie, 2009; Zwelling, 2008).

Preparation for labor and birth through childbirth education is associated with improved outcomes and greater maternal satisfaction (Cook & Loomis, 2012; Fisher, Hauck, Bayes, & Byrne, 2012; Gao, Chan, & Sun, 2012; Hidaka & Callister, 2012; Martin & Robb, 2013; Mete, Yenal, & Ojumuş, 2010; Namey & Lyerly, 2010; Remer, 2008; Stevens, Wallston, & Hamilton, 2011; Stoll & Hall, 2012; Weatherspoon, 2011). Traditionally, two common sources of education and preparation for birth have been health care providers and childbirth education classes.

As a result of the current fee-for-service health care reimbursement model, providers often have a limited amount of time for each prenatal visit translating into less in-depth conversations between the woman and her provider for education to take place (Amnesty International [AI], 2010). Currently, health care providers are reimbursed at a flat rate based on how many patients they see versus the quality, depth, or time-intensiveness of the visit, enforcing the system to encourage shorter visits in order to meet the bottom-line and keep doors open (Bailey, Crane, & Nugent, 2008; Schroeder & Frist, 2013). With the increase in the number of women with other conditions complicating pregnancy (Morello, 2014) and the minimal amount of time available for providers to provide basic antepartum care, education, and address active issues related to the pregnancy, it is unrealistic to believe education is being provided about a hospitalization that may be many weeks away (Bailey et al., 2008).

The two goals of comprehensive maternal care are the delivery of a healthy baby to a healthy mother and satisfaction with the birth experience; these goals are not mutually exclusive (Remer, 2008). There is a positive correlation between the antepartum and preconception education women received and their satisfaction with their birth experience (Artieta-Pinedo et al., 2010). Providing women with information so that they are able to make informed decisions about their care and be a part of the health care team promotes maternal satisfaction (Fisher et al., 2012). Women's involvement in decision-making during birth is important. It is commonly said that knowledge is power; through labor and birth education, women can be empowered members of their care team (Weatherspoon, 2011). However, the lack of clear, complete, and unbiased information sharing between women and providers makes it difficult for women to make informed decisions about their birth experience (Torres & De Vries, 2009).

In recent years, attendance at formal childbirth education classes has declined (Jolivet & Corry, 2010). In a national survey of mothers in 2013, 59% of first-time mothers (n = 977) reported taking a childbirth education class (Declercq et al., 2013b) compared to 70% of first-time mothers (n = 516) in 2002 (Declercq, Corry, Applebaum, & Risher, 2002). Martin, Bulmer, and Pettker (2013) speculate the decline in attendance may be a manifestation of women wanting control over their birth experience starting with choosing what topics they receive education about and in which form they receive it.

Women are choosing a more active role in the education process by seeking the information they want at the time they want it. Yet, there are challenges to this new way women are choosing to learn. As women try to prioritize what they feel to be important topics, the volume of information can become overwhelming. Websites that provide health information may be difficult for the average consumer to understand; the use of medical jargon and information

that is written at high reading and health literacy levels can create barriers to understanding. Women do not receive guidance on how to evaluate health information on the Internet, which can leave them with inaccurate or out-of-date information. Currently, there are few guidelines or recommendations to direct women to credible sites to prepare them for their labor and birth in a hospital setting. There is minimal information on recommended websites for women and there is little published information on the websites for a user to determine how the recommended sites were selected or evaluated.

Health Care System Barriers

In 2010, Amnesty International (AI) (AI, 2010) published a report entitled *Deadly Delivery: The Maternal Health Crisis in the USA*, addressing the deficiencies of women's health services in America. One area highlighted in AI's report was the need for more education and shared decision-making between patients and providers (AI, 2010). The current system is fraught with barriers to women participating in their own care and places no emphasis on women becoming informed members of the care team (AI, 2010). Consequently, women are not always included in making decisions surrounding the labor and delivery process (Angood et al., 2010; Hucker, 2011).

At the same time AI was compiling their report, Childbirth Connection was developing strategies to address and improve similar issues identified by maternity care stakeholders in the United States. Childbirth Connection, now part of the National Partnership for Women and Families, is a program whose mission is to improve maternity care in the U.S. (Childbirth Connection, n.d.a). Childbirth Connection has sponsored national *Listening to Mothers* ^{SM} surveys, in which they reach out to childbearing women across the U.S. to obtain feedback to improve maternity care through policy, research, education, and practice changes (Declercq et al., 2013b). In 2014, The Childbirth Connection became a program within the National

Partnership for Women and Families, a non-profit, non-partisan organization (Childbirth Connection, n.d.b; National Partnership for Women and Families, n.d.). During a national policy symposium with more than 100 leaders of patient safety and maternity care representing various stakeholder perspectives, they developed recommendations based on 11 areas identified as needing improvement; one such area was decision-making and consumer choice (Angood et al., 2010).

Several problems contribute to the current issues facing the maternal care delivery system and labor and birth education in the U.S. (AI, 2010; Angood et al., 2010). As this issue is complex, many factors must be considered to understand the background and significance of the problems influencing maternity care. Two problems of interest effecting the maternal care delivery system are (1) a lack of information sharing between obstetric providers and patients, which results in (2) a lack of shared decision making between patients and providers (AI, 2010; Angood et al., 2010).

One contributor to the lack of information sharing between health care providers and patients is simply a lack of time. The fee-for-service reimbursement structure of our health care system reimburses providers for billable services such as office visits and lab tests, versus the outcomes produced by these visits (United States Centers for Medicare & Medicaid, n.d.). Education itself is often not a reimbursable service (Bastable & Alt, 2014). With a finite number of hours in a typical workday, providers are expected to see a maximum number of patients in a fixed amount of time (Schroeder & Frist, 2013). This issue is highlighted when women report barriers that kept them from obtaining information from their provider are: not wanting to bother their provider, difficulty reaching their provider when they have a question, and that the provider is busy and does not spend enough time with them (Narasimhulu et al., 2016).

Another contributing factor to the lack of information sharing is the lack of continuity of patients with their primary providers. The current health care reimbursement model does not encourage care coordination between providers (Schroeder & Frist, 2013), which can be detrimental to the pregnant woman who is encouraged or required to see a variety of providers during the prenatal period. In a sample of 2400 women, one in five women reported seeing two or more providers for prenatal care (Declercq et al., 2013b; Declercq, Sakala, Corry, Applebaum, & Herrlich, 2014). One in three women had someone other than their primary prenatal care provider as the provider who delivered their baby (Declercq et al., 2013b). With limited time and the lack of continuity of providers, it can be difficult for consistent, evidence-based education to occur between the provider and the patient.

A third lapse in communication comes from a lack of empowerment of the pregnant woman as they are often reluctant to request the information they require. In a survey of 2400 mothers across the U.S., barriers to asking questions of their providers were identified. These barriers included the provider seemed rushed (30%), the care they wanted differed from their provider's recommendation (22%), or they did not want to be seen as the problem patient (23%) (Declercq et al., 2013b; Declercq et al., 2014). There is a need to prepare women for what to expect when giving birth in the hospital and this must be done outside of their prenatal appointments (Berman, 2006). To help fill this gap and address barriers to asking questions, health care providers can begin the conversation by directing patients to alternative sources of information such as childbirth education classes or to web-based resources.

Childbirth Education in the U. S.

The goals of most formal childbirth education classes are to inform and empower women and their partners to choose natural childbirth and provide them with coping strategies to deal with the pain of contractions (Lothian, 2008; Walker et al., 2009). The two most well-known

methods of childbirth education, Lamaze and the Bradley Method, rest on the main goal of achieving a natural, unmedicated birth (Lothian, 2008; Walker et al., 2009). Traditional childbirth education consists of formal, face-to-face classes, typically meeting over several weeks, that require payment to attend (Walker et al., 2009). Such classes can be an unrealistic choice for women who have limited income, live in more rural areas, have limited transportation options, or work (Berman, 2006). For women who desire a medicated birth, these classes may not meet their needs.

While Lamaze and Bradley classes are still popular with some expectant parents, formal childbirth education has gradually transitioned from being predominantly a series of classes taught by individuals in the community to hospital-based classes typically led by hospital employees (Lothian, 2008; Ondeck, 2000). The focus has changed from "natural birth" to "preparation for birth" (Lothian, 2008). Hospital-based classes often provide women with information on making choices based on the availability of options within the specific hospital—a change from traditional classes promoting natural birth (Lothian, 2008). Women and their partners are referred to the hospital-based classes by their providers who are on staff or contract with the hospital (Hotelling, 2009). Many hospital-run classes provide information about childbirth practices within the hospital (Ondeck, 2000) and provide a tour of the hospital for women and their partners. There are ethical and legal implications surrounding education being censored to only cover what is offered at the women's place of giving birth (Martin, 2008). As hospital employees, childbirth educators are challenged to provide unbiased, evidence-based information within the limitations of specific hospital practices (Angood et al., 2010; Lothian, 2008; Ondeck, 2000; Torres & De Vries, 2009). Others are able to incorporate alternative models of care, but the presence of classes within the hospital, taught by hospital employees can have

unintentional influences on women and their partners, such as a feeling of medical authority over their birth (Hucker, 2011; Ondeck, 2000).

During the time since formal childbirth education migrated into the hospitals, there has been an increased medicalization of birth. The most common reason for hospitalization in the U.S. is delivery of a newborn (Pfuntner, Wier, & Stocks, 2013). According to the Centers for Disease Control and Prevention, of the almost 3.98 million births which took place in the U.S. in 2015, 98.5% of women gave birth in a hospital and physicians attended 91.1% of those hospital births (Martin, Hamilton, Osterman, Driscoll, & Mathews, 2017). From 1996 to 2009 the cesarean section rate increased from 20.7% to 32.9% of live births; in 2015, the cesarean section rate was 32.0%, the lowest it has been since 2007 (Martin et al., 2017). Labor induction rates more than doubled from 1990 to 2010 from 9.6% to 23.8% of live births (Osterman & Martin, 2014). From 1981 to 2006, the proportion of babies born less than 39 weeks gestation increased by almost 60% and the number of babies born at 39 weeks of gestation or more declined by more than 20% (Osterman & Martin, 2014). The implication of this change in practice is that women need to be well-prepared with knowledge on which to base decisions about their care and to become involved members of their health care team.

Problem Statement

Childbirth education has not evolved at the same pace as the needs and desires of women giving birth (Angood et al., 2010; Jolivet & Corry, 2010). The ways women receive birth education has changed. Women are unlikely to receive adequate education on labor and birth from their health care providers (Angood et al, 2010). This trend, combined with the decreasing number of women going to childbirth classes, makes it clear there is a need for another way to reach women (Jolivet & Corry, 2010). Stakeholders and leaders in the field of maternity care have called for increased opportunities and tools to enable informed choices in maternity care,

and innovative and expanded models for teaching expectant parents about labor and birth (Angood et al., 2010).

Although there is a myriad of information available to the public through electronic media (web, phone applications, etc.) on birth and labor education, it is difficult for women and their families to determine the accuracy and reliability of this information and the sheer volume can be overwhelming (Daniels & Welder, 2015; Jolivet & Corry, 2010; Lothian, 2008; Narasimhulu et al., 2016). In addition, the reading level of some websites makes the information difficult to understand. Women and their families need help in identifying accurate, credible, understandable, and unbiased sources of web-based information (Hidaka & Callister, 2012). They need access to resources that can guide their choices of web-based information about labor and birth. Opportunities to engage more fully in learning and decision-making, based on current, accurate educational information, can help promote a more positive birth experience and improved outcomes. Health care providers can benefit from a similar resource as they seek to recommend credible, accurate, web-based information to their patients (Narasimhulu et al., 2016). Providers may feel more likely to engage with their patients using the Internet if they are aware of the sites their patients are using, the quality of that information, and if they have references to quality websites (Martin, Bulmer, & Pettker, 2013; Weston & Anderson, 2014).

Purpose

The purpose of this DNP project was to critically evaluate websites pregnant women commonly used for labor and birth information, identify areas in which web-based labor and birth education on induction of labor and pain management is deficient, and provide information to fill the education gap.

Project Questions

The questions that were addressed through this project were:

1. What information exists on the Internet for pregnant women about labor and birth?
2. Is this information accurate and complete?
3. Is the source of this information credible?
4. At what reading level is this information written?
5. Is this information presented effectively?
6. What information is missing or insufficient?

CHAPTER 2: REVIEW OF THE LITERATURE

This review of literature examines the current state of education to prepare for labor and birth, labor and birth education in electronic media, and evaluation of health care information websites. For the purpose of this paper, childbirth education refers to formal childbirth education classes and curricula, whereas labor and birth education refers to informal pre-hospital education, such as the use of the Internet, in which women self-prepare for decisions they will face when they are giving birth in a hospital. Natural childbirth or natural birth is used in reference to a non-epiduralized or non-medicated birth.

Search Strategy

The strategies utilized for review of the literature consisted of four phases. Phase one entailed searches of key words in the Cumulative Index for Nursing and Allied Health Literature (CINAHL), PubMed, and Google Scholar databases via access from UNC Chapel Hill Libraries. Searches included combinations of the words or phrases: empower, pregnancy, childbearing, birth, labor, gestation, gravidity, delivery, patient satisfaction, childbirth education, and childbirth classes. CINAHL mesh headers, Boolean phrase combinations, and truncation of terms were utilized to achieve a comprehensive initial search. There was no limitation of publication dates in the initial search. Phase two consisted of searching through the references used in relevant publications identified in phase one, then locating those articles using Google Scholar. Phase three utilized the "Cited by" feature on Google Scholar to locate more recent publications that had cited any articles of import to address the topic of interest. Phase four entailed the addition of publications identified through professional bulletins, colleagues, and personal files.

During phase four, publications were strategically searched for relevance to the topic of interest, publication date, publication type, and for availability of the publication in English. The primary focus was on publications from the last ten years with inclusion of earlier publications when indicated.

Importance of Education to Prepare for Labor and Birth

The topic of labor and birth education has been examined by researchers all over the world from various perspectives. Feedback from women yielded qualitative data and reports examining correlations between outcomes and education. As a result, many themes emerged in the literature addressing the importance and impact of education preparation on labor and birth.

Labor and birth education helps prepare women for the experiences they will have when giving birth (Martin & Robb, 2013). In a qualitative study of 288 women in Scotland who had recently delivered a healthy, term baby, Martin and Robb (2013) found that most women valued the feeling of preparedness garnered from having access to information prior to giving birth and that educational resources made women feel more confident about their birth.

Women need to be aware of the variety of choices available to them in order to make informed decisions and to participate as members of their health care team (Hinote & Wasserman, 2012; Records & Wilson, 2011). Women need help understanding information to be more prepared for the reality of birth and having knowledge of their options can help them feel more in control of their experience (Koehn, 2008; Lothian, 2008). Education has been shown to increase women's perceived control over, and satisfaction with, their birth experience (Fisher et al., 2012; Hidaka & Callister, 2012; Namey & Lyerly, 2010; Remer, 2008; Weatherspoon, 2011). Stevens, Wallston, and Hamilton (2011) surveyed 187 women in the U.S. and found the perception of control during the birth experience to be positively correlated with birth

satisfaction and self-efficacy. Perceived control and satisfaction were negatively correlated with postpartum posttraumatic stress symptoms (Stevens et al., 2011).

Koehn conducted three interviews with women (n = 9): two interviews prior to giving birth about their experiences with childbirth education classes and one after they delivered. Koehn (2008) concluded there is a relationship between readiness for childbirth and childbirth education classes and that through childbirth education classes women gained confidence in knowing what to expect and in their decision-making abilities. In addition, women reported feeling more connected to their partners after attending classes (Koehn, 2008).

Fisher, Hauck, Bayes, and Byrne (2012) conducted focus groups consisting of 12 new mothers and seven birth support partners in Australia. They found that mindfulness-based childbirth education led to increased feelings of empowerment during the birth experience for both the pregnant woman and her partner (Fisher et al., 2012).

Hidaka and Callister (2012) interviewed nine women 4-6 weeks after giving birth vaginally to their first baby in the U.S. to learn what their birth experience was like and how having an epidural contributed to their experience. They determined that the presence of an epidural did not guarantee a satisfying birth experience. The researchers concluded that educating women about birth allowed women to make informed choices, have a sense of power in decision making regarding their birth, and influenced patient satisfaction with their birth experience (Hidaka & Callister, 2012).

Namey and Lyerly (2010) conducted qualitative interviews with 101 women during their third trimester and postpartum period as part of a larger initiative to determine what made a "good" birth. Many women wanted to feel in control of their birth and that influenced their satisfaction and whether their birth was perceived as "good". One way women reported feeling

in control was through knowledge and acquisition of information. One respondent felt comfort and control knowing that what she was feeling was normal because of what she had read prior to being in labor (Namey & Lyerly, 2010).

Childbirth education is associated with improved outcomes, such as increased incidence of vaginal birth (Stoll & Hall, 2012), higher likelihood of successful breastfeeding (Mete et al., 2010), and decreased risk for postpartum depression (Gao et al., 2012). Through secondary data analysis of 624 women in British Columbia, Stoll and Hall (2012) found that older women (> 35 years) with higher education were more likely to attend childbirth education versus younger, less educated women. Stoll and Hall (2012) also found attendance at childbirth education classes was associated with decreased odds of delivering via cesarean section. Mete, Yenal, and Ojumuş (2010) found that women in Turkey ($n = 96$) who received childbirth education were significantly more likely to use proper breastfeeding techniques than women who did not receive childbirth education ($p < 0.05$).

Empowerment achieved through prenatal education can influence outcomes for both the mother and her baby after birth (Fisher et al., 2012; Gao et al., 2012; Mete et al., 2010). In a randomized control trial of an interpersonal-psychotherapy-oriented childbirth education program among 194 first-time Chinese mothers, not only did women have a decreased risk of postpartum depression, but they also had significantly better maternal role competence, psychological well-being, and perceived social supports compared to those in the control group (Gao et al., 2012). In interviews with 18 teen mothers in an urban area in the U.S., the teen mothers reported feeling that decisions made during childbirth would be representative of the decisions they would make in motherhood (Jacobson, 2015). When women feel supported to

make decisions and work with a provider they trust, they have more satisfaction with their birth experience (Cook & Loomis, 2012).

Labor and Birth Education through Electronic Media

Women frequently utilize the Internet, applications, and reality TV for pregnancy and birth information (Daniels & Wedler, 2015; Declercq et al., 2013b; Fleming et al., 2014; Frazer et al., 2015; Hearn, Miller, & Fletcher, 2013; Martin et al., 2013; Morris & McInemey, 2010; Narasimhulu et al., 2016). Women turn to YouTube, message boards, blogs, and search engines to make sense of information they receive and experiences they have during pregnancy (Fleming et al., 2014; Kraschnewski et al., 2014; Narasimhulu et al., 2016). In the U.S., the most commonly searched women's health-related term on Google was "pregnancy" with an average of 502,000 searches per month (Baazeem & Abenhaim, 2014). The reliance on electronic media and technology for information is likely related to learning preferences of the current generation of childbearing women (Frazer et al., 2015; Kraschnewski et al., 2014), the desire for information (Kraschnewski et al., 2014; Lagan, Sinclair, & Kernohan, 2010; Narasimhulu et al., 2016), and quick and easy access to information (Fleming et al., 2014; Narasimhulu et al., 2016).

Lagan, Sinclair, and Kernohan (2010) conducted an online survey of 613 women from six continents about their Internet use during pregnancy. The researchers found that 97.4% of women used search engines to search for pregnancy related information; however, only 44% of these same women trusted the information they found via these search engines. More than 99% of women reported using the Internet to find information for themselves; yet, more than two-thirds of women thought the information they found on the Internet was misleading or wrong. Only 11.3% of women knew to look for quality indicators on the sites from which they were getting information. When allowed to select more than one response, the majority of women felt the information they found on the Internet had some effect on helping them be involved in the

decision process (n = 577), helping them to make a better decision (n = 579), and giving them more control over decisions affecting the pregnancy (n = 584) (Lagan et al., 2010).

From respondents to their survey, Lagan, Sinclair, and Kernohan, (2011) conducted 13 asynchronous, online focus groups with 92 women from five different countries yielding qualitative data. Approximately 96% of these women had Internet access at home and 38% identified their Internet skills as "nonexpert". Most women reported they went online for information because they felt their health providers did not provide them with enough information to meet their needs. Women reported turning to the Internet because it was a judgment-free zone where they could get their questions answered anonymously. Women could access information on the Internet at any point in time whereas they only had a handful of prenatal appointments and found they had questions more frequently than they had chances to speak with their health care provider. Women indicated the beliefs that the Internet did not go out of date like books and other written material, could give them a well-rounded view of the issues, was easy to search, and was not as expensive as buying multiple books. However, to determine the accuracy of the results found on the Internet, women determined information was correct if it was found on multiple websites. With so much information available, women reported the information could make them "paranoid", "anxious", or "frightened". Yet, the information also made them feel "empowered", "in control", and "informed". It helped the women to confidently speak with their health care provider as an equal and assist in informed decision-making (Lagan, Sinclair, & Kernohan, 2011).

Fleming, Vandermause, and Shaw (2014) conducted a focus group of childbirth education providers and in-depth interviews with first-time mothers to explore the use of technology in birth preparation. The focus groups consisted of 12 providers including childbirth

educators, obstetric providers, and labor and delivery nurses. The focus groups revealed that women were not only using electronic resources to prepare for birth, but also during birth. In-depth interviews of seven first-time mothers between the ages of 18-21 years found that none of the women were given recommendations to use specific sites by their providers and the majority of them did not discuss which sites they used with their providers. These women reported that they felt anxious and did not feel adequately prepared for their births; their self-preparation was incomplete (Fleming et al., 2014).

Weston and Anderson (2014) examined Internet use in pregnancy as perceived by pregnant women (n = 5), women who had recently delivered (n = 4), and midwives (n = 13) in England. Pregnant women, women who had recently delivered, and midwives all agreed that the Internet could be a useful source for educating patients if used carefully. Women reported preferring advice from the midwife, but turned to the Internet to clarify information and for minor inquiries. Women and midwives agreed that information garnered from the Internet sparked discussion between patients and providers. Midwives reported more personal negative feelings toward Internet use in pregnancy than did the women (Weston & Anderson, 2014).

Hearn, Miller, and Fletcher (2013) utilized focus groups and interviews with 116 perinatal women and 76 health care providers in Australia to determine what online information women want about healthy lifestyles during pregnancy and in the postpartum period and in what form. Women reported regularly using search engines to locate information on the topics of interest, despite being able to name specific sites that contained desired information. Women indicated that they desired basic, reliable information on topics located in a trustworthy central site with links to other sites for further reading (Hearn et al., 2013).

Narasimhulu, Karakash, Wedon, and Minkoff (2016) used a survey to examine Internet use by 503 underserved and racially diverse pregnant women in an inner-city. Approximately 7% of women reported no access to the Internet. Of those with access to the Internet, 76.2% used the Internet to obtain pregnancy-related health information. The majority of women accessed information on their computer (85%), but the smartphone was the second most used device (67.1%). Most women (94.2%) began their search using a search engine and only looked at the first two to five search results. The two most commonly searched topics concerning childbirth were "mode of delivery" and "pain and pain relief". Narasimhulu et al. (2016) found most women use the Internet to make choices during their pregnancy, but not all women who use the Internet to make choices discuss their findings with their providers.

Evaluation of Health Care Information Websites

The use of electronic media for labor and birth education has the potential to be detrimental (Daniels & Wedler, 2015; Fleming et al., 2012). Currently, there are no regulations for electronic content presented to women advising them on labor and birth (Daniels & Wedler, 2015; Fleming et al., 2012). The US Food and Drug Administration regulates some health applications, but does not currently regulate any applications intended for general information and patient education, including those related to pregnancy (Daniels & Wedler, 2015; USDHHS, 2015). Women need help determining which web-based information is credible, reliable, and evidence-based and which information is not (Daniels & Wedler, 2015; Fleming et al., 2012; Hidaka & Callister, 2012; Jolivet & Corry, 2010; Lothian, 2008; Martin & Robb, 2013; Narasimhulu et al., 2016; Walker et al., 2009).

One of the only organizations that has published recommendations of websites based on quality criteria in an effort to help direct the public to evidence-based information is the Medical Library Association's Consumer and Patient Health Information Section (CAPHIS) (Golterman

& Banasiak, 2011). The CAPHIS created a "Top 100 List" for trustworthy health care websites, which is further subdivided into various topics such as general health, women's health, men's health, and senior health (Consumer and Patient Health Information Section [CAPHIS], 2015a). A unique feature of the CAPHIS site is that it shares with consumers the criteria used to evaluate the websites—the Health Summit Working Group guidelines (CAPHIS, 2015b). There are only nine sites in the women's health subgroup; four sites have educational information for women and their families about giving birth in a hospital and the other five sites provide links to other websites that contain information on giving birth in a hospital (http://caphis.mlanet.org/consumer/otherhealth15.html) (Appendix 1).

In the study by Narasimhulu et al. (2016), providers evaluated the accuracy of pregnancy-related information on the Internet. Narasimhulu and colleagues (2016) reviewed information on bed rest and hydration to prevent preterm birth, ginger for nausea and vomiting of pregnancy, amniotomy and labor progress, epidural and labor progress, and induction for suspected fetal macrosomia. A Google search was completed for the five different topics and the first 10 results for each question were examined. Four independent, expert reviewers evaluated the 50 webpages based on practice bulletins from American College of Obstetricians and Gynecologists (ACOG). Narasimhulu et al. (2016) found that most information found online was "fairly accurate but not uniformly accurate", which means that at least one website for every question that was examined, or at least 10% of the sites examined, had inaccurate information. This assertion is challenging because providers have no way of knowing which sites their patients are using and if they are accessing the websites with inaccurate information (Narasimhulu et al., 2016).

Health Information Technology Institute Criteria

Many criteria have been created to evaluate health information on the Internet (Aslani, Pournik, Abu-Hanna, & Eslami, 2014). One of the oldest criteria for evaluating the quality of health information websites is the Health Information Technology Institute (HITI) criteria, also known as the Health Summit Working Group guidelines. The HITI criteria address seven areas: credibility, content, disclosures, links, designs, interactivity, and caveats. This is the same tool used by CAPHIS to determine the Top 100 websites (CAPHIS, 2015b). The HITI criteria are recommended for evaluating health information on the Internet by the American Public Health Association (American Public Health Association [APHA], 2001), and the development of the criteria was sponsored by the Agency for Healthcare Research and Quality (USDHHS, 1999).

Readability

Information must also be presented at an appropriate reading level for the audience. Readability is defined as the ease of reading a piece of text. As with criteria to evaluate the quality of health content, there are many tools that can measure readability of text. One manner in which these tools vary is in how they determine short words: some define a short word as one with few syllables while others define a short word as one with few characters (Shedlosky-Shoemaker, Sturm, Saleem, & Kelly, 2009). The Flesch-Kincaid reading grade level **(**FKGL) and the Flesch reading ease scale (FRES) are two tools that evaluate written material and provide a grade level associated with the text.

Many studies compared the readability measures of text or patient education materials on the Internet as determined by 10 different tools, including at least one of the Flesch methods (Colaco, Svider, Agarwal, Eloy, & Jackson, 2013; Sedlosky-Shoemaker et al., 2009; Vargus et al., 2014). The topics studied were information on genetic counseling (Sedlosky-Shoemaker et al., 2009), urological conditions (Colaco et al., 2013), and breast cancer (Vargus et al., 2014). All

studies concluded the information was written at too high a reading level as evidenced by the Flesch tools and other methods.

Farrant and Heazell (2016) used the FRES and FKGL to evaluate the reading level of websites providing information to women and their families about reduced fetal movements, a topic pregnant women are likely to search. Of the 70 websites tested, only 20 websites (28.6%) were at an appropriate reading level for health information, which they equated to a score greater than 70 or the reading level at age 12 or younger. Thirty-eight sites (54.3%) scored in the 60-69 range, which is equivalent to reading levels for individuals ages 13-15 (Farrant & Heazell, 2016).

Studies Evaluating Health Information Websites Using HITI Criteria and Flesch Methods

The HITI criteria have been used in conjunction with the FKGL and/or FRES to evaluate website content on a variety of health topics ranging from asthma to teen pregnancy information (Dornan & Oermann, 2006; Liyanage, 2011; Nichols & Oermann, 2005; Oermann, Gerich, Ostosh, & Zaleski, 2003; Oermann, Lowery, & Thornley, 2003; Torres, 2009). Only two of these studies are specifically related to women's health issues (Dornan & Oermann, 2006; Torres, 2009) and one is related to sexual health (Liyanage, 2011).

Dornan and Oermann (2006) evaluated 30 breastfeeding websites using the HITI and FRES criteria. They found that 13 sites (43.3%) were created by for-profit companies and three were created by nonprofit organizations. In 21 of the sites (70%) the authors were identified and 11 sites (36.7%) stated when the content was last updated. Seventeen sites (56.7%) were appropriate for someone looking for basic breastfeeding information. Nineteen sites (63.3%) referred to expert opinion, research studies, or reputable organizations and 17 studies (56.7%) had disclaimers that were easy to locate. Twenty sites (67.7%) included a purpose or mission statement and 18 sites (60%) had quality links. Six of the websites (20%) had a chat room or message boards and 26 sites (86.7%) had a way to provide feedback to the site administrator.

Only one site (3.3%) contained a caveat. The websites' FRES scores ranged from 24.4 to 81.2 with a mean of 54.49, translating to a grade level of 5.1 to 12.0 with a mean grade level of 9.21 (Dornan & Oermann, 2006).

Torres (2009) used the HITI criteria and the FKGL to evaluate 12 websites on teenage pregnancy and parenting. Six sites (50%) listed qualifications and credentials of the author(s) and only one site (8.3%) listed a contact email for the creator. One site (8.3%) reported personal funding, three sites (25%) reported a commercial source of funding, five sites (41.7%) reported a non-commercial source of funding, and one site (8.3%) reported government funding. Two sites (16.7%) had advertisement banners and one site (8.3%) seemed promotional in nature. Only three sites (25%) displayed when the pages were last updated. Every site was rated as useful. Four sites (33.3%) had a mean FKGL score of 7.0-9.9 and three sites (25%) had a mean FKGL score of 4.0-6.9. Five sites (41.7%) were determined to be at a grade level of 10 or higher (Torres, 2009).

Liyanage (2011) evaluated seven websites with health information and resources for HIV+ teens and young adults using HITI and FKGL. Two sites (28.6%) listed credentials for the authors but none listed contact information for the authors. Three sites (42.3%) noted a government source of funding while two noted a commercial source. Five sites (71.4%) listed when the pages were last updated. Two sites (28.6%) referenced the original source of data for the evidence listed on the webpages, while six sites (85.7%) had references to other sources of data. Two sites (28.6%) had a disclaimer about liability concerns, while four sites (57.1%) had a disclaimer about limitations, purpose, and scope. One site (14.3%) discussed how user information would be used. Four sites (57.1%) had a mean FKGL of 7.0-9.9 and three sites (42.3%) had a mean FKGL of 10 or higher (Liyanage, 2011).

Summary

Labor and birth education has important effects on the woman and her family such as increased incidence of vaginal birth (Stoll & Hall, 2012), reduced risk for postpartum depression (Gao et al., 2012), higher likelihood of successful breastfeeding (Mete et al., 2010), and greater maternal satisfaction with her birth experience (Cook & Loomis, 2012; Fisher et al., 2012; Hidaka & Callister, 2012; Martin & Robb, 2013; Namey & Lyerly, 2010; Remer, 2008; Stevens et al., 2011; Weatherspoon, 2011). However, fewer women are going to childbirth education classes and health care providers lack the time to educate pregnant women during prenatal appointments (Declercq et al., 2013b). As a result, women now turn to various sources of electronic media to prepare them for their labor and birth (Declercq et al., 2013b). The extensive information available through the plethora of websites and applications available to pregnant women seeking information about labor and birth can be overwhelming (Daniels & Wedler, 2015; Jolivet & Corry, 2010). Consumers need help and guidance to find accurate, evidence-based, understandable information at the appropriate reading level (Daniels & Wedler, 2015; Fleming et al., 2012; Hidaka & Callister, 2012; Jolivet & Corry, 2010; Lothian, 2008; Martin & Robb, 2013; Walker et al., 2009).

In the review of literature, no studies were identified that examined the quality and readability of online health information available to pregnant women to prepare for labor and birth. However, in studies examining the quality of health information and the reading level of health information online, researchers have found great variation in the quality and reading level of the health information that exists. There is a lack of consistency in the quality of health information that is available to patients and their families. Similarly, the reading level of the information is often written at too high of a level (Dornan & Oermann, 2006; Liyanage, 2011;

Nichols & Oermann, 2005; Oermann, Gerich, et al., 2003; Oermann, Lowery, et al., 2003; Torres, 2009).

To date, there are no reports in the literature of studies that have evaluated the quality and reading level of health information on the Internet related to labor and birth. Therefore, this project was designed to help fill that gap by evaluating existing websites currently used by pregnant women seeking information on labor and birth and by creating a website that meets established criteria.

CHAPTER 3: THEORETICAL AND CONCEPTUAL FRAMEWORK

Angood et al. (2010) recommended the development of web-based educational material to help improve the maternal care system in the U.S. Web-based learning can be most effective when using knowledge derived from cognitive load theory (CLT) (Sweller, 2012). Therefore, CLT guided the development of the online resource.

Cognitive Load Theory

Cognitive load theory is a learning theory based in psychology (Moreno & Park, 2010). Cognitive load refers to the cognitive processing capacity as a result of an individual's cognitive architecture (Paas, Renkl, & Sweller, 2003; Sweller, 1988; Sweller, 1994; van Merriënboer & Sweller, 2005). If an individual's mind is solely focused on solving a problem, then there is no brainpower left for learning, or schema acquisition, when using conventional methods, such as means-ends analysis (Sweller, 1988). Learning, in regard to CLT, is defined as the movement of information from working memory to long-term memory (Mind Tools, n.d.; Sweller, 2004; Sweller, 2012; van Merriënboer & Sweller, 2005). A main tenet of CLT is that working memory can only focus on a limited amount of information at once (Chandler & Sweller, 1991; Paas et al., 2003; van Merriënboer & Sweller, 2005; Vogel-Walcutt, Gebrim, Bowers, Carper, & Nicholson, 2011). Individuals with lower health literacy tend to have more limited working memory than individuals with a higher health literacy (Baker et al., 2011). In CLT, learning is most effective when instructional material is focused on the learning versus preliminaries to learning; knowledge acquisition occurs when unnecessary activities, a type of extraneous cognitive load, are minimized (Chandler & Sweller, 1991).

In addition to extraneous cognitive load, two other categories of cognitive load exist: intrinsic and germane (Paas et al., 2003). Intrinsic load refers to cognitive load inherent in the material being learned. Intrinsic load cannot be minimized by instructional design (Paas et al., 2003). Reduction of supporting or confounding elements can influence intrinsic cognitive load (Paas et al., 2003). Extraneous load is influenced by the way material is presented; reducing unnecessary information can reduce extraneous load (Paas et al., 2003; van Merriënboer, Schuurman, de Croock, & Paas, 2002). Influenced by the creator of the material being presented, germane load is dependent on how information is presented and the activities required for learning (Paas et al., 2003; Vogel-Walcutt et al., 2011). The sum of intrinsic, extraneous, and germane cognitive loads must not be greater than the capacity of working memory for learning to occur (Paas et al., 2003).

Theory Application

How can information be presented in a way that enables focus and absorption of useful, reliable, and relevant information while minimizing the expenditure of working memory capacity in wasteful search effort (Paas et al., 2003)? By utilizing CLT to guide the design and execution of the online resource, extraneous load and germane load are minimized by reducing unnecessary information, integrating concepts when applicable, and through the presentation and accessibility of the information (van Merriënboer et al., 2002; Vogel-Walcutt et al., 2011). Through the use of CLT, information was located and presented to women and their families in a way intended to decrease the cognitive load and increase the success of learning.

When designing patient education materials, Wilson and Wolf (2009) noted the importance of having knowledge of working memory limitations and reducing cognitive load to enhance patient learning. CLT brings context and learning constraints to the forefront of educational design, which is vital to promote learning (Patel, Yoskowitz, Arocha, & Shortliffe,

2009). Research has shown that direct learning is as, if not more, effective as seek-and-find learning by freeing working memory to be available to learn rather than search (Sweller, 2012). By presenting information directly, extraneous load is decreased and germane load can be improved, allowing for women to learn more rapidly and efficiently, especially in a web-based format (Sweller, 2012; van Merriënboer et al., 2002; van Merriënboer & Sweller, 2005). The split-attention effect, one of ten cognitive load effects, exists when the learner has to integrate separate pieces of information to understand a concept, leading to an increase in cognitive load (Mind Tools, n.d.; Sweller, 2012). The modality effect explains that using narration, or auditory information, versus adding more text to an already difficult diagram can minimize split-attention effect, thus increasing working memory capacity (Mind Tools, n.d.; Sweller, 2012). In order to minimize split-attention effect and utilize the modality effect in the intervention, instead of using separate words and pictures to explain a visual concept, whenever appropriate, information should be presented to the learners already integrated into one visual with audio (Mind Tools, n.d.; Sweller, 2012).

Prior knowledge acquisition has been shown to improve problem solving as predicted by CLT (Youssef-Shalala, Ayres, Schubert, & Sweller, 2014). Vogel-Walcutt et al. (2010) found CLT guided computer-based learning was highly efficient for learners immediately and at a one-week follow-up. There is less cognitive demand when individuals retrieve information from long-term memory versus attempting to use working memory to process complex information during task performance (Paas et al., 2003; Sweller, 2004; van Merriënboer & Sweller, 2005).

This “pre-training” concept is essential to prepare women for decisions they may face during labor and birth (Mind Tools, n.d.). If women are educated prior to giving birth, the learned knowledge can enter long-term memory versus being in working memory at the time

when a decision needs to be made. With this knowledge base, women are able to apply the information to advocate for themselves, have meaningful conversations with their health care providers, and make informed choices in regard to their labor and birth. Having this pre-acquired knowledge base in long-term memory can make more working memory available while in the hospital, enabling effective participation in the sometimes difficult and complex decision-making that can occur during the labor and birth process.

CHAPTER 4: METHODOLOGY

At a national policy symposium addressing improvements to the quality and value of maternity care in the US, stakeholder and leaders in patient safety maternity care recommended the development of web-based educational materials to help improve the maternal care system in the U.S. (Angood et al., 2010). Therefore, in an effort to meet this need, I identified health information websites commonly used by pregnant women seeking information about labor and birth, evaluated the websites, and created a model website to fill the information gap. Information presented in the web-based resource was developed based on current evidence and cognitive load theory (CLT) to help educate women about labor and birth in a hospital setting.

Design

This DNP project was a systems improvement project centered on improving information sharing and decision making for pregnant women planning to give birth in a hospital. This population was targeted because more than 90% of births in the U.S. occur in hospitals and there is an increased potential for medical interventions in a hospital setting (Martin et al., 2017). This project consisted of two phases. Phase I was the examination of the current state of health information on the Internet. Phase II was the development and evaluation of a model website that filled the gaps identified during Phase I.

Phase I Procedures

Identification of Websites for Evaluation

Most women begin their Internet search for pregnancy information by typing key words into a search engine (Lagan, Sinclair, & Kernohan, 2011). Therefore, to simulate how a woman would find information, websites to be evaluated were determined by searching "labor and birth" on the three most popular search engines in the U.S. in June 2016—Google, Bing, and Yahoo! (NetMarketShare, 2016a; NetMarketShare, 2016b). Research shows traffic by users decreases by 140% between the 10th and 11th listing position; overall percentage of traffic is 91.5% on the first page of a Google search, which yields 10 results, and only 4.8% on the second page (Chitika, 2013). Google is making an effort to supply Internet users with more accurate health information by partnering with the Mayo Clinic to improve features of health-related searches (Perna, 2015).

For this project, websites listed on the first page of the search results were evaluated, excluding those results that were identified as advertisements. These sites were compared and any duplicates were deleted. For example, if one search revealed a subpage of a website and another search revealed a different subpage, then the home site was chosen and subpage duplicates were removed. If two sites were sponsored by the same organization, the first site was examined and the other site was eliminated to remove duplicated information. Websites were excluded from the review if they were:

1. Advertisements on the search engine,
2. Blogs,
3. Sites used by health care professionals for continuing education,
4. Originating outside of the U.S.,
5. Sites requiring an access fee,
6. News articles,

7. Links to books to purchase,
8. Not written in English,
9. Solely an image or a video on YouTube with no supplemental written information.

Instrumentation

The websites were evaluated using the Health Information Technology Institute (HITI) criteria for evaluating quality health information on the Internet (Mitretek Systems, 1999; USDHHS, 1999). Additionally, the reading level was measured using the Flesch Reading Ease Scale **(**FRES) (Flesch, 1948) and the Flesch-Kincaid Reading Grade Level **(**FKGL) Formula (Kincaid et al., 1975).

Health information technology institute criteria. The seven HITI criteria, as shown in Table 1, were developed in the 1990s during a Health Summit Working Group series of meetings held by Mitretek Systems and supported by the Agency for Health Care Policy and Research, now known as Agency for Health Research and Quality (USDHHS, 1999). The seven criteria are as follows: (1) credibility encompasses the source, relevance, currency, and review process of the site; (2) content includes a disclaimer and accuracy and completeness of information; (3) disclosure addresses the purpose of the site and if any information or data is being collected from the users of the site; (4) links evaluates the number and accuracy of the links as well as the link content of the site; (5) design includes navigability, accessibility, site map, and the ability to search within the site; (6) interactivity assesses the ability for the user to interact with the creator or other users and whether there are feedback mechanisms included; and (7) caveats relates to the function of the site and if the purpose of the site is to market or sell services versus to provide information (Mitretek Systems, 1999; USDHHS, 1999).

The sites were evaluated using a worksheet I created based on the HITI criteria and studies conducted by Dornan and Oermann (2006), Oermann (2003), and the Quality and Safety

Education for Nurses project (2007) for this DNP project. Six of the seven HITI criteria are more objective and can be applied to any health information website. The seventh, content, however, is specific for the type of health information being evaluated and requires a more subjective evaluation.

Quality of content. To determine the quality of content, information present on the websites should be compared to published information that represents current, evidence-based recommendations for practice (Dornan & Oerman, 2006; Mitretek Systems, 1999; Oermann, 2003). One of the seven HITI criteria is content, which consists of evaluating the accuracy and completeness of the information based on current practice standards (Dornan & Oermann, 2006; Mitretek Systems, 1999; Oermann, 2003). Evaluation of all information related to labor and birth on the websites was beyond the scope of this project, therefore two specific topics—induction of labor (IOL) and pain management—were selected as the sample content for evaluation from each website.

The information on IOL and pain management was evaluated using current evidence in the literature through a database known as UptoDate. UpToDate is an evidence-based database authored by physicians and other health care professionals with the purpose of providing information for clinicians to use in decision making (UpToDate, n.d.). The health care professionals who compose the content on UpToDate are considered content experts. The information is frequently updated and reevaluated as new literature is published. UpToDate is deemed beneficial in improving patient outcomes and is utilized by more than a million physicians from all over the world to provide evidence-based care (UpToDate, n.d.). UpToDate articles on IOL and pain management during labor were utilized to determine the completeness and accuracy of the information present on the websites.

In addition to the use of UpToDate, two expert reviewers used their professional experience to independently evaluate the completeness and accuracy of the content. I was one reviewer. My background is as a labor and delivery nurse and a clinical instructor for obstetrical nursing. The other reviewer is an obstetrics and gynecology (OB/GYN) physician with experience providing care, educating, and counseling pregnant women on IOL and pain management.

Content on a website was determined to be complete if the site addressed the subheadings listed in the UpToDate topic articles (Table 1). If any subheading was missing, the website was deemed incomplete. Accuracy was determined by comparing the content beneath each of the subheadings on the websites with the information from UpToDate and from professional experience providing care and education on these topics. If there was a discrepancy between experience and information in UpToDate, the content in UpToDate was used as the gold standard. If there was a discrepancy between the two reviewers' determinations of completeness and accuracy, the two reviewers discussed the discrepancies and reviewed the websites together. They arrived at a consensus and made a determination of completeness and accuracy.

A website was considered incomplete, yet accurate, if the site did not address all the subheadings, but the content that was present was accurate. A website was deemed complete and inaccurate if the site contained all the subheadings, but the information about each topic was not accurate.

Table 1: *UpToDate Subheadings to Determine Completeness*

Induction of Labor	Pain Management
Indications	Opioids
Contraindications	Nitrous Oxide
Pitocin	Local (pudendal)
Cervical Ripening: Mechanical	Epidural
Cervical Ripening: Medication	Spinal
Amniotomy	Continuous Labor Support
Outpatient methods, such as "stripping membranes"	Movement and Position Changes
Complications/Side Effects	Water Immersion
Failed Induction	Sterile Water Injection
	Touch and Massage
	Acupuncture and Acupressure
	Hypnosis
	Transcutaneous Electrical Stimulation Unit
	Heat and Cold
	Music and Audioanalgesia
	Aromatherapy
	Biofeedback

(Grant, 2016; Simkin & Klein, 2015; Wing, 2016)

The rationale for selection of these topics as the sample of labor and birth information to be evaluated was because the topics are somewhat controversial, are frequently changing as new evidence and recommendations become available, and involve informed consent by the woman. Approximately 24% of births in the U.S. are preceded by induction of labor (Martin et al., 2017). The guidelines about indications and timing for IOL have changed in recent years, and if websites do not frequently update content, women may be reading inaccurate and misleading information. By its very nature, labor is associated with discomfort or pain. In anticipation of labor, women seek information about the pain management options (nonpharmacologic and pharmacologic) that are available in the hospital setting. Based on knowledge of available

options, women can make informed decisions when the time comes and they are in labor. Awareness of the various options for managing labor pain can enable women to seek information about the methods that are available at the facility where they will give birth.

Flesch Reading Ease Scale and Flesch-Kincaid Reading Grade Level Formula. The FRES and the Flesch Reading formula were developed in 1943 by Rudolph Flesch (Flesch, 1948). The FRES score, which ranges from 0 to 100, was used to determine the reading level of the passage; where a score of 0 indicates the highest level of reading difficulty and a score of 100 indicates the lowest level of reading difficulty (Flesch, 1948). A score of 100 correlates with a 4th-grade reading level and every 10-point decrease correlates with one grade level higher, therefore a score of 80 would be approximately a 6th-grade reading level (Flesch, 1948). This 10-point correlation holds true only until the 7th-grade level, then the FRES underrates the grade level (Flesch, 1948). The FRES is calculated by the number or words in a sentence and the number of syllables in a word (Flesch, 1948).

The Flesch Reading formula also determines reading level based on the number of words in a sentence and the number of syllables in a word (Kincaid, Fishburne, Rogers, & Chissom, 1975). The formula was widely used; however, in 1975, Kincaid, Fishburne, Rogers, and Chissom adapted the formula for use in evaluating written material used to train military personnel by adding the number of sentences in a paragraph to the calculation (Kincaid et al., 1975).

The FKGL was developed to evaluate non-narrative, technical information, which is the way patient education is often written (Vargas, Chuang, Ganor, & Lee, 2014). When compared with other readability tools, the Flesch tools yielded a score in the middle of the score determined by other tools and was proved to be a consistent, easy-to-use, reliable tool to assess

readability and guide development of patient education materials (Colaco et al., 2013; Sedlosky-Shoemaker et al., 2009; Vargas et al., 2014). The FRES and FKGL measures have become so widely used that they are calculated by the Microsoft Word processing system when a document is checked for spelling and grammar (Microsoft, n.d.). A limitation to the calculation determined by Microsoft Word is that the highest score produced is 12 (Contra Costa College, 2011). Due to the ease of accessing the software to calculate the FRES and FKGL, their use (one or both) in multiple studies to calculate readability, and their use in conjunction with HITI, the FRES and FKGL tools were used to measure readability of websites for this project.

To determine the FRES and FKGL for each site, a page of content was copied and pasted into Microsoft Word and the reading ease and reading level were calculated (Dornan & Oermann, 2006; Nichols & Oermann, 2005; Oermann, 2003; Oermann, Gerich, et al., 2003). Content from the websites on pain management was examined to determine readability. Two sites did not have enough content present to fill an entire page of size 12, Times New Roman font. For those two sites, Wikipedia.com and March of Dimes, content on IOL was included until a full page of content was achieved. The text was converted to Times New Roman font, size 12 to standardize the amount of text examined from each site. Since numerous medical terms have many syllables, if the medical term was provided and then explained in laymen's terms, the medical term was removed from the text when scores were calculated. It is important for women and their families to be exposed to both the medical term and the laymen's term to be able to understand the jargon they may hear in the hospital or when talking with their health care provider (McGee, 2010).

It is recommended that health information be targeted at a 7th-grade reading level (U.S. National Library of Medicine, n.d.). A 7th-grade reading level is also an ideal target for labor and

birth information because research has shown that girls in the U.S. are now experiencing puberty at younger ages; on average Caucasian, African American, and Latina girls experience menses between 12 and 13 years of age (O'Grady, 2009). At 12 years of age most girls are in 7th grade. A FRES of 70-80 is considered a "fairly easy" style to read (Flesch, 1948) and correlates to an appropriate reading level for a 12-year-old and is consistent to target measures in similar studies (Farrant & Heazell, 2016).

Phase II Procedures

Website Development

Since none of the evaluated websites met all the HITI and readability criteria, I created a model website using WordPress. The website was based on HITI criteria and was written at the recommended reading level, and contained current, evidence-based information on the sample topics, IOL and pain management. The content on the two topics was based on standards of practice, UpToDate, position papers, and recommendations from professional organizations. The IOL content on the website had a FRES of 70 and FKGL of 5.7. The pain management content on the website had a FRES of 70.3 and FKGL of 6.4. The information was written at a grade level of 5th and 6th, respectively, and the style would be considered "fairly easy" (Flesch, 1948).

Evaluation of the Website

Once the website was created, it was piloted by three experts. These experts consisted of a nursing educator for OB/GYN nursing, an OB/GYN physician, and a consumer with expertise in information technology and online resources. The experts provided feedback and minor revisions were made to the website.

Then feedback from stakeholders was solicited to assess the quality, readability, and usability of the web-based resource via an online survey based on HITI criteria and readability

measures (Appendix 2). The evaluation procedure was reviewed by the Institutional Review at the University of North Carolina at Chapel Hill and was deemed to be exempt.

Instrumentation. I created a survey based on HITI criteria and readability to obtain stakeholder feedback on the website. In an effort to determine face validity and readability, the same three experts who piloted the website were enlisted to pilot the survey (Hulley, Newman, & Cummings, 2013). The survey consisted of 20 questions. Sixteen questions were Likert items with five answer choices ranging from (1) strongly disagree to (5) strongly agree with (3) being neither agree nor disagree. There were three free-response questions. One question was multiple choice to determine the profession of the survey respondent (i.e., OB/GYN physician, nurse, mother, etc.). The Qualtrics program was utilized for disbursement of the survey and data analysis of the stakeholder feedback.

Sample

The convenience, purposive sample of stakeholders consisted of women's health care providers and consumers that I was acquainted with either professionally or personally. I wanted a representative sample of individuals from across the U.S., therefore I divided the nation into four quadrants and reached out to professional contacts and stakeholders from various regions. Invitations to participate were emailed to 20 persons, including obstetricians, family medicine physicians with obstetric privileges, certified nurse midwives (CNMs), labor and delivery nurses, and childbirth educators (Appendix 3). Invitations to participate were also emailed to women who had given birth in a hospital in the last six months; they were representative of the consumers who might have accessed such a website, now with the experience of having given birth. This purposive sample intentionally targeted health care professionals and consumers representing various geographic locations across the U.S. because websites are accessible to

individuals all over the world and I wanted to make sure the information was relevant and relatable to individuals no matter where they were located in the nation.

Data Analysis

Responses from the survey were collected in Qualtrics. The quantitative data were transferred to SPSS for data analysis. The qualitative responses were reviewed in Qualtrics for any common themes. Based on the anonymous feedback from the various stakeholders, revisions to the website were made.

CHAPTER 5: RESULTS

The results are organized by phase. Phase I consisted of examination of the current state of health information on the Internet. Phase II was the development of a model website.

Phase I

The initial search of the terms "labor and birth" was conducted in June of 2016 on Google, Bing, and Yahoo. The Google search yielded approximately 92,000,000 results; the Bing search yielded approximately 21,200,000 results; and the Yahoo search yielded approximately 21,600,000 results. The first page of the search results included 11 sites on Google, 19 sites on Bing, and 16 sites on Yahoo. Four sites were excluded from the first page of the Google results due to exclusion criteria (one duplicate site, one picture, one YouTube video, and one advertisement), 16 sites were excluded from the first page of the Bing results (four advertisements, nine duplicates, two pictures, one YouTube video), and 15 sites were excluded from Yahoo (four advertisements, nine duplicates, one picture, and one YouTube video), leaving a total of 11 sites to be evaluated. Evaluations of the 11 sites (Table 2) took place in June, July, and December of 2016.

Each of the 11 websites was evaluated using the HITI criteria of credibility, content, disclosure, links, design, interactivity, and caveats. The selective sampling of content on IOL (Table 3) and pain management (Table 4) was evaluated independently by the other reviewer and myself to determine completeness and accuracy. A sample of text on either IOL or pain management was utilized to determine the readability of the website.

Table 2*: Labor and Birth Websites Evaluated Using HITI and Readability Criteria*

Organization	Website
American Pregnancy Association	americanpregnancy.org
What to Expect	whattoexpect.com
WomensHealth.gov	womenshealth.gov
Baby Center	babycenter.com
Parents.com	parents.com
Wikipedia	wikipedia.org
March of Dimes	marchofdimes.org
WebMD	webmd.com
Healthline	healthline.com
National Institute of Child Health and Human Development	nichd.nih.gov/Pages/index.aspx
VeryWell	verywell.com

Table 3*: Websites Content: Induction of Labor*

Organization	Complete and Accurate	Complete and Inaccurate	Incomplete and Accurate	Incomplete and Inaccurate	Not Present
American Pregnancy Association			X		
What to Expect	X				
WomensHealth.gov			X		
Baby Center	X				
Parents.com				X	
Wikipedia			X		
March of Dimes			X		
WebMD				X	
Healthline				X	
National Institute of Child Health and Human Development			X		
VeryWell				X	

Table 4*: Websites Content: Pain Management*

Organization	Complete and Accurate	Complete and Inaccurate	Incomplete and Accurate	Incomplete and Inaccurate	Not Present
American Pregnancy Association			X		
What to Expect				X	
WomensHealth.gov			X		
Baby Center				X	
Parents.com			X		
Wikipedia			X		
March of Dimes					X
WebMD			X		
Healthline			X		
National Institute of Child Health and Human Development			X		
VeryWell				X	

AmericanPregnancy.org

HITI

Credibility. American Pregnancy Association is a nonprofit, voluntary health organization whose website is AmericanPregnancy.org. Despite the organization being a nonprofit organization, there were multiple advertisements on this website. Advertisements were clearly marked. There was no date to indicate when the site was created. Each subpage indicated the last date the page was updated; the majority of pages were updated within the last year. Authorship was not on each page. There was no information on an editorial review process. It was unclear why or how they choose what information or resources to share.

Content. Information on IOL and pain management was presented objectively without apparent bias. A reference list was provided but there were no in-text citations. Some information referenced data that was more than 10 years old, such as cesarean rates—new

information on this type of data has been published more recently. The reference list included evidence-based resources such as Cochrane Reviews and recommendations from reputable professional organizations in women's health such as ACOG. There was no disclaimer present on the website stating that information does not substitute for the advice of a healthcare provider. The content on IOL and pain management was incomplete yet accurate.

Disclosure. There was a mission statement but it was not actually called a "mission statement". There was a statement of the purpose and goals of the site. It was not clear what information was collected from users of the site.

Links. The links within the site led to internal subpages that opened in the current window but did not take the user to the specific location on the new page referenced by the link. Links were easy to navigate. There was a site map present but it was not functional.

Design. It was not easy to navigate to the top of the page. It was possible to navigate to the homepage by clicking on the logo, but that was not clearly marked. There was a search engine located at the bottom of the page. The search engine was easy to use.

Interactivity. There was an email address, physical address, phone number, and a contact form to contact the organization. There was a discussion board and there was information on the moderator of the discussion board, however there were no credentials listed for the moderators. There was no warning that information on the discussion board may be inaccurate.

Caveats. There was information on the sponsors. It was clear that the purpose of this site was to provide information versus to sell products, however AmericanPregnancy.org does actually sell products.

Readability. The FRES was 41.1 and the FKGL was 11.4. This means the readability of the website is at the 11th-grade level and the style would be described as "difficult"; this is similar to writing found in academic journals (Flesch, 1948).

Other observations. The information on this website was available in other languages besides English. This website offered users the opportunity to create an account for free.

WhatToExpect.com

HITI

Credibility. WhatToExpect.com is a for-profit website created by the author of the book, *What to Expect When You're Expecting*. As a for-profit site, there were multiple advertisements. Advertisements were clearly marked. The site was established in 2005 and it was last updated more than one year ago. The date of the last update was not listed on every page. On pages where the last updated page was present there was content that was last updated more than a year ago. Authorship was not present on each page. There was no information on an editorial review process. It was unclear why or how they choose which information or resources to share.

Content. Information on IOL and pain management was presented objectively without apparent bias. There were no references provided. There was a disclaimer stating that information does not substitute for the advice of a healthcare provider. There was blog content that was clearly marked as being a blog post versus content from WhatToExpect.com. The content on IOL was complete and accurate. The content on pain management was incomplete and inaccurate.

Disclosure. There was no mission statement. The site clearly indicated what information was collected from users and why.

Links. The links within the site led to relevant information that opened in a new tab but did not take the user to the specific spot on the new page referenced by the link. Links were easy to navigate. There was no site map. "Promoted links" appeared at the bottom of the page but were not relevant to the information on the page. There were instances where links were referenced (i.e. "click here"), but no link was present.

Design. It was not easy to navigate to the top of the page. It was possible to navigate to the homepage by clicking on the logo, but that was not clearly marked. There was a search engine present, however the search engine did not work from every page. The site was difficult to navigate without using the search feature; it was difficult to find information by just clicking through pages.

Interactivity. There was an email address to contact the site administrators. There was also a "frequently asked questions" section. There was a blog and information on the moderator of the blog, however there were no credentials listed for the moderators. There was no warning that information on the blog may be inaccurate.

Caveats. It was clear that the purpose of this site was to provide information versus to sell products, however WhatToExpect.com does actually sell products, such as the *What to Expect* books. They also had a link to connect users with setting up a baby registry.

Readability. The FRES was 50.9 and the FKGL was 12. This means the readability of the website is at or above the 12th-grade level and the style would be described as "fairly difficult"; this is similar to writing found in quality magazines (Flesch, 1948).

Other observations. This website offered users the opportunity to create an account for free.

WomensHealth.gov

HITI

Credibility. WomensHealth.gov is a nonprofit, government site created and maintained by the Office on Women's Health, which is part of the US Department of Health and Human Services (USDHHS). As a government site, there were no advertisements present. There was no date to indicate when the site was created. The page was last updated within the last year. Authorship was not on each page. There was no information on an editorial review process. It was unclear why or how they choose which information or resources to share.

Content. Information on IOL and pain management was presented objectively without apparent bias. No references were provided. There was a disclaimer stating that information does not substitute for the advice of a healthcare provider. The content on IOL and pain management was incomplete yet accurate.

Disclosure. There was a mission statement. The site clearly indicated what information was collected from users and why.

Links. The links within the site led to definitions of the terms and opened in the current window. These links took the user to the specific location referenced by the link on the new page. Links were easy to navigate. There was no site map.

Design. It was easy to navigate to the top of the page and the homepage. There was a search engine present. The search engine was easy to use. All labor and birth information was on one page.

Interactivity. There was a phone number to contact WomensHealth.gov. There were comment sections for users. There was no moderator for the comment sections, but there was a comment policy present. There was no warning that information in the comment sections may be inaccurate, but there was a disclaimer that the comments do not necessarily represent the position of the creators.

Caveats. It was clear that the purpose of this site was to provide information versus to sell products.

Readability. The FRES was 61 and the FKGL was 8.2. This means the readability of the website is at the 8th-grade level and the style would be described as "standard"; this is similar to writing found in a digest magazine (Flesch, 1948). According to WomensHealth.gov, the goal is for their content to be written between the 6th and 8th grade reading level (USDHHS, 2016).

Other observations. The information on this website was available in other languages besides English. This website was a CAPHIS recommended site (CAPHIS, 2015a).

BabyCenter.com

HITI

Credibility. BabyCenter.com is a for-profit website affiliated with Johnson and Johnson. As a for-profit site, there were multiple advertisements. Advertisements were clearly marked. There was no date to indicate when the site was created; however, the Baby Center LLC was established in 1997. There were no dates to show when the site or subpages were last updated. Authorship was not on each page, but the site indicated that information was reviewed by a "Medical Advisory Board" that consisted of experts in various fields. There was information on an editorial review process.

Content. Information on IOL and pain management was presented objectively without apparent bias. References were provided for some topics, but there were no in-text citations. There was a disclaimer stating that information on the website does not substitute for the advice of a healthcare provider. The content on IOL was complete and accurate. The content on pain management was incomplete and inaccurate.

Disclosure. There was a mission statement. The site clearly indicated which information was collected from users and why.

Links. The links present within the text led to relevant subpages that opened in the current window but did not take the user to the specific location referenced by the link on the new page. Links were easy to navigate. A functional site map was present.

Design. It was not easy to navigate to the top of the page. It was possible to navigate to the homepage by clicking on the logo, but that was not clearly marked. There was a search engine. The search engine was easy to use.

Interactivity. There was an email address and physical address to contact the organization. There was a blog and a discussion board. There was no mention of moderators except under "Jobs"; there was a job posting for a moderator suggesting there were moderators. No credentials were listed for the assumed moderators. There was a warning that information on the discussion board and blog may be inaccurate.

Caveats. It was clear that the purpose of this site was to provide information versus to sell products, however BabyCenter.com does actually sell products.

Readability. The FRES was 50.6 and the FKGL was 11.1. This means the readability of the website is at the 11th-grade level and the style would be described as "fairly difficult"; this is similar to writing found in quality magazines (Flesch, 1948).

Other observations. The information on this website was available in other languages besides English. This website offered users the opportunity to create an account for free.

Parents.com

HITI

Credibility. Parents.com is a for-profit website, affiliated with *Parents* magazine. As a for-profit site, there were multiple advertisements on this website. Advertisements were clearly marked. There was no date to indicate when the site was created. There was no date listed to indicate any page or content updates. Authorship was present and occasionally, credentials of authors were listed. Some credentials were for medical professionals, such as nurses and physicians. Information was often presented in the form of articles that had been published in magazines or on other Parents.com sites, which was frequently from more than five years ago (2006-2009). It was unclear why or how they choose which information or resources to share.

Content. Information on IOL and pain management was presented objectively without apparent bias. Evidence was not provided for the information present. However, some data within the articles referenced data from 1999. There was a disclaimer stating that information does not substitute for the advice of a healthcare provider. The content on IOL was incomplete and inaccurate. The content on pain management was incomplete yet accurate.

Disclosure. There was no mission statement, but the "About us" section described what the organization was about although it had coding and grammar errors. The site clearly indicated what information was collected from users and why.

Links. The links within the site led to relevant information, which opened in the current window but did not take the user to the specific location referenced by the link on the new page. Links were easy to navigate. Not all information presented in links was relevant. There was a site map present but it was for the "Shop" site, not specifically Parents.com.

Design. It was not easy to navigate to the top of the page. It was easy to navigate back to the homepage. There was an easy to use search engine.

Interactivity. There was an email address listed to contact the organization. There were discussion groups and forums present. The only information on moderators was that there was not one present. There was a warning that information in the discussion groups or on the forums may be inaccurate.

Caveats. There was information on the sponsors. It was clear that the purpose of this site was to provide information versus to sell products, however Parents.com does actually sell products, such as *Parents* magazine. Advertisements for subscription deals to the magazine popped-up as you were looking at content on the website.

Readability. The FRES was 49.7 and the FKGL was 10.7. This means the readability of the website is at the 10th-grade level and the style would be described as "difficult"; this is similar to writing found in academic journals (Flesch, 1948).

Other observations. This website offered users the opportunity to create an account for free.

Wikipedia.com

HITI

Credibility. Wikipedia.com is a nonprofit website. There were no advertisements on this website. The site was established in 2001. Content was updated within the last week. Authorship was present on each area of content in the form of usernames. There were no credentials present. There was information on an editorial review process. The reviewers and editors are the users of Wikipedia.

Content. Information on IOL and pain management was presented objectively without apparent bias. References were provided for the information and in-text citations were present. There was a disclaimer stating that information on the site does not substitute for the advice of a healthcare provider. The content on IOL and pain management was incomplete yet accurate.

Disclosure. There was a mission statement present. The site clearly indicated which information is collected from users and why.

Links. The links present within the text led to pages for the term hyperlinked and opened in the current window. References were also links that brought the user to the source of the information. Links were easy to navigate. There was a site map and it was functional.

Design. It was not easy to navigate to the top of the page. It was possible to navigate to the homepage by clicking on the logo, but that was not clearly marked. There was a search engine and it was easy to use.

Interactivity. There was an email address to contact the organization. There was no chat or blog feature, but the entire site is an interactive experience. Content is developed, posted, and edited by users. Each user can act as a moderator and editor by constantly updating and checking the content. There was a community portal present. There was a warning that information present may be inaccurate.

Caveats. It was clear that the purpose of this site was to provide information versus to sell products.

Readability. The FRES was 33.5 and the FKGL was 12. This means the readability of the website is at or above the 12th-grade level and the style would be described as “difficult”; this is similar to writing found in academic journals (Flesch, 1948).

Other observations. The information on this website was available in other languages besides English.

WebMD.com

HITI

Credibility. WebMD.com is a for-profit organization. There were advertisements on the website. Advertisements were clearly marked. There was no date to indicate when the site was established, but there was a copyright date of 2005. Some pages indicated when the last update was done (2014). Authorship with credentials was present. There was information on an editorial review process; information was located under the "Who We Are" tab.

Content. Information on IOL and pain management was presented objectively without apparent bias. References were provided for the information present. There was a disclaimer stating that information does not substitute for the advice of a healthcare provider. The content on IOL was incomplete and inaccurate. The content on pain management was incomplete yet accurate.

Disclosure. There was no mission statement, but the "About WebMD" sections explained the purpose of the organization. The site clearly indicated which information was collected from users and why.

Links. The links within the site led to internal subpages that opened in the current window but did not take the user to the specific location referenced by the link on the new page. However, not all links brought the user to relevant information. For example, clicking on "cervix" took the user to a picture of a cervix, but the information underneath the picture was about cervical conditions such as polyps and cancer. Links were easy to navigate. There was a site map present and functional. Some of the links were nonfunctioning.

Design. It was not easy to navigate to the top of the page. It was possible to navigate to the homepage by clicking on the logo, but that was not clearly marked. There was an easy to use search engine.

Interactivity. There was an email address and physical address to contact the organization. There was a discussion board and information on the moderators of the discussion board, however there were no credentials listed for the moderators. There was a warning that information on the discussion board may be inaccurate.

Caveats. It was clear that the purpose of this site was to provide information versus to sell products.

Readability. The FRES was 52.2 and the FKGL was 9.8. This means the readability of the website is at the 9th-grade level and the style would be described as "fairly difficult"; this is similar to writing found in quality magazines (Flesch, 1948).

Other observations. WebMD was an HONcode certified website.

MarchOfDimes.org

HITI

Credibility. MarchofDimes.org is a nonprofit organization. There were no advertisements on this website. There was no date to indicate when the site was established. The site indicated that content was last updated more than a year ago (2012-2015). Authorship was not listed on each page. There was information on an editorial review process and an "Editorial Policy".

Content. Information on IOL and pain management was presented objectively without apparent bias. References were not provided. There was a disclaimer stating that information does not substitute for the advice of a healthcare provider. The content on IOL was incomplete yet accurate. There was no content present on pain management.

Disclosure. There was a mission statement present. The site clearly indicated which information was collected from users and why.

Links. The links to internal subpages opened in the current window but did not take the user to the specific location referenced by the link on the new page. Links were easy to navigate and led to relevant information. There was no site map. Some links were nonfunctioning.

Design. It was not easy to navigate to the top of the page. It was possible to navigate to the homepage by clicking on the logo, but that was not clearly marked. There was an easy to use search engine.

Interactivity. There was an email address and physical address to contact the organization. There was a blog present. There was no information about the moderator, however there was information about the bloggers of the site and their credentials were listed. There was a warning that information on the discussion board may be inaccurate.

Caveats. It was clear that the purpose of this site was to provide information versus to sell products.

Readability. The FRES was 67.2 and the FKGL was 7.1. This means the readability of the website is at the 7th-grade level and the style would be described as "standard"; this is similar to writing found in digest magazines (Flesch, 1948).

Other observations. The information on this website was available in other languages besides English.

Healthline.com

HITI

Credibility. Healthline.com is a for-profit website. There were multiple advertisements on this website. Advertisements were clearly marked. There was no date to indicate when the site was established. Date of last update was shown for some of the content, ranging from 2012 to

2016. Authorship was present on each page. The credentials of the authors were not listed, but the credentials of the medical reviewers were present. There was information on an editorial review process; there are medical reviewers on staff.

Content. Information on IOL and pain management was presented objectively without apparent bias. References were provided; there were no in-text citations. There was a disclaimer stating that information does not substitute for the advice of a healthcare provider. The content on IOL was incomplete and inaccurate. The content on pain management was incomplete yet accurate.

Disclosure. There was a mission statement. The site clearly indicated which information was collected from users and why.

Links. The links to external websites opened in a new window. Links were easy to navigate and led to reliable information. There was a site map present and it was functional.

Design. It was not easy to navigate to the top of the page. It was easy to navigate to the homepage. There was a search engine but it was not always functional—the page had to be re-loaded before the search engine would work.

Interactivity. There was an email address, physical address, and a phone number to contact the website. At the end of each content topic the site asked, "Was this article helpful?" to allow for feedback and some comment sections were present. There was no information on moderators. There was no warning that information in the comment sections may be inaccurate.

Caveats. It was clear that the purpose of this site was to provide information versus to sell products.

Readability. The FRES was 39.7 and the FKGL was 8.7. This means the readability of the website was at the 8th-grade level and the style would be described as "difficult"; this is similar to writing found in academic journals (Flesch, 1948).

Other observations. Healthline.com was an HONcode certified website.

NICHD.NIH.gov

HITI

Credibility. NICHD.NIH.gov is a government, nonprofit website that is a part of the Eunice Kennedy Shriver National Institute of Child Health and Human Development which is an entity of the National Institute of Health (NIH) website. There were no advertisements on the site. There was no date to indicate when the site was established. Some content was last updated more than a year ago. Updates for content ranged from 2012 to 2016. Authorship was not listed on each page. There was no explicit information on an editorial review process; however, as a government organization, there is a "Federal Advisory Committee Act (Public Law 92-463)" with the purpose to "provide advice that is relevant, objective, and open to the public" (U.S. General Services Administration, 2014, para. 3).

Content. Information on IOL and pain management was presented objectively without apparent bias. Evidence was provided for the information present; there were in-text citations. There was a disclaimer stating that information does not substitute for the advice of a healthcare provider. The content on IOL and pain management was incomplete yet accurate.

Disclosure. There was a mission statement. The site clearly indicated which information was collected from users and why.

Links. The only links present were to references. Links opened in a new page. There was no site map.

Design. It was easy to navigate to the top of the page and to the homepage. There was an easy to use search engine.

Interactivity. There was an email address, physical address, and a phone number to contact the NICHD Information Resource Center at the NIH. The site provided a section for users to make comments; there was a comment policy stating that the site administrators would review comments, although no names or credentials were listed for the reviewers. There was no warning that information in the comments may be inaccurate. There was a disclaimer that the comments do not necessarily represent the position of the creators.

Caveats. It was clear that the purpose of this site was to provide information versus to sell products.

Readability. The FRES was 58.1 and the FKGL was 8.7. This means the readability of the website was at the 8th-grade level and the style would be described as "fairly difficult"; this is similar to writing found in quality magazines (Flesch, 1948).

Other observations. The information on this website was available in other languages besides English.

VeryWell.com

HITI

Credibility. VeryWell.com is a for-profit website. There were multiple advertisements on this website. Advertisements were clearly marked. There was no date to indicate when the site was established. Some content was updated with dates ranging from 2012 to 2016. Authorship

and credentials were identified on each page. Medical reviewers were listed as being on staff; their credentials were listed. There was information on an editorial review process.

Content. Information on IOL and pain management was presented objectively without apparent bias. Evidence was provided for the information. There was a disclaimer stating information does not substitute for the advice of a healthcare provider. The content on IOL and pain management was incomplete and inaccurate.

Disclosure. There was a mission statement although it was not actually labeled as a "mission statement". Instead, there was an "Ethics policy" that explained the mission. The site clearly indicated which information was collected from users and why.

Links. The links present within the site led to internal subpages that opened in the current window but did not take the user to the specific place referenced by the link on the new page. For the most part, links were easy to navigate and led to relevant information. Some of the links were nonfunctioning or did not lead to the right information. There was not a site map.

Design. It was not easy to navigate to the top of the page. It was possible to navigate to the homepage by clicking on the logo, but that was not clearly marked. There was an easy to use search engine.

Interactivity. There was an email address and physical address to contact the website administrator. There was no blog or chat room; therefore, there was no moderator.

Caveats. It was clear that the purpose of this site was to provide information versus to sell products.

Readability. The FRES was 63 and the FKGL was 8. This means the readability of the website was at the 8th-grade level and the style would be described as "standard"; this is similar to writing found in digest magazines (Flesch, 1948).

Other observations. Healthline.com was an HONcode certified website.

Summary of Website Evaluations

None of the websites met all of the HITI criteria and readability level. The sites that came closest to meeting the HITI criteria were the two government websites, WomensHealth.gov and NICHD.NIH.gov, although they did not meet the target reading and grade-levels. Both sites were written at the 8th grade reading level with FRES of 61 and 58.1 respectively. WomensHealth.gov is a CAPHIS recommended site (CAPHIS, 2015a).

Only one site, March of Dimes, met the reading and grade-level target. The March of Dimes site contained accurate but incomplete information on IOL, with no information present about pain management. All three of the websites had no advertisements; none of the sites contained complete documentation of authorship. The NICHD website contained evidence for the information provided, whereas WomensHealth.gov and MarchOfDimes.com did not present evidence for both topics.

Phase II

Based on the detailed evaluation of websites in Phase I, it was evident that no existing website met all the HITI criteria for credibility, content, disclosure, links, design, interactivity, and caveats; and readability criteria. Therefore, I proceeded to Phase II of the DNP project. I created a model website based on the HITI criteria and provided current, evidence-based information at the appropriate reading level on the two topics, IOL and pain management. After the website was created, stakeholder feedback on the model website was solicited.

Stakeholder Feedback

Of the 20 stakeholders invited to participate in the web-based survey of the model website, 12 responded, but only nine individuals actually completed the survey. Of those nine, one was an OB/GYN physician, two were CNMs, one was a labor and delivery nurse, one was a

childbirth educator, and four were mothers of an infant aged six-months or less who had recently given birth in a hospital setting. The responses to the Likert items ranged from: 1 = strongly disagree to 5 = strongly agree. The median score for 15 of the 16 questions was 5; the median score was 4 for the item, "The links present are to quality sites" (Table 5). Although there was a slightly higher mean score for mothers' responses (4.75) as compared to health care responders' (4.56), there was no statistically significant difference in mean scores ($p > 0.05$).

Table 5: *Stakeholder Responses to Likert Items*

Questions	*n = 9*		
	Valid	Missing	Median*
The author of the information is obvious.	9	0	5.0
I can tell when the site was created.	8	1	5.0
I can tell when the content was last updated.	9	0	5.0
The information appears to be unbiased.	9	0	5.0
There are references provided for information that is presented.	9	0	5.0
The information is easy to understand.	9	0	5.0
There is a disclaimer stating that the information does not substitute for a health care provider.	9	0	5.0
There is a clear mission statement.	9	0	5.0
It is clear what information is collected about users of the site by the author.	9	0	5.0
The links present are to quality sites.	9	0	4.0
It is easy to navigate to the top of the page.	9	0	5.0
It is easy to get back to the home page.	9	0	5.0
There is a search engine.	9	0	5.0
The search engine is easy to use.	9	0	5.0
There is a way to contact the site administrator if you have questions or comments.	9	0	5.0
I would recommend this site for use by pregnant women.	9	0	5.0

**Likert items ranged from 1 = strongly disagree to 5 = strongly agree*

The stakeholders offered suggestions about content, design features, and resources to be added to the site. Content to be added included information about cesarean section, vaginal births after cesarean section, and complications. There was a suggestion to add information to content

on failed induction specifically that the woman would not be able to go home if her water was broken. One stakeholder suggested removing a specific statement about post-term inductions and cesarean sections.

There were three free-response questions. Of the nine individuals who completed the survey, three had no comments or comments of "no" or "n/a". The six other individuals responded to at least one question, with only two individuals responding to all three questions (Table 6). Four of the women's health care professionals and two mothers provided feedback to the survey questions. There were no consistent themes noted between stakeholder responses.

Table 6: *Stakeholder Responses to Free-Response Questions*

Questions	Responses
Do you have any concerns about the site that were not addressed in the previous questions?	Oversimplification of language How will women know about this site
What information would you like to see added or removed from this site?	Images (photos) In-text citations Information on women planning to have a cesarean section or VBAC More links to information and services near the woman's location Birth plan outlines that can be downloaded and used Information about complications More topics of interest to women giving birth in a hospital More detailed information about "failed induction" Remove statement about post-term inductions and cesarean reduction
Please share anything else that you think would make the site more useful.	Less information on each page to help reader's digest information easier What to expect in terms of care (how often providers check the cervix, etc.) More links to good resources More obvious there is information about natural pain relief

A concern noted by a stakeholder was the oversimplification of language. Another stakeholder was curious about how women would know about this site. Respondents identified

design features to be added to the website such as images and in-text citations with links. A stakeholder suggested adding resources including printable birth plans and links to resources and services near the woman's location.

CHAPTER 6: DISCUSSION

This was the first project of its kind to evaluate health information websites related to labor and birth using HITI and readability criteria. There were only two other published studies evaluating women's health information on the Internet using HITI criteria and readability: one evaluated breastfeeding websites (Dornan & Oermann, 2006) and the other evaluated teen pregnancy websites (Torres, 2009). This limits comparability of the results of this project to findings reported in the literature. Additionally, these two previous studies provided few translatable findings as they listed only the percentages of sites that met or did not meet the various criteria. They did not provide specific evaluative data on any website (Dornan & Oermann, 2006; Torres, 2009).

Two other studies have evaluated other women's health topics on the Internet. Farrant and Heazell (2016) used a different set of criteria (Silberg criteria) to evaluate websites with information on fetal kick counts. Narasimhulu and colleagues (2016) evaluated more birth-related topics including bed rest/hydration to prevent preterm birth, amniotomy and labor progress, epidural and labor progress, and induction for suspected fetal macrosomia. The evaluation only looked at accuracy of information and did not evaluate the websites based on other quality indicators.

The results of this DNP project show there is a need for quality, evidence-based, accurate websites about labor and birth. There is a need for increased awareness among health care providers about Internet use during pregnancy, more conversations between providers and women, and recommendations to guide women to the most reliable resources.

Quality Evidence-Based, Accurate Websites

During this evaluation of commonly used websites on labor birth, no sites met all the HITI and readability criteria. Most websites had misleading or out of date information that was not in line with current research and evidence. The government websites came closest to meeting the criteria.

One statement, that was repeated on multiple websites, was misleading and deemed inaccurate based on current literature noted in UpToDate and by ACOG. This statement was related to the relationship between induction of labor and cesarean section and the associated risks. The inaccuracy is that IOL increases the incidence of cesarean section, but current evidence suggests that IOL does not lead to an increase is cesarean section in all populations (Bailit et al., 2015; Bernardes et al., 2016; Gümezoglu, Crowther, & Middleton, 2012; Mishanina, Rogozinska, Thatthi, Uddin-Khan, & Khan, 2014; Wong, 2005). Currently, there is a large multi-organizational study being conducted to examine this relationship (Mishanina et al., 2014).

A similar finding was noted in the pain management section regarding the relationship between epidurals and cesarean sections. Multiple sites indicated that women who have epidural analgesia/anesthesia are more likely to give birth by cesarean. The research does not indicate that epidurals lead to a higher incidence of cesarean sections (Leighton & Halpern, 2002; Wong, 2005).

The majority of websites also often mentioned Demerol as a medication commonly administered during labor to manage pain. In current practice, the use of Demerol during labor is uncommon and no longer the standard of care in the U.S. (Grant, 2016). Providers more often use other opioids as a first-line treatment for pain management; however, this was not stated in the information presented in the websites.

Despite various tools to evaluate quality of health information on the Internet and access to research, it does not appear that many websites are using these tools in their web development and few researchers are using them to evaluate websites used by women to prepare for labor and birth. This is a problem because it is clear that women are turning to the Internet for information (Declercq et al., 2013b) and that the information they are finding is not always accurate (Narasimhulu et al., 2016). There is evidence that many women do not find the information to be trustworthy (Lagan et al., 2010), yet pregnant women are using this information to make health care decisions (Narasimhulu et al., 2016).

Limitations of the DNP Project

There are limitations to this project. Only 11 websites were evaluated, which may not be representative of all the websites women utilize to gather information about labor and birth. There could have been high quality websites located on subsequent pages of the search results, but only the first pages of the search results were evaluated.

Another limitation is the number of reviewers evaluating the sites. With only two reviewers, the evaluation of the sites is not as robust as it could be with more reviewers. The websites were evaluated by two health care professionals, which may have led to a higher standard of evaluation than is truly necessary for women and their families to gain the necessary information to make informed choices. Another limitation is that I was one of the two reviewers, and the other was an obstetrician; this has the potential for implicit bias in the evaluation of the websites. The evaluation survey to evaluate the website in Phase II of this study was developed by myself and focused on face validity. Content validity could have been tested and questions adjusted to refine the tool to ensure its reliability and validity.

It is worth considering that the FRES and FKGL are measures of readability and not health literacy. Information may be presented in an easy to read format with simple sentence

structure and mono-syllabic words, but if the average individual cannot understand what the terms mean or how they affect their health, then the information is not able to achieve the purpose of educating the reader. For example, the term "off-label" is a simple word and consists of two words that are easy to understand, but an individual with lower health literacy might not understand what "off-label" means.

The evaluation of the model website was completed by a limited number of people and the sampling was purposive and convenience. Since the sample size is small, it might not be representative of the population the website was intended to serve. The sample of convenience consisted of stakeholders who were known to me, either professionally or personally. Therefore, my relationship with the stakeholders may have influenced the feedback they provided.

Implications for Future Research

This project contributes to the body of knowledge on the evaluation of labor and birth information on the Internet with many possibilities as to how to further that contribution. As only 11 sites were examined, evaluating more sites could provide more insight and detail as to what information is present on the Internet for women preparing to give birth in a hospital. Quality information may appear on later search pages that women do not frequently visit, but could be a good resource for providers to recommend.

There is a lack of validated tools available to evaluate health information on the Internet. Although the HITI criteria has been used in a number of studies (Dornan & Oermann, 2006; Liyanage, 2011; Nichols & Oermann, 2005; Oermann, Gerich, et al., 2003; Oermann, Lowery, et al., 2003; Torres, 2009) and was endorsed by the American Public Health Association (APHA, 2001), the tool was developed in the 1990s when the Internet was not as expansive as it is now. The tool is subjective with open-ended questions and room for individual interpretation, thus

there is a need for robust tools to assist health care professionals and patients in evaluation of health information.

Evaluating sites for content on topics other than IOL and pain management will also contribute to the body of knowledge on this topic. A more in-depth evaluation of all content topics on a site could be beneficial in order to determine if quality measures are pervasive throughout the site regardless of the content being covered. Since the purpose of this DNP project was to pilot a model website, future work should consist of developing the website, including the addition of extra features and images included to supplement the content. The use of images, videos, and narration can help with the acquisition of learning (Mind Tools, n.d.; Sweller, 2012) and could add to the mission of the site.

Having women identify sites they use to prepare for labor and birth would also be beneficial. It might be that women are not using sites as frequently as they are using blogs or applications for this specific type of information. Having women participate in the evaluation of sites and determining the criteria they use to judge if information on labor and birth is of high quality and helpful would be beneficial. Utilizing a diverse sample of women from various socioeconomic classes, races, ages, and education levels will also give a more complete picture of Internet use across boundaries. There is a need for evaluation of websites that are written in languages other than English (e.g., Spanish) to determine if information for non-English speaking women is credible, accurate, and evidence-based.

There is also a need to evaluate Internet use by illiterate individuals and those with lower reading levels. This might include evaluating websites with videos or images, or even YouTube videos, that may be used by this population. Developing websites that meet the needs of these populations would also be a valuable resource.

In addition to having women review the sites, having more content experts and stakeholders independently review the sites would help to strengthen the robustness of the evaluation. A variety of providers from various disciplines in different geographical locations could help to determine if there are any variations based on disciplines and locations. A combination of women and health care providers evaluating the sites could lead to an interesting comparison concerning any differences between the two groups in terms of their evaluations.

The challenging part of evaluating websites is that the Internet is constantly changing. There need to be better tools that can keep up with the advances in technology and fluid nature of the Internet. A way to evaluate how to address if a website is understandable to users is also important. Readability measures the reading level, but a way to evaluate and achieve a targeted health literacy score might be more beneficial for health information.

There is a need for a high-quality website on labor and birth that meets HITI criteria and provides information at the appropriate reading level. It needs to be designed in a way that increases knowledge acquisition and learning retention. One way to achieve this goal is to be guided by a theory, such as CLT. Meanwhile, there is a need for further evaluation of existing health information websites on labor and birth; results of these evaluations should be published in the literature so that health care providers can recommend the best websites to their patients. When pregnant women and their families have access to the most current, evidence-based information, they are more likely to make informed choices about their labor and birth experiences.

This website also needs someone or some organization to take ownership of its maintenance. Ideally, a professional organization such as ACOG or the Association of Women's Health, Obstetrical, and Neonatal Nursing (AWHONN) would be the home for such a site.

ACOG currently has patient information available, but this information did not come up on the first page of any search engine search and allows access to older, out of date information which could be confusing. AWHONN does not have any information targeted at patients on labor and birth on their website. Another potential organization would be the National Partnership for Women and Families or their Childbirth Connection arm. Professional organizations need to take some responsibility for monitoring web-based information that patients are accessing. Regular evaluations of websites should be done and reported in the literature.

Until we have a high-quality website that meets health quality and readability criteria, the best secondary option is government websites. These websites can be a good starting point for providers to recommend and for women to use.

Implications for Practice

Health care providers need to be aware that women are turning to the Internet for information. This awareness extends to exploring the sites that women are using as well as other sites that may be available, but not commonly used. It is the responsibility of health care providers to ensure that their patients are well informed to make health care decisions. Yet, if providers are not aware of the sources of information women are using and unable to recommend the most reliable sources, there is a problem. This awareness of Internet use needs to extend to having a general idea of which sites are more credible than others and the quality indicators that can be used to evaluate websites. For example, some basic education for providers on Internet quality could be beneficial so the provider can try to guide women towards more credible sources that base information on current evidence-based practice (e.g., government websites), sites that are updated regularly, and sites that are reviewed by individuals with a medical background and relevant expertise.

This increased awareness is important for all health care professionals who provide care to pregnant women, including nurses who have adopted the responsibility of educating patients as a cornerstone of their profession (Fitzpatrick, 2003). Most health care providers have limited time with patients during their prenatal visits (AI, 2010; Schroeder & Frist, 2013) and in some prenatal settings, patient education falls to the nurse. Nurses may have more time to educate and discuss Internet use with patients, inquiring about the specific sites women are using, answering questions, and clarifying information. Nurses can guide women to the most credible and reliable websites, if that information is available. Until more studies are done to evaluate websites, there is a paucity of information to guide health care professionals in directing women to the best websites. Ideally, after more evaluations are published, health care professionals will be able to offer their patients a list of the best websites that will meet their health care information needs.

Dialogue about Internet use needs to be part of routine discussions during prenatal visits. Providers need to ask women where they are getting information about labor and birth. If women state that they are using the Internet, then the provider needs to ask which sites they are using. This gives the health care provider the opportunity to address any misinformation the woman might have and determine the woman's learning needs; the provider can then direct the woman to resources to best meet those needs.

As this project revealed, there is no perfect or ideal website that health care providers can confidently recommend to pregnant women. There is inaccurate and incomplete health information on the Internet, which is consistent with other evaluations (Farrant & Heazell, 2016; Narasimhulu et al., 2016; Oermann, Gerich, et al., 2003; Oermann, Lowery, et al., 2003; Torres, 2009). As health care professionals, we need to own the responsibility of educating our patients so they are able to make informed health care decisions. This is especially true for pregnant

women seeking information about labor and birth. Women have many choices to make regarding labor and birth, such as pain management, and they need accurate information on which to base their decisions. The health of mother and baby often depend on informed decision-making.

Health care professionals need to be able to direct patients to reliable websites and resources. The Internet is constantly changing, which makes it challenging to know exactly what information is being accessed; however, the best way to combat this issue is for providers and women to talk about what they are finding. This conversation should begin early on in pregnancy to help guide women to reliable websites and resources at the beginning of their information seeking and continue throughout the pregnancy. As pregnancy progresses, the learning needs of women change; as they approach the time for labor and birth, they are likely seeking information that will help them during that time, such as the websites and topics which were examined in this DNP project.

Conclusion

According to the website evaluation that was conducted in this project, there was no single website that met all the requirements outlined by the HITI criteria at the desired reading ease and grade level for an audience desiring health information on IOL and pain management. No evaluation of this kind has been published on content related to labor and birth information on the Internet. As a result of the lack of published evaluations and no sites meeting the quality and readability standards, I created a model website on labor and birth. The website was designed using HITI criteria and current evidence based information and recommendations. The website was positively evaluated by experts and consumers.

The literature points to the need for a credible, trustworthy web-based resource for women to use to during pregnancy (AI, 2010; Hearn et al. 2013; Hidaka & Callister, 2012; Narasimhulu et al., 2016). Currently, there are no regulations for health information on

pregnancy and birth presented in applications (Daniels & Wedler, 2015; Fleming et al., 2012) or on the Internet, which leads to the potential for inaccurate information being presented to women that can have harmful effects (Daniels & Wedler, 2015; Fleming et al., 2012). Women and their families need help identifying quality sources of information on the Internet (Daniels & Wedler, 2015; Fleming et al., 2012; Hidaka & Callister, 2012; Jolivet & Corry, 2010; Lothian, 2008; Martin & Robb, 2013; Narasimhulu et al., 2016; Walker et al., 2009). Providers can help with these recommendations but they must have a conversation about what sites women are utilizing (Martin & Robb, 2013; Weston & Anderson, 2014). In order for that conversation to be meaningful, providers need to be aware of quality sources of information on the Internet that they can confidently recommend to their patients (Martin & Robb, 2013; Narasimhulu et al., 2016). To date, there has not been a published evaluation on the quality of pregnancy and birth websites. With almost four million births each year in the U.S. (Martin et al., 2017), this evaluation has the potential to impact the care of millions of people.

APPENDIX 1: CAPHIS TOP 100: WOMEN'S HEALTH

Organization	Website	Content Related to Birth in a Hospital
HealthyWomen	http://www.healthywomen.org/	Information on giving birth in hospitals
Mayo Clinic: Women's Health	http://www.mayoclinic.com/health/womens-health/MY00379	Information on giving birth in hospitals
MedlinePlus: Women's Health	http://www.nlm.nih.gov/medlineplus/womenshealth.html	Links to other sites with information on giving birth in hospitals
National Institutes of Health: Women's Health	http://health.nih.gov/category/WomensHealth	Links to other sites with information on giving birth in hospitals
Women's Health Resources—Women's Health Research from NIH	http://www.womenshealthresources.nlm.nih.gov/index.html	Links to other sites with information on giving birth in hospitals
Our Bodies, Ourselves	www.ourbodiesourselves.org/	Information on giving birth in hospitals
Society for Women's Health Research	http://www.womenshealthresearch.org/	Links to other sites with information on giving birth in hospitals
U.S. Department of Health and Human Services, Office on Women's Health: womenshealth.gov	http://womenshealth.gov/	Information on giving birth in hospitals
U.S. Food and Drug Administration: For Consumers – For Women	http://www.fda.gov/ForConsumers/byAudience/ForWomen/default.htm	Links to other sites with information on giving birth in hospitals

http://caphis.mlanet.org/consumer/womenshealth15.html

APPENDIX 2: STAKEHOLDER FEEDBACK SURVEY

1. Which best represents the capacity in which you are responding to this survey?
    a. Obstetrician
    b. Family Medicine Physician
    c. Certified Nurse Midwife
    d. Childbirth Educator
    e. Labor and Delivery Nurse
    f. Mother of a newborn aged 6 months or less

For the following questions, please answer as you are looking at the site.

	Strongly Disagree	**Somewhat Disagree**	**Neither Agree nor Disagree**	**Somewhat Agree**	**Strongly Agree**
2a. The author of the information is obvious.					
2b. I can tell when the site was created.					
2c. I can tell when the content was last updated.					
2d. The information appears to be unbiased.					
2e. There are references provided for information that is presented.					
2f. The information is easy to understand.					
2g. There is a disclaimer stating that the information does not substitute for a health care provider.					
2h. There is a clear mission statement.					
2i. It is clear what information is collected about users of the site by the author.					
2j. The links present are to quality sites.					

2k. It is easy to navigate to the top of the page.					
2l. It is easy to get back to the home page.					
2m. There is a search engine.					
2n. The search engine is easy to use.					
2o. There is a way to contact the site administrator if you have questions or comments.					
2p. I would recommend this site for use by pregnant women.					

3. Do you have any concerns about the site that were not addressed in the previous questions?

4. What information would you like to see added or removed from this site?

5. Please share anything else that you think would make the site more useful.

APPENDIX 3: RECRUITMENT EMAIL

Hi,

You are invited to take part in a research survey to improve web-based labor and birth information for women planning to give birth in a hospital. Your participation will require approximately 30 minutes and is completed online at your computer. By choosing to participate, you are consenting to provide feedback on your experience utilizing the online resource (website). Any feedback you provide will be used to improve the online resource. There are no known risks or discomforts associated with this survey. There may or may not be any benefits to you personally, but your participation may help to improve information sharing and Internet use of pregnant women preparing to give birth in a hospital. Taking part in this study is completely voluntary. You may refuse to take part in the research or exit the survey at any time without penalty. You are free to decline to answer any particular question you do not wish to answer for any reason. Your responses will be kept strictly confidential, and digital data will be stored in secure computer files. Any report of this research that is made available to the public will not include your name or any other individual information by which you could be identified. If you have questions or want a copy or summary of this study's results, you can contact the researcher, Cara English, at cara.english@unc.edu. If you have any questions or concerns regarding your rights as a subject in this study, you may contact the Institutional Review Board (IRB) at 919-966-3113 or access their website at http://research.unc.edu/offices/human-research-ethics/. Please feel free to print a copy of this consent page to keep for your records.

This consent page will appear when you click the survey link below. Clicking "I Agree" on the first page of the survey indicates that you are 18 years of age or older, and indicates your consent to participate in this survey.

Website: www.laborandbirthinfo.web.unc.edu
Survey Link: https://unc.az1.qualtrics.com/SE/?SID=SV_2lU2Yv0cruvBVZj

Thank you for your time.

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