1-1-2017

The lived experience in relation to the educational needs of nurses caring for induced hypothermia patients

Marie Regina Hankinson
Nova Southeastern University

THE LIVED EXPERIENCE IN RELATION TO THE EDUCATIONAL NEEDS OF NURSES CARING FOR INDUCED HYPOTHERMIA PATIENTS

Presented in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Philosophy in Nursing Education

Nova Southeastern University

Marie Hankinson
2016

Abstract

Background*:** Ongoing educational development is essential to ensure the effectiveness of professional nurses' learning experiences. Understanding the ways in which workplace learning occurs is fundamental to enabling nurse educators to deliver that knowledge. Induced hypothermia was introduced as a new treatment modality in 2005 and education surrounding the care of the hypothermia patient is lacking in the literature. ***Purpose: The purpose of this study is to illuminate how nurses learn new knowledge in the clinical setting. ***Theoretical Framework:*** The learning theory chosen for this study is the three dimensions of learning by Illeris (2004). ***Methods:*** Semistructured interviews were conducted with each participant in one individual, face-to-face session to examine the lived experiences of nurses providing care to induced hypothermia patients. A hermeneutic phenomenology method was chosen based on the work of van Manen. Hycner's methodological approach was utilized to analyze data. ***Results:*** In this study, four learning areas emerged which corresponded to Illeris' (2003b) three dimensions of learning, including cognitive, emotional, and environmental-social dimensions. The main theme described by every nurse interviewed was the necessity to have hands-on experience to feel competent in their care for induced hypothermia patients. The unit had a special identity because of their unique work of providing hypothermia care and one nurse explained, "We are making history." ***Conclusions:*** Nurses preferred hands-on learning or experiential learning and they helped construct their learning environment. Nurse educators and nurse leaders fueled this synergetic learning process.

Table of Contents

List of Figures

Figure Page

Chapter One

Problem and Domain of Inquiry

This study illuminates how nurses learn new knowledge in clinical settings by interviewing nurses who have cared for patients undergoing therapeutic hypothermia. The American Heart Association recommended induced hypothermia as a mode of therapy in 2005 as part of its advanced cardiac life support guidelines, going as far as including a definitive statement that the use of induced hypothermia for cardiac arrest may be beneficial for neuroprotection (Holzer, 2002; Holzer & Behringer, 2005; Sayre et al., 2009). Despite recommendations for incorporating induced hypothermia into the care of cardiac arrest patients, only 26% of hospitals nationwide have implemented induced hypothermia programs (Dainty et al., 2011; Merchant et al., 2006). Although this protocol is a standard of care, many hospitals have not implemented this therapy because of the lack of data and cost of resources (Cady & Andrews, 2009). Induced hypothermia is a relatively new treatment modality that requires nurses to learn new knowledge when caring for this group of patients. Caring for patients undergoing induced hypothermia is a newly acquired skill these nurses will need to learn.

Nurse educators develop, implement, and evaluate strategies by which clinical nursing staffs demonstrate competence. Staff nurses play a key role in preventing patient complications and improving patient safety (Steen, 2010). The nursing profession needs to keep pace with the changing needs of society and health care. Reports by the Carnegie Foundation (as cited in Benner, Sutphen, Leonard, & Day, 2010) and the Institute of

Medicine (Institute of Medicine [IOM], 2010) underscored the need for innovation in nursing education to prepare future nurses. These reports placed nursing education in the national spotlight and calls for improvements to better prepare nurses and lead the reform in health care (Robert Wood Johnson Foundation, 2012).

With 2.9 million nurses in the United States (US; Buerhaus, 2012), members of the nursing profession are well positioned to exert a positive influence on health care delivery. Like the rest of the U.S. population, nursing educators and members of the nursing workforce are aging (Health Resources and Services Administration, 2010). An estimated 20% of current nurses will retire from nursing between 2010 and 2025 with approximately 118,000 nurses leaving by 2015 (Mason, Leavitt, & Chaffee, 2014) to be replaced by only 109,000 nurses in this same time period (Buerhaus, 2012). Regional-level projections show that states in the western and northeastern United States have fewer younger registered nurses (RNs) to replace a relatively larger number of older RNs; however, the Midwest and southern US have a greater number of RNs comparatively to replace a fewer number of retiring RNs (Buerhaus, Auerbach, Staiger, & Muench, 2013). Still, uneven gaps in faculty positions and aging nurse faculty exacerbate the challenge of training and preparing bedside nurses. Retiring senior faculty not only leave a gap in the resource pool of educators, but also leave fewer experienced individuals to mentor new faculty. Investment to develop educators who can teach practicing nurses new knowledge and skills and ensure the nursing workforce is ready to deliver high-quality care.

Health care is an ever-changing field that demands nurses acquire new knowledge. A 2010 report by the IOM remarked on the need for nurses to be educated in

new ways to better prepare them for the changing role of the practicing nurse. Thirty years of literature is saturated with evidence of practice and improving patient care, leaving a large gap in knowledge regarding how to develop nurse educators to enhance student learning and design the best instructional strategies (Benner et al., 2010; Shultz, 2009). Schön (1983), an influential thinker in developing learning theory in the 20th century, stated that practitioners face unique and complex situations that require new knowledge. Learning occurs through a feedback loop of life experience and learning (Schön, 1983). Knowledge demonstrates improved patient care and better patient outcomes, but the literature offers no complete picture of how nurses acquire this new knowledge. Ongoing educational development is essential to ensure the effectiveness of professional nurses' learning experiences. Understanding the ways in which workplace learning occurs is fundamental to enabling nurse educators to deliver that knowledge. A lack of research regarding how nurses learn in the workplace underscores the importance for this study, information that could assist nurse educators by providing insight into how practicing nurses learn new knowledge to care for patients.

Results of three landmark studies prompted the International Liaison Committee on Resuscitation to prepare an advisory statement recommending the use of induced hypothermia for adult patients who experience a cardiac arrest outside of the hospital setting caused by ventricular fibrillation arrhythmia (Nolan, Morley, Vanden Hoek, & Hickey, 2003). Inducing hypothermia is recommended immediately after the cardiac event to achieve and sustain a core body temperature of 32° C to 34° C for 12 to 24 hours, the objective of which is to improve neurological outcomes and mortality in patients with primary cardiac arrest who remain comatose after return of spontaneous

circulation (West, Mays, Rafferty, Rowan, & Sanderson, 2009). Bernard et al. (2002) demonstrated improved neurological outcomes for such patients based on the increased number of patients discharged home or to a rehabilitation unit.

The aim of this study is to understand the lived experience of nurses who have cared for patients undergoing induced hypothermia in the acute care setting. The researcher seeks to comprehend the nurses' experience relative to learning new knowledge to care for this patient population. Induced hypothermia care is the focus of this study because this relatively new treatment requires both experienced and inexperienced nurses to acquire new knowledge and skills when caring for this population of patients who have undergone induced hypothermia.

A qualitative design was chosen for studying nursing behavior and investigating nurses' experiences to explain how nurses learn to care for patients undergoing hypothermia treatment. Quantitative research, however, involves analysis of numerical data; this study analyzes verbal data from interviews. This study may yield insights into how nurses learn new knowledge in the workplace. This primary exploratory research is to gain an understanding of how clinical nurses learn, which will benefit the knowledge base of published material regarding how nurses learn to care for patients undergoing hypothermia.

Findings of this study may enhance nurse educators' understanding of how learning occurs when nurses learn new knowledge in caring for patients undergoing induced hypothermia. This study lays the foundation for understanding how nurses learn how to care for this specialized population. Insight gained from this study may assist other nurses who must learn to care for patients undergoing other treatment modalities

with which the nurses are unfamiliar.

Problem Statement

Research regarding nursing education and research on clinical nursing serve different purposes, but both are equally important and should be valued equally (National League of Nursing [NLN], 2002). The NLN (2002) recommended nursing instruction should be both evidence based and researched based. Nursing educators often turn to literature for assistance with decisions regarding the evaluation of learning and guidance in the development of nursing curriculum (Oermann, 2007). However, a significant problem is that nursing education cannot always prepare future nurses for the increasingly complicated nursing tasks associated with evolving treatment and diagnostic procedures along with the use of related technology in clinical settings (Benner et al., 2010). Nurses must learn on the job in less-than-optimal situations (Benner et al., 2010), and insufficient research exists about how nurses learn on the job in relation to newly instituted and complex procedures (Oermann, 2007), such as induced hypothermia (Avery, O'Brien, Pierce, & Gazarian, 2015). Nurse educators must have good evidence-based practices to promote the best teaching practices and the scholarship of teaching (Shultz, 2009).

The connection encouraged by the NLN (2002) between nursing education research and nursing education was to develop the science of nursing education. Nursing education research will build the foundation of the science of nursing education. To highlight the expansive gap in knowledge on a most critical subject, the Carnegie Foundation published the first national study in 30 years in 2010. Support from the NLN, the American Association of Colleges of Nursing, and the National Student Association.

In *Educating Nurses*: *A Call for Radical Transformation*, Benner et al. (2010) examined how nurses are prepared to enter and maintain the practice and argued that because of the increasingly complex role of nurses not only as caregivers, but as technical and procedural specialists, more attention to how nurses learn on the job is required.

New methodologies to assess clinical evaluation and research about learning have been introduced during the years. Learning effectiveness relative to student outcomes is lacking (McCartney & Morin, 2005). Of greater concern, findings from those few research initiatives that point to improved approaches to instruction are not being put into practice (Wright, Finelli, Meizlish, & Bergom, 2011). Nurse educators lack sufficient and adequate research about how nurses learn on the job in relation to unique and evolving procedures and technologies to guide nursing practice. For example, published studies representing single-site institutions have not been replicated and often include only small sample sizes (Shultz, 2009). To complicate these shortcomings, the literature provides ample evidence of the difficulties of researchers to accurately locate nursing databases (Shultz, 2009) because nursing education lacks a universal database of systemic reviews or an electronic repository where research data can be easily located (McCartney & Morin, 2005). Further exacerbating the problem is the minimal amount of evidence-based research about how to measure and evaluate nursing education (Benner et al., 2010; Shultz, 2009).

This study adds to the literature about how nurses learn on the job by exploring how nurses acquire new technical and procedural knowledge associated with induced hypothermia. Because induced hypothermia is a relatively new procedure that is complex, tense, and time-sensitive (Avery et al., 2015), it presents an excellent

opportunity to explore how nurses acquire new knowledge on the job under less-than-ideal conditions. Research on nurses' roles in induced hypothermia procedures is only now beginning to emerge, and more work in this area is crucial to avoid harmful and negative patient outcomes associated with inconsistently applied and poorly understood procedural protocols (Avery et al., 2015).

Purpose of the Study

The purpose of this study is to gain insight into how nurses learn new knowledge and apply this learning process to other situations that require new learning to occur. Findings from this study may benefit nurse educators, nursing students and learners, and the patient population.

Most nursing pedagogies are rooted in teaching and learning. For nurses, learning is different in the workplace environment. In the workplace, learning is not transferred. It is constructed and dependent on the culture of the organization and its nursing leaders. In the workplace, learning is social and constructed by learners and the environment (Allan, Smith, & Lorentzon, 2008). While traditional learning is content-driven and teacher-controlled, learning outcomes at work are dependent on many different variables in nurses' work milieus. Work-based learning requires the learner to identify his or her own learning needs and be able to learn necessary knowledge independently. Classroom learning and workplace learning are different. In the workplace setting, learning is determined by the practitioners and not the curriculum. By understanding and optimizing the process by which nurses learn new knowledge, nurse educators can develop a better understanding of how learning occurs when nurses must learn new knowledge in the workplace, including at the bedside of the patient undergoing a procedure which the

nurse is unfamiliar with and requires new knowledge.

Research Questions

The research question that guides this study is the following: What are the lived experiences of registered nurses educated in the care of patients undergoing induced hypothermia therapy? To understand and interpret the main research phenomenon, the following interview guide was used:

1. What does workplace learning look like?
2. What are the obstacles to workplace learning?
3. What influences workplace learning?
4. What motivates workplace learning?
5. How is successful learning measured?
6. What part does an organization play in developing a nurse?
7. What part does the environment play in developing a nurse?
8. Where does learning take place?
9. How do nurses perceive their use of gained knowledge to enhance patient care?

Significance of the Study

The following section discusses the significance of the proposed study in light of the need and deficiencies in current research.

Nursing Education

This study lays the foundation for describing how nurses learn new knowledge when caring for induced hypothermia patients. Included in the study is a discussion of how educators can enhance nurses' learning experiences by capturing critical thinking

and judgment skills (Gantt, 2010). A better understanding of how workplace learning occurs when nurses support sudden cardiac arrest patients undergoing induced hypothermia will benefit patients by empowering educators to target and promote nurses' learning skills.

This study focuses on how experienced nurses learn to care for complex patients, not unlike graduate nurses who have to acquire new skills to perform successfully in a novice nursing role. Benner et al. (2010) writes about high-stakes nursing and how student nurses fear making a mistake and the possibility of making a dangerous error. With rapid changes in medicine and technology, nursing education is tasked with keeping pace with the so-called practice-education gap. Caring for hypothermia patients is an example of how evidence-based practice has evolved and nursing education has trailed behind. Information about learning environments and how nurses prefer to learn when caring for hypothermia patients may be illuminated.

There is a shortage of faculty who has expertise in educational training (Forbes & Hickey, 2009). Few researchers have investigated the mismatch between learning styles and teaching styles (Naimie, Siraj, Ahmed Abuzaid, & Shagholi, 2010). Evidence regarding how nurses learn is in short supply. A good start to reduce this knowledge gap might be made if nurse educators had better tools to inventory the learning style of students (Naimie et al., 2010). A mechanism by which to evaluate student engagement and the ability to identify barriers to active learning is needed (Popkess & McDaniel, 2011). The lack of research focusing on student outcomes (Forbes & Hickey, 2009), especially student characteristics that lead to successful outcomes (Popkess & McDaniel, 2011), warrants investigation. Little is known about how instructors evaluate new

technologies and how technology meets the needs of students (Naimie et al., 2010). Knowledge gained from research in each of these areas might help educators identify needed interventions to improve instructional strategies. Few researchers have determined how to measure student learning preferences and student engagement. Knowledge is needed to identify the barriers to active learning in nursing. The nursing profession lacks faculty-trained educators to teach the next generation of nurses the skills needed for the 21st century and beyond. Researchers need to develop instructional strategies to prepare nurses for changes in future health care trends.

Also, increased attention is needed regarding education and learning in the development of staff nurses. Staff nurses play a key role in preventing patient complications and improving patient safety. Additionally, staff nurses are important in implementing appropriate and timely intervention to stop deterioration and decrease morbidity and mortality (Steen, 2010). However, staff nurses who do not work in critical care areas may not possess the necessary skills and knowledge (Steen, 2010). Consequently, more work is needed about knowledge acquisition, education, and learning in the important and critical area of staff development settings.

Nursing Practice

Nursing professionals are challenged to deliver high standards of care. This standard of care is introduced during the education process and must be expanded upon throughout the nurses' careers. Nurses' practice should have a positive influence on the bottom line of the hospital by preventing patient complications and reducing the length of hospital stays, both of which reduce the cost of care for patients. These demonstrations of competency are desired outcomes for the future of health care. By examining how

nurses learn new knowledge, nurse educators can contribute to producing highly trained bedside nurses who are motivated to learn new knowledge and deliver quality care.

The process by which nurses' learning in the workplace positively or negatively affects the care of a particular patient population will be observed in this study. The researcher explores how nurses learn procedures and care in relation to a special patient population, such as patients of induced hypothermia. An added benefit of this study is the indirect opportunity to learn about the care of patients undergoing induced hypothermia. This sample population differs on the basis of the relatively new and unused treatment of induced hypothermia. Because only 26% of hospitals nationwide have implemented induced hypothermia programs (Dainty et al., 2011; Merchant et al., 2006) and because many hospitals have not implemented this therapy because of the lack of data and cost of resources (Cady & Andrews, 2009), induced hypothermia care represents a relatively new and underused treatment modality that requires nurses to learn new knowledge when caring for this group of patients. Caring for patients undergoing induced hypothermia is a newly acquired skill these nurses learn in context and in relation to previous learning.

Nursing Research

Continuing education for nurses is an important tool for building competence and improving patient outcomes. To address the need to measure program effectiveness and student learning based on training, tools to assess program effectiveness need to be developed. The literature includes no published evidence-based research reports regarding how nurses' learning is measured and evaluated relative to the care of induced hypothermia patients. Valid and reliable tools for assessing clinical practice and how

nurses learn at the bedside are difficult to locate (Leach, 2007). Evidence about how nurses continue to learn throughout his or her career is in short supply. This study adds to nursing knowledge by investigating how nurses learn new knowledge.

Limited research documenting the benefits of innovative student-centered learning environments might be the reason why scant information exists about how nursing students learn and the actions that can be taken to improve students' capacity to learn (Carrick, 2011). Little research has been conducted to determine how to measure student-learning preferences, student engagement, and to identify the barriers to active learning in nursing programs. The nursing profession lacks faculty-trained educators to teach the next generation of nurses the skills needed for the 21st century and beyond.

Public Policy

In 2010, the IOM recommended education to transform from traditional models to those that equip nurses with competencies in decision-making and critical-thinking skills. Several learning gaps are repeatedly mentioned in nursing literature. Evidence of service reports indicates that nursing graduates are not prepared to practice in the health care setting (IOM, 2010). Nursing educators must learn to employ more innovative teaching methods to match student-learning techniques (Forbes & Hickey, 2009). Too few faculty members have expertise in educational training (Forbes & Hickey, 2009), and evidence about how nurses learn is in short supply. Researchers need to develop instructional strategies to prepare nurses for changes in health care. The results from this study may inform policy makers and legislators of the need for adequate funding that highlights teaching and learning in nursing.

Results from two international clinical trials on hypothermia after cardiac arrest

demonstrated that induced hypothermia reduced mortality and improved long-term neurological function (Holtzer, 2002). Based on these and other studies, the American Heart Association and the International Liaison Committee on Resuscitation issued guidelines recommending cardiac arrest victims be treated with induced hypothermia. Therapeutic hypothermia immediately following cardiac arrest dramatically improves survival rates and maintains neurological function (Dainty et al., 2011). Therapeutic hypothermia is being adopted by hospitals, triggering the need to develop hypothermia programs. Coronary heart disease is the most common type of heart disease, killing more than 385,000 people annually (Kochanek, Xu, Murphy, Miniño, & Kung, 2011) and is a frequently cited contributor to cardiac arrest. Coronary heart disease alone costs the United States $108.9 billion each year in health care services, medications, and lost productivity (Heidenreich et al., 2011).

Philosophical Underpinnings

Phenomenology is rooted in the work of German philosophers, such as Husserl and Heidegger. Husserl (1859–1938) is widely regarded as the founder of phenomenology (Earle, 2010) although the term *phenomenology* first appeared in the works of philosophers Kant, Hegel, and Mach. Husserl (1962) wrote about phenomenology in his *Logische Untersuchungen* (*Logical Investigations*), defining the term to mean "the science of pure consciousness" (p. 163). Phenomenology, according to Husserl, was a discipline that describes the manner in which the world is constituted and experienced through conscious acts (van Manen, 1997). As a student of Husserl, Heidegger's (1992) influential text, *Being and Time*, represented a radical move away from traditional philosophical approaches of interpretation. *Hermeneutics* is a Greek

word that means to interpret or translate. Hermeneutics influenced the interpretivist paradigm, and the process of repeatedly returning to text or to the world and finding a new interpretation for each situation is referred to as the *hermeneutic circle* (Munhall, 2007). Heidegger (1992) wrote about the concept of a hermeneutic circle as the activity between pre-understanding and understanding. In the hermeneutic circle, the interpreter seeks to understand lived experience by first examining his or her forestructure of "the things themselves" and by then moving from the whole to parts and then back to the whole in a reciprocal way (Heidegger, 1992, p. 41). Forestructure, a component of the hermeneutic circle, is prior awareness or what is known or understood before interpretation (Converse, 2012). Heidegger emphasized the notion of temporality or all possibilities of being or existence.

Developed from a reaction to the positivist paradigm, the interpretivist paradigm was heavily influenced by phenomenology and hermeneutics. Phenomenologists' approach to inquiry is to fully understand the lived experience and perceptions of the world and the need to consider human beings (Polit & Beck, 2012). Phenomenology is primarily ontological, a study of the modes of "being in the world" of human being: It is the study of essences and offers accounts of experienced space, time, body, and human relations (the lifeworlds) as people live them (Polit & Beck, 2012, p. 521). Van Manen (1997) stated the *lifeworld*, the world of lived experience, is the source and the object of phenomenological research. The aim of phenomenology and phenomenology research is to gain a deeper understanding of the nature of everyday experiences (van Manen, 1997). Munhall (2010) believes that we should pay particular attention to descriptions or characteristics that are different. Similarities or characteristics that are different tend to

be the most important for us to understand another person's experience. Multiple perspectives of an incident exist. Gathering information about a phenomenon and interpreting the event allows for an understanding of the experience. This connection between gathering and interpreting information about the world is the main tenet of interpretivism research, which is that the world cannot be observed from the outside, it must be observed through people's direct experience. "Being in the world" is the concept that explains how individuals interact and how "they think, see, hear, feel, and are conscious through their bodies' and interact with the world" (Polit & Beck, 2012, p. 227). Researchers following the interpretivist paradigm seek to understand rather than explain. This approach fits well with the purpose of this study, which is to understand how practicing nurses learn new knowledge when caring for therapeutic hypothermia patients.

A primary tenet of interpretivisim is that research is observed through individuals' direct experiences. The main source of data for this study is in-depth conversations through which the researcher gains entry into the world of the informant. Two fundamental episitemological assumptions of the interpretivism paradigm are that knowledge is gained through personal experience, and perceptions bring evidence of the world. The first assumption, according to Crotty (1996), is that knowledge and meaningful reality are constructed in and out of interactions between humans and the world. The second assumption is that human existence is of interest and humans are always conscious of something (Richards & Morse, 2007). Existence or human reality acknowledges that people are in the world and understand the context of relationships to things, people, events, and situations (Lincoln & Guba, 1985).

Interpretive methodology is directed at understanding phenomena from an

individual's perspective, investigating interaction among individuals as well as historical and cultural contexts that people inhabit (Creswell, 2014). The phenomenological researcher attempts to understand the lived experience of others. When thinking phenomenologically, the researcher must enter the conversation with no presuppositions. Phenomenological methods yield insight and understanding of behavior. Examples of phenomenological data collection methods are open-ended interviews, focus groups, open-ended questionnaires, think-aloud protocols, and role-playing. Van Manen (1997) referred to his methodological approach as the hermeneutic phenomenological approach. These approaches are used in this study to gain understanding of how nurses learn to care for induced hypothermia patients.

Interpretive paradigm is the most suitable option for this research project because of its potential to generate new understandings regarding how nurses learn new knowledge and apply that new learning in clinical practice. Heidegger (1992) emphasized background or "situatedness" in the world influences the way humans understand the world. This study focuses on how nurses learn in the workplace and how the workplace influences learning. Applying Heidegger's philosophical underpinnings allows the researcher to understand the human experience of nurses caring for therapeutic hypothermia patients. Discussion and observation about how nurses care for patients undergoing therapeutic hypothermia allows this researcher to gain an understanding of how nurses learn and apply new knowledge in daily practice while caring for patients. Therapeutic hypothermia patients were chosen as the population nurses cared for because this treatment involves a relatively new protocol that is becoming more commonly practiced and requires nurses to learn new protocols and nursing assessments. This study

illuminates how nurses learn new knowledge and apply that new knowledge in the workplace.

Research Tradition

Hermeneutic phenomenology was chosen as the methodology for this study, informed by the work of van Manen (1997). Van Manen (2001) developed a phenomenological methodology with elements of Heideggers's philosophies. The goal of hermeneutic phenomenological research is to develop a rich or dense description of the phenomenon under investigation in a particular context (van Manen, 1997). Phenomenology has been described as both a philosophical movement and an approach to human science research (van Manen, 1997).

Unlike the phenomenological approach advocated by Heidegger (1992), van Manen (1997) introduced specific steps or methodological guidelines for conducting human science research rooted in hermeneutic phenomenological inquiry. According to van Manen, phenomenology is pure description of lived experience, and hermeneutics is an interpretation of experience via some text or symbolic form. Van Manen (1997) categorized six distinct research activities: (a) identifying a particular phenomenon of interest to the researcher, (b) investigating experience as it is lived and not as it is preconceived, (c) reflecting on themes that characterize the phenomenon that the researcher is examining, (d) writing and rewriting, (e) maintaining a strong and oriented relationship with the phenomenon, and (f) consideration of parts and the whole of the phenomenon in question. For the purposes of this study, this researcher is immersed in the phenomenon by interviewing nurses who have cared for hypothermia patients and gains a deep understanding of the lived experience. By writing and rewriting, this

researcher constructed and identified themes. Maintaining a strong and oriented relationship to the phenomenom by member checking, this researcher brought forward the meaning of the lived experience. According to van Manen (1997), four fundamental lifeworld existential themes exist that allow phenomenologists to reflect about how people experience the world. These existential themes are spatiality or lived space, temporality or lived time, corporeality or lived body, and relationality or lived human relation (van Manen & Adams, 2009). *Spatiality* is the space in which humans feel or are located; people feel differently in a home space than in a work or business space (van Manen & Adams, 2009). *Temporality* refers to the way in which people refer to life events; it is subjective time. The temporal dimensions of past, present, and future constitute the horizon of a person's temporal landscape. The way in which people interpret or ascribe meaning to events that occur at a particular time may influence understanding or perceptions. For example, positive experiences with educational systems as a child can influence one's approach to these services as an adult (Converse, 2012; van Manen, 1997).

Corporeality is the concept of embodiment (van Manen, 1997); people are always experiencing life in the body. The way in which people reveal and conceal things to others may be a conscious or unconscious process. The lived body is the in-person presence that involves seeing, hearing, and being there.

Relationality is the relationships with others (van Manen, 1997). Relationships with others influence both others and the individual. Van Manen (1997) explained this process as the lived relation people maintain with others in the interpersonal space shared with others.

In identifying a phenomenon of interest, van Manen (1997) called for the researcher to unwaveringly commit to make sense of the phenomenon in question. *Bracketing* is the process by which a researcher identifies and lists any existing presumptions or knowledge about the phenomenon and acknowledges those presumptions or foreknowledge. Van Manen did not advocate bracketing because he wanted researchers to bring personal knowledge forward, believing bias or pre-understanding would reveal itself during the researcher's reflections. A fundamental aspect of interpretive phenomenology is the inseparability of the researcher from assumptions and preconceptions regarding the phenomenon under examination. Van Manen did not believe a researcher could set aside his or her preexisting knowledge or beliefs. Instead, the researcher should identify the phenomenon of interest and acknowledge his or her pre-understandings so that readers could be clear about possible factors that might influence the study (Converse, 2012). Past experiences caring for induced hypothermia patients and developing centers of care need to be discussed.

To investigate the lived experience rather than the preconceived experience, van Manen (1997) advised the researcher to become immersed in the phenomenon. The intent of immersion is to develop a deep understanding of the lived experience. Three ways exist to collect human research data as part of the phenomenological process: writing, interviewing, and observation.

Reflecting on essential themes that categorize the phenomenon is the primary means of discovering the essence of the experience (van Manen, 1997). Themes give structure to the phenomenon. A challenging feature of human science research is deciding whether a theme is essential or incidental. Van Manen (1997) described three

approaches to uncovering themes from text: (a) the holistic or sententious approach in which the fundamental meaning of the text as a whole is considered, (b) the selective or highlighting approach by which statements or phrases that are insightful are identified, and (c) the detailed or line-by-line approach in which every sentence is examined for its relevance to the phenomenon of interest (Polit & Beck, 2012). After the common themes were identified, the researcher began to identify phrases from the data that appeared to capture the meaning of the themes.

By writing and rewriting the themes, the researcher constructed a deep understanding of the lived experience (van Manen, 1997). The structuring of a phenomenon can be written and arranged according to themes, both analytically and existentially. Writing and rewriting bring the meaning to light.

The fifth research activity described by van Manen (1997) involves maintaining a strong and oriented relationship to the phenomenon. Writing text that is rich and deep allows the researcher to externalize and bring forward the meaning of the lived experience. The researcher must strive to embrace the strongest possible interpretation of the phenomenon that he or she can identify. The sixth and final activity is conducted after the study is completed. This activity involves organizing the text according to the researcher's understanding of the phenomenon.

Theoretical Framework

The framework chosen for this study is the theory of the three dimensions of learning by Illeris (2003a) because this theory allows for exploration of how nurses, who have cared for patients undergoing induced hypothermia in the acute care setting, learn new knowledge in light of previous knowledge and how nurses learn by interacting with

the environments on cognitive, emotional, and social levels. According to the theory of the three dimensions of learning, learning takes place within the individual (Illeris, 2003a). Biological qualities are involved in the learning process in three dimensions, according to two different processes. For the purposes of this study, semistructured questions posed in interviews were thematically organized, according to the three dimensions within which learning was theorized to take place (Illeris, 2003a). In this study, the researcher followed the hermeneutic phenomenological method, which van Manen (1997) referred to as "phenomenology of praxis" (p. 30).

Theory Overview

Two learning processes occur within three dimensions, according to Illeris's (2003b) theory of the three dimensions of learning. One process of learning is the interaction between the learner and the environment, which causes a tension. The other process is described by Illeris (2003a) as the result of past learning. This process accesses previous mental acquisitions, according to how the person has learned in the past. The three dimensions where learning takes place are cognition, emotion, and society. Cognition and emotion are internal dimensions; society is an external dimension. These dimensions were depicted by Illeris (2003b) as oriented on an inverted triangle (see Figure 1).

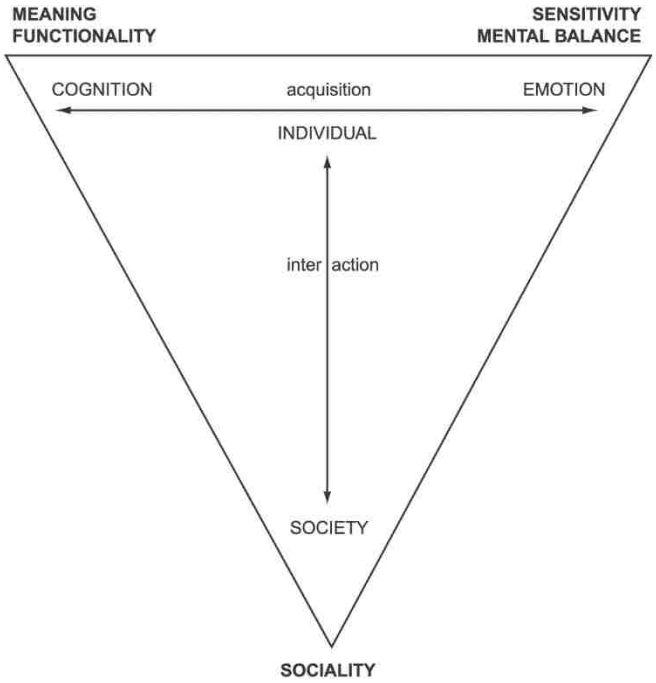

Figure 1. Three dimensions of learning. Adapted from "Workplace Learning and Learning Theory," by K. Illeris, 2003, *Journal of Workplace Learning, 15,* p. 171. Copyright 2003 by Emerald Publishing Group.

In discussing the theory of the three dimensions of learning, Merriam, Caffarella, and Baumgartner (2007) remarked that "all three dimensions are always present in a learning activity" (p. 97). The theory is built on the cognitive dimension of learning promoted by Piaget, Kolb, Bandura, and Dewey (Illeris, 2003a). Additional support is offered by the emotion dimension touted by Freud, Rogers, and Erikson. The societal dimension has been associated with Marx, Beck, and Gidden (as cited in Osborn, 2004).

History

The principles of adult learning were made popular during the 1970s with credit given to Knowles for this development (Parker, 2010). Knowles advanced six assumptions of adult learning, but the researcher's principles were critiqued on the grounds of being more of a theory of teaching than of learning (Merriam et al., 2007). Brookfield, Mezirow, Greene, and Illeris are among the few theorists recognized as

having moved the principles of learning to the level of theory (Parker, 2010).

Illeris has been associated with instruction of lifelong learning at the Danish University of Education in Copenhagen since the 1960s. From 1966 until 1987, Illeris' work focused on learning and education with a particular concentration on academic and vocational youth education. In 1987, Illeris shifted his attention within the field of adult education to general learning theory. Illeris published his theory of the three dimensions of learning in 1999. Originally intended to be used as a textbook for academia to cover learning theories, the manuscript is an eloquent presentation of the theory of learning (Poscente, 2006).

Previous Study or Application

McNamee, O'Brien, and Botha (2009) used the three dimensions of learning as the framework to describe the learning process of medical students and students' learning experience completing autopsies as part of the medical education. The researchers noted this framework was chosen because of its holistic and realistic approach. Another justification for incorporating the framework of the three dimensions of learning was because the researchers sought to examine all three dimensions of learning: cognition, emotion, and environment (McNamee, O'Brien, & Botha, 2009). Echoing the opinions of Merriam et al. (2007), McNamee et al. (2009) remarked on the belief that the theory was all-inclusive. Medical students valued the experience of learning anatomy and trauma as cognitive benefits. Students in the study by McNamee et al. expressed opinions that they would be better equipped to manage matters of death. McNamee et al. (2009) attributed this sentiment to learning in the emotional dimension. Socialization

within the context of the autopsy process influenced the students' feelings and did not detract from the value of the experience (McNamee et al., 2009).

Similarly, the cognitive requirements of nurses include knowledge and memorization of anatomy, equipment, processes, and procedures. Emotionally, nurses must deal with affective taxing and stressful situations and events, such as trauma, illness, and death. Socially, nurses are required to interact with doctors and patients and work in conjunction with other nurses. Additionally, because Illeris' theory of learning considers how individuals learn through interactions with the environment and in relation to past learning, it is well suited to explore how nurses interact in relatively new situations, such as caring for induced hypothermia patients and how nurses use previously acquired knowledge in these new situations.

Definition of Terms

The following terms are relevant to the topic and are used in the study.

Terms

Cognition. An internal dimension of knowledge or skills that builds up the understanding and ability of the learner. In the context of the three dimensions of learning, cognition is indicated by functionality (Illeris, 2003a).

Competence. A specific range of skill, knowledge, or ability (Benner, 1984).

Corporeality. The lived body is the in-person presence that involves seeing, hearing, and being there (van Manen, 1997).

Emotion. An internal dimension of mental energy, feelings, and motivations. In the context of the three dimensions of learning, emotion is indicated by sensibility (Illeris, 2003a).

Hermeneutic circle. The method by which the interpreter seeks to understand lived experience by first examining his or her forestructure of "the things themselves" and by then moving from the whole to parts and then back to the whole in a reciprocal way (Heidegger, 1992, p. 41). The process of repeatedly returning to text or to the world and finding a new interpretation each time is referred to as the hermeneutic circle (Munhall, 2007).

Hermeneutic phenomenology. A qualitative research tradition that focuses on the lived experience of humans and how they interpret those interactions (Polit & Beck, 2012).

Induced hypothermia. A therapeutic medical treatment that is recommended immediately after a cardiac event to achieve and sustain a core body temperature of 32° C to 34° C for 12 to 24 hours, the objective of which is to improve neurological outcomes and mortality in patients with primary cardiac arrest who remain comatose after the return of spontaneous circulation (West et al., 2009).

Learning. "Covering all processes that lead to relatively lasting changes of capacity, whether they be of a motor, cognitive, psychodynamic (emotional, motivational, or attitudinal) or social character, and which are not due to genetic-biological motivation" (Illeris, 2003a, p. 397).

Learning processes. "External interaction process between the learner and his or her social, cultural, or material environment, and an internal psychological process of acquisition and elaboration" (Illeris, 2003a, p. 398).

Phenomenology. The study of the structures of experience, or consciousness, or the way humans experience things (Munhall, 2007).

Society. An external dimension of interaction such as participation, communication, and cooperation. In the context of the three dimensions of learning, society is indicated by sociality (Illeris, 2003a).

Spatiality. The space in which people feel or are located; people feel differently in a home space than in a work or business space (van Manen & Adams, 2009).

Temporality. The way in which people refer to life events; it is subjective time (van Manen, 1997).

Workplace learning. The workplace environment as a learning space (Illeris, 2003b).

Chapter Summary

Nursing professionals are challenged to deliver high standards of care. This standard of care is introduced during the education process and must be expanded upon throughout nurses' careers. Highly skilled nurses are those capable of providing quality care. Nurses' behavior has a positive influence on the bottom line of the hospital by preventing patient complications and reducing the length of hospital stays, which reduces the cost of care for patients. These demonstrations of competency are desired outcomes for the future of health care. By examining how nurses learn new knowledge, nurse educators can contribute to producing highly trained bedside nurses who are motivated to deliver quality care.

The researcher employed a qualitative design to examine the lived experience of nurses who provide care to induced hypothermia patients. The learning theory, chosen as the framework, is the three dimensions of learning by Illeris (2003b). This theory allows examination of all three dimensions of learning: cognition, emotion, and society. Illeris

(2004) applied learning theory to working life or workplace learning. The researcher believes this theory yielded benefits to the results of the study.

Chapter Two

Review of the Literature

The purpose of this literature review is to examine the nursing literature for information regarding how practicing nurses learn to care for patients undergoing induced therapeutic hypothermia therapy. A review of the nursing literature was conducted using CINAHL and Medline databases. The search term *induced hypothermia* yielded 35 references published from 2001 through 2010. The same search term, used from 2010 through 2014, yielded 119 full-text articles, demonstrating the increased interest in induced hypothermia in the past 4 years. A search of the Cochrane Database of Systemic Reviews returned four full-text articles published during the same period. Conducting additional inquiries using the search terms *induced therapeutic hypothermia* and *temperature management* yielded six articles from the United Kingdom, Australia, and North America. Only those references published in the past 5 years were reviewed.

Other criteria for inclusion in this literature review were articles that contained research-based data collections and historical information on the topic of continuing professional nursing education in the care of the induced therapeutic hypothermia patient. Several articles were excluded because of the nonspecificity to use hypothermia for cardiac arrest. Articles were excluded if the studied population involved pediatric or neonatal patients. Of the 119 articles found, only 14 articles met the criteria for inclusion in this literature review. No literature regarding educational programs or learning relative

to induced therapeutic hypothermia was found. No studies were found where researchers examined educational programs and the effectiveness of those programs. In addition, no studies were found where researchers examined learning theories or evaluated learning techniques regarding education programs pertaining to induced therapeutic hypothermia for sudden cardiac arrest.

Induced Therapeutic Hypothermia

According to Roger et al. (2012), who wrote on behalf of the American Heart Association (AHA), sudden cardiac arrest is the leading cause of death in the United States, claiming more than 350,000 lives each year (Peberdy et al., 2010). *The American Heart Association Heart Disease and Stroke Statistics—2014 Update* (Go et al., 2014) reported that more than 424,000 people experience nontraumatic out-of-hospital cardiac arrest every year, and those treated with induced therapeutic hypothermia have a higher incidence of survival than do those who do not receive induced therapeutic hypothermia. Approximately 209,000 sudden cardiac arrests occur in hospitalized patients. Based on 2010 death rate data, the survival rate for adults experiencing out-of-hospital arrest is 9.5% while in-hospital survival for adults experiencing a sudden cardiac arrest is 23.9% (Go et al., 2014). Each day, more than 2,150 individuals in the United States die. An even more dramatic statistics is that one person in the United States dies every 40 seconds from cardiovascular disease. Half of these deaths are attributable to sudden cardiac arrest (Roger et al., 2012). Induced therapeutic hypothermia has been recognized by the AHA as one of the top scientific advances for 2013 (Go et al., 2014). Cooling patients who have survived sudden cardiac arrest can improve survival and brain function (Beddingfield & Clark, 2012; Bernard et al., 2002).

Induced therapeutic hypothermia is a recommended cooling treatment that can be used for persons who experience a sudden cardiac arrest (Go et al., 2014). In the first few years of the 21st century, this treatment was targeted for those individuals who had a sudden cardiac arrest outside a hospital setting. Recent studies have shown that induced therapeutic hypothermia is beneficial for hospitalized patients who have a sudden cardiac arrest (Bernard et al., 2002). Induced therapeutic hypothermia, a cooling procedure, has been credited with saving lives and improving neurological function following a sudden cardiac arrest. Ongoing development of new technology to cool patients has made induced therapeutic hypothermia easier to implement, but many nurses and physicians are not comfortable using this procedure (Abella, Rhee, Huang, Vanden Hoek, & Becker, 2005). Furthermore, the therapy is currently underutilized because of the lack of equipment, training, and resources available (Bernard et al., 2002; Harden, 2011).

Historical Overview of the Use of Induced Therapeutic Hypothermia

Although induced therapeutic hypothermia has only been a recommended therapy since the early 2000s, it was previously described by the ancient Egyptians and Greeks. Wilkins (1992) described Hippocrates's use of hypothermia to preserve limbs and numb areas. According to Wilkins, Hippocrates was the first to document the use of hypothermia by packing injured soldiers in snow and ice during battles. Benson, Williams, Spencer, and Yates (1959) were credited as the first physicians to use hypothermia following cardiac arrest. They described the process as "total body refrigeration" (Williams et al., 1959, p. 423), but the technique proved both therapeutic and too difficult to implement because of the lack of technology to monitor patients and the scarcity of intensive care units. Nurses caring for these patients were unable to obtain

accurate temperatures with clinical thermometers, and the ice and water used to maintain refrigeration impeded the process of repositioning the patient to obtain a rectal temperature reading. Monitoring blood pressure was impossible, and the staff reported being in a constant state of alarm (Benson et al., 1959). Even this early report on the use of hypothermia did not go into any detail about how the nurses were educated or otherwise prepared to care for induced hypothermia patients, or whether the training was evaluated in any way.

Despite the benefits reported by Benson et al. (1959; an increase in survival rate from 14% to 50%), total body refrigeration was abandoned as a form of therapy following cardiac arrest until the late 1980s and early 1990s. Popularity of therapeutic hypothermia reemerged in 2002, following publication of two landmark studies that touted significant improvements in short-term survival, long-term survival, and neurological recovery from cardiac arrest in patients undergoing induced hypothermia (Bernard et al., 2002; Hypothermia After Cardiac Arrest Study Group [HACASG], 2002). These three clinical trials provide foundational work on induced hypothermia following cardiac arrest (Arrich, Holzer, Herkner, & Müllner, 2009). The purpose of each of these studies was to determine whether induced hypothermia improved neurological recovery of patients who had survived cardiac arrest. Differences between the studies included the methods used to cool patients, the length of time patients were cooled, and the cooling temperatures achieved. Still, despite these differences, each of the studies demonstrated improved patient outcomes and led to the International Liaison Committee on Resuscitation's recommendation of the use of induced hypothermia for adult patients who experienced a sudden cardiac arrest outside the hospital setting

because of ventricular fibrillation (Nolan et al., 2003). These studies are covered more in depth below.

Review of Current Studies

Three key studies were found in the literature regarding the topic of induced therapeutic hypothermia following sudden cardiac arrest. These studies helped lead the way for increased acceptance of the use of induced hypothermia therapy (Bernard et al., 2002; Hachimi-Idrissi, Corne, Ebinger, Michotte, & Huyghens, 2001; HACASG, 2002; Laurent et al., 2005; & Mori et al., 2000). Inclusion criteria for these studies were patients who experienced sudden cardiac arrest inside or outside the hospital setting as either a witnessed or an unwitnessed event. The first confirmed cardiac rhythm was either ventricular fibrillation or asystole. A limiting factor in each of the studies was that neither the role of nurses nor nursing care was mentioned. No literature was found on the topic of educational programs or learning in regard to therapeutic induced hypothermia therapy.

The first of the current studies, conducted in Belgium, involved 33 therapeutic hypothermia patients who had experienced a sudden cardiac arrest outside the hospital, and the first recognized cardiac rhythm was identified as asystole (Hachemi-Idrissi et al., 2001). Hachemi-Idrissi et al. (2001) sought to test the feasibility and cooling rate of a helmet device containing an aqueous glycerol solution placed around the head and neck to cool patients to a target temperature of 34° C. The helmet device was being tested because previous cooling techniques were time consuming, expensive, and difficult to perform in hospital settings. Patients underwent cooling for only 3 hours, and then they were passively rewarmed for 8 hours. Hachemi-Idrissi et al. found that mild hypothermia

induced by the device was effective and inexpensive, easy to perform, safe, and feasible with no increase in hypothermia-related complications (Hachemi-Idrissi et al., 2001).

The second study, which took place in Australia, involved 77 patients who similarly had experienced sudden cardiac arrest outside the hospital, but the patients' first identifiable cardiac rhythm was ventricular fibrillation (Bernard et al., 2002). Bernard et al. (2002) employed a noninvasive cooling process that consisted of strategically placing ice packs around the head, neck, torso, and limbs to achieve a target temperature of 33° C. Therapy was intended to be initiated within 2 hours of the cardiac event with the cooling phase lasting for 12 hours, followed by passive rewarming. Bernard et al. found that moderate induced hypothermia appeared to improve outcomes in patients after resuscitation from cardiac arrest out of hospital and was not associated with clinically significant adverse effects.

The third study, conducted in nine centers in five European countries, enrolled 275 patients who had experienced sudden cardiac arrest both inside and outside the hospital (HACASG, 2002). These patients, who were chosen because they had either ventricular fibrillation or nonperfusing ventricular tachycardia as their first rhythm following cardiac arrest, were cooled with cooling blankets to a target temperature of 32° C to 34° C for 24 hours before passive rewarming for 8 hours was begun (HACASG, 2002). Mild induced hypothermia was found to increase the rate of a favorable neurological outcome and reduce mortality (HACASG, 2002).

Consequently, in October 2002, based on the remarkable results of these three landmark studies, the International Liaison Committee on Resuscitation released an advisory statement recommending the use of induced hypothermia for adult patients who

experienced a sudden cardiac arrest outside of the hospital setting because of ventricular fibrillation (Nolan et al., 2003). The committee recommended initiating induced hypothermia immediately after the cardiac event to achieve and sustain a core temperature of 32° C to 34° C for 12 to 24 hours. The advisory statement also mentioned this treatment protocol would be beneficial in other types of cardiac arrest scenarios (Nolan et al., 2003). Another turning point in cardiac treatment occurred when the American Heart Association revised its post-resuscitation guidelines in 2005 and again in 2010 to include a strong recommendation of induced hypothermia for treatment of patients experiencing cardiac arrest whether in or out of the hospital setting (Harden, 2011). The recommendation included a definitive statement that the use of induced hypothermia for cardiac arrest may be beneficial for neuroprotection. Furthermore, the methods of inducing hypothermia demonstrated by various researchers have included cost-effective options from which care providers can choose, helping to meet previous cost-prohibitive challenges posed by induced hypothermia (Nolan et al., 2003).

The purpose of each of the studies was to determine whether induced hypothermia improved the neurological recovery of patients who had survived cardiac arrest. Differences between the studies included the methods used to cool patients, duration of cooling, and the temperature achieved. Despite these differences, each of the studies demonstrated improved patient outcomes. For example, the study by Hachemi-Idrissi et al. (2001) demonstrated that the helmet device can be applied at any time during the resuscitation attempt, is cost effective, and can improve the neurological outcomes. Bernard et al. (2002) demonstrated improved neurological outcomes based on the increased number of patients discharged to home or a rehabilitation unit. The HACASG

(2002) demonstrated a positive neurological outcome as defined by the Glasgow-Pittsburgh cerebral performance category (Laird, 2008). Despite the advancements of these studies concerning the use and benefits of induced hypothermia, however, none of the researchers addressed issues of nursing or the specific knowledge required of nurses involved in the induced hypothermia procedure and its aftercare.

Pathophysiology of Induced Therapeutic Hypothermia

The effects of induced therapeutic hypothermia on brain function are based on empirical, biological, and medical evidence. Consequently, it is important that nurses involved in induced hypothermia procedures and its aftercare acquire specific knowledge regarding associated biochemical interactions. Induced therapeutic hypothermia involves cooling the body temperature from its average temperature of 37° C (98.6° F) down to 32° C to 34° C (89.6°–93.2° F) for 12 to 24 hours following a cardiac arrest (Beddingfield & Clark, 2012; Harden, 2011). The purpose of reducing body temperature is to protect the brain from neurological damage. The goal of induced therapeutic hypothermia is to minimize inflammation and decrease the formation and accumulation of toxic enzymes and free radicals that precipitate following reperfusion of the brain with oxygen after experiencing a sudden cardiac arrest. Inducing hypothermia prevents astroglial cells from multiplying and releasing cytokines, which cause cell injury and cell death (Beddingfield & Clark, 2012). The accumulation of toxic enzymes and free radicals following re-oxygenation causes ischemia.

Cooling the body temperature prevents excitatory neurotransmitter releases and glycine, thereby providing neuroprotection (González-Ibarra, Varon, & López-Meza, 2011). Induced therapeutic hypothermia has the added benefit of decreasing intracranial

pressure, which prevents the occurrence of reperfusion injury (Lee & Asare, 2010), the most serious adverse event (short of death) that occurs following a sudden cardiac event. Cooling the body temperature reduces the risk of reperfusion injury by slowing down cellular metabolism and oxygen demand while maintaining normal calcium, sodium, potassium, and acid/base balance (Lee & Asare, 2010). Induced hypothermia prevents ischemia and decreases the inflammatory cascade of events from occurring by reducing cellular metabolism and oxygen consumption, ultimately producing better patient outcomes (Beddingfield & Clark, 2012).

Techniques for Cooling Patients

In addition to acquiring biochemical knowledge, it is important for nurses to be trained in the specific procedural techniques of induced therapeutic hypothermia as well. Cooling techniques for inducing therapeutic hypothermia can be noninvasive or invasive. Surface cooling can be achieved by application of cooling blankets, a method that reduced body temperature at a rate of 0.9 degrees per hour (Bernard et al., 2002) The most widely used noninvasive cooling method in the pre-hospital setting involves initiating induced therapeutic hypothermia by applying ice packs to armpits, head, neck regions, and groin area (Harden, 2011). Cooling with ice packs takes a longer time to reach therapeutic temperature because the process reduces the body temperature at a slower rate than invasive methods. This method of surface cooling can be cumbersome because it requires the nursing team to readjust and replace ice packs frequently (Kupchik, 2009; Merchant, Abella, et al., 2006).

Invasive methods involve rapid infusion of cold intravenous solutions. This method yields more rapid results than noninvasive methods for reducing temperature to

therapeutic levels, which can be reached within 30 minutes (Bernard et al., 2002). Common invasive methods include cold carotid infusions, ice water nasal lavage, cold peritoneal and lung lavage, nasogastric lavage, and rectal lavage. In addition to intravenous infusions and lavages, devices exist through which blood can be circulated extracorporeally and reperfused to cool the body. Extracorporeal cooling requires expensive equipment, training, and staff to be available around the clock. Policies and protocols addressing the possibility of a patient requiring extracorporeal cooling when the resources are being used by another patient should be in place before the need arises. Because of the cost and training required to use this method, extracorporeal equipment is typically available only at centers that provide induced therapeutic hypothermia care frequently.

Despite the many different applications and methods for cooling patients, favorable outcome differences between the invasive and noninvasive approaches remain statistically insignificant (Bernard et al., 2002; Tomte et al., 2011). Mooney et al. (2011) evaluated the survival rate and positive neurological outcomes for 140 patients in Minneapolis who experienced an out-of-hospital cardiac arrest during a three-year period. Half of the patients were sent to a regional hospital capable of initiating induced therapeutic hypothermia and half were transferred to another hospital where this treatment was not offered. The authors reported a 56% survival rate to discharge for patients who were treated at the hospital where induced therapeutic hypothermia was available (Mooney et al., 2011). Mooney et al. attributed the high survival rate to early cooling and transfer to a tertiary center. The authors did not mention training or competence of the caregivers.

Post-Resuscitative Care

Increased use of induced therapeutic hypothermia calls for increased and specific attention to how induced hypothermia patients are cared for. Post-resuscitative care is another area not covered in the research literature associated with induced hypothermia, requiring nurses to learn specific knowledge and procedures to care for patients. Efforts are underway to establish standardized guidelines to care for patients undergoing induced therapeutic hypothermia, and several protocols can be found in the literature that are specific to individual hospital sites (Koran, 2009). However, the guidelines and protocols vary as to inclusion and exclusion criteria, cooling technique, length of cooling, temperature measurement, management of shivering, and other factors. A gold standard for care has not been published or agreed upon; consequently, administration of this treatment mechanism varies from facility to facility (Beddingfield & Clark, 2012). The lack of a standard of care for induced therapeutic hypothermia poses significant challenges in educating, training, and preparing nurses to address the specific needs of these patients (Beddingfield & Clark, 2012; Koran, 2009).

The three foundational, clinical trials on induced hypothermia mentioned above described protocols on hospital procedures, cooling and rewarming procedures, and neurological assessment. Each study included the outcomes of survival and discharge information. However, none of these landmark studies mentioned information regarding nursing practices or any nursing education provided (Bernard et al, 2002; Nolan et al., 2003; West, Mays, Rafferty, Rowan, & Sanderson, 2009). Demographic information about education levels of the nurses or the amount of nurse training required was also not included. A gap in the literature exists regarding how nurses are trained to care for this

special population, and more research is needed to help fill this gap in the research literature. Furthermore, this situation also allows an opportunity to study how nurses learn new information and procedures in the workplace.

Other Uses for Induced Therapeutic Hypothermia

Induced therapeutic hypothermia for out-of-hospital and in-hospital cardiac arrest is only one of several possible applications for this type of therapy. Researchers have sought other opportunities to use temperature management. Pediatric and neonatal cooling are being investigated along with stroke, subarachnoid hemorrhage, burns, brain trauma, spinal injuries, and myocardial infarction (Herr & Badjatia, 2009). Cooling treatments are being credited with saving lives and preserving neurological function. Through research, scientists are gaining valuable information about how temperature management affects reperfusion injury and intracranial pressure. Scientific progress in the field of temperature management has been growing exponentially since the dawn of the 21st century, with temperature management becoming a state-of-the-art capability in critical care nursing (Sund-Levander & Grodzinsky, 2009).

Education Gaps in the Literature

Despite overwhelming evidence supporting induced hypothermia as a lifesaving approach following a sudden cardiac event, Merchant et al. (2006) reported that only 20% of hospitals nationwide have implemented induced hypothermia programs. Clinicians posit that although this protocol is a standard of care, many hospitals have not implemented this therapy because of the lack of data, education, and cost of resources (Cady & Andrews, 2009). Merchant et al. found that 74% of the physicians in the United States and 64% of the physicians outside the United States never used induced

hypothermia as a treatment following cardiac arrest.

One of the barriers identified in the literature was a lack of education surrounding the care of the induced hypothermia patient (Beddingfield & Clark, 2012). The purpose of inducing hypothermia is to improve neurological outcomes and mortality in patients with primary cardiac arrest who remain comatose after the return of spontaneous circulation. However, if clinicians are not trained to provide this care, they will not be able to change the practice. In the literature to date, researchers have described management of the patient undergoing induced therapeutic hypothermia, but not the education of the caregiver. Knowing how to evaluate the care these patients receive and understanding the best possible training techniques can ensure the best outcomes for induced therapeutic hypothermia patients. Caring for the hypothermia patient is a new phenomenon in the field of nursing requiring information and procedures specific to this population. The phenomenon also allows the opportunity to study how nurses learn new information and procedures in the work place settings.

Concerns of how nurses are being prepared to care for these patients are largely lacking in the literature, but research is slowly beginning to emerge. For example, in 2009, Koran, an advanced practice nurse in an emergency department setting, published an article discussing how a team of emergency department clinicians developed protocols and procedures for induced hypothermia. Koran (2009) explained how physicians, nurses, and transporters were informed about new policies and protocols. Separate education delivery plans were developed for each of the emergency department roles. Different training strategies, such as e-mail, monthly meetings, and change-of-shift education were discussed. Koran, however, did not discuss any part of the actual content

of the education itself, but outlined the process by which emergency leaders can introduce an induced hypothermia program. While patient outcomes were consistently reviewed, the education plan itself was not evaluated and learner knowledge acquisition was not measured.

The only other example to date is an article published by two Canadian nurses, describing the advanced knowledge and specialized training required for nurses in the intensive care unit to care for these patients (Gardner & McDonald, 2013). Gardner and McDonald (2013) discussed a flexible self-learning program that consists of learning modules, lectures, and return demonstration. Such a flexible educational delivery program is needed in a clinical setting to accommodate the schedule of busy nurses. Although the article is commendable for providing early work in this area, it emphasized a monitoring program to reduce shivering, a major complication of induced hypothermia, and paid little attention to actual program content or how learner knowledge acquisition was measured. Similar to the article by Koran (2009), no educational content was covered, nor was there a description of how the program was evaluated or learner acquisition was measured.

Another serious gap in the research literature is represented by the conspicuous absence of standardized policies and guidelines for induced therapeutic hypothermia. Induced therapeutic hypothermia for sudden cardiac arrest is 10 years old. During those years, each institution that delivered this type of care has created its own guidelines to meet the needs of the particular institution. The literature lacks a standard curriculum teaching or a procedural guideline directing clinicians about how to care for induced hypothermia patients (Herr & Badjatia, 2009). As of mid-2014, no program criteria or

evaluation of training programs using evidence-based practice to care for these patients has been published (Herr & Badjatia, 2009; Kupchik, 2009).

A final gap in the literature is the way clinicians communicate practice changes surrounding induced hypothermia (Herr & Babjatia, 2009). Copious information exists regarding researchers examining patient outcomes, and many protocols are available, allowing for the creation of individualized institution guidelines. However, in 2009, Herr and Badjatia reported that less than 20% of physicians in the United States were aware that the AHA had made induced hypothermia guidelines. Even now, as of early 2014, a lack of expert organization remains in the care of induced hypothermia that explains the large variation in practice standards.

Workplace Learning

One of the main ways nurses learn is through actual experience in the workplace, and various educational learning theories and aspects of learning have been used to explain how nurses learn in the clinical environment. For example, Malcolm Knowles, largely associated with adult learning popularized in the 1970s, advanced six principles characterizing adult learning: (a) adults are self-motivated and directed, (b) adults bring life experience to learning situations, (c) adults are goal oriented, (d) adults are relevancy oriented, (e) adults are practical, and (f) adults learners like to be respected (Merriam et al., 2007). Adult learners are characterized as being self-directed and become ready to learn when expected or required to do something (McAuliffe, Hargreaves, Winter, & Chadwick, 2008). Experiential learning theory (Rogers, 1969) posits that learning takes place when the learner participates fully in the learning process; people learn through participation, through experience, and subsequent reflection on that experience. Role-

playing, return demonstration, and simulation are examples of experiential learning approaches (Shultz, 2009), which contrast to those of rote or didactic methods in which a teacher merely conveys knowledge to a learner. Reflective learning, such as narrative pedagogy, is another example of how learning occurs in clinical areas. Narrative pedagogy is a form of learning that allows learners to explore and reflect on the meaning of learning experiences and moves away from the idea of skill mastery and focuses more on how knowledge is acquired (Andrews et al., 2001). Recent calls for nursing education reform indicate a preference for a research-based pedagogy based on best teaching strategies (Benner et al., 2010). This paradigm shift in nursing education represents a move from passive to active learning (Diekelmann, 2002) in which learners are active knowledge builders and teachers facilitate learning rather than merely providing or conveying answers (Mann et al., 2011).

Staff Development

Not only is it important to understand how nurses learn informally on the job, but also it is crucial to better understand how staff nurses are formally trained and professionally developed throughout their careers. Generally, staff development is defined as the processes through which employees of an organization increase skills and knowledge in ways that are beneficial to their roles in the organization (Marriss, 2011). Staff development for nurses can be described as a formal system of education delivery of an organization that involves the continual training and professional development of nurses within that organizational or workplace setting (Marriss, 2011). Nursing staff development goes back to the efforts of Florence Nightingale to establish training for nurses and improve care delivery in hospitals. The American Nurses Association (ANA)

established the Council on Continuing Education in 1973 and published *Guidelines for Staff Development* in 1978, both landmark events establishing staff development for nurses as a distinct health care specialty (Avillion, 2008). In the recent past, staff development departments were staffed by nurses to conduct on-the-job training sessions and orientations for members of the nursing department. However, staff development is more complex, often involving a variety of disciplines and being staffed by personnel often responsible for the delivery of educational services and products to whole hospitals and health care systems (Avillion, 2008).

Despite the changed nature of staff development, the study of how nurses learn and develop on the job remains important, and the foundational work of Patricia Benner has become an influential model for how nurses acquire necessary skills moving from classroom to work settings. Applying the Dreyfus model of skills acquisition to nursing, Benner posited that nurses pass through five stages of proficiency: (a) novice, (b) advanced beginner, (c) competent, (d) proficient, and (e) expert (Benner, 1982). For Benner (1982), experience and theory go hand-in-hand. Theory guides practice, and experience, seen as more than simply the passage of time, allows for the refinement of theory by engaging various actual situations that add new and different perspectives to previous learning (Benner, 1982).

Benner (1982) defined the five stages of proficiency as follows. Novices are beginners with no experience in relation to the situations in which he or she is required to perform; the difficulty for beginners is that they have no experience on which to base discretionary judgments (Benner, 1982). Advanced beginners have begun to cope with enough real situations to be able to begin to apply knowledge from previous experiences

to present situations; however, advanced beginners need help in clinical settings to set priorities and gauge the importance of various situational aspects (Benner, 1982). Competency, usually reached in 2 to 3 years on the job, is characterized by a sense of mastery based on past experiences and the ability to begin to effectively deal with on-the-job contingencies (Benner, 1982). Additionally, nurses begin to see their actions in terms of long-range plans and are able to gauge the importance of various situational aspects. The competent nurse moves on to the proficient stage, and part of this transition involves enhanced speed and flexibility, or proficiency. From past experience, the proficient nurse knows how to react in a given situation and how to adapt in response to contingencies (Benner, 1982). The expert nurse has amassed a large amount of experience, giving him or her an intuitive grasp of situations and the ability to solve problems accurately and expeditiously; expert nurses no longer need to rely on principles or guidelines to connect situational understanding to appropriate action (Benner, 1982).

In her 2013 study, Takase observed that Benner's model illustrates competence development as a step-function with one step leading to the next. Noting the lack of empirical investigation into the competence development of nurses, Takase sought to explore the relationship between the levels of nurse competence and the length of nurses' clinical experience in providing a tentative model of the continuing competence of nurses. Takase surveyed 599 nurses from a university hospital located in the central west region of Japan on five dimensions of self-assessed nursing competence. Competence was plotted against the length of nurses' clinical experience and analyzed using fractional polynomial regression analysis. Takase found that nursing competence development may be seen as two distinct periods: periods of rapid growth followed by periods of stability.

Takase's study was important because it suggested that nurse competence development may not be accurately modelled as a step-function and that recognizing that nurses go through different stage lengths of competence development throughout their careers may help to facilitate time-specific intervention crucial to nurses' development.

Other current contributions to staff development include research-based pedagogy founded on best teaching strategies (Benner et al., 2010), approaches that emphasize active learning (Mann et al., 2011), case studies (Sprang, 2011), and experiential learning wherein individuals learn through experience or experience-based simulations and role-playing (Schultz, 2009). For example, researchers have begun exploring the benefits of patient simulation in staff development based on the success of simulation in undergraduate nursing education (Leigh, 2011; Nickerson, Morrison, & Pollard, 2011). Leigh (2011) characterized simulation as engagement with controlled approximations of authentic, realistic clinical situations with the opportunity to receive immediate feedback. Leigh (2011) contended that staff development is undergoing a "simulation revolution" (p. 54) and stated that one of the benefits of high-fidelity simulation is that it works for nurses of varying generations, each with different learning styles, which is important because nursing staffs typically comprise a combination of several generations of nurses. Nurses in their mid-forties and older (baby boomers) appreciate teamwork and opportunities to improve performance (Leigh, 2011). Nurses in their 30s and early 40s (Generation X) are generally techno-savvy and desire to keep their skills current to ensure employability while younger nurses (millennials) are accustomed to the kind of quick response and feedback that simulation technology affords (Leigh, 2011). Furthermore, patient simulation scenarios can be edited to reflect the latest changes in

practice, procedures, and evidence-based nursing (Leigh, 2011).

In their conceptual analysis of simulation, Nickerson et al. (2011) noted that simulation has been used throughout the years in many areas and industries in which actual scenarios would prove too costly or too dangerous (e.g., the automobile and aviation industries as well as military applications). In addition, educating new physicians in anatomy for years was accomplished through the examination of cadavers simulating live bodies (Nickerson et al., 2011). Nickerson et al. found that there were defining attributes of clinical simulation beneficial for educating staff nurses. These attributes included knowledge acquisition, fidelity, and outcomes. Knowledge acquired though simulation bridges the gap between actual clinical practice with patients and knowledge gained in the classroom, and Nickerson et al. found knowledge acquisition through simulation was learner-centered, experiential, and team-focused. Fidelity refers to the degree to which the simulation mimics reality, and Nickerson et al. found that simulations were highly interactive and provided a learning environment that was safe, nonjudgmental, controlled, and ethical. In addition, Nickerson et al. found the outcomes of simulation learning involved the crucial characteristics of skill development, knowledge integration, critical thinking, learner independence, self-confidence, and learner satisfaction, all of which are important aspects of active, learner-based, experiential learning. Consequently, simulation may prove to be a cost-effective, ethical, and safe option for approximating induced hypothermia situations and educating staff nurses about the procedures required for patients of induced hypothermia in acute care settings.

Not all nurses employ the same learning style or advance through the learning

stages at the same pace, but it remains the nurse educator's responsibility to develop a plan to engage all level of learners to achieve their maximum learning potential (Herbert & Lohrmann, 2011). Passive forms of teaching, such as lecture, might not be optimally effective and reach all learners. The nurse educator needs to use a variety of instructional strategies to engage students. A lack of researchers have determined how to measure student learning preferences, student engagement, and to identify the barriers to active learning when developing an educational program for hypothermia care.

Educational Theories

The educational theories for this study will include five theories that address how nurses learn. These theories include behaviorism, cognitivism, humanism, constructivism, and social cognitive theory. Education theories are continually reviewed and perspectives on learning are constantly reinvented. Theories of learning reflect underlying beliefs evolving from cognitive theorists, behaviorists, and social behaviorists (Young & Patterson, 2007).

Theory of behaviorism. Theories of behaviorism focus on changes in the learner's behavior, and Pavlov's famous studies of dogs exemplify the early behaviorists' use of both positive and negative reinforcement (Hean, Craddock, & O'Halloran, 2009). Stimuli to learn, and the consequences of learning, originated in behaviorism and remain central to medical education (Mann, 2011). Behaviorism has influenced the direction of nursing education since the 1950s, mainly because of Ralph Tyler and his plan for curricular development. Tyler (1975) is largely credited with widespread curricular development in the United States, which guided educators in planning the direction of their programs, developing learning objectives, focusing on the students' learning needs,

and in producing change in behavior. Behaviorists believe in stating learning objectives in very precise terms; learning objectives are aligned with learning activities and measure the evaluation of the learned behavior (Mann, 2011).

Historically, clinical learning has been rooted in behaviorist philosophy to produce desirable actions (Handwerker, 2012). Behaviorism reinforces learning by eliminating free will and building upon the expected outcome. Many clinical skills are taught by the educator by producing desirable actions. A very basic skill of identification of a patient prior to administration of a medication, or the correct way to give an intramuscular injection, is a skill grounded in a psychomotor skill set that is taught through behaviorist pedagogy. For the behaviorist, the role of the instructor is to transmit knowledge, and the role of the learner is to be a passive receiver of this information (Parker & Myrick, 2009). The central argument against behaviorist pedagogy is its failure to engage students in developing critical thinking and limiting students to memorizing and recalling rote learning skills (IOM, 2010).

Behaviorist influence on nursing curriculum can be found simply by examining curriculum construction, organization of content, and the evaluation of outcomes (Handwerker, 2012). Paralleling Tyler's (1975) rationale, the National League for Nursing and the American Association of Critical Care Nurses mandated that the nursing curriculum have a planned course, objectives, and program outcomes. In addition, to become licensed professionals, nurses must pass the National Council Licensure Examination for Registered Nurses. These are both examples of evaluation and outcomes used to evaluate successful learning.

Cognitive theory. Cognitive theory emerged in the 1950s and became the

dominant theory of learning at the time by challenging behaviorism's approach toward learning (McLeod, 2012). Cognitivism strives to understand how the brain works and processes information as well as the roles thinking and knowing play in the process of learning. Bruner (1977) believed the processing of information leads to behavioral changes. Clinical decision-making or critical thinking and the foundations of problem-based learning emanated from this theoretical underpinning (Mann, 2011). In his book entitled *A Landmark in Educational Theory,* Bruner described the purpose of educational structure. Learning is transferred in two ways: by training of a skill and by training for principles and ideas. Bruner named this concept "spiral curriculum," which is the continual broadening and deepening of knowledge in terms of basic and general ideas, whereas curriculum design is a building of general ideas from basic to more complex at gradually increasing difficulty. Piaget and Bruner both believed in stages of cognitive development by teaching complex ideas at a simplified level first and gradually introducing more complex levels later on.

Theory of humanism. Humanism emerged in the 1960s from the works of Rogers and Maslow (Hean et al., 2009). The theory of humanism is built on the assumption that people act from intention and values. In this sense, learning is purposeful and grows according to one's potential. Self-direction and lifelong learning are key tenets of humanistic learning. Learning should be student-centered with the educator acting as a facilitator of learning rather than simply a provider of knowledge. Such a view is different from the behaviorist's belief of operant conditioning and the cognitivist's view that the discovery of knowledge is central to learning. Humanism involves experiential learning, and according to Kolb (1984), learners continually gain

knowledge through both personal and environmental experiences.

Examples of humanistic approaches to nursing education include Jean Watson's (1985) *Human Science and Human Care: A Theory of Nursing* and Rosemarie Rizzo Parse's (1998) *The Human Becoming School of Thought: A Perspective For Nurses And Other Health Professionals.* The commonality between each of these approaches was to make sure each patient reached a higher degree of health. The nurse's role is to influence interventions and help patients make decisions that will improve the patient's overall health. According to Paterson and Zderad (1976), humanistic nursing is described as an inter-human event. The patient-nurse relationship is characterized by interactions designed to promote existential growth. The goal of humanistic education is to produce students who are thinking human beings who can feel deeply and continue the process of self-education (Mahura, 1998).

Constructivist theory. Constructivism is also based on active learning. The tenets of constructivism posit that learning is an active process by which individuals build on his or her own experience and make sense of those life experiences. Each learner is an active constructor of knowledge based on experiences and previous knowledge (Mann, 2011). According to Nalliah and Idris (2014), unlike processes involved in programmed instruction and behaviorism, constructivism involves actively constructing knowledge rather than passively acquiring it. Learners construct or participate in the making of knowledge based on the learner's environment and personal experiences (Nalliah & Idris, 2014). Learners continuously engage in social negotiation through which he or she applies hypotheses derived from cultural factors and experiences to present situations (Nalliah & Idris, 2014).

A nursing education curriculum based on constructivist theories is designed to promote experiential and reflective learning. The curriculum is designed to provide information in small doses as students' progress through academic learning in order to facilitate reflection and incorporate learners' experiences. Learning is largely student-oriented and involves using problem-solving and active learning exercises, incorporating task-based activities to invoke social learning, and reflecting on and retaining contextual learning. Information does not flow in one direction from teacher to student but rather dialogically, encouraging students to give opinions and to work out problems in a non-threatening, interaction-rich environment (Nalliah & Idris, 2014).

According to Brandon and All (2010), applying constructivism theory as an educational tool for nursing students' education curricula can encourage rapid adaptions of evidence-based practice changes and improve critical thinking skills. By developing the ability to gather information, analyze, and evaluate the information critically and experientially and by developing a framework for analyzing information, nursing graduates can acquire critical-thinking skills (Brandon & All, 2010). Core elements of nursing education that align with constructivism include student-centered, innovative, and interactive curricular components. Using a constructivism-based curriculum will assure that nurse educators will be in a position to lead as facilitators and coaches.

Social development theory. Vygotsky (2012) laid the foundation for social development theory by positing that learning occurs by observing, talking, and interacting with others in social settings. In short, learning requires interaction with others (Leinster, 2009; Nickle, 2007). Social cognitive theory, or social learning theory, according to social cognitive theorist Bandura (1977), describes learning as taking place

from the environment through the process of observational learning; learners learn by observing and imitating observed behavior (Ferrari, Robinson, & Yasnitsky, 2010). According to social learning theory, adult learners are active learners and learning can be influenced by each learners' goals, attitudes, and experiences (Merriam et al., 2007).

Social development theory has a relatively high profile in health care and health theory research. According to Desbiens, Gagnon, and Fillio (2012), competence, which is a construct of social development, involves social, cognitive, and behavioral skills and must be effectively orchestrated to serve numerous purposes. Each unique care situation requires a variety of competencies to deliver effective performance or an adapted response. The construct of competence represents the capability to translate (a) emotional, cognitive, social, and sensorimotor values; (b) knowledge; and (c) attitudes into proficient actions (Bandura, 1986). Nursing competence requires integrating disciplinary knowledge that can be categorized into five types: aesthetic, scientific, ethical, personal, and emancipatory (Carper, 1978; Chinn & Kramer, 2008). Competence is acquired and is largely developed through experience and training (Benner, 1984).

Theoretical Framework

I will use Illeris' (2003a) learning theory to frame and undergird this study because it allows for a broad and rich understanding of how nurses who have cared for patients undergoing induced hypothermia in the acute care setting learn new knowledge in light of previous knowledge. Illeris' (2003a) theory of learning considers psychological, affective, and social dimensions and, consequently, is suitable for exploring how nurses learn in realistic learning situations by interacting with the environments on cognitive, emotional, and social levels. According to Illeris (2003b),

two learning processes occur within three dimensions of learning. One process of learning is the interaction between the learner and the environment, which causes a tension. The other process is described by Illeris (2003a) as the result of past learning. This process accesses previous mental acquisitions according to how the person has learned in the past. The three dimensions where learning takes place include cognition, emotion, and society. Cognition and emotion are internal dimensions; society is an external dimension. These dimensions were depicted by Illeris (2003b) as oriented on an inverted triangle (see Figure 1).

Illeris's learning theory has been used previously to explore the learning experiences of medical students. McNamee et al. (2009) used the three dimensions of learning as the framework to describe the learning process of medical students and their learning experience completing autopsies as part of his or her medical education. The researchers noted this framework was chosen because of its holistic, realistic approach. Another justification for incorporating the framework of the three dimensions of learning was because the researchers sought to examine all three dimensions of learning: cognition, emotion, and environment (McNamee et al., 2009). Echoing the opinions of Merriam et al. (2007), McNamee et al. (2009) remarked on their belief that the theory was all-inclusive. Medical students, McNamee et al. stated, valued the experience of learning anatomy and trauma as cognitive benefits. Students in the study by McNamee et al. expressed opinions that the students would be better equipped to manage matters of death; McNamee et al. attributed this sentiment to learning in the emotional dimension. Socialization within the context of the autopsy process influenced the students' feelings and did not detract from the value of the experience (McNamee et al., 2009).

Similarly, the dimensions of the learning experience described in McNamee et al.'s (2009) study resemble those that nurses regularly encounter. For example, the cognitive requirements of nurses include knowledge and memorization of anatomy, equipment, processes, and procedures. Emotionally, nurses must deal with affective taxing and stressful situations and events, such as trauma, illness, and death. Socially, nurses are required to interact with doctors, patients, and work in conjunction with other nurses. McNamee et al. found that Illeris's theory offered a broad, holistic framework appropriate to realistic learning experiences. Additionally, because Illeris' theory of learning considers how individuals learn through interactions with the environment in relation to past learning in addition to the three dimensions outlined above, it is deemed well-suited to explore how nurses interact and learn in relatively new situations, such as caring for induced hypothermia patients and how nurses use previously acquired knowledge in these new situations.

Furthermore, according to Illeris (2003b), when considering workplace learning, it is important to be aware that adults are selective regarding learning choices, which are based on personal experiences and interests. Illeris (2003b) posited that (a) adults learn what they want or what they feel is meaningful to them; (b) adults draw on resources and previous experiences; (c) adults take as much responsibility for their learning as they want to take; and (d) because adults are not inclined to learn that which is not interesting to them or which they do not see as meaningful, adults learn what they are required to learn in partial or unmotivated ways. Illeris further categorized adult learning in workplace settings into three main groups based on various needs and levels of qualification. Those groups included: (a) those with secure work positions who need to

continue developing competencies to become further qualified, (b) those who have been cut out of their fields for various reasons and are in need of different education to become re-qualified in a different field, and (c) those on their way to the working world and are in need of professional knowledge for basic qualification.

Illeris's categorization of adult learners based on learners' qualifications and needs may relate to how nurses learn in different points in their careers. Adults requiring further qualification usually are motivated and have a positive attitude regarding upgrading or supplementing training, which is because these adult nurses already hold a relatively safe position at work and see the education or training as immediately relevant or meaningful to them (Illeris, 2003b). This idea may apply to those nurses who need to learn new knowledge and procedures associated with induced hypothermia and who are already established and experienced in their professions. In contrast, those needing to learn new knowledge to become re-qualified in a new area may have a difficult time re-adjusting. According to Illeris (2003b), the situation is demanding because it usually involves phasing out an old identity and developing a new one as well as learning new skill sets. Those requiring basic qualifications, however, do not have it as difficult because learning new qualifications and developing a professional identity is not as daunting as unlearning previous qualifications and readjusting to new ones (Illeris, 2003b).

Exploring how nurses learn new knowledge in clinical settings is important for institutions, such as Fort Lauderdale's Holy Cross Hospital, a 559 bed private not-for profit Magnet-designated facility that provides a wide range of acute care services. Holy Cross is the first hospital in Broward County, Florida, to perform induced hypothermia in

patients suffering from cardiac arrest (Holy Cross Hospital, n.d.). Not only does performing induced hypothermia require nurses to acquire new knowledge related to cooling procedures and aftercare, but it also requires them to learn how to operate particular state-of-the-art, elite cooling technology. Regular performance of induced hypothermia in clinical settings is relatively new and requires that nurses learn new technical and procedural knowledge. Findings from this study may provide information to assist nurse educators in understanding how nurses of varying levels of experience learn in the workplace in relation to this new yet increasingly used procedure.

My Experience with Workplace Learning

I have never been trained to care for the hypothermia patient but have talked to nurses who have dramatic stories of how the procedure saved lives. I have been involved in my professional organization, Emergency Nurses Association (ENA), since entering my career. As a young nurse, I recognized I needed to be involved and aware of nursing practice issues. Being a member in the ENA has allowed me to remain knowledgeable of health care issues at a local, state, and national level. In addition, because of my participation in this organization, I have been involved in workplace learning, such as identification of a new or different approach to an existing problem and taking a stand on that approach, then promoting that approach to be adopted universally with support of published standards. Early in my career, I was fortunate to have a nurse leader who allowed me to participate and encouraged me to attend ENA meetings. I was encouraged to obtain specialty certification. Advanced cardiac life support was required. Intentionally or otherwise, she served as a role model of how to become involved in nursing practice issues. Through her actions, she taught me the importance of being

aware, participating, and shaping the future of nursing practice. I will be forever grateful to this nurse leader for her mentorship. I try to replicate her role as mentor for the nurses who work with me, gently prodding them to identify opportunities for betterment through education and certification.

Chapter Summary

Having a better understanding of how workplace learning occurs relative to supporting sudden cardiac arrest patients undergoing induced hypothermia benefits patients and educators. The study includes insight regarding how educators can enhance nurses' learning experience by capturing critical thinking and judgment skills needed to care for induced therapeutic hypothermia patients (Gantt, 2010), and the researcher lays the foundation for describing how nurses learn new knowledge when caring for induced therapeutic hypothermia patients.

Based on the number of increasingly larger studies conducted since 2002, the importance of survival attributable to temperature regulation is becoming more widely recognized and will need to be operationalized by nurses. The problem is that little attention has been given to how nurses learn to manage the care of these patients, and this study lays the foundation for understanding how nurses learn how to care for these patients.

Nursing professionals are challenged to deliver quality care. This standard of care must be introduced during the education process and expanded upon throughout the nurse's career. Nurses' knowledge can have a positive influence on the hospital's bottom line by preventing patient complications and reducing the length of hospital stays, which reduces the cost of care for patients (Aiken, Clarke, Cheung, Sloane, & Silber, 2003).

The researcher of this study examines how nurses learn new knowledge when caring for patients who require specialized care unfamiliar to the nurse. Nurses' ability to deliver safe and quality patient care are desired outcomes for the future of health care (IOM, 2010). By examining how nurses learn new knowledge, nurse educators can contribute to producing highly trained bedside nurses who are motivated to deliver quality care.

Chapter Three

Methods

The qualitative study is posed to yield new information regarding how nurses acquire new knowledge and apply this learning process to other situations that require new learning to occur. The study is focused on the learning experiences for nurses who have been educated in the care of cardiac arrest patients undergoing induced hypothermia with attention to motives, barriers, and the role of the learning environment. To do this, the researcher conducted the study following a hermeneutic phenomenological approach as developed by van Manen (1997). The following chapter delineates the rationale behind this design as well as the specific procedures used during the collection of data, interpretation of results, and protection of human subjects.

Research Design

The present study involves a purely qualitative design. Using this research design, results are a presentation of the internal experience of this phenomenon using first-person reports (Moustakas, 1994). Qualitative research is used to describe experiences or internal events, not to provide explanations or conduct analyses. A phenomenological approach is appropriate because the current research is used to gain an understanding of internal experiences of a diverse nursing population (van Manen, 1997). The researcher recounts details of the learning process experienced by nurses who have been educated in the care of cardiac arrest patients undergoing induced hypothermia.

Phenomenology

This researcher utilized a qualitative research method, and employed phenomenology in the research design. This design was selected because qualitative research allows for the study of things and people in the natural setting and the development of meaning through data collection. According to Merriam (2009), the qualitative research method is useful in illuminating three primary facets of the human experience: (a) "How people interpret their experiences," (b) "How they construct their worlds," and (c) "What meaning they attribute to their experiences" (p. 23). Further, Cooper and Schindler (2006) attested to the viability of qualitative research, noting that it encompasses an "array of interpretive techniques which seek to describe, decode, translate, and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world" (p. 196). A qualitative research design is appropriate for this study because it enabled the researcher to develop a broad understanding of the phenomenon of learning as it pertains to nurses who have been educated in the care of cardiac arrest patients undergoing induced hypothermia. The researcher was able to conduct an in-depth exploration of several facets of this experience that included the motives, barriers, and the role of the environment on the learning process.

Hermeneutic phenomenology. To specifically address the phenomena of interest, a hermeneutic phenomenological method was chosen based on the work of van Manen (1997). Hermeneutic phenomenology is used to examine the life world, or lived human experience. Wilson and Hutchinson (1991) posited that this type of phenomenology is focused on seemingly trivial details of an experience that may be

taken for granted in daily life. Examination of these details is conducted with the goal of achieving a sense of understanding (Wilson & Hutchinson, 1991). To investigate the lived experience of this population of nurses, this method immersed the researcher in the phenomenon of interest and extracted thematic interpretations to responses that informed the research question.

Van Manen (1997) suggested that research can be reduced to a methodical structure, and hermeneutic phenomenological research can be described as an interaction between six functions. Those six functions include the following:

1. Turning to a phenomenon, which seriously interests us and commits us to the world.
2. Investigating experience as we live it rather than as we conceptualize it.
3. Reflecting on the essential themes, which characterize the phenomenon.
4. Describing the phenomenon through the art of writing and rewriting.
5. Maintaining a strong and oriented pedagogical relation to the phenomenon.
6. Balancing the research context by considering parts and whole (van Manen, 1997, pp. 30–31).

In the first stage, turning to the nature of the lived experience, van Manen posited a researcher must focus in on the phenomenon under study. This research is a product of the researcher's ideas and thoughts while attempting to make sense of the phenomenon. However, the research is always only one version or description of the phenomenon (van Manen, 1997). The second stage, investigating experience as people live it, is how a researcher approaches the subject (van Manen, 1997). Researchers must immerse themselves in the lived experience of others and be an active participant in the

exploration of the experience. Reflecting on essential themes, the third stage, entails that a researcher must carefully examine the appearance and the essence of the phenomenon of interest (van Manen, 1997). A researcher should attempt to bring hidden facets of the phenomenon into focus in order to elucidate and inform the subject. The next stage involves the art of writing and rewriting. The craft of writing helps describe and record the phenomenon, which involves the ability to spiral in and out of the data and to arrange and rearrange the data until themes begin to emerge and are written down and edited repeatedly (van Manen, 1997).

In the fifth stage, maintaining a strong and oriented relation, a researcher must stay on task and be true the original question (van Manen, 1997). Being distracted by the many ideas found in the data is easy; however, a researcher must maintain discipline and focus to capture the essence of the data under examination in the study. Researchers must be immersed in the data and not unattached. Researchers need to be passionate and involved throughout the process (van Manen, 1997). Finally, a researcher needs to balance the research context by considering individual parts and the whole without being overwhelmed or lost in the data. Researchers need to constantly understand the data he or she is uncovering and take a straight path to the heart of the study (van Manen, 1997).

Research Assumptions

Van Manen (1997) stated that phenomenology is based on several underlying assumptions. The role of the researcher is not to be a disinterested party, because the researcher is supposed to be immersed in the lifeworld (van Manen, 1997). Phenomenologists acknowledge how he or she fits into the phenomenon under study and know that being completely objective is not possible (Patton, 2002). Researchers must

bracket preconceived ideas. *Bracketing* is the process of understanding, admitting, and putting aside any ideas that a researcher has towards the phenomenon under study (Tracy, 2013). Van Manen (1997) suggested that a researcher investigates the experience as it is lived, and not as a researcher preconceives it. To achieve bracketing, a researcher should identify, list, and acknowledge any existing presumptions or existing knowledge about the phenomenon. Van Manen did not advocate bracketing because he believed that the researcher should bring his or her knowledge forward. Van Manen suggested that bias or pre-understanding would reveal itself during a researcher's reflections (Wilson & Hutchinson, 1991). The researcher for this study utilized a reflexive diary to actively document personal feelings and perceptions to identify areas of potential bias. The researcher has work experience educating nurses and has been responsible for monitoring nurse practice. The researcher attempted to set aside all beliefs regarding training, education, and nurses' learning process. The purpose of the study is to gain a deeper understanding of how work place learning occurs for the nurses in this study, which requires the researcher to be open and welcoming to interpret new perspectives about learning.

The next assumption of phenomenologists is that the research aims to gain enlightenment about the everyday experiences that nurses undergo. Phenomenological researchers examine the minutia of daily life (van Manen, 1997). Van Manen (1997) also stated that phenomenologists go into a study blind. These researchers do not presuppose what will be uncovered, but instead try to make meaning of the phenomenon and stay open to all possibilities.

Using phenomenology requires a researcher to conduct the study in the open and

not block the flow of information. The findings are not clinical; instead, the results are found inductively and describe the actual experience (van Manen, 1997). Phenomenology is uniquely focused on human experiences. Lastly, phenomenology examines conscious lived experiences, and phenomenologists do not examine hypotheticals. When using this method, a researcher and participants will give and receive meaning from the world (van Manen, 1997).

According to Patton (2002), understanding the assumptions of a study provide a foundation for making statements regarding the nature of the findings. The key assumptions of this research are as follows:

1. The sampled nurses have a clear understanding and memory of the specific methods and experiences he or she experienced in learning to care for patients using induced hypothermia.
2. The researcher must assume that the sampled nurses will participate willingly and provide honest and useful responses to the interview questions.
3. The researcher must also assume that all participants will be able to provide firsthand knowledge of individual experiences.
4. Assumed motives and barriers exist within the learning process, and participants are expected to be able to recount these.
5. The researcher assumes participants understand the role of the learning environment to either facilitate or impede progress in learning.
6. The researcher will be able to set aside all prior beliefs about training, education, and nurses' learning process.

Setting

The current study is inclusive of all nurses who have experience with learning to care for patients of induced hypothermia, which intrinsically limits the research to a hospital setting with specific emphasis on patient care. Because of the researcher's location and plan to conduct face-to-face interviews, the sample of interest was collected from a single hospital in Fort Lauderdale, Florida. The facility is a 559-bed, private, not-for profit Magnet-designated facility that provides a wide range of acute care services. This facility was the first hospital in Broward County to offer induced hypothermia therapy.

Sampling Plan

Sampling Strategy

The sample was contacted using purposeful convenience sampling procedures. Purposeful convenience sampling is a non-probabilistic sampling technique, wherein a researcher wishes to identify and select specific individuals with salient experience relevant to the topic of interest (Coyne, 1997). The sampling method is one of convenience because the researcher sampled from a hospital within driving range where induced hypothermia is known to be used as a standard protocol. The purpose of this sampling method is to gather only participants who may lend valuable information regarding the phenomenon of interest rather than collecting participants with the intention of generalizing the results to larger populations. The identities of participants in the study were protected through the assignment of participant pseudonyms. Identifying information, such as the participants' names, will not be included in the publication or presentation of the results of the study.

Participants were recruited for the study by utilizing personal contacts provided by the Nursing Research Committee. Recruitment materials, including an email (Appendix A) and informed consent forms (Appendix A), to nurses in the facility of interest were disseminated via email. These materials explained the topic of the study, listed the exclusion criteria, and invited prospective participants to contact the researcher for more information. Participants who consented to be interviewed were given research credits to use towards their clinical ladder program. It is the researcher's belief that the nurses who put forth the effort to respond to these recruitment materials will have the greatest level of investment and be able to provide the richest information in the topic of study. Study subjects were self-selecting. Should initial recruitment efforts result in too few participants, snowball sampling methods would be employed. Snowball sampling refers to the process by which study participants provide suggestions for other prospective participants who may inform the study (Marshall, 1996). These prospective participants would then be contacted to explain the purpose of the study and to solicit his or her consent for participation in line with primary sampling procedures.

Eligibility Criteria

Inclusion criteria. According to Moustakas (1994), participants should meet the essential criteria of having experience with the phenomenon, interest in the phenomenon, and willingness to participate in the study. The researcher utilized a selection criteria for inclusion in the study. Participants must (a) be currently employed as a nurse within the facility chosen for study, (b) have experience learning to care for cardiac arrest patients using induced hypothermia, and (c) currently use the induced hypothermia technique at the time of data collection.

Exclusion criteria. Participants were not eligible for the study if he or she did not meet the inclusion criteria. In addition, participants were not included in the study if he or she failed to provide informed consent.

Sample Size

For qualitative research, saturation is the primary consideration when making determinations concerning sample size (Bowen, 2008). Saturation is obtained when additional participants in the data collection process no longer add novel or substantive information to the data (Bowen, 2008; Francis et al., 2010). One must consider both information that points to novel themes as well as information that illuminates the relationships that exist between identified themes (Corbin & Strauss, 2008). It is also necessary that a researcher examine every identified theme to determine that it has been described and substantiated sufficiently in order to achieve saturation (Mason, 2010). Corbin and Strauss (2008) maintained that sampling should be considered satisfactory when the identified themes reflect complexity, profundity, and diversity of experience, then the researcher's understanding of the phenomenon has fully developed. Using a phenomenological design, the researcher aimed to gather sufficient perspectives and experiences such that the sample did not depend on the number of participants as a sufficient quantity and quality of data would be extracted from each participant (Sandelowski, 1986).

Researchers have offered different suggestions for the practical determination of sample size when conducting a phenomenological study. Francis et al. (1998) recommended a sample size between 10 and 13 participants. Morse (1994) advised researchers to utilize a minimum sample size of six. Guest, Bunce, and Johnson (2006)

stated that a sample size of 12 is fitting to achieve saturation when conducting interview-based qualitative research. In accordance with these prescriptions, a sample size of approximately 10 to 15 participants, or until saturation is met, was be utilized in this study. It is the researcher's belief that a sample of this size was sufficient to elicit responses that encompassed and adequately represented the perceptions held by the target population.

Protection of Human Subjects

When a researcher conducts studies involving the use of human subjects, the protection of participants becomes a major responsibility of the researcher (Bloomberg & Volpe, 2012). In the current study, the researcher abided by the ethical and moral prescriptions set by the Nova Southeastern University Institutional Review Board (IRB) and federal regulations. Participants were informed prior to beginning the study of any known risks associated with participation in the study. The researcher kept all data collected in this study confidential to protect the identity of participants. All participants received a pseudonym. Data was collected from human subjects for use in this study. Institutional approval for the study was obtained through the Nova Southeastern University IRB (see Appendix A). The method of data collection consisted of individual interviews completed with all participants. In the presentation of results, no identifying information was included to maintain the confidentiality of the participants.

Informed consent. Participants were asked to sign a consent form prior to participation in the study. All participants were informed that participation in the study was voluntary and anyone could withdraw from the study at any point. Informed consent forms included the details of the study, procedures for data collection, and full disclosure

for the risks and benefits to participation. This procedure allowed full participant disclosure and was used to ensure that the researcher fully explained the study to each participant. It also allowed the researcher a degree of assurance that the research subjects were willing and able to participate.

Risks and benefits of participation. No foreseeable risks are associated with participation in this study. In addition, participants were interviewed during their work hours and were given research credits to use towards their clinical ladder program. Participants were notified that the only risks to inclusion in the study were the potential for discomfort during the interview process and the inconvenience of time spent scheduling an interview and taking the time to meet with the researcher to provide responses. Direct benefits to participation occurred, and participants were reminded that he or she would receive recognition for participating in a nursing research project and receive clinical ladder points. Participants were, however, informed that participation was crucial to fully understanding the phenomenon of interest and that his or her responses were of great benefit to the body of knowledge about nurses' learning.

Data storage. The researcher kept interview materials, including audio recordings and interview transcripts, in a locked filing cabinet in the researcher's home office. Digital material was stored on the researcher's password-protected computer. Access to the raw data was limited to the primary researcher and the research committee. The data will be stored for a period of 3 years. Once this time has elapsed, the material will be destroyed through the shredding of written documents and erasing the information from computer drives.

Procedures

Recruitment

Participants were recruited from a large hospital located in Fort Lauderdale, Florida, using a convenience sampling method. Upon approval from the Holy Cross Research Committee email distribution occurred with assistance from the hospital committee. The researcher distributed emails to prospective participants describing the nature and procedures related to the study and asked if he or she would like to participate. Those who displayed interest were provided with an informed consent form and asked to provide consent after being recruited for the study. Upon achieving data saturation, the researcher concluded with a sample size of 12 participants that were recruited and interviewed. Interviews took place at the hospital where these nurses work and were conducted in a quiet and isolated location that was comfortable for the participant, allowed for privacy, and minimized the possibility of interruptions during the interview process.

Interviews. Semistructured interviews were conducted with each participant in one individual, face-to-face session. Interviews lasted approximately 1 hour. Interviews were recorded through the use of an audio recording device. Participants were debriefed following the completion of the interview to inform the participants of the objectives of the study and to answer any questions he or she may have had regarding the research. Participants received the researcher's contact information to address any future questions or concerns he or she may have had concerning the study.

Data management. Upon completion of the interviews, a transcriptionist received the audio recordings to transcribe the interviews, which enabled textual analysis.

The audio recordings were labeled with participant identification (ID) numbers and did not contain identifying information. Prior to receiving the audio recordings, the transcriptionist was required to sign a letter of confidentiality (Appendix D).

Textural interview data was imported to NVivo version 10 for phenomenological analysis. The researcher analyzed this interview data, according to the procedures indicated by van Manen (1997). According to van Manen, phenomenology is pure description of lived experience, and hermeneutics is an interpretation of experience via a text or symbolic form.

Data Collection Instruments

The purpose of this study is to understand how nurses learn new knowledge in the clinical area. Hypothermia care was chosen because temperature therapy is a relatively new treatment modality to care for patients, and it requires nurses to learn new knowledge and skills. Because temperature therapy is a newer treatment, it is believed that this method would be easier for nurses to recall how he or she learned to care for this group of patients regardless of years of experience. As such, interviews were the main data collection instrument in the study.

Demographic Data

Prior to interviewing, participants were asked a series of questions aimed at collecting demographic information. These questions focused on gathering details from the sample so that transferability was better understood, and any potential sampling biases were addressed. Data were collected regarding each sampled nurse's gender and age as well as educational background (Appendix C). Data were also collected regarding how long ago participants experienced the phenomenon of interest and where this

learning process was experienced.

Interview Questions

The researcher used face-to-face interviews as the primary instrument in the data-gathering phase of this study. A pilot interview was obtained from a volunteer nurse with experience in hypothermia care. The purpose of this interview was to identify any potential problems with the interview questions and enable the researcher to gain experience with the interview protocol. Interviews followed an interview protocol developed by the researcher. The interview protocol consisted of a brief demographic survey and open-ended interview questions. These questions elicited information concerning the lived experience of the participants while learning how to provide care for induced hypothermia patients.

Britten (1995) stated that interviews are a flexible and dynamic tool for qualitative researchers. DiCicco-Bloom and Crabtree (2006) explained that interviews are utilized in qualitative research to collaboratively build meaning with interviewees by reassembling and regenerating impressions of happenings and occurrences. Opdenakker (2006) has discussed several advantages of the use of face-to-face interviewing as a tool in qualitative research. Opdenakker cited the ability to notice nonverbal cues, which can inform and illuminate implicit feelings and perceptions. Opdenakker also discussed the spontaneity of response that occurs during face-to-face interviews as a beneficial aspect of this form of interviewing, which yielded more honest responses from participants (Opdenakker, 2006). Further, interviews were tape-recorded for the purposes of extended analysis and reflection.

Opdenakker (2006) cautioned that face-to-face interviews can lend themselves to

researcher bias when a researcher directs the respondent toward a specific response. However, the use of an interview guide in this study limited this potentiality (Opendakker, 2006). Because of the ability of interviews to enable the exploration of participant perceptions to deduce and illuminate the meaning ascribed to a phenomenon, semi-structured interviewing is an appropriate data collection tool for the current study. Semi-structured interviews were conducted using the following guiding questions:

1. Can you describe your experiences working with hypothermia patients?
2. What did your training program look like? How did you learn to assess patients (e.g., book, simulation, or real patients)? Which clinical parameters were you told to look for? Which classes did you attend? Which materials were you given? Who taught you?
3. What, if anything, would you change about the learning process? What assisted you the most and the least?
4. Aside from your hospital and coworkers, did you prepare or seek out information to care for this population? How do you keep your knowledge and skills up to date? What information or resources do you seek out?
5. Can you describe a difficult experience that you had while taking care of a hypothermia patient that required you to search for additional information? Where did you search? Did you ask anyone for advice?
6. Are you or your co-workers or hospital ever recognized for the care of these patients? Have you ever attended workshops or seminars pertaining to hypothermia care, or shared your data?
7. Is there anything else that you want to describe? Is there anything else you

believe I should ask you about?

Field Notes

Using Hycner's (1999) phenomenological approach to analysis, the researcher has closely read and analyzed the transcribed data for themes, concepts, and models to make interpretations (Groenewald, 2004). The researcher has also examined the field notes to increase information. Field notes can consist of notes regarding which actions occurred, the researcher's thoughts, methods and instruments, and an analysis of each interview (Lofland & Lofland, 1999). Unlike quantitative data analysis following a deductive method, qualitative research is inductive and free of preconceived notions (Creswell, 2014). The ideas that form the basis for a general inductive approach include condensation of extensive raw data into a summarized format, identifying clear links between the data and the research idea, findings that are easy to explain and demonstrable, and to show a model of the indications of the data (Groenewald, 2004). The central theme of phenomenological research is to describe the experience and remain true to the view of the participant (Giorgi, 2002). The field notes also contained a detailed log of events and decisions made regarding the study. This detailed log assisted the researcher in providing an audit trail and the ability to replicate the study. In addition, the field notes contain any ideas or observations that the researcher experiences during the data collection process.

Data Management and Organization

Transcription

After data transcription, the researcher double checked each textual document and assured that transcriptions were accurate and fully encompassed the verbal exchanges

between interviewer and interviewee. To insure accuracy, the researcher hired a reputable transcriptionist. Once transcription was complete, the researcher listened to each interview recording and read the corresponding textual data. Any areas that did not match, or were not clear enough to be transcribed, were noted and amended where possible.

Category Scheme

The steps Hycner (1999) outlined include bracketing and phenomenological reduction, delineating units of meaning, clustering the units and forming themes, summarizing each interview, and extracting general and unique themes to make a complete picture of the themes and the interactions. Hycner (1999) stated that interviewers should listen to the recorded interview several times to form a picture of the interview in its entirety. Then, a researcher should read though the manuscripts. By reading and re-reading, a researcher will begin to mark patterns of comments, words, and phrases seen in the interviews. The analysis begins as a researcher starts to group together the information found and search for associations and emerging themes (Hycner, 1999). Factors a researcher can examine in this analysis are the actual words transcribed, specific word usage, tone, and intonation from the recordings, and non-verbal clues observed while conducting the interview. In the next step, a researcher begins to note how frequently a possible theme occurs, how themes interact, and the emergence of sub-themes (Groenewald, 2004). All of the steps by Hycner were completed. The researcher used the computer program NVivo 10 to aid in the analysis.

Once the initial analysis was completed, the researcher shared themes and results with the participants to ensure accuracy. Confirming that the meaning of the interviews

was captured ensured that the results accurately reflected the participants' lived experiences.

Coding Data

Textual data was read and re-read by the researcher to fully immerse in the lived experience of the participants. The first reading of the textual data was aimed at gathering a general understanding of the overarching tone and an appreciation of the basic content of the participants' reports. Upon the second reading of the data, the researcher's basic familiarity with the data facilitated the emergence of patterns or themes within the data. After the identification of relevant themes, data were coded within nodes to classify supporting excerpts from the textual data into the appropriate theme. Re-readings of this material facilitated the illumination of additional themes and relationships among those themes. It was expected that additional rounds of coding would yield increased specification and shaping of identified themes, including the emergence of subthemes. Any anomalies or contradictions within the responses were identified as well so that all perspectives were accurately portrayed.

Data Analysis

Data analysis in this study centered on a descriptive framework. Themes were constructed in accordance with the research sub-questions so that responses were categorized to inform each sub-question. As such, identified commonalities or themes described the lived experience the participants encountered while learning to care for cardiac arrest patients using induced hypothermia with a specific focus on the influence of work place learning as well as the obstacles and motivators. Themes also focused on the role of an organization or environment in developing a nurse to care for the

hypothermia patient. The researcher aimed to describe and present the variety of these experiences and perceptions regarding the central and sub-research questions. This study did not attempt to establish or present causal relationships between these factors. The researcher looked for other sources of data, such as artwork, biography, or video tapes as outlined by van Manen (van Manen, 1997).

Trustworthiness and Integrity

Trustworthiness

The seminal work of Guba and Lincoln (1985 as cited in Bloomberg & Volpe, 2012) described a competing paradigm between qualitative and quantitative research designs because of the difficulty establishing trustworthiness in qualitative research, which address traditional validity issues that are seemingly germane to quantitative research. These authors highlighted credibility, dependability, confirmability, and transferability as four factors that are necessary in establishing the trustworthiness within qualitative research (Bloomberg & Volpe, 2012; Bowen, 2008).

Credibility

Credibility in qualitative research is aligned with its internal validity counterpart in quantitative research. It is a reflection of how well the results reflect the ideas the participants were attempting to convey. It is essential for qualitative interpretations to be "authentic and accurate to the descriptions of the primary participants" (Drisko, 1997, p. 191). The participants must be able to see themselves and their lived experiences in the results of the study.

The goal of credibility is for qualitative researchers to ensure findings are accurate and credible (Bloomberg & Volpe, 2012; Bowen, 2008). Anderson (2010) stated that

when performed correctly, qualitative research is "valid, reliable, credible and rigorous" (p. 22). As Rolfe (2004) explained, validity in qualitative research is referred to by a variety of nomenclature, including the term *credibility*. Credibility, in qualitative research, refers to the degree to which the results reflect the true and accurate experiences of the participants. A study is said to be credible when the findings presented are sufficiently accurate in description that an individual with similar experiences would readily express recognition of the presented phenomenon (Krefting, 1990).

A number of methods can be used to improve the credibility of a study. To improve credibility, the researcher encouraged participants to provide honest and candid information throughout the interviews. Participants were encouraged to elaborate on responses that warrant additional explanation. Other strategies used included triangulation, thick description, and member checking. Triangulation is when a researcher is able to layer two or more sources of data together to gain a complete picture of the phenomenon (Padgett, 2008). Thick description is when the words used by the participants capture social actions, thoughts, emotions, motivations, and intentions. The description and information are so detailed and rich that the reader feels the truth of the statements (Shenton, 2004). Member checking gives the participant the power and participants become co-researchers, which ensures that the researcher has understood and interpreted the essence of the participants' lived experience and conveyed that information in a manner that is authentic (Osbourne, 1994). To ensure credibility, the researcher supported thick description during the interviews, kept detailed and organized field notes, and ensured that the participants were given the opportunity to examine the results of the study (Shenton, 2004).

Achievement of saturation increases the credibility of the findings of the study by ensuring that the identified themes were confirmed sufficiently by the data (Morse, Barrett, Mayan, Olson, & Spiers, 2002). Discrepant cases or contradictory findings upon analysis of the data were identified. These findings were discussed among the other identified results to ensure that the entire breadth of participant perspectives has been represented. In this study, the researcher addressed credibility from the methodological and interpretive perspectives.

Dependability and Confirmability

Dependability in qualitative research is analogous to the concept of reliability in quantitative research and, therefore, can be described as the reliability or repeatability of the study findings (Bowen, 2008). Bloomberg and Volpe (2012) proposed maintaining an audit trail that captures the evolution of thinking and records the rationale for all the choices and decisions made throughout the research study process. Confirmability in qualitative research parallels the concept of objectivity in quantitative research and endeavors to discount researcher subjectivity and biases and provide an audit trail throughout the data collection and analysis processes that establishes the findings, interpretations, and recommendations (Bloomberg & Volpe, 2012; Bowen, 2008). In this study, the researcher addressed both dependability and confirmability by maintaining a journal to chronicle general insights and decisions relating to the study, document the researcher's perspective regarding how data was analyzed, and capture the basis of interpretations used to derive the research findings. Member checking was done in this study to share themes and results with participants to ensure accuracy. Participants were asked during the interview to summarize or verify information and again during the final

summary of themes.

Transferability

In qualitative research, transferability refers to the ability of the findings to be generalized to other contexts. In essence, transferability refers to the extent the phenomenon in a particular context is transferrable to another context (Bloomberg & Volpe, 2012). Because the sample was recruited from only one organization, the degree of transferability was not expected to be great. However, several researchers believe that generalization is not a relevant concern in qualitative research because of the fact that qualitative researchers aim to describe a unique phenomenon or experience rather than generate broad generalizations (Krefting, 1990; Seidman, 2006). Instead, the reader determines the degree of transferability of a study.

Through the provision of thick and detailed description, the reader would be able to make personal judgments concerning the ability of the study's findings to be transferred and applied to other settings (Krefting, 1990). In the context of qualitative research, the extent of transferability or generalizability resides with the reader; however, the research design for this study addressed transferability by providing rich, deep descriptions of the research context and the assumptions that were principal to the investigation (Bloomberg & Volpe, 2012; Bowen, 2008; Maxwell, 2005).

Transferability was best defined by outlining demographic data from the sample. In order to explain the details of the sampled interviewees, each interview began with a demographic questionnaire, which would allow readers of the research findings to apply the results more applicably to other settings and more clearly identify the demographics of the sample and match these to other settings (Maxwell, 2005). A thorough description

of the sample's demographic information also allows overrepresentation of any group to be identified so that sampling biases may be accounted for within the context of the current study.

Authenticity is an important part of a study's credibility. Authenticity includes ensuring that the results of the study accurately reflect the meanings and experiences the participants described (Sandelowski, 1986). Remaining true to the phenomenon under study is of the utmost importance. The authentic voices of the participants must ring through the words on paper (Hammersley, 1992). By remaining true to the participants' lived experiences, it is possible to find multiple realities and experiences that combine for a richer narrative (Bailey, 1996).

It is important to interpret and understand the study in context. While replicating the study could add to transferability if the findings match differing findings, it does not lessen the validity of the study, but may reflect different experiences and reasons behind variations, which may prove to be highly enlightening (Dervin, Foreman-Wernet, & Lauterbach, 2003). A researcher must also consider whether the "notion of producing truly transferable results from a single study is a realistic aim or whether it disregards the importance of context . . . a key factor in qualitative research" (Shenton, 2004, p. 71).

In order to increase rigor, an audit trail is essential (Creswell, 2014). Audit trails arise from thorough documentation of each stage and step in the research process. An independent auditor can use these notes to examine the study and establish reliability and lack of bias (Lincoln & Guba, 1985). Guba and Lincoln (1982) stated that documentation created by the researcher should include a reflexive journal and the audit trail. By having an independent auditor examine the study, the rigor is increased, thus the findings can be

regarded as trustworthy and transferable. To strengthen the rigor of this study, after completion of the first two interviews, a peer reviewer examined the results. In addition, having trustworthy documentation enables the study to be replicated elsewhere. Replication of the study and results can lead to more data that supports the conclusion from this research opportunity, increasing the likelihood of transferability.

Chapter Summary

Chapter 3 included a detailed explanation of the methodological procedures that were utilized. The procedures for the collection and analysis of the data were also provided. The objective of this phenomenological study is to explore the lived experiences and perceptions of nurses in regard to workplace learning with specific examination of nurses' experiences while learning to care for cardiac arrest patients using induced hypothermia. Through this inquiry, the body of knowledge concerning the three dimensional learning process for nurses using induced hypothermia may be illuminated. In Chapter 4, the researcher presents the results of the research. Thematic analysis of the obtained data is also presented along with the comprehensive findings of the research.

Chapter 4

Interpretation of the Findings

This qualitative research study yielded new information regarding how nurses acquire new knowledge and apply this learning process in the clinical setting. The study involved a focus on the learning experiences of nurses who have been educated in the care of cardiac arrest patients undergoing induced hypothermia with attention to motives, barriers, and the role of the learning environment. To capture the richness of their lived experiences, the study followed a hermeneutic phenomenological approach as developed by van Manen (1997). In this chapter, the researcher aimed to gain insight into how nurses learn on the job by exploring how nurses learned induced hypothermia procedures and how to care for induced hypothermia patients in a critical care setting.

To accomplish this aim, the following sections contain information regarding the research questions, participant demographics, data collection, and data analysis procedures. The chapter contains ordered themes and extracted quotes from nurse participants to expand the relevant body of knowledge where results are organized by research question. This section concludes with a summary of the findings.

Demographics

The study participants included 12 nurses. The age range of the participants was 29 to 61 years of age. All of the participants were employed fulltime: nine on dayshift and three on nightshift. All participants had a minimum of 2 years of experience caring

for hypothermia patients. Three of the participants had Associate of Science in Nursing degrees, eight had Bachelor of Science in Nursing degrees, and three nurses had Master of Science in Nursing degrees. Of the participants, six were certified: four were critical care certified nurses, one was a chemotherapy-certified nurse, and one participant was a certified medical-surgical nurse.

Data Collection

Recruitment for participants for this research study occurred at an acute care facility in South Florida. Using a convenience sampling method, prospective participants received emails describing the nature and procedures related to the study, asking if he or she would like to participate.

Interviews occurred at the hospital where the nurses were employed and held in a quiet and isolated location that was comfortable for the participant, which allowed for privacy and minimized the possibility of interruptions during the interview process. The researcher obtained written consent prior to the start of the interview. Interviews conducted with each participant involved an individual, face-to-face session. Interviews lasted approximately 1 hour and were recorded with an audio recording device. At the end of each interview, participants were debriefed following the completion of the interview. The participants received the researcher's contact information to address any future questions or concerns he or she could have concerning the study.

Upon completion of the interviews, a transcriptionist received copies of the audio recordings and transcribed the interviews. The transcriptionist labeled all recordings with participant ID numbers, which did not contain identifying information. In addition, each participant was assigned a pseudonym, such as Nurse 1, to protect confidentiality of

participants. Once transcription was completed, data was imported into NVivo 10 to aid with the organization and analysis of the data.

Data Analysis

Data analysis in this study focused on creating a descriptive framework as van Manen (1997) described. The construction of the themes was in accordance with the research sub-questions, and the researcher described responses in relation to the overarching research question as well as the research sub-questions. The results outline the commonalities or themes that described the lived experience the nurses encountered while learning to care for cardiac arrest patients using induced hypothermia. Data analysis included a description and presentation of the variety of experiences and perceptions regarding the use of a novel treatment modality and the effect of learning new methods the nurses underwent using Hycner's (1999) method of analysis.

Van Manen (1997) posited that within the hermeneutic framework, themes should be experiential structures that comprise an experience, but this author does not prescribe a specific method to analysis. Rather, van Manen provided three general approaches toward isolating thematic explanations of an experience. The current study followed van Manen's (1997) *wholistic*, or *sententious* approach, where "we attend to the text as a whole and ask, *What sententious phrase may capture the fundamental meaning or main significance of the text as a whole?*" (p. 93). In this approach, the researcher must attempt to describe meaning through the formulation of phrases that embody each facet of meaning. For this reason, Hycner's (1999) method provides the most relevant stepwise process to coding and is the most applicable to the goals of hermeneutic phenomenology. Van Manen (1997) focused on the need for themes to embody and

dramatize the meaning that participants describe as is the purpose of Hycner's (1999) method of analysis.

Aligned with the hermeneutic framework of van Manen (1997), the steps Hycner (1999) outlined include (a) bracketing and phenomenological reduction, (b) delineating units of meaning, (c) clustering the units and forming themes, (d) summarizing each interview, and (e) extracting general and unique themes to make a complete picture of the themes and the interactions. Hycner stated that interviewers should listen to the recorded interview several times to form a picture of the interview in its entirety and read the manuscripts thoroughly. By reading and re-reading patterns of comments, words and phrases began to emerge from the interviews. Similar information was grouped together to conduct a search for associations and emerging themes (Hycner, 1999). The following factors were examined for analysis: (a) actual words transcribed, (b) specific word usage, (c) tone and intonation from the recordings, and (d) nonverbal clues observed while conducting the interview. In the next step, the frequency at which potential themes occurred was noted as well as how the themes interacted and the emergence of subthemes (Groenewald, 2004).

Once completing the initial analysis, participants received the themes and results to ensure accuracy. Participants' confirmation that the meanings of the interviews were captured ensured that the following results accurately reflected the participants' lived experiences.

Coding Data

The researcher repeatedly read textural data to fully immerse in the lived experiences of the participants. The aim of the first reading of the textual data was to

gather a general understanding of the overarching tone and an appreciation of the basic content of the participants' reports. Upon the second reading of the data, a basic familiarity with the data facilitated the emergence of patterns or themes within the data. After the identification of relevant themes, the researcher coded the data within nodes to classify supporting excerpts from the textual data into the appropriate theme. Reading and re-reading of this material also facilitated the illumination of additional themes and relationships among those themes. Van Manen (1997) placed emphasis on the importance of reading and re-reading in order to achieve an understanding of the richness of an experience and to produce results reflective of this richness.

Van Manen (1997) identified four essentials of a lived experience as guides to experiential reflection, including (a) *lived space,* or spatiality; (b) *lived body*, or corporeality; (c) *lived time*, or temporality; and (d) *lived human relation,* or relationality. Lived space is examined in an attempt to understand the landscape where people live out their experiences (van Manen, 1997). Lived body refers to the concept that all experiences are lived through the filter of a physical body and acknowledges that interactions with others are always prefaced by the perception of their physicality (van Manen, 1997). Phenomenological researchers must also take into account lived time, which is subjective, as opposed to the objective understanding of clock time (van Manen, 1997). Lived human relation refers to the interpersonal relationships that people must maintain within a landscape shared among parties (van Manen, 1997). Using Hycner's (1999) approach to coding allowed each of these concepts to be identified in a systematic manner. To further detail the richness of these shared experiences, data presentation included any anomalies or contradictions within the responses so that all perspectives

were accurately portrayed.

Results for Overarching Research Question

At the close of the coding process, a total of four overarching themes and 12 subthemes emerged that pertained to the central research question, How do nurses learn to care for hypothermia patients? The four identified themes were cognition, emotion, environmental, and social. Each of the themes explained in this chapter detail the common lived experiences and perceptions among the 12 sampled nurses as they completed their training for induced hypothermia. Many participants discussed the required annual and ongoing training, hands-on modes of learning, protocols, and available resources, which fell into the overall theme of cognition. Others discussed family interactions, outcomes of training, and receiving recognition, which were classified as pertinent to the theme of emotion. The participants discussed the challenges to learning, constant updating of skills, and the induced hypothermia cart as subthemes to the environment. In addition, the participants cited both the support of colleagues and involvement of the team as pertinent to the social theme.

McNamee et al. (2009) used Illeris' theory of the three dimensions of learning because of its broad holistic approach, including cognitive, emotional, and environmental-social dimensions. The theory served as the theoretical framework for the present study to help explain how the four dimensions, cognitive, emotional, environmental, and social, influenced how nurses learned on the job in caring for induced hypothermia patients. Although Illeris combined environmental and social dimensions, for the purpose of the present study, I separated the environmental and social dimensions

to allow for distinction between the two and a more in depth discussion of each. While Illeris' model contains three dimensions, mine contains four.

Cognitive dimensions of learning included the importance of experiential and hands-on learning. Emotional dimensions of learning included the influence of patients' families' emotions and concerns as well as nurses worrying about patient outcomes. Environmental-social dimensions of learning included the hospital environment (e.g., the induced hypothermia cart and patient and room preparation), communicating with various teams throughout the procedure, and the support of mentors. Figure 2 illustrates the overlapping and interrelated themes identified that related to the cognitive, emotional, and environmental dimensions of learning.

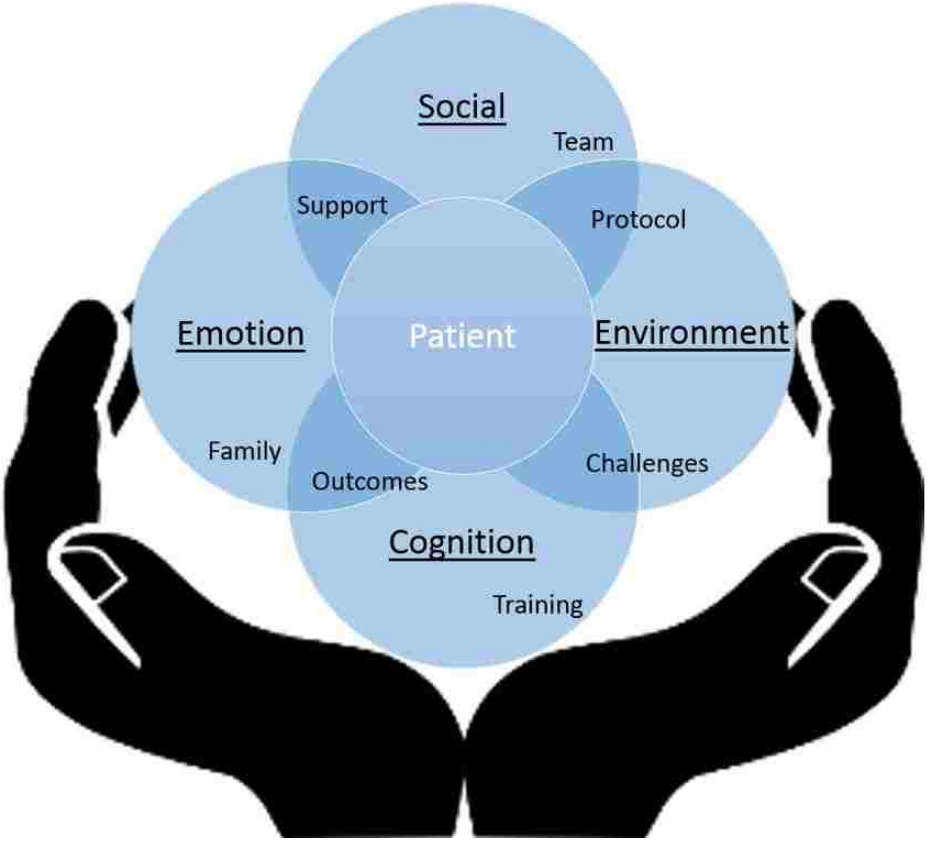

Figure 2. Model of nurses learning to care for hypothermia patients.

Cognition

Each nurse interviewed had experienced some form of cognition during his or her training course. This theme consisted of four subthemes. The first subtheme of cognition was training, which included both ongoing and annual training. A majority of the sampled nurses recalled the PowerPoint presentations and training manuals they encountered during their introductory hypothermia training. The second subtheme was hands-on training in which nurses described the hands-on nature of their training experience. The third subtheme pertained to the protocols used in treating induced hypothermia patients, which nurses perceived as clearly stated and provided a systematic process to follow when caring for hypothermia patients. Within this overarching theme, the final subtheme was resources where many nurses discussed their experiences using additional resources, such as their phones, to access vital information that helped to efficiently care for patients and quickly access information. The following paragraphs detail the subthemes of cognition.

Training. The first subtheme of cognition was training. Of the nurses, 11 out of the 12 (92%) referenced annual training, ongoing training, or both. Participants mentioned these forms of training 29 times during the course of the 12 interviews. Participants received PowerPoint presentations and handouts in accordance with the training. However, participants also tended to specify that the instructors did not provide textbooks to aid in the learning process. Nurse 4 detailed this training and stated the following: “I think it was, like, a two hour maybe, a two hour class. Went over the setup of the machine and, and all our protocol that we were going to follow.”

Nurse 11 supported this statement and reiterated the following:

> The training program here, we did have a, I think an in service that was done. I think it was maybe about a two-hour class. I'm not sure, it's been a while, but however that doesn't really prepare you for when you get your first patient.

Nurse 11 also stated that the training was enough to provide a full experience and that "You have to get a patient to actually get the full experience on what it's like."

Nurse 12 had a slightly greater degree of involvement in the training, having taken part in 4 hours of training, returning for a second four-hour refresher. Many of the nurses also cited the clinical specialist, Anne, as their main source of training.

Nurse 8 cited similar occurrences with training, including PowerPoint presentations and handouts and felt that the training was highly detailed. Nurse 8 continued her account stating,

> I think it was a good class, especially for us not knowing anything about the class or, or about the actual, the protocol or the reason behind it because to this day I still, I actually have the original PowerPoint and slides and presentations that I've used for people that come new to the unit.

Nurse 3 reported a good experience with the training and mentioned that typical training does not come close to preparing one for the content. Nurse 3 indicated, "I, you know, in other cases, I've had experiences where you get something today and then tomorrow you see the patient and you're like, you know, but I think this was a very good rollout."

Hands-on training. The second subtheme of cognition was hands-on training. A large portion of the sampled nurses agreed that the hands-on aspect of the training was the most important.

Nurse 8 stated, "You definitely have to have hands-on training. PowerPoints and slides are great, but if you can actually touch and feel and look." This participant detailed this response by stating that, "it's the hands-on that makes a huge difference because until

you use it, train me all you want, but, again, it ain't [*sic*] going to click until my hands are touching it."

Nurse 11 stated that training included the following:

> A lot of hands on demonstration and the educator that taught us used a lot of real life experiences and stories and for an experienced nurse that's a little bit more valuable than, you know something more abstract that you're teaching. And then just being at the bedside, the hands on stuff, that really drives it home.

Nurse 3 also stated, "For me it was the hands on. The actual first patient. The first patient was my learning curve and the manual was my life saver." Although the hands-on work was essential, the participants also suggested that the hypothermia manual, which was a part of the formal training, was equally integral to their success in applying their knowledge with induced hypothermia.

Nurse 11 supported the argument for the importance of hands-on education:

> It was go, go to and the nurses that helped me were fantastic. So that was the- I liked the class; the class was fine, it was informative but you don't really get comfortable doing something until you actually do it. So. It was the first patient that did it for me. Once I did my first code white, went thru it, I was pretty comfortable doing anything with- as far as related to that.

Nurse 3 cited the importance for the hands-on learning and felt that it was integral to the continued education of induced hypothermia. Nurse 3 concluded, "You learn with every new patient that you encounter."

Nurse 4 explained how the instructors taught the procedures: "[the nurses] couldn't envision what was going to happen with the patient." To help remedy this situation, the instructing nurses were on call for a year, and came in for every case. Nurse 4 continued, "That was helpful because to teach this going forward it was easier for me to see it and apply it than it was reading it and trying to teach it."

Protocol. The third subtheme of cognition was protocol. Many participants

discussed the protocols in place for caring for induced hypothermia patients. The participants explained that these protocols were extremely helpful in allowing a learning nurse to easily complete all the necessary steps and keep within the indicated guidelines.

Nurse 3 asserted the following:

> Based on the protocol, you know we follow the protocol in terms of what medication we use and how we assess them. And the protocol really set the guidelines to see how we know—when can we do newer assessment, when can we do weak assessment. You know, so when we follow the protocol it acts as a guide.

This nurse continued to elaborate that the first resource would be the protocol, depending on the circumstances. Nurse 6 echoed this concept and believed that the protocol was helpful by providing, "a whole order set with algorithms, excluding criterias [*sic*], inclusion criterias [*sic*]." Nurse 3 stressed the importance of this protocol and stated that the reference manual contained the order of operations for an induced hypothermia patient. Nurse 3 continued by emphasizing the importance of the protocol. Even more than the initial training, Nurse 3 maintained that "Whenever I had a patient, the manual was always open, and I'd always refer to it." Nurse 3 stated, "It's not like I learned and then I, you know, never took it out."

Resources. The fourth subtheme of cognition was resources. Nurses utilized many types of resources, ranging from cell phone Internet searches to vendor instructions to colleagues. Nurse 1 recalled using a personal cell phone in many instances where clarity or guidance was needed:

> We have a computer in our rooms and then a lot of us—people see us on our cell phones but we're not on our cell phones doing social calls. We have apps and stuff that we pull up and we'll use them. Cause you know we'll use Hippocrates we use for writing scripts or whatever.

Other nurses used similar strategies for double-checking their procedures and

guiding the process when taking on such new and ever-changing treatments. Nurse 2 mentioned the value of mobile technology to keep abreast of the practices necessary to treat induced hypothermia patients:

> Yeah I said just recently, with our technologies advancing so much that any time I personally have to question you know what a drug is used for or a procedure or something that I'm not familiar with I can Google it and have a whole bunch of information at my fingertips . . . It speeds the learning process.

Others had issues with the machines and utilized a set of helpful contacts that could assist if problems arose. Nurse 1 indicated the following:

> I don't find the machine user friendly and the programming of it, especially when you're re-warm the patient you have to put it in a mode called fever mode so that the machine turns on enough to maintain the normal body temperature so they don't go back into hypothermia or get overheated so I always have a problem finding that fever mode so I got my go to people.

Nurse 10 used a similar strategy to quickly and efficiently guide the processes of working the machines and leaving nothing to chance, citing the use of "other co-workers, you know, and seek[ing] their opinion." Nurse 10 elaborated by stating, "If I don't feel like it's the appropriate answer or whatever, I don't feel comfortable with it, then I go to the supervisor."

Nurse 2 made the effort to act as a resource to other nurses who may have encountered difficulty or confusion. Nurse 2 stated, otherwise, "We do try to spread it [information] around when we have the induced hypothermia patients just so we can stay up to date on things and keep familiar with everything." Nurse 2 concluded that "If it was something related to the machine, I would go to the manufacturer on the machine." This individual reported that the machines are a resource on their own, explaining "there's a phone number on there [the machine] that we can call for information." Nurse 5 added, "The vendor has a lot of good resources."

Nurse 4 learned using slightly different resources. This nurse did a large deal of independent reading and study to familiarize with the machine, protocols, and general information about the entire process of inducted hypothermia. This nurse testified that "I taught me. It was all by reading. The reps came in and taught me about the machine, but I . . . it was all just from reading, studies that had been done, publications, and case studies."

Emotion

The second overall theme pertinent to the experience of learning to treat induced hypothermia patients was emotion. The patients' families, outcomes of the procedure, and recognition among patients and colleagues all spurred emotions. The nurses themselves had emotional reactions to using this technology. Nurse 1 stated,

> It made me feel great. I'm like wow I actually did something. It's like sometimes when you're doing nursing you feel like you're babysitting or you're- it's just the same old thing but when you actually do something and you help save someone's life it's great.

Nurse 11 echoed this sentiment. Nurse 11 said, "Well, it's a good feeling really. At least you did something that was good." Using hypothermia as a treatment produced positive emotional responses as nurses felt they were in a position to provide help to their patients that was not available before. The following sections detail the subthemes of emotion.

Families. The first subtheme of emotion was families. Families to the patients could bring about several emotions. While participants perceived some emotions as rewarding, many felt an added stress from family involvement in the process. Nurse 1 explained, "A lot of times the families, it's like quite jarring when they come in the room and they see them," citing the large machine and catheters used in the induced

hypothermia process. Nurse 1 continued by detailing the following:

> . . . The families really have a hard time. They really do. And when it comes right down to it, you're taking care of the patient and the family. Cause they're—I'm telling you, I haven't met a family member who hasn't been freaked out.

Nurse 8 also spoke about the family's involvement. Nurse 8 recalled, "It's just a matter of preserving the brain at the time, so, and, and, you know, and telling the families, 'No, you can't touch. No stimulation.' So that's hard for loved ones, you know?" This part was a difficult aspect of the process where emotions were strong and nurses had an added aspect of treatment as well as an added source of emotional input. Nurse 11 described this emotional input and said, "I think the hardest thing is seeing the family because it's almost like a, you know, watchful waiting."

Nurse 12 had made a similar recollection. This nurse cited the way that family members added a level of stress to the procedures:

> The family is very anxious, and as a nurse, you do not want to give them false hope because they, you know, they actually, the family actually sort of questions, "Is, is my loved one going to wake up? Are they going to be able to, you know, totally comprehend what's going on, be totally with it," and sometimes you can't really give them, you know, an answer because you really don't know.

Nurse 12 added, "It's an uncertain time for them. We understand that."

Nurse 6 made note of the unsure feeling towards how emergency room physicians present families with information and the drawbacks of viewing the procedure:

> Sometimes I wonder if the emergency room physician explains things to them as opposed, you know, what this entails because we've had I think one or two where once the family saw all the tubes and wires and machinery and stuff, "No. Take it off. Don't want it."

Nurse 8 added to this statement, "How do you give reassurance when you're not sure even yourself what the outcome may be at that time, you know?" Still others tied familial interaction to the positive outcomes of a successful procedure.

Outcomes. The second subtheme of emotion was outcomes. Nurse 1 recalled the first patient who she witnessed go through the induced hypothermia process, "He was a gentleman from Quebec." Nurse 1 framed her experience, recalling "They came on vacation. His—I guess his wife and I think it was her sister. You could tell they were scared, they would sit there." Nurse 1 then continued her story:

> I'll never forget, he was my first patient and he woke up and he was able to follow commands and he walked out of here. So, I was really encouraged by that and then my second patient did the same thing. So. When that happens like wow this really works.

Similar to this incident, others cited remarkable outcomes when using induced hypothermia. Nurse 3 described a particularly delicate procedure with a surprising conclusion:

> So, I remember taking care of this young man and he went thru the protocol and it took him a long time to reach his long range and his cooling range. We had such a problem getting him hemo-dynamically stable to the point where we were using so many pressers, so many pressers that he really experienced peripheral shut down. Ended up losing a foot because of, you know from vasoconstriction.

Nurse 3 detailed the most stressful stages of this individual's treatment:

> He was pretty much unresponsive for quite a while and normally when you wean them off all of the sedation you expect a response. And based on how quickly they respond then you say ok maybe neurologically this one may be gone. And he was literally not expected to do well.

Despite the odds, the patient made a full recovery. "I was amazed one day when he showed up in the intensive care unit in a wheelchair with a sister, brought him to look for us. I mean, it was amazing. It was amazing," Nurse 3 concluded. Later, the patient's sister returned to inform Nurse 3 that he had fully recovered and was working two jobs. Nurse 3 stated, "I talked about it all the time because it gave me goose bumps when she say [*sic*], he had two jobs now." This nurse spoke with a tone of elation when recalling

the outcome. It gave the nurse a feeling of pride and awe.

Nurse 4 described outcomes in terms of numbers where induced hypothermia patients could be shown to have better outcomes than patients who did not receive this intervention. Nurse 5 cited the challenge and explained that every patient is different Although, ". . . When you do have a good outcome it's really liberating to see . . ." Nurse 6 also focused on the statistics and measured patient outcomes numerically. "I think I remember the chances of surviving cardiac arrest are about seven percent, and I think we're upwards of closely thirty percent here at this facility," Nurse 6 specified. Nurse 2 indicated, "We're giving someone about a four to five time greater chance of survival than if we did not do it." The nurses had a less emotional response to the outcomes of induced hypothermia, instead using numbers and facts to support their pride in giving these patients a second chance.

A smaller number of the sampled nurses were more doubtful of the induced hypothermia process. These individuals responded with some disappointment regarding the procedure's outcome. Nurse 4 detailed these doubts, stating,

> I really don't know, you know? When we get these, not that an 84-year-old or something doesn't stand a chance to, to live, but, you know, and it's like, you know, if they follow the original protocol we had, it seems like we had better outcomes in the beginning than we have lately, in my opinion.

Nurse 2 also shared doubts regarding the procedure. Nurse 2 stated,

> . . . sometimes I wonder, I question whether it's actually therapeutic. Because there's no way to tell. You know if we didn't do it, would the patients have still had the same outcome? I mean there's no—you don't have any definite information that this helps or doesn't help.

Nurse 9 noted feeling doubt during each procedure as well. Nurse 9 stated, "There's always the, the, the point of 'are they going to wake up?'" Nurse 9 continued to explain

that the results are not always immediate. The suspense lies in the fact that some patients may not wake up until several weeks after the procedure while others may give an immediate response.

Recognition. The final subtheme of emotion was that of recognition: both recognition among family members and colleagues were exciting parts of the experience for the nurses. Many nurses felt self-fulfilled when a procedure went well. Nurse 12 explained, "Well, it's a good feeling really. At least you did something that was good." For Nurse 3, "[Recognition] comes a lot of times when—cause on many occasions we have patients who come back and they ask for group pictures and for me that's recognizing and sending appreciation for what you did."

Although Nurse 7 specified that she did not specifically seek recognition, there was a situation where "[Nurse 7] actually was part of two letters from families for, just thanking me for their, you know, for the care that I provided to their family members." Nurse 8 contributed to their experience and explained "We have a couple of them that actually come and met us a couple of times already."

Nurse 9 received recognition from the hospital itself. This nurse recalled "We've been recognized as a unit because our unit is known as the unit that takes care of these patients." Nurse 9 was most excited during the program's rollout and was thrilled that their unit was recognized for bringing the program to the forefront for the county. This nurse continued in stating, "In the beginning when it was new, it was, like, you know, we're doing this new cutting edge thing. It was exciting." Although recognition was a positive and extremely encouraging part of the learning and implementation process for induced hypothermia nurses, the nurses did not view this as the end goal.

Environment

The third theme regarding nurses' experience learning to treat induced hypothermia patients was that of the environment. The learning environment, nurses explained, was centered on three foci. The hypothermia cart was a large part of the learning environment as it was where many resources and important tools were held. In less concrete terms, the challenges and constant updating of skills were also properties of the nurses' learning environment. The following paragraphs detail the subthemes of environment.

Hypthermia cart. The first subtheme of environment was the hypothermia cart. Several nurses made note of the hypothermia cart as a part of the environment. Nurse 5 explained the role of the hypothermia cart in the environment, clarifying the following:

> The cart basically has everything that you need for the protocol to do induced hypothermia. It has extra supplies, the startup kit's in there, things to draw blood and the train of four's in there, all of that kind of stuff.

According to Nurse 8, the hypothermia cart maintained its use in the environment. Nurse 8 stated,

> So, so the cart was a great resource from day one. We, we put a cart together, actually, in the critical care unit, and as well as the emergency department, both areas have their own, their own induced hypothermia cart is what we called it.

Nurse 9 also mentioned this cart as a place where the nurses could find all necessary resources. Nurse 4 stated that without the hypothermia cart, many of the nurses would be without a central location to access when materials, such as tools or important procedural information, are needed. Nurse 8 continued, "To this day, you know, seven, eight, nine years later, we still have the cart. It's like our safety blanket."

Challenges. The second subtheme of environment was challenges. Although

many nurses tended to feel that positive outcomes existed and that recognition was pleasingly fulfilling, the participants also faced several challenges intrinsic to the environment. Nurse 1 felt that the most difficult part of performing induced hypothermia was "when they [the patients] initially come in." Nurse 1 elaborated, "Sometimes it will take about two three hours just to set up and especially when you're new at doing it, it takes a long time."

Nurse 11 cited similar challenges with setting up patients for induced hypothermia, "sometimes it can be overwhelming initially because there is a lot of, a lot of things to do." Nurse 11 continued by detailing the following:

> There's a lot involved as far as setting up the machine, putting the patients on the necessary drips such as the Nimbex. If the patient requires vasopressors and also insulin, patients are also put on insulin when in induced hypothermia.

Nurse 11 also experienced difficulty with the primary stages of induced hypothermia. This individual cited difficulty with "trying to get all the right information to, to see where the patient is at." Nurse 11 felt that it was difficult to determine which care had been provided and which needed to be done next, and provided an example:

> Have they started the ice saline in the ER or have they started the ice saline in, by EMS? Have the patient had the CAT scan done because all that needs to be done before we actually continue the protocol from the patient getting the emergency.

Nurse 5 experienced a similar challenge, and explained "The whole setup too is a bit of a challenge, there's a lot going on, a lot of people."

Nurse 2 felt that doctors did not follow the standard procedure, which presented difficulties when attempting to keep everything running smoothly. Nurse 2 explained

> . . . A lot of the doctors when they institute the induced hypothermia protocol they alter it and they don't follow it as they're supposed to. Some doctors won't paralyze the patient. Some doctors don't do the insulin drip. Some doctors alter it depending on what they want. Some of them won't put an arterial line in. Just a

lot of variations depending on who's ordering it.

Nurse 12 also experienced difficulty when it was doubtful whether doctors were following protocol. In many cases, the participants felt that many doctors with whom they worked may not have followed the protocol and were selecting candidates who were not the best fit for the procedure. The selection of patient candidates impeded the processes and negated some of the hard work that goes into the procedure.

Nurse 2 felt that many of the patients did not meet the criteria of induced hypothermia in the first place. Nurse 4 also struggled with the fact that some of the patients were poor candidates. However, this nurse attributed this difficulty to the fact that a large number of outside facilities with automatic electric defibrillator devices did not know how to use this device when cardiac arrests occurred outside the hospital. Nurse 4 stated, "That's another thing I've been focused on is they're coming from gyms or restaurants, and they have an automatic electric defibrillator and if they did why aren't they using it?" This nurse suggested reaching out to the community and teaching them how to use the equipment so that more patients enter the hospital as eligible candidates.

Nurse 5 reiterated the concept:

> I think that's probably the most challenging decision to see whether the person's a candidate. Then, if they are, to the beginning process the first couple of hours making sure that they're still stable enough to do it.

Skills update. The third subtheme of environment was keeping skills updated. Half of the sampled nurses engaged in ongoing learning and expressed the need to keep skills updated between patients. Nurse 1 recalled that she had "read about three or four different articles" in an attempt to provide continued support to patients and not lose any acquired skills. Nurse 1 also cited some disconcerting findings during this article review,

recalling “Several researches showed that there really wasn't any benefits of doing it and then certain hospitals that did it all the time—but see that could be because they specialized in it so it could be a bias.”

Nurse 1 also kept her pertinent skills updated between patients using ongoing coursework, describing

> It was an advanced research. We had to do research article, some type of study, I don't remember if it was qualitative or quantitative so we picked an article, a couple of articles, and we put together a PowerPoint together, a PowerPoint teaching students about hypothermia, how it's done the equipment. How to maintain the patient over the 24 hours. The re-warming. We went thru the whole thing on the PowerPoint. So it was basically a teaching tool for hypothermia.

Nurse 11 took a hands-on approach to the maintenance of skills when induced hypothermia patients were not a daily experience. This nurse would seek out these patients when they arrived in other areas of the hospital:

> I’ll look at it and see, you know, what’s going on, or if there’s a patient that’s for sure an induced hypothermia call, then the patient comes into the unit, I’ll assist the other nurse setting up so that way it keeps me up-to-date with setting up the machines and whatnot.

Nurse 8 reported that others in the hospital who were charged with training the material “did make it a point to come out a couple times in-between even though we hadn’t had any patients, you know, just to make sure that, you know, ‘Did you need a refreshing class?’”

Nurse 12 talked about the tools and ongoing professional development opportunities provided to nurses, which took the form of “skills fairs.” During these fairs, this nurse elaborated, “You go on the Internet and other things.” Nurse 3 also discussed these skills fairs, indicating that “a lot of it [continued education] we get from our skills fair. Which is a yearly thing.” Nurse 4 also reported going to conferences as a

form of ongoing training where new skills and updated procedures could be accessed and brought back to the hospital for continuing education. This new information is shared with others to ensure everyone had the latest and most current information about the procedure.

Social

Another large aspect of the learning and maintenance process for the skill set necessary to using induced hypothermia was the social aspect of the hospital. Several of the sampled nurses expressed feeling that their supervisors and coworkers were both great sources of support in their hospital and suggested that they could always rely on their team to keep everything efficient during induced hypothermia treatment. The following paragraphs detail the subthemes of social.

Support. The first subtheme of social was support. A large portion of the sampled nurses made note of all the support that they felt from their colleagues and mentors. Much of this support was the result of in-house trainers and mentors who took the nurses under their care when performing induced hypothermia. The nurses all indicated that supervisors and coworkers who acted as sources of support were available at any time they were needed so that none of the nurses had to fend for him or herself.

Nurse 3 exemplified this experience in stating,

> Anne was also very much involved and she's very informative and very supportive. So you always feel that that support system was there and the fact that she's in-house makes it more comfortable because you always know that if you have a patient she's a phone call away

Nurse 5 also discussed the support the nurses experienced from Anne, who was called into several procedures to help resolve any issue that might arise. Nurse 8 also highlighted the involvement of educators, describing

> . . . We had the two educators that were strongly involved. Deborah was in the Emergency Room at the time. I think that was her, Deborah, I think that's who it was, in the ED, and then Anne, of course, in the Critical Care area. So they, of course, you know, support 24/7 for any questions.

The group of nurses who supported the theme of social support felt that the support they experienced from these educators was of such value that they would be unable to perform with any confidence if not for the educators' involvement.

Team. The second subtheme of social was team. Aside from the general support of educators and mentors, this sample viewed other nurses as team members when discussing the social aspect of training. Nurse 1 discussed two nurses who were knowledgeable in treatment using induced hypothermia. Nurse 1 continued to explain that the nurses were helpful and acted as a resource: "Because they're really good, they're very calm. They don't get flustered over everything. They've been nurses forever." Nurse 1 then elaborated, "They've been nurses for 20 plus years, so you know. And then their personality: they're friendly and warm and I'm comfortable working with them . . ."

Nurse 3 provided further support:

> . . . you always feel that that support system was there and the fact that she's [the educator] in-house makes it more comfortable because you always know that if you have a patient, she's [the educator] a phone call away so you always want to make sure whoever's training you is available when you need so that was like a comfort zone.

Nurse 12 had similar things to say regarding the teamwork that could be utilized in the hospital. Nurse 12 stated, "Here you have your buddies. Pretty much when we get a patient, we will all pitch in. One person's doing this, one person's doing that so." Nurse 12 felt that the help of the team was sufficient to keep the large amount of work involved with induced hypothermia at a level where everything could be accomplished efficiently and with minimal stress. This individual explained, "Initially when you get these patients

it's usually very hectic. It is very busy. So with your other friends, someone put it in this someone put it in that. Life is a little bit easier." Nurse 3 also felt that the support of a team was a resource that could be used at any time:

> The support was always there. There was always good support. Because what I think I like about it, you get an induced hypothermia patient, you go to set up the machine and for all you know there may be five or six people in the room who is [*sic*] trouble shooting and giving that support.

Nurse 5 claimed, "A lot of the times we're . . . everyone's in each other's rooms helping each other out, we have really good teamwork." This team effort was one of the most highly regarded aspects of not only the learning process, but also the execution. Nurse 8 concluded, "It's a group, group, huge group effort of different people."

Subresearch Question Results

After detailing the experience of learning among nurses trained in induced hypothermia, examination of the individual sub-questions followed. In doing so, significant passages and concepts were extracted from the logged experiences to inform each particular sub-question. The following sections include each sub-question restated with pertinent quotes specified. The sections detail the responses useful to inform each sub-question. Findings for overarching themes and subthemes related to cognitive, emotional, environmental, and social dimensions of workplace learning cut across results to sub-questions; consequently, how results of sub-questions relate back to the overarching themes and subthemes are discussed under each sub-question.

Workplace Learning

Nurses explained that workplace learning largely took place through courses but also through the sharing of information among colleagues. Consequently, workplace learning involved both cognitive and social dimensions; nurses believed that it was

important that inexperienced nurses learn collaboratively and work alongside nurses experienced in induced hypothermia care to supplement formal learning. Nurse 1 described the courses provided when hospitals were first implementing induced hypothermia, "They explain . . . In the training they also explain the dynamics of hypothermia, the benefits . . . they do didactic instruction . . . They use PowerPoints, that kind of thing." Nurse 2 also cited the materials and protocols used during training and recalled that, ". . . There was a like a packet on induced hypothermia and caring for the patient and there was also—there is a protocol that we have." Nurse 2 described the process as follows:

> There was just a single class in the beginning and then when we got the patient like I said then there was a group of us working with the patient along with the nurse educator and the assistant nurse manager to kind of make sure we were doing everything we were supposed to do.

Nurse 4, the nurse educator, constructed a visual aid and shared this with other nurses. Nurse 4 described the resource and explained the following:

> I created a gingerbread man and it had the effects of hypothermia on every system on the card. It was given to them as a resource and I don't know if they referred to that or not but it was my way of learning so I shared it with others.

This example was a form of dissemination of ideas and materials that were not originally introduced. As a form of teamwork, one nurse's concepts and facilitating materials could be shared among peers to bring the process to his or her level. Nurse 4 continued, "I still use the gingerbread man today, in today's teaching." Figure 3 presents Nurse 4's gingerbread man resource.

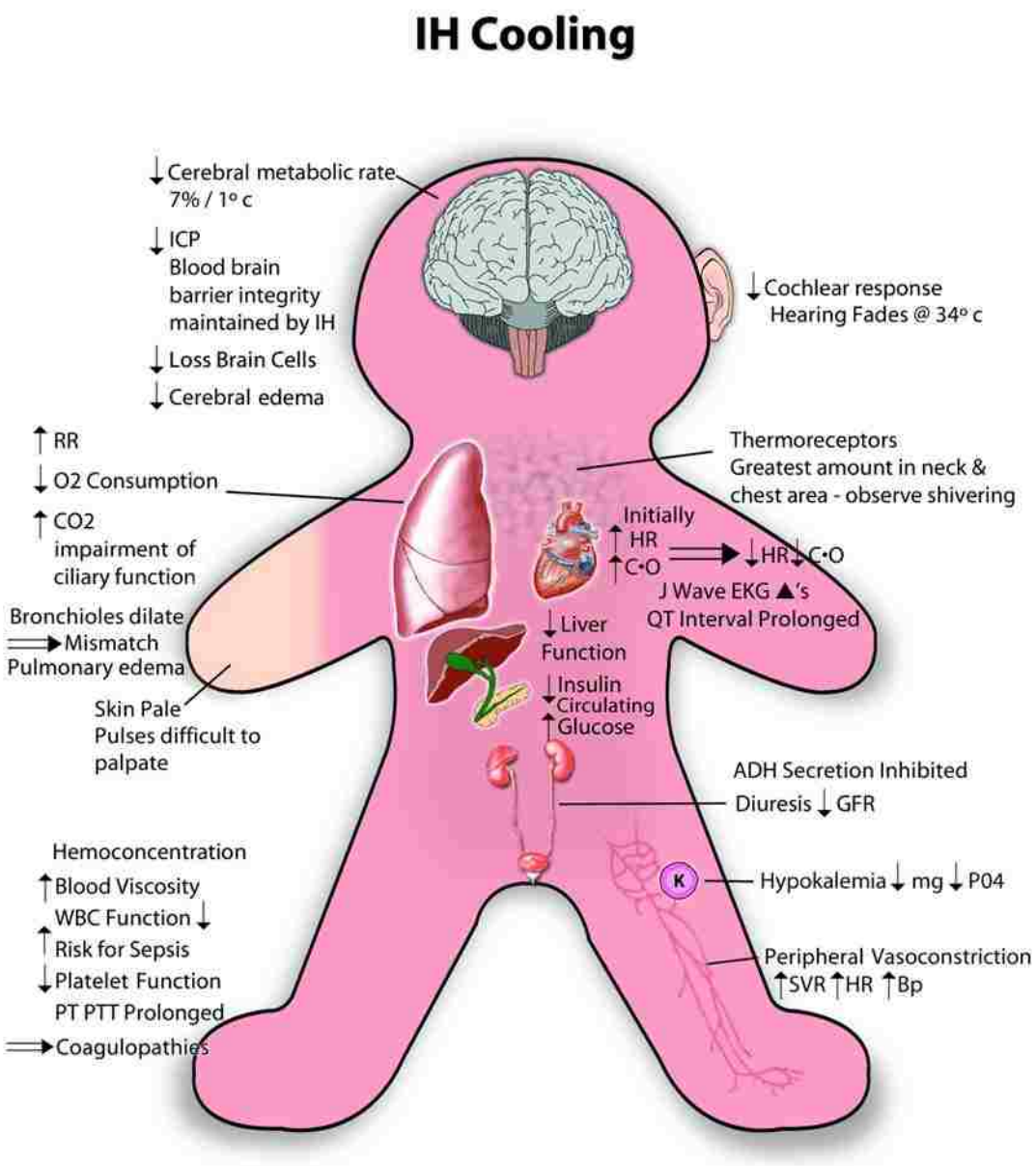

Figure 3. Gingerbread man resource. Reprinted with permission.

Nurse 4 also had access to ". . . a book that we created that they still have, and it included the contents of the cart; what's in it." This nurse described this book, stating, "It included the pathophysiological changes of the patient, it included trouble shooting, setting up a machine, and it included data that we were capturing. So it's a cheat sheet screening the patients." This form of teamwork provided a streamlined way for nurses to

share information that they perceived as being most useful from an insider's perspective. Nurse 6 reported simply being guided through the steps from an educator, although this method was not the most common form of learning. Nurse 12 expressed the majority's experience with different types of learning media, "I think it was a mix . . . I think I saw video. I think I saw also the policy and procedures, yeah. They were presented to us . . ."

The role of the advanced practice nurse and nurse leaders influenced new workplace learning (see Figure 4), and nurses in the study explained that they worked together, looked towards the more experienced nurses for guidance, referred to policies and procedures, and called upon their nurse leaders when they had clinical questions. Figure 4 illustrates a flywheel representing workplace learning. Nurse educators and nurse leaders fueled the learning of hypothermia care, setting into motion a learning process wherein all components contributed in a synergetic and reciprocal way to generate momentum needed for learning on the job. Continual input from all parts was necessary to maintain learning, as well as to support the guidance and education provided by nurse educators and nurse leaders.

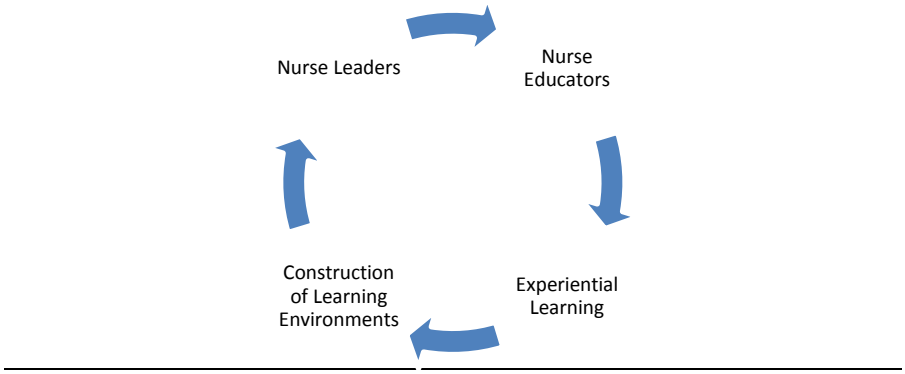

Figure 4. Synergy of learning in hypothermia care.

What Are the Obstacles to Workplace Learning?

Many nurses felt a degree of difficulty in comprehension before they had a chance to experience the procedures first hand and with a real patient. Obstacles to workplace learning were in part cognitive, and nurses overcame these cognitive obstacles to workplace learning through hands-on experience. Nurse 1 clarified, "Especially during the re-warming process that was explained, I didn't quite make the connections until I actually did it so that part of the class might have been clarified just a little bit." Nurse 3 also experienced difficulty understanding the method until the nurses had actually interacted with the process: "Sometimes it's a while before you have a patient with induced hypothermia . . ." Nurse 3 elaborated, ". . . Like everything else when it comes to the equipment, if you don't touch it for a couple months then when you do get don't touch it, cause you know learning is hands on."

Nurse 9 had a similar opinion and suggested, "You know, simulation is great, but is it really what's going to happen?" However, Nurse 9 made it clear: "I can't think of, of anything that I didn't like from when I took the course. I thought it was a good course when we took it, so, yeah, I think it was good training." Thus, the nurses did not perceive the course as being intrinsically flawed, but the nurses did not interpret the learning process as being complete until accomplishing fieldwork or learning to provide care to an actual patient.

What Influences Workplace Learning?

The trainers largely influenced workplace learning, suggesting that social and environmental factors influenced workplace learning. Trainers can be viewed as part of the social support and collaborative network of the learning environment. Nurse 3 specified, "The support was always there. There was always good support." Nurse 4 felt

that the learning process was also influenced by collaboration: “We all regrouped, looked at what worked, what didn't work, the inclusion, exclusion criteria with cardiology at the table. Um, and tweaked it to include the code heart aspect of the patient.” Nurse 12 added, “And of course the machines were always in the unit, so I used to work nights at one time so. When the time was available we would fiddle around with it a little bit.” The ability to take time to work closely and personally with the procedure was highly influential to the way that the nurses learned.

What Motivates Workplace Learning?

Instructors were a frequently cited source of motivation, suggesting that social and environmental factors motivated workplace learning. Similar to trainers, instructors, too, can be viewed as part of the social support and collaborative network of the learning environment. Nurse 1 explained that the instructor motivated the nurses. This instructor, Nurse 1 indicated, “will literally—if you say listen I don't understand how this thing works, she will sit there and show you thru demonstration she'll bring out books, explanation.” Nurse 1 also cited being motivated by “The fact that there were different materials that were being used. Because she [the instructor] made it interactive.” According to Nurse 3, “Anne was also very much involved, and she's very informative and very supportive.” Nurse 4 was motivated by extrinsic sources as well. For this nurse, “The actual . . . going to North Carolina, speaking to people who were doing it and actually seeing a patient” sparked an interest and contributed to the motivation to learn these skills and produce more success stories.

Measurement of Successful Learning

Many of the sampled nurses indicated that learning was measured by the completion of competency assessments. Nurse 1 recalled a formal indicator to having successfully learned the material and described this procedure as the following: "When you're done, when you're successfully been checked off . . . And they also check you off, as far as competencies as far as the machine itself and some of the other equipment . . ." Nurse 9 provided a similar explanation of the measure of success:

> Well, we have yearly competencies that we do, so, you know, that's part of, you know, what we have to do. We . . . not only do we, do we have take part [*sic*], we also have to be validators.

As a validator, Nurse 9 explained that one must watch another nurse set up the machine and make sure that this is done correctly. This experience was reported as a part of the yearly competency assessment and, together with having individual skills validated, were the actual measurements of nurse success when working with induced hypothermia.

What Part Does An Organization Play In Developing A Nurse?

A majority of the sample felt that the hospital was integral to the process of learning, but more importantly, it was the way that this sample of learners received support and confidence. Nursing development involved a combination of environmental and social elements, including organizational support in the form a skills fairs and the support of experienced nurses. Nurse 1 stated, "I work night shift so you have a lot of strong veterans who've been who've been doing it so when I first started doing it, it wasn't tremendously overwhelming." The support of others in the organization, who had experience and were willing to share, was perceived as the most useful role that the organization could play in the learning process. In this way, the organization's role could

be seen as retaining and developing individuals who act as a source of support and knowledge.

Nurse 3 noted the organization's yearly skills fair. This nurse indicated that not only was the skills fair a helpful aspect of a nurse's development, but that the fair was a chance for staff to encourage one another. Nurse 3 described the following:

> So a lot of it [development] we get from our skills fair. Which is a yearly thing. And in between staff is always encouraged to—especially staff who was in school or more versed in certain areas they are encouraged to maybe do a little in-services.

Nurse 4 specified that core groups go to conferences for further information regarding the procedures. These conferences served as a way that the organization keeps abreast of updates and changes, which are brought back to the organization itself and shared among nurses and doctors.

What Part Does the Environment Play in Developing a Nurse?

The environment in this hospital was one of support and encouragement, indicating the importance of both a positive organizational setting and supportive social network in nurse development. Nurse 1 indicated the following:

> You know, you're never in the room alone especially on your first go around. So they really do give you support that way. And then once you get comfortable you know, you start doing it more often. Just like riding a bike.

Nurse 3 also made specific note of the supportive and encouraging environment in the hospital. This individual specified, "When we do have a hypothermia patient, I must say the challenges are minimized because we have the support system in place . . . In terms of my coworkers who I work with." Nurse 5 stated, "A lot of the times we're . . . everyone's in each other's rooms helping each other out, we have really good teamwork."

Where Does Learning Take Place?

Each of the surveyed nurses discussed the courses and workshops used to introduce the nurses to the processes and procedures of induced hypothermia. Learning cut across both cognitive and environmental dimensions as learning involved supplementing classroom content knowledge with on-the-job learning.

Nurse 1 explained, "They send you to a class. And it's specific to hypothermia. They show you how to use the cooler, the machine . . . as far as the class, the training." Nurse 2 also spoke about this mandatory course: "It was a course that we had to take and get signed off on by the people that manufactured the induced hypothermia machine along with the nurse educators here." While much of the learning occurred onsite, Nurse 5 indicated that the nurses completed some training online: "There's e-path on the computer, computer training that we could do."

Although Nurse 4 attended the courses, the nurses also suggested that they were self-taught. "I taught me," Nurse 4 explained, "It was all by reading. The reps came in and taught me about the machine, but I . . . it was all just from reading, studies that had been done, publications, and case studies." This explanation suggests that learning is not entirely structured and even outside of the scope of hands-on learning, nurses may take an interest and take part in independent research.

However, Nurse 4 indicated that some of the nurses attended an international conference, which was separate from the acute care facility's training courses, just prior to going live with induced hypothermia at their facility. This same nurse also hosted a course four times a year at a local college away from the hospital. Nurse 6 also participated in some training at a separate Florida college and discussed participation in a

symposium at a major university in South Florida.

Aside from formal classes, many nurses stressed the importance of on-the-job training and felt that this aspect of learning was highly helpful and possibly the most applicable. The only way to understand the procedure, the nurses argued, was by completing the actual process on a real patient.

Nurses Use of Gained Knowledge to Enhance Patient Care

Although some nurses met the process with doubt, a majority felt pride and satisfaction from the ability to use this groundbreaking procedure, suggesting an emotional dimension to learning about hypothermia procedures and care. Nurse 1 recalled an instance that came as a shock during the primary stages of induced hypothermia's implementation at the acute care facility:

> I'll never forget, he was my first patient and he woke up and he was able to follow commands and he walked out of here. So I was really encouraged by that and then my second patient did the same thing. So. When that happens like wow this really works. So that was a good feeling.

Nurse 3 also recalled an experience with a man who made a full recovery against all odds. Nurse 3 stated, "This was a guy who everyone expected [not to make it]—so I'm like ok so, that was like a wild experience for me." This nurse's perception was one of exuberant disbelief. Nurse 5 had similar experiences with the treatment, citing "Overall, I really enjoy it. It's a great experience, I like the challenge and they're near the same, every patient's different. And it's . . . when you do have a good outcome it's really liberating to see the outcome."

In addition to the satisfaction with successful treatments, others felt that the procedure was fun. Nurse 8 explained,

The patient care itself, it's actually pretty, pretty exciting and fun, especially in

> the beginning because there's just so much involved and so many different things to monitor on how often and so many different drips that are necessary on top of whatever may be ongoing for the patient.

Nurse 9 elaborated on how exciting the procedure can be. Nurse 9 stated, "It's exciting, and like I said, the most part it's always rewarding when they wake up without the deficits and make it out of the hospital."

Summary

The purpose of this qualitative phenomenological study was to examine how nurses experience the process of learning to treat patients using induced hypothermia. Chapter 4 included a restatement of this purpose as well as the procedures used in collecting, coding, and organizing data. This chapter outlined the sample from which phenomenological data described the results with excerpts taken as direct quotes from the participants during the interviews. The researcher identified findings pertinent to the overarching research question and presented information to support each theme to inform each of the subresearch questions. Findings included the four main themes of social, environmental, cognition, and emotional aspects of training and 12 subthemes that fell into one of the overarching four themes. Chapter 5 will involve an examination of these findings relating to the extant literature. The researcher will assess the results for their significance to the body of knowledge and prescribe suggestions for future research.

Chapter Five

Discussion and Summary

How workplace learning occurs for nurses learning to care for induced hypothermia patients in a critical care setting was the focus of the qualitative study. Workplace learning remains a fundamental component of how nurses learn new knowledge and develop skills (Benner, 1982). Induced hypothermia is a relatively new treatment modality for which procedural guidelines and care recommendations are only beginning to emerge. The participants of the study did not have prior experience caring for hypothermia patients. During the past 10 years, a training program was developed, and nurses trained on site. The present study findings illuminated how the nurses learned to care for hypothermia patients. As a new procedure, induced hypothermia is complex, tense, and time-sensitive (Avery et al., 2015). The present study involved an exploration of how nurses acquire new knowledge and become competent to care for hypothermia patients. The chapter contains a summary of findings, an integration of the findings with previous literature and theory, and a discussion of the implications of the findings.

Summary of the Findings

The nurses interviewed in the study described a workplace in which their learning was a form of experiential learning as the nurses actively participated in the care they provided to patients. All of the participants reported that participating in hands-on patient care enhanced and expanded their formal learning. In addition to the experiential learning of actively participating in hypothermia care, the nurses constructed their

workplace learning environment with the help of nurse leaders and nurse educators. Nurses helped construct this environment by creating policies and procedures, developing a hypothermia cart, creating a procedure book, scheduling a hypothermia nurse on shift at all times, and upholding ongoing training. These measures provided guidance and security to ensure that the nurses provide a high level of care to hypothermia patients. Nurse educators and nurse leaders led the learning of hypothermia care and helped set into motion a learning process wherein nurses and nurse educators contributed in a synergetic way to generate momentum needed for learning on the job. Continual input from all staff was necessary to maintain learning, and support the guidance and education provided by nurse educators and nurse leaders.

Theoretical Framework

In the present study, four overarching themes corresponded to Illeris' (2003b) three dimensions of learning, including cognitive, emotional, and environmental-social dimensions. In addition, 12 subthemes emerged that pertained to the central research question. Participants discussed annual and ongoing training, hands-on modes of learning, protocols, and available resources, which emerged under the overall theme of cognition. Some participants discussed their families, concerns about patient outcomes, and receiving recognition, all classified under the theme of emotion. The environmental challenges of learning, constant updating of skills, and the induced hypothermia cart were all pertinent subthemes to environment. In addition, both the support of colleagues and involvement of the team emerged as significant factors to the social dimension of workplace learning.

In addition to explaining the cognitive, emotional, and environmental-social dimensions of learning, Illeris' (2003b) theory of workplace learning also holds that adult workplace learners who hold secure work positions may seek to continue developing competencies to become further qualified and advance their careers. Illeris' idea of workplace learning and advancement applies to experienced nurses seeking to advance their skills and careers by participating in unconventional, advanced health care, such as the care associated with induced hypothermia. The uniqueness of induced hypothermia procedures and care afforded nurses opportunities to develop new skills and untapped facets of their professional identities. In addition, workplace learning for participants involved a sense of pride and uniqueness. One participant stated, "We're doing this cutting edge [work]."

Integration of the Findings with Previous Literature

For the participants, the learning environment included training strategies and keeping skills updated, which are important components to staff development (Benner et al., 2010). In addition, ongoing staff development and workplace learning involved a combination of self-directed and formal learning practices. Participants reported that they engaged in a large amount of ongoing learning through seeking out hands-on opportunities to learn; searching the Internet; and through formal delivery methods, such as skills fairs. This finding supports that workplace learning is an important way that nurses learn (Benner et al., 2010) and nurses engaged in workplace learning that was largely active, self-directed, self-motivated, and goal-oriented (McAuliffe et al., 2008; Merriam et al., 2007). Ongoing staff development and education is essential to ensure the effectiveness of professional nurses' learning experiences, and findings indicate that

this education is especially important in complex nursing situations requiring highly specialized knowledge, such as required for induced hypothermia (Abella et al., 2005).

Cognitive Dimensions to Workplace Learning

All twelve study participants described the importance of hands-on or actual experiences in learning how to care for hypothermia patients. In addition, most participants indicated that hands-on learning largely supplemented their formal training of PowerPoint presentations and handouts. One nurse stated, "It's [the training program] been a while, but however that doesn't really prepare you for when you get your first patient." This finding confirms that a crucial way nurses learn is through actual experience in the workplace and supports experiential learning approaches, which hold that people learn through participation and through experience (Benner et al., 2010; Rogers, 1969). Nurses learned how to care for induced hypothermia patients by participating in the care of the patients. The nurses interviewed described themselves as tactile, hands-on learners who shared the common belief that the best way for a nurse to care for a hypothermia patient was to allow the inexperienced nurse the opportunity to learn through hands-on experience. However, the nurses also believed that it was important that inexperienced nurses learn collaboratively and work alongside nurses experienced in induced hypothermia care.

Participants also reported their reliance on existing protocols and other resources in learning to care for induced hypothermia patients. This finding suggests that nurses learning to care for induced hypothermia patients may be at Benner's (1982) advanced beginner stage of learning even though nurses were experienced in other aspects of nursing. At this stage, nurses learn from experience and begin to apply that knowledge to

new situations; however, nurses still need help and guidance with various situational aspects. In the present study, nurses relied on existing protocols to help them learn to care for induced hypothermia patients. A novel finding was that nurses also relied on other resources in learning to care for patients, such as cell phones, colleagues, and independent research. Nurses reported using cell phone applications and Internet searches on their phones to access information and to learn about technology and procedures. This finding suggests that outside and additional resources may enhance and facilitate nurses' cognitive requirements, including knowledge and the memorization of equipment, processes, and procedures and that nurses are motivated to take advantage of various means at their disposal to help learn necessary skills. Using outside or additional sources supports theories of adults in the workplace as largely active, self-directed, self-motivated, and goal-oriented learners (McAuliffe et al., 2008; Merriam et al., 2007).

Emotional Dimensions to Workplace Learning

Learning how to care for induced hypothermia patients also involved emotional dimensions, such as those related to patients' families, patients' outcomes, and the feelings associated with the recognition of a job well done. This finding aligns with the findings of McNamee et al. (2009), who found that the learning process of medical students completing autopsies as part of their medical education occurred in the emotional dimension as well as the cognitive because this learning experience helped the students deal with and understand death on a professional level. Emotionally, nurses must deal with affectively taxing and stressful situations, such as trauma, illness, and death. Nurses also often interact and communicate with the families of patients.

Every participant verbalized ethical concerns for patients' families and patients' outcomes. The families of patients in the present study represented an emotional dimension that affected how nurses learned on the job. Participants felt that family members of patients added stress to their working and learning environments as well as an ethical dimension. Participants reported that family members of patients needed emotional support and explanation from nurses. One participant in the present study explained:

> Families really have a hard time. They really do. And when it comes right down to it you are taking care of the patient and the family. Cause they are, I am telling you that I haven't met a family member who hasn't been freaked out.

In addition, worrying about outcomes (e.g., if induced hypothermia actually helped patients) and recognition of nurses' efforts represented other emotional dimensions of working with induced hypothermia patients. Benner et al. (2010) stated that nurses often learn on the job in less-than-optimal situations. The findings of the study suggest that the emotional dimensions of learning on the job for nurses may be a component of such less-than-optimal situations that require additional practical and theoretical attention.

Environmental-Social Dimensions to Workplace Learning

Environmental-social dimensions in the present study included the induced hypothermia cart, challenges of performing induced hypothermia, the training environment for keeping skills updated, support for colleagues and mentors, and teamwork. For the participants, the induced hypothermia cart represented an integral part of their working and learning environments. Because the cart contained the supplies the nurses needed to carry out protocol and procedures for induced hypothermia patients,

nurses saw the cart as a central resource and a reminder for their knowing the exact expectations. One nurse described the cart as a "safety blanket." Nurses saw the cart as a place where needed materials, such as equipment or important procedural information, were located. Insufficient research exists on how nurses learn on the job in relation to newly instituted and complex procedures (Oermann, 2007), such as induced hypothermia (Avery et al., 2015). The findings from the nurses suggested that reliable and predictable environmental factors may help nurses focus and learn in otherwise complex and demanding situations.

In addition, the nurses talked about complexity and demands of preparing for the procedure of induced hypothermia, which involved preparing the patient and the room as well as setting up the necessary equipment. Social and institutional environments are important external components that influence learning (Allan et al., 2008). In workplace learning, social and environmental dimensions matter much more than they do in classroom learning environments wherein learning is largely content-driven and divorced from hands-on interaction with work environment factors (Allan et al., 2008). The nurses' workplace environment presents challenges unique to the workplace and not found in classroom environments (Allan et al., 2008). In the present study, participants indicated that preparing rooms for induced hypothermia was challenging and that challenges involved both environmental and social dimensions. For example, it takes about 2 to 3 hours to prepare a room for the procedure, which involves setting up equipment and coordinating care between all of the departments involved. In addition, nurses described the importance of communication from the prehospital setting to the emergency department and then to the critical care unit. The nurses must maintain a

continuum of care to ensure that the correct information is shared with each of the interdisciplinary teams caring for the patient.

However, learning procedures and care in this challenging environment also included social support from colleagues, mentors, in-house trainers, and experienced team members. Socially, nurses must interact with doctors, patients, and work in conjunction with the entire team, and social dimensions are present in any learning situation (Allan et al., 2008). Participants reported support systems in the form of in-house trainers who were available at all times, so participants never felt that they were completely on their own. Participants felt that the level of support actually boosted their confidence. In addition, participants reported that experienced team members made them feel at ease and more comfortable in tense working environments. One participant described the availability of experienced team members as a "comfort zone." This finding suggests that nurses at Benner's (1992) advanced beginner stage of competence require social support to effectively learn about and address on-the-job contingencies.

The main theme described by every nurse interviewed was the necessity to have hands-on experience to feel competent in their care for induced hypothermia patients. Teamwork and mutual support were important resources, but not as important as the nurse educator, who were the nurses' first resource and their clinical guide. The complexity of the environment and preparing the equipment prior to the patient arriving for the procedure presented challenges to learning. All of the nurses described the empathy they felt for family members and feelings of anticipation to learn if their patient would wake up, suggesting an ethical dimension to the workplace learning experience.

In addition, nurses of the unit felt as if they had a special identity because of their unique work of providing hypothermia care. As one nurse explained, "We are making history."

Conclusions

Conclusions drawn from the findings of the present study include the following:

- Novice nurses paired with experienced nurses was effective for learning new knowledge.
- Nurses sought out one another as resources.
- Nurses preferred hands-on learning.
- Nurses helped create the learning environment.
- Nurses believed that this was special work and that they were making history.
- Nurse educators fueled synergetic learning processes.

Implications and Recommendations

Caring for the hypothermia patient is a new phenomenon in the field of nursing, requiring nurses to learn information specific to this procedure and population. Information collected from the study led to a better understanding regarding how nurses learn on the job, particularly in situations that require acquiring new knowledge and skills; caring for critically ill patients; and working in stressful, less-than-ideal environments. The findings from the present study can help to establish best instructional strategies to provide care for critically ill patients and contribute to literature on how nurses learn in the workplace.

The concept of knowledge transfer from the classroom to the practice setting is necessary to prepare our practicing and future nurses. To improve the quality of health care delivery the valuation of nurses' ability to investigate and utilize best practices is

essential. How we prepare our practicing nurses to utilize evidence-based nursing is vital to the advancement of nursing education science. The goal of evidence-based nursing is taking the best available evidence from the literature to achieve the best possible outcomes **(**Stacey, Domecq, Crawley, & Doucet, 2015). Publications and research studies will contribute to the advancement of nursing education science as we share them with our profession.

Staff Development and Nursing Education

The nurses on this unit received training in induced hypothermia care and procedures by attending a formal class that included didactic training, which explained induced hypothermia and how it worked. Nurses received handouts and instructions of hospital protocol with repeated demonstrations of setting up equipment. When the hospital admitted the first several hypothermia cases, the advanced practice nurse was present to assist nurses and provide support. Nurses then became validators and were able to complete the training process for other nurses. The nurses had the opportunity to attend in-service sessions and complete annual training covering hypothermia. To keep their skills updated, nurses often volunteered to assist caring for a hypothermia patient.

The present study did not involve use of the recent approach of learning through simulation (Leigh, 2011; Nickerson et al., 2011). Rather, active learning occurred by pairing new learners with experienced clinicians in actual on-the-job situations. Avillion (2008) observed that staff development often occurs by nurse educators conducting on-the-job training sessions and orientations for nursing staff. The findings of the present study indicated the importance of on-going formal training in conjunction with hands-on training with experienced nurses and nurse-educators. Consequently, nurse educators

should develop training programs that ensure a combination of formal and hands-on learning opportunities. The nurses were also motivated to seek out knowledge through cell phone applications and the Internet. Nurse educators should create opportunities for nurses to share the findings of their own research during training sessions in order to validate self-motivation efforts, facilitate teamwork, and disseminate potentially useful information. Recommendations also include introducing nurses to and preparing them for ethical issues they may encounter in challenging and unique nursing situations.

Nursing Research

As suggested by the findings, future avenues of research regarding nursing education include more research about how nurses learn in challenging and unique care situations other than induced hypothermia. Such information would add to the literature pertaining to how nurse learning is specific to clinical environments and would help identify factors that are common and different in various situations that may affect learning. Future researchers might also address how nurses' motivation to learn on their own influences how and what they learn as well as the sources they use for additional information. In addition, more research on reliable and predictable environmental factors that help nurses focus and learn in otherwise complex and demanding experiential situations would add to the literature as well as forms of social support and teamwork that facilitate hands-on learning for nurses. Further investigation regarding how experienced nurses revert to advanced-beginners in relation to learning new procedures and care as well as the role nurse-educators play in workplace learning for nurses. Future researchers should focus on how emotional stress and ethical issues involved in patient care may influence how nurses learn on the job.

Public Policy

Various hospitals are adopting therapeutic hypothermia, triggering the need not only for more research in this area but also for more in-depth development of hypothermia programs. Cardiac arrest associated with coronary heart disease is one of the primary reasons patients undergo therapeutic hypothermia. Coronary heart disease is the most common type of heart disease, killing more than 385,000 people annually (Kochanek et al., 2011) and is a frequently cited contributor to cardiac arrest. Coronary heart disease alone costs the United States $108.9 billion each year in health care services, medications, and lost productivity (Heidenreich et al., 2011). Findings from the study may help to inform formal policy and legislative issues that support this practice area.

Developing and implementing induced hypothermia protocols based on empirical evidence and best practice models is an important practice change that has demonstrated improvement in neurological outcomes for post-cardiac arrest patients. The International Liaison Committee on Resuscitation and the American Heart Association has been instrumental in providing guidelines about the approach needed to care for the patients. However, researchers need to conduct more work to develop standardized protocols and standardized training programs for cooling patients. Furthermore, cooling is a type of care many hospitals have not yet implemented because of a lack of data and the cost of resources (Cady & Andrews, 2009).

Induced hypothermia is a new phenomenon introduced into practice in 2005 by the American Heart Association (Nolan, Deakin, Soar, Bottinger, & Smith, 2005). Only a small percentage of emergency departments and hospitals offer this type of therapy.

However, as the phenomenon grows, prehospital entities, emergency response programs, and hospitals will need to coordinate multidisciplinary plans and develop policy to provide this evidence-based care in their communities.

Limitations

Qualitative research is dependent on the skills and ability of the researcher conducting the study. Study outcomes maybe influenced by the researcher's personal bias, which makes trustworthiness an important component of the study (Polit & Beck, 2012). Findings in a qualitative study cannot be generalized to a larger population, but the findings can be transferable to other settings or groups (Munhall, 2010). The specific limitations for this study included the researcher's presence during data collection, which may have influenced a subject's response. The geographic area or restricting data collection to one hospital site may be a limitation. The small sample size may lead to issues of anonymity and confidentiality when presenting the findings.

Strengths and Limitations

Trustworthiness

The issue of trustworthiness is an important consideration for qualitative researchers and consists of credibility, dependability, confirmability, and transferability as the four factors that are necessary in establishing trustworthiness (Bloomberg & Volpe, 2012; Bowen, 2008). The study design was to ensure trustworthiness; however, limitations to the study existed. Consequently, readers should consider the findings with the limitations in mind.

Credibility

Rich description and peer review helped achieve credibility of the study. To achieve rich description results reflected true and accurate experiences of the participants. The researcher encouraged participants to provide honest and candid information throughout the interviews. Participants were encouraged to elaborate on responses that warranted additional explanation. Furthermore, the nurse educator who developed and directed the training program reviewed interview responses. However, lack of member checking represents a major limitation of the study. Participants' insights on the accuracy of their responses were not available due to the failure of participants to return their responses.

Dependability and Confirmability

In the study, the researcher used triangulation to address both dependability and confirmability by maintaining a journal to chronicle general insights and decisions relating to the study, documenting the researcher's perspective regarding data analysis, and capturing the basis of interpretations used to derive the research findings. Data analysis involved comparing the sources of data to one another to gain a more complete picture of the phenomenon.

Transferability

Because recruitment of the sample was from only one private not-for profit Magnet-designated facility in south Florida, the degree of transferability is low. In addition, the study focused on a highly specialized procedure and its aftercare: induced hypothermia. Therefore, the findings may not generalize to how nurses in other regions and clinical settings learn in relation to different procedures and patients. However,

qualitative researchers often aim to describe a unique phenomenon or experience rather than generate broad generalizations.

Personal Reflections

As a qualitative researcher, I reflect on how my findings will affect my future commitment to the science of nursing education. As a young student in this program and throughout my education tract, I have been asked, why a PhD? My response has been the same. I want to obtain a terminal degree to be able to contribute to the profession of nursing. My contributions could be in the areas of teaching, research, or leadership. My nurse leaders challenged me to continue my educational journey. This conversation was always troubling as some nurse leaders lack understanding of the need for nurses to obtain their advanced education.

During my program at Nova Southeastern University, I learned about different educational issues that affect the way we practiced nursing and developed our nursing scope of practice. I paid attention to the discussions, and my curiosity was piqued. I learned about the *practice versus education gap* that exists in nursing today. In retrospect, I experienced difficulty belonging to either group. I was in a practice role and trying to learn the role of the nurse educator. Later in my program, I became a new educator not as emotionally attached to the issues as some of my peers were, but it was easy to detect dissention among some of my peers as they closed ranks into two opposing camps.

Identification of my dissertation study focused on bedside nurses and how they learn to care for patients. I was not targeting the student nurse or the new graduate nurse. I was interested in the bedside or practicing nurse and how he or she learned new

knowledge when caring for patients. As a nurse leader, recognizing the importance of high performing teams or those teams with advanced skill levels and emotional maturity, my main inquiry regarded how to produce centers of clinical excellence. I entered into my study to reveal how nurses learn. I chose the hypothermia patient because hypothermia is a new treatment modality that requires nurses to learn new skills and knowledge.

The nursing team that I was able to recruit to participate in my study was a high performing team with outstanding team skills and passion for nursing care. They welcomed me into their unit and talked to me openly about their thoughts and experiences. I could not have asked for more cooperation or a better assignment to carry out my mission. What I discovered was that I was shaping a deeper understanding of the nurse educator role and how nurse educators influence nursing practice.

Today, I need to reflect on how I can assist in leading policy change so that the importance of the nurse educator is recognized. The educator needs to be a partner in leadership. The educator needs to have a place at the boardroom table to inform others about education policy. What I indirectly discovered was that the nurse educator influences nursing practice. My education program and the study will assist me to make a difference in the science of nursing education. For me, the most worthwhile aspect of this program was the requirement for self-engagement in the research process. I found it challenging by having to design my study, interview participants, categorize the data, and interpret the findings. This endeavor will remain high on my list of personal achievements. Having to do my own research was, I believe, more beneficial than any other part of the program.

Chapter Summary

The study provided insight into how critical care nurses learned to care for induced hypothermia patients in a hands-on instructional curriculum. Participants in this current study did not have prior experience at another hospital and did not have any prior education to care for hypothermia patients. The nursing literature is scarce on information regarding hypothermia care and instruction materials for procedures. The nursing participants reported that experiential learning was crucial to how the nurses learned on the job. Learning experiences consisted of cognitive, emotional, and environmental-social dimensions that align with Illeris' (2003b) learning theory. Cognitively, nurses learned by engaging in procedures and by working collaboratively and alongside nurses experienced in induced hypothermia care. Participants also reported their reliance on existing protocols and other resources, including formal presentations and informal use of cell phones to obtain information in learning to care for induced hypothermia patients and described how they constructed their learning environment. Emotional dimensions also influenced how participants learned. Participants talked about their experiences with pride, indicating that they were proud to be learning about the unique procedure in the special unit. In addition, participants discussed the emotionally stressful work environment that included supporting families and the ethical kinds of decisions the families must confront. Environmental-social factors that influenced workplace learning included experienced nurses who provided guidance as well as in-place protocols, ongoing training opportunities, and reliance on the induced hypothermia cart.

Findings of the study also suggest that in relation to induced hypothermia patients and procedures, nurses may be at Benner's (1982) advanced beginner stage of learning. Although participants were experienced nurses, they were not experienced in induced hypothermia care and procedures. Participants learned from experience and started to apply new knowledge to novel situations; however, nurses still needed help and guidance in various situational aspects. The results of the study confirmed that experiential learning is an important way that nurses learn on the job and provided a better understanding of how workplace learning occurs across cognitive, emotional, and environmental-social dimensions. A hypothermia program to care for induced hypothermia patients afforded the opportunity to study how nurses learn in a unique and challenging situation and concluded with all of the participants preferring hands-on experience when learning how to care for the patients. The results of the study also suggest that more research is needed regarding how nurse educators and nurse leaders influence learning across cognitive, emotional, and environmental-social dimensions to better prepare nurses for unique and challenging nursing tasks associated with evolving treatment and care procedures in clinical settings.

References

Abella, B. S., Rhee, J. W., Huang, K.-N., Vanden Hoek, T. L., & Becker, L. B. (2005). Induced hypothermia is underused after resuscitation from cardiac arrest: A current practice survey. *Resuscitation, 64,* 181–186. http://dx.doi.org/10.1016/j.resuscitation.2004.09.014

Aiken, L. H., Clarke, S. P., Cheung, R. B., Sloane, D. M., & Silber, J. H. (2003). Educational levels of hospital nurses and surgical patient mortality. *Journal of American Medical Association, 290,* 1617–1623. http://dx.doi.org/10.1001/jama.290.12.1617

Allan, H. T., Smith, P. A., & Lorentzon, M. (2008). Leadership for learning: A literature study of leadership for learning in clinical practice. *Journal of Nursing Management, 16,* 545–555. http://dx.doi.org/10.1111/j.1365-2834.2007.00817.x

Anderson, C. (2010). Presenting and evaluating qualitative research. *American Journal of Pharmaceutical Education, 74*(8), 141. doi:10.5688/aj7408141

Andrews, C. A., Ironside, P. M., Nosek, C., Sims, S. L., Swenson, M. M., Yeomans, C., . . . Diekelmann, N. (2001). Enacting narrative pedagogy. *Nursing and Health Care Perspectives, 22,* 252–259. http://dx.doi.org/10.1043/1094-2831(2001)022<0252:ENP>2.0.CO;2

Arrich, J., Holzer, M., Herkner, H., & Müllner, M. (2009). Hypothermia for neuroprotection in adults after cardiopulmonary resuscitation. *Cochrane Database of Systematic Reviews, 2009*(4). http://dx.doi.org/10.1002/14651858.CD004128.pub2

Avery, K. R., O'Brien, M., Pierce, C. D., & Gazarian, P. K. (2015). Using a nursing check list to facilitate implementation of therapeutic hypothermia after a cardiac arrest. *Critical Care Nurse*, *35*(1), 29-37.

Avillion, A. E. (2008). *A practical guide to staff development: Evidence-based tools and techniques for effective education* (2nd ed.). Marblehead, MA: HCPro.

Beddingfield, E., & Clark, A. P. (2012). Therapeutic hypothermia after cardiac arrest: Improving adherence to national guidelines. *Clinical Nurse Specialist, 26,* 12–18. http://dx.doi.org/10.1097/NUR.0b013e31823f8a02

Bailey, P. H. (1996). Assuring quality in narrative analysis. *Western Journal of Nursing Research*, *18*, 186–194. http://dx.doi.org/10.1177/019394599601800206

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84,* 191–215. http://dx.doi.org/10.1037/0033-295x.84.2.191

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*.

Englewood Cliffs, NJ: Prentice-Hall.

Benner, P. (1982). From novice to expert. *The American Journal of Nursing, 82,* 402–407. http://dx.doi.org/10.2307/3462928

Benner, P. (1984). *From novice to expert.* Boston, MA: Addison-Wesley.

Benner, P., Sutphen, M., Leonard, V., & Day, L. (2010). *Educating nurses: A call for radical transformation.* Stanford, CA: Jossey-Bass.

Benson, D. W., Williams, G. R., Jr., Spencer, F. C., & Yates, A. J. (1959). The use of hypothermia after cardiac arrest. *Anesthesia and Analgesia, 38,* 423–428. http://dx.doi.org/10.1213/00000539-195911000-00010

Bernard, S. A., Gray, T. W., Buist, M. D., Jones, B. M., Silvester, W., Gutteridge, G., & Smith, K. (2002). Treatment of comatose survivors of out-of-hospital cardiac arrest with induced hypothermia. *New England Journal of Medicine, 346,* 557–563. http://dx.doi.org/10.1056/NEJMoa003289

Bloomberg, L. D., & Volpe, M. (2012). *Completing your dissertation: A roadmap from beginning to end* (2nd ed.). Thousand Oaks, CA: Sage.

Bowen, G. A. (2008). Naturalistic inquiry and the saturation concept: A research note. *Qualitative Research, 8*(1), 137–152. doi:10.1177/1468794107085301

Brandon, F., & All, A. C. (2010). Constructivism theory analysis and application to curricula. *Nursing Education Perspectives*, *31*(2), 89–92. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/20455364

Britten, N. (1995). Qualitative interviews in medical research. *BMJ: British Medical Journal*, *311*(6999), 251–253.

Bruner, J. S. (1977). *The process of education: A landmark in education theory.* Cambridge, MA: Harvard University Press.

Buerhaus, P. I. (2012). What will happen to the nursing workforce in the years ahead? *Tar Heel Nurse, 74*(3), 10–11. Retrieved from http://www.ncnurses.org/

Buerhaus, P. I., Auerbach, D. I., Staiger, D. O., & Muench, U. (2013). Projections of the long-term growth of the registered nurse workforce: A regional analysis. *Nursing Economics*, *31*(1), 13–17. Retrieved from hhtp://www.ncbi.nlm.nih.gov/pubmed/23505738

Cady, C., & Andrews, S. (2009). Prehospital resuscitated cardiac arrest patients: Role for induced hypothermia. *Prehospital Emergency Care, 13,* 402–405. http://dx.doi.org/10.1080/10903120902935314

Carper, B. A. (1978). Fundamental patterns of knowing in nursing. *Advanced in Nursing*

Science, 1(1), 13–24. http://dx.doi.org/10.1097/00012272-197810000-00004

Carrick, J. A. (2011). Student achievement and NCLEX-RN success: Problems that persist. *Nursing Education Perspectives, 32,* 78–83. http://dx.doi.org/10.5480/1536-5026-32.2.78

Chinn, P. I., & Kramer, M. K. (2008). *Intergrated theory and knowledge development in nursing*. St. Louis, MO: Mosby/Elsvier

Clark, V. L. P., & Creswell, J. W. (2014). *Understanding research: A consumer's guide*. London, UK: Pearson.

Converse, M. (2012). Philosophy of phenomenology: How understanding aids research. *Nurse Researcher, 20*(1), 28–32. http://dx.doi.org/10.7748/nr2012.09.20.1.28.c9305

Cooper, C. R., & Schindler, P. S. (2008). *Business research methods* (10th ed.). Boston, MA: McGraw-Hill.

Corbin, J., & Straus, A. (2008) *Basics of qualitative research* (3rd ed.). Thousand Oak, CA: Sage.

Coyne, I. T. (1997). Sampling in qualitative research. Purposeful and theoretical sampling: Merging or clear boundaries? *Journal of Advanced Nursing*, 26, 623–630. http://dx.doi.org/10.1046/j.1365-2648.1997.t01-25-00999.x

Creswell (2014) *Research design: Qualitative, quantitative and mixed method approaches* (3rd ed.). Thousand Oaks, CA: Sage.

Crotty, M. (1996). *Phenomenology and nursing research*. Melbourne, AU: Churchill Livingstone.

Dainty, K. N., Scales, D. C., Brooks, S. C., Needham, D. M., Dorian, P., Ferguson, N., . . . Morrison, L. J. (2011). A knowledge translation collaborative to improve the use of therapeutic hypothermia in post-cardiac arrest patients: Protocol for a stepped wedge randomized trial. *Implementation Science, 6*(4). doi:10.1186/1748-5908-6-4

Dervin, B., Foreman-Wernet, L., & Lauterbach, E. (2003). *Sense-making methodology reader: Selected writings of Brenda Dervin*. New York, NY: Hampton Press.

Desbiens, J., Gagnon, J., & Fillion, L. (2012). Development of a shared theory in palliative care to enhance nursing competence. *Journal of Advanced Nursing, 68*(9), 2113–2124. doi:10.1111/j.1365-2648.2011.05917.x

DiCicco-Bloom, B., & Crabtree, B. F. (2006). The qualitative research interview. *Medical Education, 40,* 314–321. doi:10.1111/j.1365-2929.2006.02418.x

Diekelmann, N. (2002). Engendering community: Learning and sharing expertise in skills and practices of teaching. *Journal of Nursing Education, 41,* 241–242. Retrieved from http://www.healio.com/journals/jne

Drisko, J. W. (1997). Strengthening qualitative studies and reports: Standards to promote academic integrity. *Journal of Social Work Education, 33*(1), 185–197.

Earle, V. (2010). Phenomenology as research method or substantive metaphysics? An overview of phenomenology's uses in nursing. *Nursing Philosophy, 11,* 286–296. http://dx.doi.org/10.1111/j.1466-769X.2010.00458.x

Ferrari, M., Robinson, D. K., & Yasnitsky, A. (2010). Wundt, Vygotsky and Bandura: A cultural-historical science of consciousness in three acts. *History of the Human Sciences 23*(3), 95–118. http://dx.doi.org/10.1177/0952695110363643

Forbes, M. O., & Hickey, M. T. (2009). Curriculum reform in baccalaureate nursing education: Review of the literature. *International Journal of Nursing Education Scholarship, 6*(1). http://dx.doi.org/10.2202/1548-923X.1797

Francis, J., Johnston, M., Robertson, C., Glidewell, L., Entwistle, V., Eccles, M. P., & Grimshaw, J. M. (2010). What is an adequate sample size? Operationalizing data saturation for theory-based interview studies. *Psychology & Health, 25*(10), 1229–1245. doi:10.1080/08870440903194015

Gantt, L. T. (2010). Using the Clark simulation evaluation rubric with associate degree and baccalaureate nursing students. *Nursing Education Perspectives, 31,* 101–105. http://dx.doi.org/10.1043/1536-5026-31.2.101

Gardner, G., & MacDonald, S. (2013). Caring for patients receiving therapeutic hypothermia post cardiac arrest in the intensive care unit. *Canadian Journal of Cardiovascular Nursing, 23*(3), 15–17. Retrieved from http://pappin.com/journals/cjcn.php

Giorgi, A. (2002). The question of validity in qualitative research. *Journal of Phenomenological Psychology,* 33(1). Retrieved from http://education2.uvic.ca/faculty/hfrance/research/validity.pdf

Go, A. S., Mozaffarian, D., Roger, V. L., Benjamin, E. J., Berry, J. D., Blaha, M. J., . . . Turner, M. B. (2014). Executive summary: Heart disease and stroke statistics—2014 update: A report from the American Heart Association. *Circulation, 129,* 399–410. http://dx.doi.org/10.1161/01.cir.0000442015.53336.12

González-Ibarra, F. P., Varon, J., & López-Meza, E. G. (2011). Therapeutic hypothermia: Critical review of the molecular mechanisms of action. *Frontiers in Neurology, 2*(4). http://dx.doi.org/10.3389/fneur.2011.00004

Groenewald, T. (2004). A phenomenological research design illustrated. *International Journal of Qualitative Methods, 3*(1). Retrieved from

http://www.ualberta.ca/~iiqm/backissues/3_1/pdf/groenewald.pdf

Guba, E. G., & Lincoln, Y. S. (1982). Epistemological and methodological bases of naturalistic inquiry. *Educational Communication and Technology Journal*, *30*(4), 233–252.

Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough?: An experiment with data saturation and variability. *Field Methods, 18*(1), 59–82. doi:10.1177/1525822X05279903

Hachimi-Idrissi, S., Corne, L., Ebinger, G. Michotte, Y., & Huyghens, L. (2001). Mild hypothermia induced by a helmet device: A clinical feasibility study. *Resuscitation, 51,* 275–281. http://dx.doi.org/10.1016/S0300-9572(01)00412

Hammersley, M. (1992). *What's wrong with ethnography? Methodological exploration*. London, UK: Routledge.

Handwerker, S. M. (2012). Transforming nursing education: A review of current curricular practices in relation to Benner's latest work. *International Journal of Nursing Education Scholarship, 9*(1). http://dx.doi.org/10.1515/1548-923X.2510

Harden, J. (2011). Take a cool look at therapeutic hypothermia. *Nursing 2014, 41*(9), 46–51. Retrieved from http://www.nursingcenter.com/lnc/

Hean, S., Craddock, D., & O'Halloran, C. (2009). Learning theories and interprofessional education: A user's guide. *Learning in Health and Social Care, 8,* 250–262. http://dx.doi.org/10.1111/j.1473-6861.2009.00227.x

Heidegger, M. (1992). *Being and time*. Oxford, UK: Basil Blackwell.

Heidenreich, P. A., Trogdon J. G., Khavjou O. A., Butler, J., Dracup, K., Ezekowitz, M. D., . . . American Heart Association. (2011). Forecasting the future of cardiovascular disease in the United States: A policy statement from the American Heart Association. *Circulation, 123*(8), 933–944. http://dx.doi.org/10.1161/cir.0b013e31820a55f5

Herr, D. L., & Badjatia, N. (2009). Therapeutic temperature management: Why, who, when, where, and how. *Critical Care Medicine, 37*, S185. http://dx.doi.org/10.1097/CCM.0b013e3181af4f4b

Herbert, P. C., & Lohrmann, D. K. (2011). It's all in the delivery! An analysis of instructional strategies from effective health education curricula. *Journal of School Health, 81,* 258–264. doi: 10.1111/j.1746-1561.2011.00586.x

Holy Cross Hospital. (n.d.). Holy Cross Hospital joins an elite group of hospitals around the world adopting live-saving technology. Retrieved from https://www.holy-cross.com/holy-cross-hospital-joins-elite-group-hospitals-around-world-adopting-life-saving-technology

Holzer, M. (2002). Mild therapeutic hypothermia to improve the neurologic outcome after cardiac arrest. *New England Journal of Medicine, 346,* 549–556. http://dx.doi.org/10.1056/NEJMoa012689

Holzer, M., & Behringer, W. (2005). Therapeutic hypothermia after cardiac arrest. *Current Opinions in Anaesthesiology, 18,* 163–168. http://dx.doi.org/10.1097/01.aco.0000162835.33474.a9

Husserl, E. (1962). *Ideas: General introduction to pure phenomenology.* New York, NY: Collier Books.

Hycner, R. H. (1999). *Some guidelines for the phenomenological analysis of interview data*. In A. Bryman & R. G. Burgess (eds.), *Qualitative research* (Vol. 3, pp. 143–164).

Hypothermia After Cardiac Arrest Study Group. (2002). Mild therapeutic hypothermia to improve the neurologic outcome after cardiac arrest. *New England Journal of Medicine, 346,* 549–556. http://dx.doi.org/10.1056/NEJMoa012689

Illeris, K. (2003a). Towards a contemporary and comprehensive theory of learning. *International Journal of Lifelong Education, 22,* 396–406. http://dx.doi.org/10.1080/02601370304837

Illeris, K. (2003b). Workplace learning and learning theory. *Journal of Workplace Learning, 15,* 167–178. http://dx.doi.org/10.1108/13665620310474615

Illeris, K. (2004). A model for learning in working life. *Journal of Workplace Learning, 16,* 431–441. http://dx.doi.org/10.1108/13665620410566405

Institute of Medicine. (2010). *The future of nursing: Leading change, advancing health.* Washington, DC: National Academies Press.

Kochanek, K. D., Xu, J. Q., Murphy, S. L., Miniño, A. M., & Kung, H. C. (2011). Deaths: Final data for 2009. *National Vital Statistics Reports, 60*(3). Retrieved from http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_03.pdf

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall.

Koran, Z. (2009). Therapeutic hypothermia in the postresuscitation patient: The development and implementation of an evidence-based protocol for the emergency department. *Journal of Trauma Nursing, 16,* 48–57. http://dx.doi.org/10.1097/01.JTN.0000348070.09712.40

Krefting, L. (1990). Rigor in qualitative research: The assessment of trustworthiness. *The American Journal of Occupational Therapy: Official Publication of the American Occupational Therapy Association, 45,* 3, 214–222. Retrieved from http://ajot.aotapress.net/content/45/3/214.abstract

Kupchik, N. (2009). Development and implementation of a therapeutic hypothermia protocol. *Critical Care Medicine, 37*, S279–S284. http://dx.doi.org/10.1097/CCM.0b013e3181aa61c5

Laird, P. (2008). Induced hypothermia for neuroprotection following cardiac arrest: A review of the literature. *Internet Journal of Advanced Nursing Practice, 10*(2). Retrieved from http://www.ispub.com/journal/the-internet-journal-of-advanced-nursing-practice/

Laurent, I., Adrie, C., Vinsonneau, C., Cariou, A., Chiche, J.-D., Ohanessian, A., . . . Monchi, M. (2005). High-volume hemofiltration after out-of-hospital cardiac arrest: A randomized study. *Journal of the American College of Cardiology, 46,* 432–437. http://dx.doi.org/10.1016/j.jacc.2005.04.039

Leach, M. J. (2007). Revisiting the evaluation of clinical practice. *International Journal of Nursing Practice, 13*, 70–74. http://dx.doi.org/10.1111/j.1440-172X.2007.00616.x

Lee, R., & Asare, K. (2010). Therapeutic hypothermia for out-of-hospital cardiac arrest. *American Journal of Health System Pharmacy, 67,* 1229–1237. http://dx.doi.org/10.2146/ajhp090626

Leigh, G. (2011). The simulation revolution: What are the implications for nurses in staff development? *Journal for Nurses in Staff Development*, *27*(2), 54–57. doi:10.1097/NND.0b013e31820eecea

Leinster, S. (2009). Learning in the clinical environment. *Medical Teacher, 31,* 79–81. http://dx.doi.org/10.1080/01421590902744936

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry.* Newbury Park, CA: Sage.

Lofland, J., & Lofland, L.H. (1999). Data logging in observation: Fieldnotes. In A. Bryman & R. G. Burgess (Eds.), *Qualitative research,* (Vol. 3, Part 1) London, UK: Sage.

Mahara, M. S. (1998). A perspective on clinical evaluation in nursing education. *Journal of Advanced Nursing, 28*(6), 1339–1346. http://dx.doi.org/10.1046/j.1365-2648.1998.00837.x

Mann, K., van der Vleuten, C., Eva, K., Armson, H., Chesluk, B., Dornan, T., . . . Sargeant, J. (2011). Tensions in informed self-assessment: How the desire for feedback and reticence to collect and use it can conflict. *Academic Medicine, 86,* 1120–1127. http://dx.doi.org/10.1097/ACM.0b013e318226abdd

Marriss, D. (2011). Academic staff development. In A. McIntosh, J. Gidman, & E. Mason-Whitehead (Eds.), *Sage key concepts*: *Key concepts in healthcare education* (pp. 1–6). http://dx.doi.org/10.4135/9781446251744.n1

Marshall, M. N. (1996). Sampling for qualitative research. *Family Practice, 13*(6), 522–525. doi:10.1093/fampra/13.6.522

Mason, D. J., Leavitt, J. K., & Chaffee, M. W. (2014). *Policy & politics in nursing and health care* (6th ed.). St. Louis, MO: Saunders.

Mason, M. (2010). Sample size and saturation in PhD studies using qualitative interviews. *Forum: Qualitative Social Research, 11*(3). Retrieved from http://nbn-resolving.de/urn:nbn:de:0114-fqs100387

Maxwell, J. A. (2005). *Qualitative research design: An interactive approach* (2nd ed.). Thousand Oaks, CA: Sage.

McAuliffe, M., Hargreaves, D., Winter, A., & Chadwick, G. (2008). Does pedagogy still rule? *Proceedings of the 19th Annual Conference of Australasian Association for Engineer Education, Yeppoon, Australia*. Retrieved from http://aaee.com.au/conferences/papers/2008/aaee08_submission_T2A1.pdf

McCartney, P. R., & Morin, K. H. (2005). Where is the evidence for teaching methods used in nursing education? *MCN, American Journal of Maternal Child Nursing, 3,* 406–412. http://dx.doi.org/10.1097/00005721-200511000-00010

McLeod, S. A. (2012). *Bruner.* Retrieved from http://www.simplypsychology.org/bruner.html

McNamee, L. S., O'Brien, F. Y., & Botha, J. H. (2009). Student perceptions of medico-legal autopsy demonstrations in a student-centred curriculum. *Medical Education, 43,* 66–73. http://dx.doi.org/10.1111/j.1365-2923.2008.03248.x

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation.* San Francisco, CA: John Wiley & Sons.

Merriam, S. B., Caffarella, R. S., & Baumgartner, L. M. (2007). *Learning in adulthood: A comprehensive guide* (3rd ed.). San Francisco, CA: Jossey-Bass.

Merchant, R. M., Abella, B. S., Peberdy, M. A., Soar, J., Ong, M. E., Schmidt, G., . . . Vanden Hoek, T. L. (2006). Therapeutic hypothermia after cardiac arrest: Unintentional overcooling is common using ice packs and conventional cooling blankets. *Critical Care Medicine, 34*(12 Suppl.), S490-S494.

Merchant, R. M., Soar, J., Skrifvars, M. B., Silfvast, T., Edelson, D. P., Ahmad, F., . . . Abella, B. S. (2006). Therapeutic hypothermia utilization among physicians after resuscitation from cardiac arrest. *Critical Care Medicine, 34,* 1935–1940. http://dx.doi.org/10.1097/01.CCM.0000220494.90290.92

Mooney, M. R., Unger, B. T., Boland, L. L., Burke, M. N., Kebed, K. Y., Graham, K. J., . . . Parham, W. M. (2011). Therapeutic hypothermia after out-of-hospital cardiac arrest: Evaluation of a regional system to increase access to cooling. *Circulation,*

142, 206–214. http://dx.doi.org/10.1161/CIRCULATIONAHA.110.986257

Morse, J. M. (1994). Designing funded qualitative research. In N. K. Denizin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed, pp.220-235). Thousand Oaks, CA: Sage.

Morse, J. M., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2002). Verification strategies for establishing reliability and validity in qualitative research. *International Journal of Qualitative Methods, 1*(2), 1–19. Retrieved from http://www.ualberta.ca/~ijqm/

Moustakas, C. E. (1994). *Phenomenological research methods*. Thousand Oaks, CA: Sage.

Munhall, P. L. (Ed.). (2010). *Nursing research: A qualitative perspective* (5th ed.). Boston, MA: Jones & Bartlett.

Naimie, Z., Siraj, S., Ahmed Abuzaid, R., & Shagholi, R. (2010). Hypothesized learners' technology preferences based on learning style dimensions. *The Turkish Online Journal of Educational Technology, 9*(4), 83–93. Retrieved from http://www.tojet.net/

National League of Nursing. (2002). Position statement: The preparation of nurse educators. Retrieved from http://www.nln.org/aboutnln/PositionStatements/preparation051802.pdf

Nalliah, S., & Idris, N. (2014). Applying the learning theories to medical education: A commentary. *International E-Journal of Science, Medicine & Education, 8*(1), 50–57. Retrieved from http://web.imu.edu.my/ejournal/approved/9.Commentary_Sivalingam_50-57.pdf

Nickerson, M., Morrison, B., & Pollard, M. (2011). Simulation in nursing staff development: A concept analysis. *Journal for Nurses in Staff Development, 27*(2), 81–89. doi:10.1097/NND.0b013e3181a68abd

Nickle, P. (2007). Cognitive apprenticeship: Laying the groundwork for mentoring registered nurses in the intensive care unit. *Dynamics, 18*(4), 19–27. Retrieved from http://www.caccn.ca/

Nolan, J. P., Morley, P. T., Vanden Hoek, T. L., & Hickey, R. W. (2003). Therapeutic hypothermia after cardiac arrest: ILCOR advisory statement by the Advanced Life Support Task Force of the International Committee on Resuscitation. *Circulation, 108*, 118–121. http://dx.doi.org/10.1161/01.CIR.0000079019.02601.90

Opdenakker, R. (2006). Advantages and disadvantages of four interview techniques in qualitative research. *Forum: Qualitative Social Research, 7*(4). Retrieved from http://www.qualitative-research.net/fqs-texte/4-06/06-4-11-e.htm

Oermann, M. H. (2007). Approaches to gathering evidence for educational practices in nursing. *Journal of Continuing Education in Nursing, 38,* 250–255. Retrieved from http://www.healio.com/nursing/journals/jcen

Osborn, P. G. (2004). Book review: The three dimensions of learning: Contemporary learning theory in the tension field between the cognitive, the emotional and the social, by K. Illeris. *Adult Education Quarterly, 55,* 72–73. doi:10.1177/0741713604268897

Padgett, D. K. (2008). *Qualitative methods in social work research* (2nd ed.). New York, NY: Sage.

Parker, B. C., & Myrick, F. (2009). A critical examination of high-fidelity human patient simulation within the context of nursing pedagogy. *Nurse Education Today, 29,* 322–329. http://dx.doi.org/10.1016/j.nedt.2008.10.012

Parker, J. (2010). Adult learning principles as the foundation for innovative technology applications in business and higher education venues. In V. C. X. Wang (Ed.), *Integrating adult learning and technologies for effective education: Strategic approaches* (pp. 136–152). http://dx.doi.org/10.4018/978-1-61520-694-0.ch008

Parse, R. R. (1998). *The human becoming school of thought: A perspective for nurses and other health professionals* (2nd ed.). Thousand Oaks, CA: Sage.

Paterson, J. G., & Zderad, L. T. (1976). *Humanistic nursing*. New York, NY: John Wiley & Sons.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (Vol. 3). Thousand Oaks, CA: Sage.

Peberdy, M. A., Callaway, C. W., Neumar, R. W., Geocadin, R. G., Zimmerman, J. L. Donnino, M., . . . Kronick, S. L. (2010). 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation, 122,* S5768–S786. http://dx.doi.org/10.1161/CIRCULATIONAHA.110.971002

Polit, D. F., & Beck, C. T. (2012). *Nursing research: Generating and assessing evidence for nursing practice* (9th ed.). Baltimore, MD: Lippincott Williams & Wilkins.

Popkess, A. M., & McDaniel, A. (2011). Are nursing students engaged in learning? A secondary analysis of data from the National Survey of Student Engagement. *Nursing Education Perspectives, 32,* 89–94. http://dx.doi.org/10.5480/1536-5026-32.2.89

Poscente, K. (2006). Book review: Three dimensions of learning: Contemporary learning theory in the tension field between the cognitive, the emotional and the social, by K. Illeris. *International Review of Research in Open and Distance Learning, 7*(1). Retrieved from http://www.irrodl.org/index.php/irrodl/

index

Richards, L., & Morse J. M. (2007). *Readme first for a user's guide to qualitative methods* (2nd ed.). Thousand Oaks, CA: Sage.

Robert Wood Johnson Foundation. (2012, July). *Implementing the IOM Future of Nursing report, Part III: How nurses are solving some of primary care's most pressing challenges* [Issue brief]. Retrieved from http://www.rwjf.org/en/library/research/2012/07/cnf-implementing-the-future-of-nursing-report-part-three.html

Roger, V. L., Go, A. S., Lloyd-Jones, D. M., Benjamin, E. J., Berry, J. D.., Borden, W. B., . . . Turner, M. B. (2012). Heart disease and stroke statistics—2012 update. *Circulation, 125,* e2–e220. http://dx.doi.org.10.1161/CIR.0b013e31823ac046

Rogers, C. R. (1969). *Freedom to learn: A view of what education might become*. Columbus, OH: Merrill.

Rolfe, G. (2004). Validity, trustworthiness, and rigour: Quality and the idea of qualitative research. *Journal of Advanced Nursing, 53*(3), 304–310. doi:10.1111/j.1365-2648.2006.03727.x

Sandelowski, M. (1986). The problem of rigor in qualitative research. *Advances in Nursing Science, 8*, 27–37. http://dx.doi.org/10.1097/00012272-198604000-00005

Sayre, M. R., Cantrell, S. A., White, L. J., Hiestand, B. C., Keseg, D. P., & Koser, S. (2009). Impact of the 2005 American Heart Association cardiopulmonary resuscitation and emergency care guidelines on out-of-hospital cardiac arrest survival. *Prehospital Emergency Care, 13,* 469–477. http://dx.doi.org/10.1080/10903120903144965

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action.* New York, NY: Basic Books.

Seidman, I. (2006). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (3rd ed.). New York, NY: Teachers College.

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for information*, *22*(2), 63–75. Retrieved from http://eric.ed.gov/

Shultz, C. M. (Ed.). (2009). *Building a science of nursing education: Foundation for evidence-based teaching-learning.* New York, NY: National League for Nursing Press.

Sprang, S. M., (2011). Making the case: Using case studies for staff development. *Journal for Nurses in Staff Development*, *26*(2), E6–E10. http://dx.doi.org/10.1097/nnd.0b013e31819b5ee5

Stacey, D., Domecq, M., Crawley, F., & Doucet, J. (2015). Research reflections: Finding research to answer patients' questions. *Canadian Oncology Nursing Journal/Revue Canadienne De Soins Infirmiers En Oncologie, 25*(3), 266-267. Retrieved from http://canadianoncologynursingjournal.com/index.php/conj/article/view/567

Steen, C. (2010). Prevention of deterioration in acutely ill patients in hospital. *Nursing Standard*, *24*(49), 49–57. http://dx.doi.org/10.7748/ns2010.08.24.49.49.c7935

Sund-Levander, M., & Grodzinsky, E. (2009). Time for a change to assess and evaluate body temperature in clinical practice. *International Journal of Nursing Practice, 15*, 241–249. http://dx.doi.org/10.1111/j.1440-172X.2009.01756.x

Takase, M. (2013). The relationship between the levels of nurses' competence and the length of their clinical experience: A tentative model for nursing competence development. *Journal of Clinical Nursing, 22*(9-10), 1400–1410. doi:10.1111/j.1365-2702.2012.04239.x

Tomte, Ø., Draegni, T., Mangschau, A., Jacobsen, D., Auestad, B., & Sunde, K. (2011). A comparison of intravascular and surface cooling techniques in comatose cardiac arrest survivors. *Critical Care Medicine, 39,* 443–449. http://dx.doi.org/10.1097/CCM.0b013e318206b80f

Tracy, S. J. (2013). *Qualitative research methods: Collecting evidence, crafting analysis, communicating impact.* Hoboken, NJ: Wiley-Blackwell.

Tyler, R. W. (1975). *Basic principles of curriculum and instruction*. Chicago, IL: University of Chicago Press.

U.S. Department of Health and Human Services, Health Resources and Services Administration. (2010). *The registered nurse population: Findings from the 2008 National Sample Survey of Registered Nurses.* Rockville, MD: Author.

van Manen, M. (1997). *Researching lived experience: Human science for an action sensitive pedagogy* (2nd ed.). Albany, NY: State University of New York Press.

van Manen, M. (2001). Professional practice and doing phenomenology. In S. K. Toombs (Ed.), *Handbook of phenomenology and medicine* (pp. 457–474). Dordrecht, NL: Kluwer Press.

Van Manen, M., & Adams, C. (2009). The phenomenology of space in writing online. *Educational Philosophy and Theory, 41*, 10–21. http://dx.doi.org/10.1111/j.1469-5812.2008.00480.x

Vygotsky, L. S. (2012). *Thought and language*, (E. Hanfmann, G. Vakar, & A. Kozulin, Trans.). Cambridge, MA: MIT Press.

Watson, J. (1985). *Human science and human care: A theory of nursing*. Norwalk, CT:

Appleton-Century-Croft.

West, E., Mays, N., Rafferty, A. M., Rowan, K., & Sanderson, C. (2009). Nursing resources and patient outcomes in intensive care: A systematic review of the literature. *International Journal of Nursing Studies, 46,* 993–1011. http://dx.doi.org/10.1016/j.ijnurstu.2007.07.011

Wilkins, R. H. (Ed.). (1992). *Neurosurgical classics.* Park Ridge, IL: American Association of Neurological Surgeons.

Wilson, H. S., & Hutchinson, S. A. (1991). Triangulation of qualitative methods: Heideggerian hermeneutics and grounded theory. *Qualitative Health Research, 1*(2), 263–276. http://dx.doi.org/10.1177/104973239100100206

Wright, M. C., Finelli, C. J., Meizlish, D., & Bergom, I. (2011). Facilitating the scholarship of teaching and learning at a research university. *Change: The Magazine of Higher Education, 43*(2), 50–56. http://dx.doi.org/10.1080/00091383.2011.550255

Young, L. E., & Patterson, B. L. (Eds.). (2007). *Teaching nursing: Developing a student-centered learning environment.* Philadelphia, PA: Lippincott Williams & Wilkins.

Appendix A

IRB Permission Documents

NOVA SOUTHEASTERN UNIVERSITY
Institutional Review Board

MEMORANDUM

To: Marie Regina Hankinson, MSN
HPD – College of Nursing

From: Matthew Seamon, Pharm.D., JD
Chair, Institutional Review Board
WHS for Dr. Seamon

Date: June 18, 2015

Re: *The Lived Experience of Nurses Caring for Induced Hypothermia Patients* – NSU IRB No. 06021520Exp.

I have reviewed the revisions to the above-referenced research protocol by an expedited procedure. On behalf of the Institutional Review Board of Nova Southeastern University, *The Lived Experience of Nurses Caring for Induced Hypothermia Patients* is approved in keeping with expedited review category #6 and #7. Your study is approved on **June 18, 2015** and is approved until **June 17, 2016**. You are required to submit for continuing review by **May 17, 2016.** As principal investigator, you must adhere to the following requirements:

1) CONSENT: You must use the stamped (dated consent forms) attached when consenting subjects. The consent forms must indicate the approval and its date. The forms must be administered in such a manner that they are clearly understood by the subjects. The subjects must be given a copy of the signed consent document, and a copy must be placed with the subjects' confidential chart/file.

2) ADVERSE EVENTS/UNANTICIPATED PROBLEMS: The principal investigator is required to notify the IRB chair of any adverse reactions that may develop as a result of this study. Approval may be withdrawn if the problem is serious.

3) AMENDMENTS: Any changes in the study (e.g., procedures, consent forms, investigators, etc.) must be approved by the IRB prior to implementation.

4) CONTINUING REVIEWS: A continuing review (progress report) must be submitted by the continuing review date noted above. Please see the IRB web site for continuing review information.

5) FINAL REPORT: You are required to notify the IRB Office within 30 days of the conclusion of the research that the study has ended via the IRB Closing Report form.

The NSU IRB is in compliance with the requirements for the protection of human subjects prescribed in Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) revised June 18, 1991.

Cc: Dr. Patricia Dittman
Dr. Jo Ann Kleier
Mr. William Smith

3301 College Avenue • Fort Lauderdale, Florida 33314-7796
(954) 262-5369 • Fax: (954) 262-3977 • Email: *irb@nova.edu* • Web site: *www.nova.edu/irb*

NOVA SOUTHEASTERN UNIVERSITY
Health Professions Division
College of Nursing

Dear Nurse:

I am requesting your participation in the study titled, "**The Lived Experience of the Nurse Caring for the Hypothermia Patient.**"

If you are employed at Holy Cross Hospital as a registered nurse and have experience caring for hypothermia patients you may qualify to participate. The aim of the research is to illuminate how bedside nurses learn about new techniques and procedures.

Participants will be asked to complete a short demographic form and complete a face-to-face interview. The interview would be no longer than 60 minutes. Additionally, you may be contacted to validate your comments to be sure the interviewer has interpreted your responses correctly.

Your consent to be a research participant is strictly voluntary and should you decline to participate or choose to drop out at any time during the study, there will be no adverse effects on your employment at the facility. If you choose to participate, your responses will be kept confidential and your name will not appear in any presented documentation, or in the interview recording.

If you have any questions or concerns regarding the study or your participation in the study, you may contact me **Marie Hankinson** at (561)-543-5531 or at NSU, **Dr. Patricia Dittman** at (954)262-1991.

Participants who meet the inclusion criteria and complete all processes of the study will receive a $25 gift card.

Thank you,
Marie Hankinson

3200 South University Drive • Fort Lauderdale, Florida 33328-2018
(954) 262-1983 • Fax: (954) 262-1036

College of Osteopathic Medicine • College of Pharmacy • College of Optometry • College of Health Care Sciences
College of Medical Sciences • College of Dental Medicine • College of Nursing

NOVA SOUTHEASTERN UNIVERSITY
Health Professions Division
College of Nursing

Consent Form for Participation in the Research Study Entitled: *The Lived Experience of the Nurse Caring for the Hypothermia Patient*

Funding Source: None.

IRB protocol #:

Principal investigator(s)
Marie Hankinson, M.S.N., RN
2064 Tigris Drive
West Palm Beach, FL 33411
561-543-5531

Co-investigator(s)
Patricia W. Dittman, Ph.D., M.S.N
College of Nursing
3200 South University Drive
Ft. Lauderdale, FL 33328
954-262-1991

For questions/concerns about your research rights, contact:
Human Research Oversight Board (Institutional Review Board or IRB)
Nova Southeastern University
(954) 262-5369/Toll Free: 866-499-0790
IRB@nsu.nova.edu

Site Information
Name of site: Holy Cross Hospital
4725 North Federal Highway
Fort Lauderdale, Florida 33308

Initials _____ Date _____

What is the study about?
This study will illuminate how nurses learn new knowledge in clinical settings by interviewing nurses who have cared for cardiac arrest patients undergoing therapeutic hypothermia. This study will include research conducted with the use of face-to-face interviews.

Why are you asking me?
This study is focused on the lived experiences of nurses who have learned to care for cardiac arrest patients undergoing induced hypothermia. You have been chosen to participate because of your experiences with this phenomenon, and will be asked to provide as much detail regarding this process as possible. This study will include 10-15 interviewees, including yourself.

What will I be doing if I agree to be in the study?
During participation in this study, you will be asked to engage in one individual, face-to-face interview. The interview is expected to last approximately 60 minutes, and you may choose to leave at any time during the process. Prior to interviewing, you will be asked to fill out a brief demographic form, and indicate a pseudonym that you would like to be used in place of your name. This will be used in place of your own during recording so that your birth name cannot be traced back to your responses without access to the demographic form, which will be stored at the researcher's residence.

Following interviews, your immediate participation is concluded. However, in the weeks following the interviews, you may be contacted via email with a listing of preliminary findings and asked to confirm or deny that these align with your lived experience. This process is used to ensure that I am properly documenting the results of the study, and you are not required to respond. However, your consideration is greatly appreciated. If you complete the entire process asked of you, you will receive a $25 gift card in appreciation of your participation.

Is there any audio or video recording?
This research project will include audio recording of an interview about your experiences learning to care for cardiac arrest patients undergoing therapeutic hypothermia. This audio recording will be available to be heard by the researcher, the IRB, the dissertation chair or committee, and a transcriptionist. The recording will be transcribed by NVivo software. The recording will be kept securely on a flash drive which will be stored in a locked filing cabinet when not in use. The recording and transcription will be kept for 36 months and destroyed after that time by shredding (for paper documents) or erasure (for electronic documents). Because your voice will be potentially identifiable by anyone who hears the recording, your confidentiality for things you say on the recording cannot be guaranteed although the researcher will try to limit access to the tape as described in this paragraph.

Initials _____ Date _____

What are the dangers to me?
There are no foreseeable dangers associated with participation in this study.

Are there any benefits for taking part in this research study?
There are no direct benefits for participation in this study.

Will I get paid for being in the study? Will it cost me anything?
There are no costs to you for participating in this study; however, participants who meet the inclusion criteria and complete all processes of the study will receive a $25 gift card.

How will you keep my information private?
Your confidentiality in this study is of utmost importance. To ensure that none of your identifying information is accessible, a pseudonym will be used during the recording process. This pseudonym will conceal your identity as the recorded interview is transcribed. It will also be used as an identifier in the presentation of results. Any records indicating your birth name will be kept in a locked filing cabinet in the researcher's home. All data will be stored for a period of 3 years following the completion of the project, and will be shredded or erased (as appropriate) at the end of this period.

What if I do not want to participate or I want to leave the study?
You have the right to leave this study at any time or refuse to participate. If you do decide to leave or you decide not to participate, you will not experience any penalty or loss of services you have a right to receive. If you choose to withdraw, any information collected about you **before** the date you leave the study will be kept in the research records for 36 months from the conclusion of the study but you may request that it not be used.

Other Considerations:
If significant new information relating to the study becomes available, which may relate to your willingness to continue to participate, this information will be provided to you by the investigator.

Voluntary Consent by Participant:
By signing below, you indicate that

- this study has been explained to you
- you have read this document or it has been read to you
- your questions about this research study have been answered
- you have been told that you may ask the researchers any study related questions in the future or contact them in the event of a research-related injury
- you have been told that you may ask Institutional Review Board (IRB) personnel questions about your study rights
- you are entitled to a copy of this form after you have read and signed it
- you voluntarily agree to participate in the study entitled " The Lived Experience of the Nurse Caring for the Hypothermia Patient."

Participant's Signature: _____ Date:_____
Participant's Name: _____ Date:_____
Signature of Person Obtaining Consent: _____
Date: _____

Institutional Review Board Approval Amended 7-28-15

NOVA SOUTHEASTERN UNIVERSITY
Institutional Review Board

MEMORANDUM

To: Marie Regina Hankinson, MSN
HPD – College of Nursing

From: Matthew Seamon, Pharm.D., JD
Chair, Institutional Review Board

Date: July 28, 2015

Re: *The Lived Experiences of Nurses Caring for Induced Hypothermia Patients* – NSU IRB No. 06021520Exp.

I have reviewed the amendments to the above-referenced research protocol by an expedited procedure. On behalf of the Institutional Review Board of Nova Southeastern University, the following amendments to *The Lived Experiences of Nurses Caring for Induced Hypothermia Patients* are approved:

- Addition of Tracey Melhuish as a research assistant

Please note that this does not affect the continuing review date for this protocol.

Cc: Dr. Patricia Dittman
Dr. Jo Ann Kleier
Mr. William Smith

3301 College Avenue • Fort Lauderdale, Florida 33314-7796
(954) 262-5369 • Fax: (954) 262-3977 • Email: *irb@nova.edu* • Web site: *www.nova.edu/irb*

Dear Nurse:

I am requesting your participation in the study titled, "*The Lived Experience of the Nurse Caring for the Induced Hypothermia Patient.*"

If you are employed at Holy Cross Hospital as a registered nurse and have experience caring for hypothermia patients you may qualify to participate. The aim of the research is to illuminate how bedside nurses learn about new techniques and procedures.

Participants will be asked to complete a short demographic form and complete a face –to-face interview. The interview would be no longer than 60 minutes. Additionally, you may be contacted to validate your comments to be sure the interviewer has interpreted your responses correctly.

Your consent to be a research participant is strictly voluntary and should you decline to participate or chose to drop out at any time during the study, there will be no adverse effects on your employment at the facility. If you choose to participate, your responses will be kept confidential and your name will not appear in any presented documentation, or in the interview recording.

If you have any questions or concerns regarding the study or your participation in the study, you may contact me Marie Hankinson at (561) 543-5531 or Tracey Melhuish at Holy Cross at (954) 229-7916, or at NSU, Dr. Patricia Dittman at (954) 262-1991.

Participants who meet the inclusion criteria and complete all processes of the study will receive Clinical Ladder Points and paid time for participating.

NOVA SOUTHEASTERN UNIVERSITY
Health Professions Division
College of Nursing

Consent Form for Participation in the Research Study Entitled: *The Lived Experience of the Nurse Caring for the Induced Hypothermia Patient.*

Funding Source: None.

IRB Protocol No. 06021520Exp.

Principal investigator(s)
Marie Hankinson, M/S.N., RN
2064 Tigris Drive
West Palm Beach, FL 33411
561-543-5531

Co-investigator(s)
Patricia W. Dittman, Ph.D., M.S.N.
College of Nursing
3200 South University Drive
Ft. Lauderdale, FL 33328
954-262-1991

Research Assistant(s)
Tracey Melhuish, MSN, RN
Holy Cross Hospital
954-229-7916

For questions/concerns about your research rights, contact:
Human Research Oversight Board (Institutional Review Board or IRB)
Nova Southeastern University
(954) 262-5369/Toll free: 866-499-0790
IRB@nsu.nova.edu

Site Information
Name of Site: Holy Cross Hospital
4725 North federal Highway
Fort Lauderdale, Florida 33308

Initials _____ Date _____

What is the study about?
This study will illuminate how nurses learn new knowledge in clinical settings by interviewing nurses who have cared for cardiac arrest patients undergoing therapeutic hypothermia. This study will include research conducted with the use of face-to-face interviews.

Why are you asking me?
This study is focused on the lived experiences of nurses who have learned to care for cardiac arrest patients undergoing induced hypothermia. You have been chosen to participate because of your experiences with this phenomenon, and will be asked to provide as much detail regarding this process as possible. This study will include 10-15 interviewees, including yourself.

What will I be doing if I agree to be in the study?
During participation in this study, you will be asked to engage in one individual, face-to-face interview. The interview is expected to last approximately 60 minutes, and you may choose to leave at any time during the process. Prior to interviewing, you will be asked to fill out a brief demographic form, and indicate a pseudonym that you would like to be used in place of your name. This will be used in place of your own during recording so that your birth name cannot be traced back to your responses without access to the demographic form, which will be stored at the researcher's residence.

Following interviews, your immediate participation is concluded. However, in the weeks following the interviews, you may be contacted via email with a listing of preliminary findings and asked to confirm or deny that these align with your lived experience. This process is used to ensure that I am properly documenting the results of the study, and you are not required to respond. However, your consideration is greatly appreciated. If you complete the entire process asked of you, you will receive a $25 gift card in appreciation of your participation.

Is there any audio or video recording?
This research project will include audio recording of an interview about your experiences learning to care for cardiac arrest patients undergoing therapeutic hypothermia. This audio recording will be available to be heard by the researcher, the IRB, the dissertation chair or committee, and a transcriptionist. The recording will be transcribed by NVivo software. The recording will be kept securely on a flash drive which will be stored in a locked filing cabinet when not in use. The recording and transcription will be kept for 36 months and destroyed after that time by shredding (for paper documents) or erasure (for electronic documents). Because your voice will be potentially identifiable by anyone who hears the recording, your confidentiality for things you say on the recording cannot be guaranteed although the researcher will try to limit access to the tape as described in this paragraph.

What are the dangers to me?
There are no foreseeable dangers associated with participation in this study.

Are there any benefits for taking part in this research study?
There are no direct benefits for participation in this study.

Will I get paid for being in the study? Will it cost me anything?
There are no costs to you for participating in the study; however, participants will get clinical ladder points and will be paid for participating.

How will you keep my information private?
Your confidentiality in this study is of utmost importance. To ensure that none of your identifying information is accessible, a pseudonym will be used during the recording process. This pseudonym will conceal your identify as the recorded interview is transcribed. It will also be used as an identifier in the presentation of results. Any records indicating your birth name will be kept in a lock filing cabinet in the researcher's home. All data will be stored for a period of 3 years following completion of the project, and will be shredded or erased (as appropriate) at the end of this period.

What if I do not want to participate or I want to leave the study?
You have the right to leave this study at any time or refuse to participate. If you do decide to leave or you decide not to participate, you will not experience any penalty or loss of services you have a right to receive. If you choose to withdraw, any information collected about you before the date you leave the study will be kept in the research records for the 36 months from the conclusion of the study but you may request that it not be used.

Other Considerations:
If significant new information relating to the study becomes available, which may relate to your willingness to continue to participate, this information will be provided to you by the investigator.

Initials _____ Date _____

Voluntary Consent by Participant:
By signing below, you indicate that

- this study has been explained to you
- you have read this document or it has been read to you
- your questions about this research study have been answered
- you have been told that you may ask the researchers any study related questions in the future or contact them in the event of a research-related injury
- you have been told that you may ask Institutional Review Board (IRB) personnel questions about your study rights
- you are entitled to a copy of this form after you have read and signed it
- you voluntarily agree to participate in the study entitled " The Lived Experience of the Nurse Caring for the Hypothermia Patient."

Participant's Signature: _____ Date: _____
Participant's Name: _____ Date: _____
Signature of Person Obtaining Consent: _____
Date: _____

Institutional Review Board Approval Amended 8-28-15

NOVA SOUTHEASTERN UNIVERSITY
Institutional Review Board

MEMORANDUM

To: Marie Regina Hankinson, MSN
HPD – College of Nursing

From: Cristina Garcia-Godoy, D.D.S., M.P.H., C.C.R.P. RD for CGG.
2nd Vice Chair, Institutional Review Board

Date: August 28, 2015

Re: *The Lived Experiences of Nurses Caring for Induced Hypothermia Patients* —NSU IRB Protocol No. 06021520Exp.

I have reviewed the amendments to the above-referenced research protocol by an expedited procedure. On behalf of the Institutional Review Board of Nova Southeastern University, the following amendments to *The Lived Experiences of Nurses Caring for Induced Hypothermia Patients* are approved:

- **Addition of Tracey Melhuish as a Co-Investigator.**

Please note that this does not affect the continuing review date for this protocol.

Cc: Dr. Patricia Dittman
Dr. Jo Ann Kleier
Mr. William Smith

3301 College Avenue • Fort Lauderdale, Florida 33314-7796
(954) 262-5369 • Fax: (954) 262-3977 • Email: *irb@nova.edu* • Web site: *www.nova.edu/irb*

NOVA SOUTHEASTERN UNIVERSITY
Health Professions Division
College of Nursing

Dear Nurse:

I am requesting your participation in the study titled, "*The Lived Experience of the Nurse Caring for the Induced Hypothermia Patient.*"

If you are employed at Holy Cross Hospital as a registered nurse and have experience caring for hypothermia patients you may qualify to participate. The aim of the research is to illuminate how bedside nurses learn about new techniques and procedures.

Participants will be asked to complete a short demographic form and complete a face –to- face interview. The interview would be no longer than 60 minutes. Additionally, you may be contacted to validate your comments to be sure the interviewer has interpreted your responses correctly.

Your consent to be a research participant is strictly voluntary and should you decline to participate or chose to drop out at any time during the study, there will be no adverse effects on your employment at the facility. If you choose to participate, your responses will be kept confidential and your name will not appear in any presented documentation, or in the interview recording.

If you have any questions or concerns regarding the study or your participation in the study, you may contact me Marie Hankinson, PhDc, RN at (561) 543-5531 or Tracey Melhuish, MSN, RN at Holy Cross at (954) 229-7916, or at NSU, Dr. Patricia Dittman at (954) 262-1991.

Participants who meet the inclusion criteria and complete all processes of the study will receive Clinical Ladder Points and paid time for participating.

Health Professions Division
College of Nursing
3200 South University Drive · Fort Lauderdale, FL 33328-2018
(954) 262-1983 · FAX (954) 262-1036

NOVA SOUTHEASTERN UNIVERSITY
Health Professions Division
College of Nursing

Consent Form for Participation in the Research Study Entitled: *The Lived Experience of the Nurse Caring for the Induced Hypothermia Patient.*

Funding Source: None.

IRB Protocol No. 06021520Exp.

Principal investigator(s)
Marie Hankinson, M/S.N., RN
2064 Tigris Drive
West Palm Beach, FL 33411
561-543-5531

Co-investigator(s)
Patricia W. Dittman, Ph.D., M.S.N.
College of Nursing
3200 South University Drive
Ft. Lauderdale, FL 33328
954-262-1991

Sub-Investigator for Holy Cross Hospital
Tracey Melhuish, M.S.N., RN
Holy Cross Hospital
954-229-7916

For questions/concerns about your research rights, contact:
Human Research Oversight Board (Institutional Review Board or IRB)
Nova Southeastern University
(954) 262-5369/Toll free: 866-499-0790
IRB@nsu.nova.edu

Site Information
Name of Site: Holy Cross Hospital
4725 North federal Highway
Fort Lauderdale, Florida 33308

Initials _____ Date _____

NSU
NOVA SOUTHEASTERN UNIVERSITY
Health Professions Division
College of Nursing

What are the dangers to me?
There are no foreseeable dangers associated with participation in this study.

Are there any benefits for taking part in this research study?
There are no direct benefits for participation in this study.

Will I get paid for being in the study? Will it cost me anything?
There are no costs to you for participating in the study; however, participants will receive Clinical Ladder points and will be paid for participating.

How will you keep my information private?
Your confidentiality in this study is of utmost importance. To ensure that none of your identifying information is accessible, a pseudonym will be used during the recording process. This pseudonym will conceal your identify as the recorded interview is transcribed. It will also be used as an identifier in the presentation of results. Any records indicating your birth name will be kept in a lock filing cabinet in the researcher's home. All data will be stored for a period of 3 years following completion of the project, and will be shredded or erased (as appropriate) at the end of this period.

What if I do not want to participate or I want to leave the study?
You have the right to leave this study at any time or refuse to participate. If you do decide to leave or you decide not to participate, you will not experience any penalty or loss of services you have a right to receive. If you choose to withdraw, any information collected about you before the date you leave the study will be kept in the research records for the 36 months from the conclusion of the study but you may request that it not be used.

Other Considerations:
If significant new information relating to the study becomes available, which may relate to your willingness to continue to participate, this information will be provided to you by the investigator.

Initials _____ Date _____

Health Professions Division
College of Nursing
3200 South University Drive · Fort Lauderdale, FL 33328-2018
(954) 262-1983 · FAX (954) 262-1036

NOVA SOUTHEASTERN UNIVERSITY
Health Professions Division
College of Nursing

What are the dangers to me?
There are no foreseeable dangers associated with participation in this study.

Are there any benefits for taking part in this research study?
There are no direct benefits for participation in this study.

Will I get paid for being in the study? Will it cost me anything?
There are no costs to you for participating in the study; however, participants will receive Clinical Ladder points and will be paid for participating.

How will you keep my information private?
Your confidentiality in this study is of utmost importance. To ensure that none of your identifying information is accessible, a pseudonym will be used during the recording process. This pseudonym will conceal your identify as the recorded interview is transcribed. It will also be used as an identifier in the presentation of results. Any records indicating your birth name will be kept in a lock filing cabinet in the researcher's home. All data will be stored for a period of 3 years following completion of the project, and will be shredded or erased (as appropriate) at the end of this period.

What if I do not want to participate or I want to leave the study?
You have the right to leave this study at any time or refuse to participate. If you do decide to leave or you decide not to participate, you will not experience any penalty or loss of services you have a right to receive. If you choose to withdraw, any information collected about you before the date you leave the study will be kept in the research records for the 36 months from the conclusion of the study but you may request that it not be used.

Other Considerations:
If significant new information relating to the study becomes available, which may relate to your willingness to continue to participate, this information will be provided to you by the investigator.

Initials _____ Date _____

Health Professions Division
College of Nursing
3200 South University Drive · Fort Lauderdale, FL 33328-2018
(954) 262-1983 · FAX (954) 262-1036

NOVA SOUTHEASTERN UNIVERSITY
Health Professions Division
College of Nursing

Voluntary Consent by Participant:
By signing below, you indicate that

- this study has been explained to you
- you have read this document or it has been read to you
- your questions about this research study have been answered
- you have been told that you may ask the researchers any study related questions in the future or contact them in the event of a research-related injury
- you have been told that you may ask Institutional Review Board (IRB) personnel questions about your study rights
- you are entitled to a copy of this form after you have read and signed it
- you voluntarily agree to participate in the study entitled "The Lived Experience of the Nurse Caring for the Hypothermia Patient."

Participant's Signature: _____ Date: _____
Participant's Name: _____ Date: _____
Signature of Person Obtaining Consent: _____
Date: _____

Initials _____ Date _____

Health Professions Division
College of Nursing
3200 South University Drive · Fort Lauderdale, FL 33328-2018
(954) 262-1983 · FAX (954) 262-1036

Site Approval

Holy Cross Hospital
4725 North Federal Highway
Fort Lauderdale, Florida 33308
www.holy-cross.com
954-771-8000

TO: **Marie Regina Hankinson, MSN (HPD-College of Nursing)**
Nova Southeastern University

-c: **Mr. William Smith, Nova IRB**
Taren Ruggiero, Chief Nursing Officer/Holy Cross Hospital
Tracey Melhuish, MSN, Sub-Investigator/Holy Cross Hospital

FROM: **Paul Papagni, JD/Executive Director, Research**
Janice Schuck, MBA, CIPP/Clinical Research Administrator (Cardiology)

DATE: **August 31, 2015**

SUBJECT: **The Lived Experience of Nurses Caring for Induced Hypothermia Patients (NSU-IRB No. 06021520Exp)**

Holy Cross Hospital, Department of Research has reviewed the submitted above named study, recruitment flyer and amendment form naming Tracey Melhuish, MSN as a Sub-Investigator at Holy Cross Hospital. It is understood that the NOVA IRB has approved the study as of June 18, 2015 as well as the amendment on August 28, 2015 via Expedited Review.

As you have complied with our request for amendment, we are providing approval of deferral of regulatory oversight to Nova IRB. Please understand that any amendments (other than the above referenced addition of a Sub-Investigator) will require additional review and consideration. Please be sure to use only the informed consent with Tracy Melhuish, MSN, Sub-Investigator, for those subjects enrolled at Holy Cross Hospital.

We are also requesting that Tracey Melhuish, MSN, Sub-Investigator, retain a copy of all signed consents secured from HCH nurse enrollment.

Should you have any questions regarding this deferment, please do not hesitate to contact either of us:

Paul Papagni, JD/Executive Director of Research
(954) 229-8553 paul.papagni@holy-cross.com

Or, Janice Schuck, Clinical Research Administrator (Cardiology)
(954) 776-3239
Janice.schuck@holy-cross.com

A member of Catholic Health East, sponsored by the Sisters of Mercy

Appendix B

Certification of Authorship

COLLEGE OF NURSING

CERTIFICATION OF AUTHORSHIP

Submitted to (Chairperson's Name): _____
Student's Name: _____
Title of Submission: _____
_____

- ❑ Dissertation Proposal
- ❑ Final Dissertation Report

Certification of Authorship: I hereby certify that I am the author of this document and that any assistance I received in its preparation is fully acknowledged and disclosed in the document. I have also cited all sources from which I obtained data, ideas, or words that are copied directly or paraphrased in the document. Sources are properly credited according to accepted standards for professional publications. I also certify that this paper was prepared by me for this purpose.

Student's Signature: _____

Date of Submission: _____

Appendix C

Demographic Data Form

Demographic Form for Induced Hypothermia Study

Date _____

Name Pseudonym _____

Contact Information phone_____

Email_____

Preferred way to contact you? _____

Please check one:

Male ___ Female ____

Full Time ____Part Time _____PRN _____

Day ____ Eve_____ Night _____

Please complete:

Entry Level of Nursing Education _____

Highest Level of Education _____

Years of Experience _____

Years of experience caring for hypothermia patients _____

Certification _____

Appendix D

Guiding Questions

Please see the attached guiding questions for the semi-structured interviews.

Guiding Questions

1. Can you describe your experiences working with hypothermia patients?

2. What did your training program look like? How did you learn to assess patients (e.g., book, simulation, or real patients)? What clinical parameters were you told to look for? What classes did you attend? What materials were you given? Who taught you?

3. What, if anything, would you change about the learning process? What assisted you the most and the least?

4. Aside from your hospital and coworkers, did you prepare or seek out information to care for this population? How do you keep your knowledge and skills up to date? What information or resources do you seek out?

5. Can you describe a difficult experience that you had while taking care of a hypothermia patient that required you to search for additional information? Where did you search? Did you ask anyone for advice?

6. Do you or your co-workers or hospital ever get recognized for the care of these patients? Have you ever attended workshops or seminars pertaining to hypothermia care, or shared your data?

7. Is there anything else that you want to describe? Is there anything else you believe I should ask you about?

Appendix E

Letter of Confidentiality

NON-DISCLOSURE AGREEMENT

This Non-disclosure Agreement (this **"Agreement"**) is made effective as of March 27, 2015 (the **"Effective Date"**), by and between MovingOn Productions, LLC (the **"Owner"**), of 19 West 105th Street, New York, New York 10025, and Marie Hankinson (the **"Recipient"**), of transcription Services _____, _____ _____.

Information will be used in the purpose of contracted work. The Owner has requested and the Recipient agrees that the Recipient will protect the confidential material and information which may be disclosed between the Owner and the Recipient. Therefore, the parties agree as follows:

I. CONFIDENTIAL INFORMATION. The term "Confidential Information" means any information or material which is proprietary to the Owner, whether or not owned or developed by the Owner, which is not generally known other than by the Owner, and which the Recipient may obtain through any direct or indirect contact with the Owner. Regardless of whether specifically identified as confidential or proprietary, Confidential Information shall include any information provided by the Owner concerning the business, technology and information of the Owner and any third party with which the Owner deals, including, without limitation, business records and plans, trade secrets, technical data, product ideas, contracts, financial information, pricing structure, discounts, computer programs and listings, source code and/or object code, copyrights and intellectual property, inventions, sales leads, strategic alliances, partners, and customer and client lists. The nature of the information and the manner of disclosure are such that a reasonable person would understand it to be confidential.

A. "Confidential Information" does not include:

- matters of public knowledge that result from disclosure by the Owner;
- information rightfully received by the Recipient from a third party without a duty of confidentiality;
- information independently developed by the Recipient;
- information disclosed by operation of law;
- information disclosed by the Recipient with the prior written consent of the Owner; and any other information that both parties agree in writing is not confidential.

II. PROTECTION OF CONFIDENTIAL INFORMATION. The Recipient understands and acknowledges that the Confidential Information has been developed or obtained by the Owner by the investment of significant time, effort and expense, and that the Confidential Information is a valuable, special and unique asset of the Owner which provides the Owner with a significant competitive advantage, and needs to be protected from improper disclosure. In consideration for the receipt by the Recipient of the Confidential Information, the Recipient agrees as follows:

A. No Disclosure. The Recipient will hold the Confidential Information in confidence and will not disclose the Confidential Information to any person or entity without the prior written consent of the Owner.

B. No Copying/Modifying. The Recipient will not copy or modify any Confidential Information without the prior written consent of the Owner.

C. Unauthorized Use. The Recipient shall promptly advise the Owner if the Recipient becomes aware of any possible unauthorized disclosure or use of the Confidential Information.

D. Application to Employees. The Recipient shall not disclose any Confidential Information to any employees of the Recipient, except those employees who are required to have the Confidential Information in order to perform their job duties in connection with the limited purposes of this Agreement. Each permitted employee to whom Confidential Information is disclosed shall sign a non-disclosure agreement substantially the same as this Agreement at the request of the Owner.

III. UNAUTHORIZED DISCLOSURE OF INFORMATION - INJUNCTION. If it appears that the Recipient has disclosed (or has threatened to disclose) Confidential Information in violation of this Agreement, the Owner shall be entitled to an injunction to restrain the Recipient from disclosing the Confidential Information in whole or in part. The Owner shall not be prohibited by this provision from pursuing other remedies, including a claim for losses and damages.

IV. RETURN OF CONFIDENTIAL INFORMATION. Upon the written request of the Owner, the Recipient shall return to the Owner all written materials containing the Confidential Information. The Recipient shall also deliver to the Owner written statements signed by the Recipient certifying that all materials have been returned within five (5) days of receipt of the request.

V. RELATIONSHIP OF PARTIES. Neither party has an obligation under this Agreement to purchase any service or item from the other party, or commercially offer any products using or incorporating the Confidential Information. This Agreement does not create any agency, partnership, or joint venture.

VI. NO WARRANTY. The Recipient acknowledges and agrees that the Confidential Information is provided on an "AS IS" basis. THE OWNER MAKES NO WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THE CONFIDENTIAL INFORMATION AND HEREBY EXPRESSLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL THE OWNER BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING OUT OF THE PERFORMANCE OR USE OF ANY PORTION OF THE CONFIDENTIAL INFORMATION. The Owner does not represent or warrant that any product or business plans disclosed to the Recipient will be marketed or carried out as disclosed, or at all. Any actions taken

by the Recipient in response to the disclosure of the Confidential Information shall be solely at the risk of the Recipient.

VII. LIMITED LICENSE TO USE. The Recipient shall not acquire any intellectual property rights under this Agreement except the limited right to use as set forth above. The Recipient acknowledges that, as between the Owner and the Recipient, the Confidential Information and all related copyrights and other intellectual property rights, are (and at all times will be) the property of the Owner, even if suggestions, comments, and/or ideas made by the Recipient are incorporated into the Confidential Information or related materials during the period of this Agreement.

VIII. INDEMNITY. Each party agrees to defend, indemnify, and hold harmless the other party and its officers, directors, agents, affiliates, distributors, representatives, and employees from any and all third party claims, demands, liabilities, costs and expenses, including reasonable attorney's fees, costs and expenses resulting from the indemnifying party's material breach of any duty, representation, or warranty under this Agreement.

IX. ATTORNEY'S FEES. In any legal action between the parties concerning this Agreement, the prevailing party shall be entitled to recover reasonable attorneys fees and costs.

X. GENERAL PROVISIONS. This Agreement sets forth the entire understanding of the parties regarding confidentiality. The obligations of confidentiality shall survive 1 year from the date of disclosure of the Confidential Information. Any amendments must be in writing and signed by both parties. This Agreement shall be construed under the laws of the State of New York. This Agreement shall not be assignable by either party. Neither party may delegate its duties under this Agreement without the prior written consent of the other party. The confidentiality provisions of this Agreement shall remain in full force and effect at all times after the effective date of this Agreement. If any provision of this Agreement is held to be invalid, illegal or unenforceable, the remaining portions of this Agreement shall remain in full force and effect and construed so as to best effectuate the original intent and purpose of this Agreement.

XI. SIGNATORIES. This Agreement shall be executed by Lisa Smith, Officer, on behalf of MovingOn Productions, LLC and Marie Hankinson and delivered in the manner prescribed by law as of the date first written above.

OWNER:
MovingOn Productions, LLC

By: Lisa Smith
Lisa Smith

RECIPIENT:
Marie Hankinson

By: _____

Appendix F

PhD Tracking Forms

COLLEGE OF NURSING

DISSERTATION COMMITTEE MEMBERSHIP FORM

We, the undersigned, agree to serve as members of the Dissertation Committee of:

Marie R. Hankinson who is developing a proposal for a dissertation tentatively titled:

The Lived Experience of Nurses Caring for Induced Hypothermia Patients

(Agreement to be a member of the Dissertation Committee does not imply acceptance of the proposal.)

Signed, Chairperson, Dissertation Committee — Printed Name — Date 3/9/15

Signed, 2nd Committee Member — Printed Name: Robin Chard — Date 3/9/15

Signed, 3rd Committee Member — Printed Name: Mary Ellen Mitchell Rosen — Date 3/9/15

Signed, PhD Program Director — Printed Name — Date 3/9/15

COLLEGE OF NURSING

APPROVAL TO SCHEDULE THE PROPOSAL or DISSERTATION DEFENSE

To the PhD in Nursing Education Program Director:

We, the undersigned, agree that the following candidate's proposal/dissertation is acceptable for the scheduling of a defense.

Candidate's full name: MARIE HANKINSON

Dissertation Title: The Lived Experience of Nurses Caring for Induced Hypothermia Patients

Signed:

Chairperson, Dissertation Committee

Robin Chard, PhD, RN, CNOR
2nd Member, Dissertation Committee

Mary Alice Mitchell-Rowe, PhD, RN
3rd Member, Dissertation Committee

DEFENSE TIME AND LOCATION

Day Tuesday Date 04 / 21 / 2015 Time: 11:00 AM

Location: Seminar 2124

PhD in Nursing Education Program Director:

Signature 4/21/15 Date