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Nurses' Perceptions of Intradermal Sterile Water Injection Use in Labor

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by

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Abstract

Nurses' perceptions of barriers may influence the type of pain control options offered to women in labor. While effective in relieving low-back pain associated with labor, nurses rarely utilize intradermal sterile water injections for women during labor. Using the Nurses' Perceptions of the Use of Intradermal Sterile Water Injections in Labor survey, labor nurses identified barriers to offering intradermal sterile water injections during labor. Individual and institutional characteristics were associated with higher perceived barriers. Nurses who reported working primarily day shift ($t = 2.06$, $p = .05$), higher epidural rates ($r = .45$, $p = .018$), and higher physician-attended deliveries ($t = 2.06$, $p = .05$) reported more barriers. There were no significant differences in perception of barriers for nurses working at hospitals with different levels of care or with higher cesarean rates. The culture of the labor unit in which nurses provide care influences the perception of barriers to the use of intradermal sterile water injections during labor.

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CHAPTER ONE

INTRODUCTION

There is limited use of alternative methods of pain control in the United States for women in labor. According to Peart (2008), non-pharmacologic methods of pain relief are rarely offered to laboring women in the United States despite the evidence such methods are effective in managing labor pain. Intradermal sterile water injections during labor are an inexpensive, non-pharmacologic, and effective method of pain control for women experiencing lower back pain related to labor (Bahasadri, Ahmadi-Abhari, Dehghani-Nik, &Habibi, 2006). However, the limited range of choices for alternative pain control methods offered in labor may be a reflection of professional constraints in managing labor pain (Peart, 2008), specifically related to the labor nurse's knowledge and perception of barriers to utilizing intradermal sterile water injections.

Background and Need

Sterile water injections have been used for women in labor as a form of non-pharmacologic alternative pain control in the United States since 1990 (Duff, 2008); research studies from the 1990's describe the effectiveness of sterile water injections in reducing low back pain for women in labor (Ader, Hansson, &Wallin, 1990; Trolle, Moller, Kronberg, & Thomsen, 1991). However, laboring women within the United States are not routinely offered non-pharmacological pain control methods, such as intradermal sterile water injections, within the hospital setting. When surveyed, antenatally 62% of women planned to use non-pharmacologic methods of pain control, however only 9% of women were successful in utilizing non-pharmacologic methods of pain controlduring labor (Peart, 2008). This low success rate may be due to the lack of non-pharmacologic pain control methods available to laboring women in the hospital

setting, and the nurse's lack of knowledge of labor regarding the effectiveness of non-pharmacologic pain control methods.Nurses who lack knowledge about the safety and effectiveness of intradermal sterile water injections may be hesitant to suggest it as a method of pain control, as the use of non-pharmacologic pain control methods requires different skills and approaches by the nurse regarding the pain a woman experiences in labor (Stark & Miller, 2010). The need for availability and utilization of non-pharmacologic pain control methods is paramount since the satisfaction a woman experiences with childbirth is directly related to how her birthing preferences are supported during labor (Carlton, Callister, &Stoneman, 2005). Nurses are often the key in providing support of maternal pain control preferences during labor.

Purpose of the Study

The purpose of this study is to examine the knowledge level of the registered nurse working in a labor and delivery unit regarding the use of intradermal sterile water injections used for pregnant women experiencing lower back pain during labor: to examine the barriers registered nurses perceive to utilizing intradermal sterile water injections in labor. This study is proposed because there is limited use of alternative methods of pain control in the hospital setting for labor, and no available evidence in the literature examining nurses' perceived barriers of using intradermal sterile water injections for women in labor. The aim of this study is to determine labor and delivery nurses' perceived knowledge, and perception of barriers to using intradermal sterile water injections for laboring women.

Significance of the Study to Nursing

According to Tzeng and Su (2008), 75% of women in labor suffer from episodes of back pain, and 30% of all women in labor suffer from continuous low-back pain

(Martensson&Wallin, 2006). Continuous low-back pain during labor does not allow the woman to rest between contractions, and may affect the methods of pain relief a woman chooses in labor. "Giving birth is a powerful, life-changing event that leaves a lasting impact on the child-bearing woman" (Carlton et al., 2005, p. 146).Therefore, it is important for the nurse to promote maternal satisfaction with the experience and support the laboring woman's pain control preferences. Identifying nursing barriers to implementing non-pharmacologic pain control techniques can elucidate strategies to promote the usage of intradermal sterile water injections as a form of non-pharmacologic pain control by reducing perceived barriers, thus providing nursing support for maternal pain control preferences in labor.

Research Questions

What factors do nurses perceive as barriers to the use of intradermal sterile water injections during labor? What individual factors do nurses perceive as barriers to the use of intradermal sterile water injections for women in labor? What health care environment factors are associated with nurses' perceptions of barriers to implementing intradermal sterile water injections for women in labor?

Definition of Terms

- Intradermal sterile water injection – injection of small amount (0.05mL) of sterile water intradermally into the lower back for women experiencing lower back pain in labor. The number of injections ranges from one to four depending on the laboring woman's localization of pain.
- Labor nurse – the registered nurse primarily providing care for the women in labor, working in the labor and delivery unit.

- Non-pharmacologic/alternative methods of pain control – methods used to relieve pain and provide comfort, which include complementary medicine, biopsychosocial techniques, and psychological/psychosocial techniques (Menefee-Pujol& Wang, 2007)

Theoretical Framework

Greipp'sModel of Ethical Decision Makingis used as the theoretical framework to guide this research. According to Greipp (1992), nurses need to become more aware of everyday ethical dilemmas in order to apply theory and ethical decision making to all components of practice. Greipp's model proposes that nurses may have personal beliefs and knowledge about pain and pain management techniques that influence the nurse's decision to provide certain pain management strategies. According to Kennedy and Lyndon (2008), nurses may provide pain management in labor based on personal philosophical beliefs about the process and risks of labor.Greipp's model is universal and applicable in any setting to identify areas of difficulty in making minor and major decisions (Greipp, 1992). The underlying assumptions of Greipp's model (1992) are that all clients (i.e. laboring women) share a need for basic health care; nurses act as a decision maker with daily decisions; all nurses practice within a code of ethics; decision making is a complex process subject to variations imposed by people, situations, and environments.

The major concepts of Greipp's Model of Ethical Decision Making (1992) include nurse, client, learned potential inhibitors, education, ethical framework, deontological base, nursing process, and decision making. The nurse is a biological essence and defined as an "individual with physical and mental characteristics/capabilities attributable to parentage, growth and developmental factors"

(Greipp, 1992, p. 735). The nurse is educated to provide appropriate nursing care. Theoretically, this is the registered nurse caring for the woman in labor.

The client is also defined as "a biological essence with physical and mental characteristics attributable to parentage, growth and developmental factorsthat is in need of professional nursing health care" (Greipp, 1992, p. 735). The client may communicate needs for nursing health care by physiological expressions, verbal expressions, and non-verbal expression. Theoretically, the client can be defined as the laboring woman in need of pain management and nursing support.

Greipp (1992) defines learned potential inhibitors as "the nurse's and client's psychosociocultural variables which may enhance the person's interactions with others" (p. 736).Greipp's model (1992) is focused on the potential of variables to inhibit the nurse's interactions with the client and potentially affect the quality of health care given. Learned potential inhibitors are further categorized as belief system, culture, personal experiences, and professional experiences (Greipp, 1992). Theoretically, the learned potential inhibitor of belief system is the nurse's beliefs about the normalcy of pain in labor and the perceived risks of labor. The learned potential inhibitor of culture is defined as the culture of the labor and delivery unit in which the nurse practices and which the laboring woman receives care. The learned potential inhibitor of personal experience refers to the previous experiences the nurse may recall during her own labor regarding pain control preference. The learned potential inhibitor of professional experience can be defined as the previous experience the nurse may have had with other women experiencing pain during labor.

Education represents a general or specific teaching and learning which effects a behavior change. "Education is necessary to change psychosociocultural

variables"(Greipp, 1992, p. 736).Theoretically, education refers to the current knowledge the labor nurse has regarding the normalcy of birth, and the safety and effectiveness of both pharmacological and non-pharmacological methods of labor pain control.

Griepp's ethical framework contains the four ethical principles autonomy, beneficence, non-malfeasance, justice, and responsibility/accountability for competence, modeled after the International Council of Nurses' *Code for Nurses,* and the American Nurses' Association *Professional Code for Nurses* (Greipp, 1992). Theoretically, autonomy is the registered nurse respecting the laboring woman's ability to determine which type of pain relief is most beneficial for her labor experience. Beneficence refers to the registered nurse seeking to help the laboring woman achieve her goals for pain control during labor. Non-malfeasance is defined as the registered nurse avoiding bias, based on personal preferences, toward pain control interventions that may harm the woman in labor. Justice refers to the registered nurse respecting the laboring woman's rights to make informed decisions about pain control during labor. Responsibility and accountability for competence is defined as the registered nurse accepting responsibility for maintaining competence in the labor and delivery unit, and maintaining a current knowledge base in order to make effective judgments and decisions regarding appropriate pain control for women in labor.

Deontological base is "a fundamental belief in, and respect for, one's obligations to other human beings – one's duty. A belief that individuals are ends in and of themselves" (Greipp, 1992, p. 736). Theoretically, deontological base is defined as the nurse's ability to provide pain relief to a woman in labor that will enhance the woman's ability to give birth while supporting the woman's birthing preferences. Registered

nurses working with women in labor must ultimately demonstrate respect for the woman and obligation to meeting the needs of the woman in labor.

Nursing process is defined as the focus on the independent actions of the nurse that predict and solve problems related to care, and includes the collaboration and participation of the client (Greipp, 1992). Theoretically, nursing process refers to the ability of the nurse to offer non-pharmacologic pain control methods in collaboration with the woman's labor and desires for pain control. The registered nurse working with women in labor must be able to use problem-solving techniques to analyze the progression of labor, safety of pain relief method, desires of the client, and collaboration of the client when making decisions regarding offering non-pharmacologic pain relief.

Greipp's Model of Ethical Decision Making advocates that decision making should ideally be a partnership between nurse and client that is based on the realities identified by the client (Greipp, 1992). The resolution of decision making is guided by ethical principles which respect the client (Greipp, 1992). Theoretically, decision making refers to the end decisionof the registered nurse and the woman in labor. Essentially, this is the pain control method ultimately offered to the woman in labor. It is the duty of the nurse to provide the laboring woman with appropriate options devoid of personal bias, and to assist and support the woman's final decision for labor pain control.

Figure 1
Conceptual-Theoretical-Empirical Diagram for Ethical Decision Making

Conceptual →	**Theoretical** →	**Empirical**
Nurse	Biological essence educated to provide care	Registered nurse caring for the woman in labor
Client	Biological essence in need of health care	Laboring woman in need of pain management and support
Learned Potential Inhibitors	Psychosociocultural barriers (belief system, culture, personal experience, and professional experiences)	Personal and cultural beliefs about labor and pain, personal labor experience, and professional labor experience
Education	General or specific teaching and learning which effects a behavior change	Current knowledge regarding the safety and effectiveness of both pharmacological and non-pharmacological methods of labor pain control
Ethical Framework	Autonomy, beneficence, non-malfeasance, justice, and responsibility/accountability for competence	The registered nurse's autonomy, beneficence, non-malfeasance, justice, and responsibility/accountability for competence
Deontological Base	Fundamental belief in, and respect for, one's obligations to other human beings	The registered nurse's ability to provide pain relief to a woman that will enhance the woman's ability to give birth while supporting the woman's birthing preferences
Nursing Process	Independent actions of the nurse that predict and solve problems related to care, and includes the collaboration and participation of the client	Ability of the nurse to offer non-pharmacologic pain control methods in collaboration with the woman's labor and desires for pain control
Decision Making	Partnership between nurse and client that is based on the realities identified by the client	End decision regarding pain control chosen by collaboration between the nurse and laboring woman

Conclusion

Studying nurses' perception of knowledge and barriers to usingintradermal sterile water injections for pregnant women experiencing back pain during labor is needed to provide information relevant to the lack of use of non-pharmacologic pain control methods in the United States. The results of this study will identify nurses' perceptions of barriers to the use of intradermal sterile water injections in labor and attempt to establish relationships between perceived knowledge and perceived barriers. Data gathered can be used to create educational strategies and programs to increase the success of implementing the use of intradermal sterile water injections within the hospital setting.

CHAPTER TWO

LITERATURE REVIEW

Sterile water injections have been used for women in labor as a form of non-pharmacologic alternative pain control in the United States since 1990 (Duff, 2008). Research studies from the 1990's describe the effectiveness of sterile water injections in reducing low back pain for women in labor (Ader, Hansson, &Wallin, 1990; Trolle et al., 1991). A preliminary literature search, utilizing the Cochrane and Cumulative Index to Nursing and Allied Health Literature (CINHAL) and PubMed, and using the terms "intradermal sterile water injections," "sterile water blocks," "sterile water injections," and "low back pain labor" revealed four current quantitative studies, one current qualitative study, and three reviews. All quantitative studies were conducted outside of the United States: one in India, one in Australia, one in China, and one in Iran. The qualitative study was conducted in Sweden. An additional literature search using the terms "labor pain," "pain control," "nurse perception," "nurse barriers," "alternative pain control," "childbirth," "labor support," and "labor comfort" revealed five quantitative studies and four qualitative studies. All studies were conducted in the United States, except two quantitative study conducted in Canada. When adding the terms "nurse perception," "nurse barriers," and "labor comfort" to the literature search on intradermal sterile water injections, no additional literature was retrieved. Thus, there is an inference that a gap exists in the literature on nurse's perceptions of barriers in providing intradermal sterile water injections to women in labor. This literature review will identify possible nursing barriers to the use of sterile water injections. This literature review describes the effectiveness of sterile water injections in labor for comfort and safety of the mother and fetus and illustrates the importance of alternative pain control methods in

improving maternal satisfaction with the birth experience and birth outcome within the United States.

Effectiveness and Usage of Non-pharmacologic Pain Control Methods

Saxena, Nischal, and Batra (2009) used a quantitative, randomized double-blind trial including a placebo and treatment group to discover whether intradermal sterile water injections are effective in relieving back pain during labor and free from side effects. A sample group comprised of 100 pregnant women in the first stage of labor in a hospital in India was used to complete this study. Computer-generated numbers randomized the participants into two groups. Using the gate-control theory as a framework, the researchers injected the intervention group with 0.5 ml of sterile water and injected the control group with 0.5 ml of normal saline (placebo). Using the verbal numerical pain rating scale, Saxena et al. (2009) recorded pain assessment scores reported by the participants prior to injections and 10 minutes, 45 minutes, and 90 minutes after the injections were administered. There was significant reduction of pain at all three measurements in the intervention group when compared to the control group ($p < .005$). Physician assessment of perceived pain was also recorded at 10 minutes, 45 minutes, and 90 minutes after administration of injections. There was a significant difference ($p < .05$) between the intervention group and the control group at all three measurements. There was no significant difference between length of delivery and infant Apgar score at birth when the intervention group and control group were compared. Limitations of this study include limiting the duration of observation of pain to 90 minutes after injection administration, which restricted the study of maximum duration of pain relief provided. Another limitation is the cultural difference in Indian women regarding pain in labor. According to Saxena et al. (2009), many laboring women in

India do not want pain relief with narcotic drugs for fear of negative side effects on the fetus or risk of losing control during labor.

Peart (2008) used aquantitative, exploratory, comparative study and qualitative questionnaire to evaluate the efficacy and acceptability of sterile water injections to relieve lower back pain during labor. A sample group consisting of 60 women experiencing back pain during labor (52 completed the survey) at two maternity units in Australia was used to complete this study. Peart (2008) and the staff at the maternity units assessed pain severity, utilizing the Visual Analog Scale (VAS), immediately prior to the injection, five minutes after the injection, and every thirty minutes for up to three hours following the injection. On the second post-partum day, satisfaction surveys were distributed to all participants to collect qualitative data on the birthing experience. Data was analyzed using Statistical Program for Social Sciences (SPSS). Using Melzak and Wall's framework, Peart (2008) described that all the participants (100%) identified lack of fetal harm an important consideration in choosing sterile water injections. Participants identified the relief provided by the injection being worth the transient pain initially associated with the injection. Most (90%) of participants stated they were satisfied or extremely satisfied with the pain relief provided. Peart did not provide the results of the VAS pain scores to determine if the use of sterile water injections did decrease pain scores for women in labor. The results of the study by Peart (2008) advocate the use of sterile water injections for back pain in labor are a safe, effective method of pain relief for women in labor based on maternal satisfaction. Limitations include a small sample size, an over-representation of primagravidas within the sample, and a high proportion of participants less than 30 years of age.

A quantitative, correlational design with repeated measures was used by Tzeng and Su (2008) to describe the prevalence, anatomic regions affected, type, pattern, intensity trend, effective interventions, and exacerbating factors related to intrapartum low back pain. Tzeng and Su (2008) also explored the factors associated with low back pain during labor. A convenience sample of 93 low-risk Taiwan women in active labor was used to complete this study. Participants were assessed a three points in time during labor using the visual analog scale. Data regarding quality of pain experienced was also recorded. A one-way analysis of variance (ANOVA) repeated measures analysis of variance was calculated revealing a significant difference ($p < .001$) between pain scores for at least two of the data collection timeframes (Tzeng& Su, 2008). Tzeng and Su (2008) found that low back pain was prevalent in 75% of the 93 participants with anatomic variations related to stage of labor and cervical dilation, thus recommending prevention and early intervention. Interventions that effectively alleviated low back pain were massage (65.3%), position changes (61.1%), application of heat (38.9%), relaxation and breathing (27.4%), and other maneuvers (Tzeng& Su, 2008). Exacerbating factors include progression of labor (80%), supine positioning (74.3%), uterine contractions (71.4%), continuous fetal monitoring (41.4%), vaginal examinations (35.75), rupture of membranes (32.9%), massage (17.1%), application of heat (8.6%), and other maneuvers (Tzeng& Su, 2008). Limitations of this study include using a convenience sample, and a sample consisting of exclusively of Taiwanese women. Although the researchers desired to study low back pain in Taiwan women, this may have resulted in culturally biased reports and responses to low back pain in labor.

A quantitative, double-blind randomized controlled trial was used by Bahasadri, Ahmadi-Abharl, Dehghani-Nik, and Habibi (2006) to examine the effects of sterile water

injections on back pain for women in labor. A sample group of 100 pregnant women in Iran in the first stage of labor with planned normal vaginal delivery was used for this study. There was no significant difference regarding maternal age, weight, gestational age, parity, gravidity, and degree of effacement between the two groups. Using the gate-control theory as a framework, the researchers injected the intervention group with 0.5 ml of sterile water and injected the control group with 0.5 ml of normal saline (placebo). Pain scores were measured using the faces rating scale. Bahasadri et al. (2006) analyzed data using the Mann-Whitney U-test and *t*-test performed using SPSS. Bahasadri et al. (2006) found that pain severity was reduced in both the sterile water and placebo (normal saline) groups 10 and 45 minutes after the injection. However, pain reduction was more pronounced in the sterile water group than the placebo (normal saline) groups at 10 minutes ($p < .01$) and 45 minutes ($p < .01$). The results of the study by Bahasadri et al. (2006) advocate administering one subcutaneous injection of sterile water in a painful point of the lumbo-sacral area as being effective in reducing pain during labor. The major limitation of this study is that the pain score was assessed twice after the injection of sterile water therefore making determination of onset and duration unknown.

A qualitative, non-experimental descriptive survey design was used to complete the study conducted by Martensson and Wallin (2006) examining the use of acupuncture and sterile water injections for labor pain. Surveys were completed by 565 midwives in Sweden who worked in the delivery ward and had formal acupuncture training to determine the variation in acupuncture and sterile water injection usage for pain control and relaxation. The study was completed after a pilot study of 20 midwives had been conducted. Martensson and Wallin (2006), found that midwives used both acupuncture and sterile water injections, but reported higher usage of acupuncture. Most midwives

(68%) use acupuncture for relaxation, whereas for pain relief, midwives were more likely to choose a combination of both techniques. Using descriptive statistics for analysis, Martensson and Wallin (2006) report a significant difference in estimate of knowledge in favor of acupuncture, which may explain the higher usage thereof. Martensson and Wallin (2006) conclude that midwives report administering acupuncture more often than sterile water injections. Martensson and Wallin (2006) report sterile water injections do not have research to recommend use for relaxation, but research does report sterile water injections provide pain relief for low back pain in labor. The major limitation of this study is the sample population consisting entirely of midwives with acupuncture education.

Perceptions of Pain, Pain Relief, and Support During Labor

Quantitative Designs

Stark and Miller (2009) used a quantitative, comparative descriptive survey design to determine nurses' perceived barriers to using hydrotherapy in labor. According to Stark and Miller (2009), hydrotherapy is effective in relieving pain, reducing anxiety, encouraging relaxation, and promoting a sense of control, but is rarely used in labor. Using Greipp's Model of Ethical Decision Making in the Management of Clients' Pain as the theoretical framework, Stark and Miller (2009) recruited 401 participants, who had provided care to laboring women within the past 12 months, from a national conference and from members of perinatal listserves for the sample population. The 30-item, Likert-format questionnaire Nurses' Perception of the Use of Hydrotherapy in Labor was offered in paper and online format to participants. Stark and Miller (2009) conclude that institutional characteristics were more responsible for perceived barriers to using hydrotherapy in labor opposed to individual characteristics (age, education, and role).

Nurses in facilities with more certified nurse midwives-attended deliveries reported significantly fewer barriers than nurses in facilities with more physician-attended deliveries (F=6.84, df=2, p = .000). Specifically the birthing unit, and generally the hospital facility provide the context for nursing practice in caring for laboring women more than the nurse's education, experience, or personal factors (Stark & Miller, 2009). Limitations include using a convenience sample of well-educated, actively engaged professional nurses to represent all intrapartum nurses, and a sample consisting of approximately 25% of administrators and educators. The length of the survey resulted in the last portion of the survey to contain more missing data. In addition, nurses were asked to estimate characteristics of their birth unit, which did not result in actual, verifiable rates for comparison.

A quantitative, descriptive survey design was used by Stark and Miller (2010) to develop and test an instrument of nurses' perceptions of the barriers of using hydrotherapy in labor as a form of alternative pain control. Using Greipp's Model of Ethical Decision Making in the Management of Clients' Pain, Stark and Miller (2010) designed the Nurses' Perception of the Use of Hydrotherapy in Labor questionnaire (NPUHL). In phase one, a sample of 65 registered nurses who had provided care to laboring women within the past 24 months was used to complete a 39-item Likert-format online survey. Results of the data gathered from phase one was compared to the Labor Support Scale for content validity, and used further to develop the NPUHL. In phase two, a sample of 401 registered nurses who had provided care to laboring women within the past 12 months was used to complete a 30-item Likert-format written and online questionnaire. In phase one, the score of the NPUHL was significantly and negatively correlated with the Labor Support Scale. In phase two, there was a significant negative

correlation (r= -.61) between the use of hydrotherapy and the total NPUHL score, indicating nurses with access to hydrotherapy tubs perceived fewer barriers to hydrotherapy than nurses without access to the use of hydrotherapy. The 30-item NPUHL scale demonstrated evidence of high internal consistency, good initial reliability, and strong validity for use in evaluating nurses' perceptions of barriers to using hydrotherapy in labor (Stark & Miller, 2010). One limitation of the study include using a convenience sample of nurses attending a national conference, which may have provided more positive results as nurses attending an educational conference are more likely to be engaged in learning and professional development. Another limitation includes lack of systemic content validation in the initial development of the NPUHL.

Bryanton, Gagnon, Johnston, and Hatem (2008) used a quantitative, prospective, cohort design to determine factors that predict women's perceptions of the childbirth experience and to examine whether these variables vary with the type of birth experienced. A sample population of 652 women and their newborns in eastern Canada were used for this study. Data were collected using a self-report questionnaire and chart review within 12 to 48 hours postpartum. The five variables most predictive of birth perception for all types of birth ($p < .00$) were degree of awareness, helpfulness of partner support, being together with the infant, degree of relaxation, and type of birth (Bryanton et al., 2008). For the subset vaginal births, the five variables most predictive of birth perception were being together with infant, degree of awareness, helpfulness of partner support, and degree of relaxation and control (Bryanton et al., 2008). For the subset emergency cesarean births, the five variables most predictive of birth perception were degree of awareness, less worry about the infant, degree of control, enjoyed holding infant, and pleased with birth (Bryanton et al., 2008). For the subset planned cesarean

births, the five variables most predictive of birth perception were perception of fear, pleasantness experienced, being together with infant, enjoyed holding infant, and helpfulness of nursing support (Bryanton et al., 2008). The degree of awareness of the events occurring during labor and birth was the strongest predictor of perception across all the models (Bryanton et al., 2008). Limitations of this study include a sample with an underrepresentation of women having cesarean births and complications, and a general birth environment with low interventions. Other limitations include the possibility that non-participants with complications may have been more negative about their birth experience, resulting in a higher study mean birth perception scores (Bryanton et al., 2008).

Payant, Davies, Graham, Peterson, and Clinch (2008) used a quantitative descriptive survey to examine the determinants of nurses' intentions to practice continuous labor support. Ninety-seven registered nurses from two birthing units in a large urban hospital in Canada were utilized for this study (Payant, et al., 2008). Using the Theory of Planned Behavior as a theoretical framework, a survey consisting of two scenarios was developed and tested prior to distribution to participants (Payant, et al., 2008). Nurses had significantly lower intentions to provide continuous labor support to women with epidural analgesia ($p < .0001$) and had intentions influenced by the perceived social pressures on their unit. Payant et al. (2008) recommend examining nurses' attitudes and beliefs regarding the benefits of continuous labor support in order to achieve optimal labor support practices. Limitations of this study include using a selection of nurses from the same hospital, lack of participants from a level I birthing unit, lack of prospective assessment of nurses' actual support behavior, and repetitiveness of survey construction that may have influenced the participants' responses.

A quantitative, descriptive survey research design was conducted by Heinze and Sleigh (2003) to determine the relationships between beliefs about childbirth and pain control choices in relationship to epidural anesthesia. A sample group consisting of 46 women who had given birth within six months prior to the study was used for this study. Ages ranged from 21 – 40 years, with a mean age of 28.5 years. Twenty-six women received an epidural and 20 did not receive an epidural. Participants were white/Caucasian living in the United States, except for two of which one was German and one was Indian. Data was collected using a three-part e-mail survey questioning the women's fear of the childbirth process, the childbearing health locus of control, and the passive compliance versus active participation in childbirth care decisions. Data was analyzed and evaluated using SPSS and multivariate analysis of variance (MANOVA). The results of the study indicate women who had an epidural were observed to have a significantly higher fear of childbirth, increased dependence on powerful others, and higher passive compliance. Heinze and Sleigh (2003) report there was no significant difference of greater knowledge of epidural side effects between women who had an epidural and women who did not have an epidural. Results of a *t*-test showed that women who had a higher effective rating for an alternative method of pain control were less likely to receive an epidural. Women who rated alternative forms of pain control as being effective had a lower fear of childbirth, lower dependence on powerful others, and lower passive compliance. The results of Heinze and Sleigh's study (2003) support the argument that a woman's choice about pain control is more closely related to her ideologies about childbirth than to her physical situation or amount of pain during childbirth. The researchers recommend educating the laboring woman about pain control options and then supporting the laboring woman's choice for pain control, since overall

women were satisfied with their pain control choices despite the differences in their choices. Limitations of this study include lack of sample population diversity, and use of a website that may have resulted in a non-representative population.

Qualitative Designs

Fleming, Smart, and Eide (2011) used a qualitative, descriptive study to explore grand multiparous women's perceptions of the evolving changes in birthing, nursing care, and technology. A sample of 13 grand multiparous women from eastern Washington shared their personal 105 birth stories. Interviews were conducted for 60-90 minutes. Data was analyzed using audiotapes, transcriptions, and field notes. Data was verified by a team of nurse researchers familiar with the study content or design, and validated by evaluating criteria developed by Whittlemore, Chase, and Mandle (Fleming, Smart, &Eide, 2011). Fleming et al. (2011) reported eight themes of multiparous women's perceptions, which were divided into the two aims of the study. The first aim, to explore grand multiparous women's perceptions of nursing care during childbirth, consisted of the six themes of providing welcoming care, offering choices, following birth plans, establishing trust and rapport, being an advocate, and providing reassurance and support (Fleming et al., 2011). The second aim, to explore grand multiparous women's perceptions of nurses' use of technology during childbirth, consisted of relying on electronic fetal monitors and assessments versus nursing presence, and having epidurals coupled with loss of bodily cues (Fleming et al., 2011). Fleming et al. (2011) imply that women in labor desire nurses to provide care following the eight identified themes, have greater satisfaction in labor when nurses give labor support, and have greater sense of control when nurses offer choices. Limitations of this study include a small sample size of women in a local area. Although the births were dispersed in various locations

throughout the United States and one location in Russia, the results may indicate preferences of women living in a local area. A sample population from various locations may yield different results.

A qualitative, ethnography design was utilized by Kennedy and Lyndon (2008) to explore the relationships between registered nurses and midwives in providing maternity and labor care. The sample consisted of 11 certified nurse midwives (CNMs) and 14 registered nurses (RNs) from a midwifery practice in a large urban teaching hospital in northern California. Data was collected over two years using participant observation field notes and in-depth interviews of CNMs and RNs. Qualitative analysis of data occurred throughout the study and was entered into Atlas.ti V. 4.2 for analysis. Kennedy and Lyndon (2008) reported two overarching themes, tension and teamwork, that characterized the relationship between CNMs and RNs. Tensions included philosophic tensions regarding the philosophy of caring for women in labor, communication and respect tensions regarding the expectations of CNMs and RNs in relationship to physicians, and tensions regarding pain management in labor. Teamwork was further defined as working together for the woman, commitment, and teaching midwifery. Kennedy and Lyndon (2008) suggest that women in labor can be caught between the providers' (physicians, CNMs, RNs) philosophic conflicts, rather than having personal preferences for pain management in labor respected and supported. The main limitation of this study includes the use of a single birth setting and midwifery practice for data collection.

Sleutal, Schultz, and Wyble (2007) conducted a qualitative content analysis to explore labor and delivery nurses' views of intrapartum care, particularly factors that help or hinder their efforts to provide professional labor support. Sleutal et al. (2007) used a

convenience and snowball sample of 416 intrapartum registered nurses with six months experience in labor and delivery recruited from conferences or electronic mailing lists. A questionnaire, which encouraged nurses to write comments by three optional open-ended questions on labor support, was available in paper or online format. The participants in the first phase of data collection were recruited from a national Association of Women's Health Obstetrics and Neonatal Nurses conference using paper surveys (Sleutal et al. 2007). The second phase of participants was recruited through professional electronic mailing lists, at a second obstetric national conference, and through professional contacts. Both phases of participants expressed similar viewpoints on the survey. Three major categories were identified which included barriers or obstacles that hinder nurses' intrapartum care; facilitators or factors that help nurses provide intrapartum care; and strategies nurses use to enhance labor, prevent cesarean births, and improve birth outcomes. The category of factors that hinder nurses' intrapartum care consisted of six themes: hastening, controlling, and mechanizing birth; facility culture and resources; mothers' knowledge, language, and medical status; outdated practices; conflict; and professional and ethical decline (Sleutal et al., 2007). Four themes emerged from the category of factors that help nurses' provide intrapartum care: teamwork and collaboration; philosophy of birth as natural process; facility culture and resources; and nursing impact, experience, and autonomy (Sleutal et al., 2007). The results of the survey concerning the last category of specific strategies used to enhance labor, prevent cesarean births, and improve birth outcomes was not reported in this study. Limitations of the study include using a convenience and snowball sample of intrapartum nurses, and sampling nurses attending a national conference, which may represent more educated nurses than would be represented by the average intrapartum nurse population.

Using a descriptive, qualitative study researchers Carlton, Callister, and Stoneman (2005) examined the ethical issues for perinatal nurses in supporting the decisions of women in labor. A convenience sample of 33 primiparous and multiparous women who gave birth vaginally to healthy term infants in the western United States was used for the study. Only women who indicated upon admission that their birth preference was "un-medicated birth" or "wait and see" and later changed their preference were included in the study. The researchers audiotaped interviews, which were transcribe and placed into Ethnograph V.5 format for analysis. Carlton et al. (2005) reported that data obtained from the interviews were grounded in details, evidence, and examples articulated in the interviews. Major themes identified from the study include wanting an un-medicated birth, making a change in pain management, changing birth preferences, and reconciling feelings about making that change. Carlton et al. (2005) identified an emerging framework outlining factors affecting decision making in childbearing women. The results of the study indicate women changed their birth preferences because of intense pain, length of labor, exhaustion, lack of preparation, not knowing what to expect, and not feeling supported by the nurses. Limitations of the study include the homogeneity and high level of maternal education in the sample population.

Meta-Analyses

Researcher Duff (2008) used a literature review design to examine the effectual use of sterile water injections for laboring women to relieve low back pain. Duff (2008), discussed the findings of seven research studies, three systematic reviews, and two early studies that did not use a control group. A literature review of seven research studies, performed from 1990 to 2008, was conducted to review participants, intervention, control, outcome, and main result of each study. Studies that did not include a control

group were not considered for data evaluation. Duff (2008) reported statistically significant results in reduction of VAS pain scores with all seven studies. Duff (2008) also reported that only two of the seven studies identified any statistical differences between birth outcomes of the experimental or control groups, one of which reported a significant difference in the cesarean section rates between the groups ($p< 0.05$), the other which reported no statistical difference between the two groups. Duff (2008) noted the study, which reported no difference between birth outcomes, already had a low cesarean rate (7%), in which case knowing the cesarean rate for the population would have been valuable. The evidence from Duff's (2008) review of seven research studies suggest that sterile water injections are an effective method to relieve low back pain in laboring women versus a placebo.

Utilizing a research-study review design, Martensson and Wallin (2008) conducted a literature review of sterile water injections as treatment for low-back pain in laboring women. Three databases were searched from inception to 2008. The inclusion criteria for studies included trials elucidating the pain relief effect of sterile water injections during labor. Using the Jadad Score Instrument to assess the quality of the research articles, only six of 64 trials were of adequate quality to be included in Martensson and Wallin's (2008) review. Martensson and Wallin (2008) determined all six studies has similar aims, designs, measurement instruments, and reported good pain relief particularly for low-back pain during labor. The pain score reduction was approximately 60% and the effect remained up to two hours with use of sterile water injections (Martensson&Wallin, 2008). The results of the research study review by Martensson and Wallin (2008) conclude that sterile water injections seem to be a good alternative for laboring women experiencing low-back pain.

Using a systematic review, Simkin and O'Hara (2002) examined the use of five different methods of non-pharmacologic relief of pain during labor. The use of sterile water injections was one of these five methods. Simkin and O'Hara (2002) obtained articles by searching relevant studies published between 1950 and 2001 in the English language. Simkin and O'Hara (2002) analyzed four randomized controlled trials of intradermal water injections used for women in labor. Simkin and O'Hara (2002) reported back pain was significantly relieved for 45 to 90 minutes with the intradermal water injections in all four trials ($p<.001$ at 10 minutes, p varied from $< .001$ to $<.05$ at 45 – 120 minutes). The researchers also reported subsequent requests for other pain medications were not different in three of the trials, but more women who received the sterile water injections stated they would use them again in the future than the women who received normal saline injections in three of the trials. The results of the review by Simkin and O'Hara (2002) conclude intradermal sterile water injections are effective in reducing severe back pain, inexpensive, simple to administer, and have no known risks. Simkin and O'Hara (2002) discussed that although sterile water injections are not found to generally reduce the use of pain medications in women, they may be useful to relieve severe back pain in subgroups of women who are in early labor, who wish to avoid or delay the use of epidural analgesia, or those for whom epidural analgesia is not available.

Conclusion

In conclusion, current literature supports the use of sterile water injections as an effective method of pain control for women in labor, and the importance of supporting maternal choices in labor. Sterile water injections can promote comfort and safety of the mother and fetus while improving maternal satisfaction with the birth experience and birth outcome. Literature also supports identifying and recognizing intrapartum nurses'

perceptions of barriers to utilizing alternative methods of pain control during labor and providing continuous support during labor. Identifying perceived barriers may allow for education and restructuring of organization policies that prohibit continuous labor support and the use of alternative pain control methods in labor. Despite the current literature recommending intradermal sterile water injections for women experiencing back pain in labor, there isa lack of current evidence that identifies nurse's perceptions of barriers in providing intradermal sterile water injections to women in labor.

CHAPTER III

METHODOLOGY

Design

A comparative descriptive design was used to test the three research questions proposed in this study. A survey instrument was used to collect data. Data collected from the survey was used to measure and compare nurses' perceptions of barriers to using intradermal sterile water injections for women experiencing lower back pain during labor.

Ethical Considerations

Prior to data collection, approval was obtained to conduct this study from the Institutional Review Board (IRB) for Gardner-Webb University (see Appendix A). Informed consent from the participants was gained prior to any data collection and participants were provided with contact numbers of the primary investigator (PI) and IRB at Gardner-Webb University (see Appendix B). The consent detailed that the survey was anonymous and voluntary, andinformed participants of the purpose and rights for participating in a proposed research study. Participants were recruited to complete surveys using snowball sampling.

Instruments

Data was collected using the Nurses' Perceptions of Intradermal Sterile Water Injection Use in Labor (NPISWIL), a 20-item survey with statements regarding barriers that may be encountered in providing intradermal sterile water injections during labor (see Appendix C). Nurses could respond to each item on a 5-point Likert scale that ranged from zero (strongly agree) to four (strongly disagree). Higher scores indicated greater perception of barriers. The NPISWIL was developed using the Nurses'

Perception of the Use of Hydrotherapy in Labor instrument (NPUHL) as a model. Permission to use and modify the NPUHL was obtained from the author prior to development of the NPISWIL (see Appendix D). The NPUHL overall demonstrates high internal consistency, strong construct validity, and acceptable content, concurrent, and predictive validity (Stark & Miller, 2010). Internal consistency was computed at .93 using Cronbach's α for the NPHUL scale (Stark & Miller, 2009). Four subscales were determined by exploratory factor analysis, Health Care Environment; Knowledge and Beliefs; Personal Concerns; Effort Required for Hydrotherapy. Items on the Health Care Environment subscale indicate support of the nursing staff and facility (Stark & Miller, 2009). The Knowledge and Beliefs subscale includes items on the safety and effectiveness of hydrotherapy for mother and fetus (Stark & Miller, 2009). Items on the Personal Concerns subscale include items about risk of injury or other problems that might encountered during hydrotherapy (Stark & Miller, 2009). The Effort Required for Hydrotherapy subscale include items indicating preparation and possible strain encountered by the nursing staff when hydrotherapy is provided (Stark & Miller, 2009). Items from the NPHUL were modified for use in the NPISWIL by changing the term "hydrotherapy" to the term "intradermal sterile water injections." Items that could not be modified or were irrelevant to intradermal sterile water injections were excluded from the NPISWIL, such as "Cleaning the tub after hydrotherapy requires great effort." Ten items from the NPHUL were excluded in creation of the NPISWIL.

Data analysis

Data were entered into Statistical Package for the Social Science (SPSS) version 19 for analysis. The NPISWIL scale was computed by finding the mean of all items. Question four and question seven required reverse scoring. Means were calculated for

comparison rather than sums so that unanswered items would not influence the results. Four subscales were computed by finding the mean of the items in each scale. The mean of the four subscales were rank ordered to determine the relative value of each as a barrier to the use of intradermal sterile water injections in labor to answer the first research question. To address the second and third research questions, relationships between demographic and birthing unit were computed with parametric and non-parametric statistics.An α of .05 was used to determine significance. Two-tailed *p* values were used to determine significance unless otherwise noted.

Conclusion

Antenatally 62% of women planned to use non-pharmacologic methods of pain control for labor, however only 9% of women were successful in utilizing non-pharmacologic methods of pain controlduring labor (Peart, 2008). This low rate of success may be related to nurses' perceptions of barriers in offering non-pharmacologic methods of pain control to women during labor. According to Carlton, Callister, and Stoneman (2005), a woman's satisfaction with the experience of childbirth is directly related to how her birthing preferences are supported during labor. Examining the barriers nurses perceive to using intradermal sterile water injections can help nurses attempt to support the woman's birthing preferences and enhance maternal satisfaction with the birth experience.

CHAPTER IV

RESULTS

Sixty surveys were distributed, of which 32 were returned, yielding a response rate of 52%. Three of the surveys submitted had no answers for any of the Nurses' Perceptions of Intradermal Sterile Water Injection Use in Labor (NPISWIL) items and were not included in the data analysis, leaving a sample of 29 completed surveys. Not all participants answered all questions. Returned surveys were assigned a numerical code to avoid identification of participants.

Sample

Registered nurses were recruited for the study (N = 29) if they had provided care to laboring women within the past 12 months. Nurses were recruited from North Carolina and South Carolina. All participants were female and 28 of the 29 participants were Caucasian. Ages of the participants ranged from 27 to 57 years old, with a mean age of 41.6. Years in nursing ranged from one to 31 years, with a mean of 15.7 years. Years in obstetrics ranged from three to 30 years, with a mean of 13.5 years. Of the participants, 86%were staff nurses, 7% were advanced practice nurses, and 7% were nurse educators. Of the sample, 44.8% of nurses worked day shift, and 48.3% of nurses worked night shift. Concerning education, 37% of participants held a diploma or associate degree in nursing, and 62% held a bachelor's degree or higher in nursing.

Characteristics of the birthing unit include a mean yearly birth rate of 3386, with ranges from 500 to 6000. Cesarean rates ranged from 20 to 50%, with a mean of 28.7%. Epidural rates ranged from 25 to 100% with a mean of 64.1%. No participants reported use of intradermal sterile water injections. More information is provided in Table 1.

Table 1

Characteristics of the Sample

Variable	Mean (SD)	n (%)
Age	41.6 (7.8)	
Years in nursing	15.7 (7.8)	
Years with laboring women	13.5 (6.8)	
Current nursing role		
Staff nurse		25 (86.2%)
Nurse-midwife		2 (6.9%)
Educator		2 (6.9%)
Highest nursing degree		
Diploma		1 (3.4%)
Associate's degree		10 (34.5%)
Bachelor's degree		13 (44.8%)
Master's degree		5 (17.2%)
Primary shift worked		
Day		13 (44.8%)
Night		14 (48.3%)
Birthing unit characteristics		
# of births (yearly)	3,386 (1,982)	
Cesarean rate	28.7 (8.5)	
Epidural rate	64.1 (24.5)	
ISWI rate	0	
Primary birth attendant		
Resident physicians		9 (31%)
CNM's		2 (6.9%)
Obstetricians		12 (41.4%)
Level of care		
I		1 (3.4%)
II		11 (37.9%)
III		16 (55.2%)

Perception of Barriers Subscales

The means of the NPISWIL and four subscales were computed. The four subscales were rank ordered, with subscales having higher means being perceived as having greater barriers (see Table 2). Of the four subscales, Health Care Environment was the greatest barrier. Knowledge and Beliefs was the next highest ranked subscale. Effort Required for ISWI and Personal Concerns had the lowest perception of barriers.

Table 2

Nurses' Perceptions of the Use of Intradermal Sterile Water Injections in Labor (NPISWIL) Scale Scores

Scale	Mean	SD	Range
NPISWIL (overall scale)	2.84	.60	1.85-4.50
Health Care Environment	3.16	.71	2.00-4.78
Knowledge and Beliefs	2.42	.74	1.40-2.40
Effort Required for ISWI	2.38	.82	1.00-5.00
Personal Concerns	1.76	.99	1.00-4.00

Relationship of Personal Characteristics

In exploring the relationship between the personal characteristics of nurses and their perception of barriers to using intradermal sterile water injections in labor, primary shift worked was the only factors associated with nurses' perception of barriers (see Table 3). The analysis of primary shift worked was negatively correlated the mean NPISWIL scale, and was statistically significant at $p = .05$, with a medium power ($r = -.43$) indicating the sample was adequate to detect the difference present.

Table 3

Relationships Between Personal Characteristics of the Nurses and Nurses' Perceptions of the Use of Intradermal Sterile Water Injections in Labor (NPISWIL) Scale

Personal Characteristics	Mean (SD) of NPISIWIL scale	Statistic	P
Age		$r = .21$	ns
Years in nursing		$r = -.04$	ns
Years with laboring women		$r = .03$	ns
Education		$t = 1.43$, $df = 25$	ns
Holding graduate degree	2.73 (.48)		
Less than graduate degree	3.07 (.76)		
Nursing role		$t = 1.29$, $df = 25$	ns
Staff nurse role	2.90 (.60)		
Other roles	2.49 (.54)		
Primary shift worked		$t = 2.06$, $df = 23$	.05
Day shift	3.15 (.68)		
Night shift	2.70 (.40)		

Relationship of Institutional Characteristics

Characteristics of the facility at which the nurses worked were examined for their relationship to perceived barriers (see Table 4).

Table 4

Relationships Between Institutional Characteristics and Nurses' Perceptions of the Use of Intradermal Sterile Water Injections in Labor (NPISWIL) Scale

Institutional Characteristics	Mean (SD) of NPISIWIL scale	Statistic	P
Birth rate		r = -.25	ns
Cesarean rate		r = -.04	ns
Epidural rate		r = .45	.018
Level of care		F = .43 (df= 2)	ns
I	2.70 (0)		
II	2.95 (.78)		
III	2.73 (.46)		
Primary birth attendant		t = 2.06, df= 25	.05
Physician	2.90 (.57)		
Nurse-midwife	2.05 (.28)		

At facilities were nurses reported higher birth rates, nurses reported lower Cesarean rates (r = -.65, p = .000), and lower epidural rates (r = -.50, p = .006). When examining these factors for their relationship to perceived barriers of using ISWI in labor, higher epidural rates were associated with higher perception of barriers to ISWI, while the relationship to birthrate and Cesarean rate were not significant. No nurses reported working at a facility using ISWI; therefore, data was not available to compare barriers perceived by nurses working at facilities using ISWI versus facilities not using ISWI. When level I, II, and III facilities were compared for nurses' perception of barriers, there were no significant differences noted. The providers who attended most of the births where the nurses from this sample worked were grouped into physicians and nurse-midwives. When perceived barriers were examined by provider groups, there was a

significant different between physicians and nurse-midwives (see Table 4). Differences between the provider groups were examined and compared to the four subscales. Because the differences between provider groups and overall NPISWIL scores had achieved the level of significance, one-tailed *p* values were used for determining significance for comparing provider groups to all subscale scores (see Table 5). The subscale Health Care Environment had the highest perceived barriers of the subscales; when examined in relationship to provider groups, there was no significant difference ($t = 1.69$, $df = 27$, $p = .51$). There was a significant difference between provider groups on the Knowledge and Beliefs subscale ($t = 1.90$, $df = 26$, $p = .035$). The comparison of provider group and Knowledge and Beliefs subscale indicated nurses working were nurse-midwives attended most births perceived fewer knowledge barriers to using ISWI in labor. The subscales Personal Concerns and Effort Required for ISWI were excluded from analysis due to the inclusion of one question available to determine the subscale mean.

Table 5

Relationships Between Primary Birth Attendant and Perceptions of the Use of Intradermal Sterile Water Injections in Labor (NPISWIL) Subscales

Subscale	Mean (SD) for Physician	Mean (SD) for Midwife	Statistic	P
Health Care Environment	3.23 (.71)	2.52 (.36)	$t = 1.69$	.51
Knowledge and Beliefs	2.49 (.73)	1.50 (.14)	$t = 1.90$	.035
Effort Required for ISWI	1.73 (.92)	2.00 (1.70)		
Personal Concerns	2.31 (.68)	3.00 (1.73)		

Comparison of Survey Questions

Survey questions with the lowest mean were Question 4 “There is a risk of injury to the nurse who provides ISWI in labor” ($M = 1.76$, $SD = .99$), Question 3 “ISWI are

safe for the fetus" (*M* = 1.86, *SD* = 1.09), and Question 2 "ISWI are safe for the laboring mother" (*M* = 1.90, *SD* = 1.08). See Table 6.

Table 6

Nurses' Perceptions of the Use of Intradermal Sterile Water Injections in Labor (NPISWIL) Question Scores with Least Barriers

Question	Mean	SD	Range
Risk of Injury to Nurse	1.76	.99	1-4
ISWI Safe for Fetus	1.86	1.09	1-5
ISWI Safe for Mother	1.90	1.08	1-5

Survey questions with the highest mean were Question 11 "The health care providers (physicians and nurse-midwives) are experienced in providing labor care to patients requesting ISWI"(*M* = 3.72, *SD* =1.16), Question 19 "We are able to accommodate the wishes of laboring women who request ISWI in the facility where I practice" (*M* = 4.03, *SD* = 1.18), and Question 14 "There are clear policies and procedures for providing ISWI for patients in labor" (*M* = 4.10, *SD* = .94). See Table 7.

Table 7

Nurses' Perceptions of the Use of Intradermal Sterile Water Injections in Labor (NPISWIL) Question Scores with Most Barriers

Question	Mean	SD	Range
Providers Experienced with ISWI	3.72	1.16	1-5
Ability to Accommodate for ISWI	4.03	1.18	2-5
Clear Policies and Procedures for ISWI	4.10	.94	3-5

CHAPTER V

DISCUSSION

Significance of Findings

The purpose of this study was to understand perceived barriers labor and delivery nurses encounter in providing intradermal sterile water injections (ISWI) to women in labor. In this sample, nurses identified Health Care Environment as the greatest barrier to providing ISWI to women in labor. This may be related to the fact that none of the nurses in the sample reported using ISWI in their current practice. Health Care Environment barriers may also be related to the environment of the labor and delivery unit and the hospital facility in supporting pharmacologic pain control methods more than non-pharmacologic pain control methods for labor pain. This finding coincides with Stark and Miller (2009), who report that nurses utilize a variety of personal, educational, and past experiences when offering pain control options to women in labor, but "the birthing unit specifically and the hospital facility more generally provide the context for nursing practice" (p. 672). The means of the subscales Effort Required for ISWI and Knowledge and Beliefs had similar means indicating that nurses found these to be nearly equivalent barriers to the use of ISWI for women in labor. Not having sufficient knowledge of current research and evidence-based practice may hinder the implementation of nursing research into practice. According to Payant et al. (2008), almost 40% of nurses are unaware of research evidence related to continuous labor support. This finding from Payant et al. (2008) concurs with the findings in this study, and may explain why nurses were unaware of the use of ISWI, although ISWI are supported by current literature, and why nurses did not report ISWI being used in the facilities of the sample. Participants identified Personal Concerns as the lesser barrier to

providing intradermal sterile water injections. This may be because administering intradermal sterile water injections is similar to injections nurses already administer when providing care to women in labor.

Of the personal characteristics of the sample, only primary shift worked had a significant relationship to NPISWIL score. Nurses working day shift perceived more barriers to using ISWI in labor than nursing working night shift perceived. This is most likely related to the high number of scheduled cesarean surgeries and inductions during day shift hours, usually requiring more medical interventions during labor. Nurses working primarily day shift hours may perceive more barriers to using ISWI in labor because the perception of benefits are outweighed by the expected need for pharmacologic pain control options. Nurses working primarily night shift may perceive fewer barriers to using ISWI in labor because the options of epidurals may be limited during the night hours. According the Sleutel et al. (2007), nurses who had positive experiences influencing birth outcomes were more likely to feel empowered. Nurses working night shift may have had more practice in providing non-pharmacologic pain control options and perceive fewer barriers to using these methods for laboring patients.

When comparing institutional characteristics of the sample, higher epidural rates and higher physician attended deliveries were significantly related to the perception of more barriers to using ISWI in labor. Interestingly, perception of barriers was not related to higher birth rates, higher cesarean rates, or level of care. Nurses working in birthing units that routinely provide epidurals for labor may have different expectations of the nursing role in providing care to laboring women when compared to nurses in birthing units with low percentages of epidural use and routine medical interventions. Payant et al. (2008) reported that nurses' intentions to provide labor support were significantly

lower in a scenario where epidural analgesia was provided than in an identical scenario where epidural analgesia was not provided. Nurses may feel that an epidural renders their labor support skills unnecessary. Similarly, nurses in the current study who reported working in facilities with high epidural rates may feel non-pharmacologic labor support, including ISWI, is superfluous. Conversely, non-pharmacologic pain control methods, including ISWI, being available in facilities may decrease the need for medical interventions, reflecting the atmosphere of the birthing unit, and resulting in a perception of fewer barriers to using ISWI.

Nurses practicing in a facility with a higher number of births attended by nurse-midwives perceived significantly fewer barriers to using ISWI than nurses practicing in a facility with a higher number of births attended by physicians. Nurse-midwives usually approach labor with the attitude that birth is a normal process (Kennedy & Lyndon, 2008). Intradermal sterile water injections are a form of non-pharmacological pain control available to women in labor that supports the normal process of labor and birth, so that medical interventions can be avoided or delayed (Romano & Lothian, 2008). Nurses perceived significantly less Knowledge and Beliefs barriers and Health Care Environment barriers when working in a facility with more deliveries attended by nurse-midwives than deliveries attended by physicians. Having more births attended by nurse-midwives may enhance the birthing unit atmosphere in perpetuating the philosophy that birth is a natural process. The perception of fewer barriers to using ISWI with more nurse-midwife-attended deliveries is an expected finding.

Nurses identified the risk of injury to the nurse and safety of ISWI for the mother and fetus as having the least amount of barriers to using ISWI in labor. This indicates that fear of harming the patient, fetus, or self were not considered barriers to nurses in

providing ISWI as a form of pain control. Nurses indicated provider's experience, availability of ISWI at their facility, and clear policies and procedures as having the most barriers to implementing ISWI. This finding is to be expected as none of the sample participants reported working in a facilities currently using ISWI for patients in labor.

Implications for Nursing Practice

Identifying barriers before attempting to implement practice changes is paramount to effecting successful change in nursing practice (Kennedy & Lyndon, 2008). While almost all birthing units have access to some form of non-pharmacologic pain control options, these methods are used infrequently, despite current evidence that most methods are at most effective and at least not harmful to the mother or fetus. Identifying barriers nurses encounter when providing non-pharmacologic pain control methods, including ISWI, can help limit or remove these barriers to allow more frequent use of these methods. According to Stark & Miller (2009), "evidence-based practice guidelines must be developed by nurses for each facility" which will require additional efforts, as there are no accepted national standards for providing ISWI to women in labor (p. 673). Policies should include the frequency of injections, number of injections, amount of solution to be injected, and contraindications to injections (e.g., infection at the injection site). Nurses more comfortable providing non-pharmacologic care to women in labor could mentor nurses who are not comfortable providing non-pharmacologic care.

Limitations

Several limitations of this study must be acknowledged. First, a convenience, snowball-sampling method was used to recruit participants. Participants were from North Carolina and South Carolina, which may not reflect the general attitudes and beliefs of the majority of labor and delivery nurses. Second, none of the participants

reported using ISWI in the facility where they work. Repeating this study with participants actively using ISWI in their current practice is recommended to detect difference in perceptions of barriers. Third, the sample size was small and may not have been large enough to detect significant differences. Repeating this study with a larger sample size is recommended. Fourth, the instrument used for this study (NPISWIL) was new and modeled after the NPHUL, which is also a newer instrument. Further testing of this instrument with other samples is suggested. Fifth, the study required approximately 10 minutes to complete. Consequently, some participants who started the survey did not complete the survey. Last, the nurses completing the survey were asked to estimate characteristics of their birthing unit, such as epidural rate and birth rate; actual rates could not be verified.

Recommendations

More research on the use of ISWI in labor and its barriers with other samples is needed in order to design interventions to overcome those barriers. Supporting nurses in practice change is necessary to successful implementation of research evidence (Stark & Miller, 2009). Indentifying barriers and their relationship to personal and institutional characteristics more specifically will allow for a successful intervention development. Including physicians, nurse-midwives, nurse managers, nurse educators, and staff nurses in planning for the use of ISWI and other non-pharmacologic interventions is important, because the atmosphere of the birthing unit may dictate acceptable and supported practices. Although this study explored the factors that nurses perceived as barriers to the use of ISWI, patient perspective was not considered. Future research could focus on barriers or facilitators that patients and families perceive with the use of ISWI.

Importance of Findings

Intra-partum nurses are privileged with the opportunity to provide comfort, reassurance, and care to the woman in labor. Intradermal sterile water injections are safe, effective, and a relatively inexpensive method to provide relief to the woman experiencing back pain in labor, after the initial investment in staff education. However, ISWI, and other alternative methods of pain control, are rarely used for labor (Peart, 2008). Barriers within the facility and birth unit were perceived as being inhibitors to providing ISWI to women in labor. Comprehending and resolving these barriers may increase the use of ISWI in labor and concurrently delay or avoid pharmacologic pain management interventions.

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Appendix A

THE INSTITUTIONAL REVIEW BOARD
of
GARDNER-WEBB UNIVERSITY

This is to certify that the research project titled
Barriers to the Use of Intradermal Sterile Water Injections in Labor

being conducted by Abby Barlock

has received approval by the Gardner-Webb University IRB. Date 10/13/11

Exempt Research

Signed Cindy Miller
Department/School/Program IRB Representative
Vicki Walker
Department/School/Program IRB Member

Expedited Research

Signed _____
Department/School/Program IRB Representative

_____
Department/School/Program IRB Member

_____
IRB Administrator or Chair or Institutional Office

Non-Exempt (Full Review)

Signed _____
IRB Administrator

_____
IRB Chair

_____
IRB Institutional Officer

Expiration Date _____

IRB Approval:

X Exempt ____Expedited ____Non-Exempt (Full Review)

Revised 3/10

Appendix B

Informed Consent

Nurses' Perceptions of Intradermal Sterile Water Injection Use in Labor

You are being invited to participate in a research study about nurses' perceptions of barriers regarding the use of intradermal sterile water injections in labor for the relief of lower back pain. This thesis research is being conducted by Abby Garlock, RN, BSN, LCCE, an MSN student at Gardner-Webb University. The objective of this research project is to attempt to understand what barriers nurses encounter in administering intradermal sterile water injections to women in labor.

There are no known risks if you decide to participate in this research study, nor are there any costs or incentives for participating in the study. The information you provide will help the researcher understand potential barriers and educational needs of nurses working with laboring women in regards to non-pharmacologic pain relief methods.The information collected may not benefit you directly, but information from this study should provide general benefits to nurses and facilities providing care to women in labor.

This survey is anonymous. If you choose to participate, donot write your name on the questionnaire. The researcher will assign random numbers to surveys for coding purposes to avoid further identification. No one will be able to identify you, nor will anyone be able to determine at which facility you work. No one will know whether you participated in this study.

Your participation in this study is voluntary. If you choose to participate, please place your completed questionnaire in the return envelope provided, and mail the survey to Abby Garlock,3533 Artee Rd, Shelby, NC 28150.

If you have any questions or concerns about completing the questionnaire, about being in this study, or feel you have been harmed in any way by this survey, you may contact the researcher at 704-434-5823 or at agarlock@gardner-webb.edu.

The Gardner-Webb University Institutional Review Board has reviewed the researcher's request to conduct this project and granted approval to conduct this project. If you have any concerns about your rights in this study, please contact Gardner-Webb University Institutional Review Board, Dr. Vickie Walker at 704-406-4384 or email at vwalker@gardner-webb.edu.

Please retain this page for reference and contact information.

Appendix C

Nurses' Perceptions of Intradermal Sterile Water Injection Use in Labor

In this questionnaire, you will be asked some questions about the use of intradermal sterile water injections in labor. Intradermal sterile water injections involve injecting small amounts (0.05 to 0.1 ml) of sterile water intradermally around the sacral area using a TB syringe. Intradermal sterile water injections offer pain relief for women experiencing lower back pain in labor but do not alleviate contraction pain. The number of injections usually ranges from one to four depending on the localization or generalization of back pain the women reports. For the purpose of this study, consider the use of intradermal sterile water injections in the facility where you work for low risk/healthy laboring women only.

This survey is six (6) pages long and should take approximately 10 minutes to complete. Because we want to get the best data possible for understanding nurses' use of intradermal sterile water injections in labor, it is important that you answer each question as best you can for your facility.There is no right or wrong answer.

The abbreviation ISWI will be used throughout this survey to refer to intradermal sterile water injections.

Have you provided nursing care for laboring women in the last 12 months?

____ no → ***If no, skip to Section 2 on page 3***

____ yes

Continue to section 1

Section 1:

You will read some statements. For each statement, check (√) the box that indicates the extent to which you agree. Mark only one choice per question.

	Stongly Agree	Mostly Agree	Neither agree or disagree	Mostly Disagree	Strongly Disagree
1. I feel comfortable providing ISWI to my patients in labor.					
2. ISWI are safe for the laboring mother.					
3. ISWI are safe for the fetus.					
4. There is a risk of injury to the nurse who provides ISWI in labor.					
5. ISWI are effective in relieving tension during labor.					

	Stongly Agree	Mostly Agree	Neither agree or disagree	Mostly Disagree	Strongly Disagree
6. ISWI are effective for pain management during labor.					
7. Providing ISWI to laboring patients requires great effort.					
8. ISWI are easily accessible.					
9. The staffing level is adequate to support ISWI.					
10. The health care providers (physicians and nurse-midwives) support the use of ISWI.					
11. The health care providers (physicians and nurse-midwives) are experienced in providing labor care to patients requesting ISWI.					
12. The nurse manager or supervisor supports the use of ISWI in labor.					
13. The nursing staff supports providing ISWI in labor.					
14. There are clear policies and procedures for providing ISWI for patients in labor.					
15. Equipment needed for ISWI (sterile water, syringes) is readily available.					
16. The fetus is easily monitored while the mother is receiving ISWI.					
17. Legal liability is a concern with ISWI in labor.					
18. Pediatric care providers support the use of ISWI in labor.					
19. We are able to accommodate the wishes of laboring women who request ISWI in the facility where I practice.					
20. With the present rate of labor induction, epidural analgesia, and cesarean delivery, ISWI do not have an important role in current intrapartum practice.					

Section 2.

1. In the last 12 months, estimate a percentage of patients at the facility where you work that used each of the following comfort measures, for example 0%, 25%, 90%. The numbers do not have to add up to 100%; each measure could be used up to 100%. (For example, both epidurals and narcotics could be used 75% of the time.)

_____ Intradermal sterile water injections

_____ Epidurals

_____ Narcotics

_____ Non-pharmacologic methods (breathing techniques, shower, immersion in a tub/pool, birthing ball, massage, relaxation, visualization, hypnosis, application of hot or cold, position changes, and/or movement)

2. How effective do you believe the following measures are for pain relief during labor?

For each statement, check *(√)* the box that indicates the extent to which you find the following measures helpful. Mark only one choice per question.

	Very Helpful	Somewhat Helpful	Not Very Helpful	Not Helpful
1. Intradermal sterile water injections				
2. Epidurals				
3. Narcotics				
4. Shower or immersion in tub/pool				
5. Birthing ball				
6. Hands-on techniques				
7. Mental strategies				
8. Changes to the environment				
9. Application of hot or cold				
10. Breathing techniques				
11. Position changes and/or movement				

Section 3.

Following are some general questions about you and the facility where you provide care to laboring women. If you are not sure of the answer, your best estimate will be adequate.

1. Approximately how many birth per year take place in your facility? This includes both vaginal and cesarean deliveries.

   _____ birth per year

2. Approximately what percentage of patients deliver by cesarean section?

   _____%

3. Approximately what percentage of all patients who deliver at your facility use intradermal sterile water injections during labor?

   _____%

4. Who attends **most** of the births where you work? Select the one most appropriate response:
   _____ Resident physicians
   _____ Nurse-midwives
   _____ Obstetricians
   _____ Family Practitioners

5. In what type of setting do you provide care to laboring women?
   _____Hospital
   _____Birth center
   _____ Other, please list _____

6. What best describes you current nursing role?

   _____ Staff nurse
   _____ Manager/administrator
   _____ Clinical specialist
   _____ Advanced practice nurse/nurse practitioner
   _____ Nurse-midwife
   _____ Nurse educator
   _____ Other, please list_____

7. How would you describe the level of obstetrical care at the facility where you practice?

_____Level 1
_____Level 2
_____Level 3

8. In what type of unit do you practice mostly?

_____Labor and delivery only
_____Antepartum
_____Neonatal
_____Postpartum
_____Labor, delivery, recovery, post partum (LDRP)
_____Other, please list.

9. What is your highest degree in nursing?

_____Diploma
_____Associates degree
_____Bachelors degree
_____Masters degree
_____Doctorate

10. How many years have you worked as a nurse?

_____ years

11. How many years have you worked with laboring women?

_____ years

12. How old are you today?

_____years

13. What shift do you work, primarily?

_____Day
_____Night
_____Other, please list _____

14. What is your gender?

    _____ Male
    _____Female

15. In what state do you work? (If more than one state, choose the state where you work most)

    _____state

16. Which of the following best describes your race?

    _____American Indian or Alaskan Native
    _____Asian or Pacific Islander
    _____African American
    _____Caucasian
    _____Hispanic/Latino
    _____Other_____

Any additional comments:
_____
_____
_____
_____

Thank you for participating in this study!

Please enclose this survey in the stamped, return envelope that was provided, and return before November 18, 2011.

Appendix D

Letter of Author's Permission to Use and Modify NPUHL

Mary Ann Stark [mary.stark@wmich.edu]

To:

Abby Elisabeth Garlock

Attachments:

(2)Download all attachments

NPUHL Final.pdf (44 KB)[Open in Browser]; Scoring Instructions for N~1.pdf (5 KB)[Open in Browser]

Friday, August 26, 2011 11:14 PM

You forwarded this message on 10/5/2011 10:34 PM.

Hi Abby,

Thank you for your interest in the NPUHL. I have attached it along with instructions for scoring. As your advisors will remind you, each instrument is only valid for a specific sample. Please let me know if you have any questions. I wish you the best in your thesis research and graduate studies.

MAS