From Novice to Expert, What Are Nurses' Beliefs About Personal Protective Equipment?

by

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Abstract

Nursing is a profession in which nurses come in contact with infectious disease on a daily basis. There are risks associated with caring for patients through exposure to blood and body fluids. The purpose of this study was to determine the knowledge base and proficiency of nurses and their use of personal protective equipment (PPE). The aims of the study were to analyze nurses' beliefs and knowledge of Standard Precautions and the use of PPE. The study was conducted in the State of Georgia and used 30 participants who were licensed Registered Nurses between the ages of 20 and 65 years old. The sample was collected using snowball sampling and participants were divided into two groups based on whether they had less than or greater than one year of nursing experience. The data were gathered using an email survey via Survey Monkey®. The results suggested that nurses with greater than one year of experience felt more confident in caring for patients when exposed to blood and body fluids as well as felt more confident in removing PPE. Overall, the majority of nurses felt that further education and competency training on PPE and Standard Precautious would be beneficial.

Proposal Approval

The proposal for this study was approved by the Committee on the Conduct of Nursing Research, Department of Nursing, College of Sciences and Health Professions, and Albany State University.

Thesis Approval

Accepted by the faculty of the College of Sciences and Health Professions, Albany State University, in partial fulfillment of the requirements for the Master of Science in Nursing Degree.

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Dean, College of Sciences and Health Professions

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Date

Research Committee:

_____, Chair

_____, Member

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Dedication

Our work is dedicated to the protection of the nursing profession. To all the nurses around the globe, we salute you for what you do every day. If, by any chance, our work makes your day safer, we have fulfilled our mission.

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Chapter I

Introduction

Nursing is a profession that cares for individuals throughout their life span. Nurses care for the injured and sick and promote health to prevent disease in patients. Nurses do not get to choose their patients. Due to the nature of nursing, nurses are exposed to pathogens daily. Since the early 1800's, new measures have been introduced to prevent the spread of pathogens from patient to patient and patient to nurse.

As new diseases have evolved, updated measures have been introduced to protect the patient and the nurse from exposure via research and government guidelines from the Center for Disease Control and Prevention (CDC) in the United States. The use of these measures known as Standard Precautions, provide infection control guidelines that are not mandated. The nurse, an individual, chooses to learn and follow the newest guidelines out of personal responsibility to self. The purpose of this study is to analyze the use of Standard Precautions, particularly Personal Protective Equipment (PPE), by nurses who have less than one year of experience as opposed to those with greater than one year of experience.

Research in PPE use is minimal from a nursing aspect. By analyzing the nurse's faith in or belief in PPE, one can better understand the willingness to care for individuals with pathogenic diseases in nursing. The goal of the investigators' research is to understand and explore the relationship that exists between experience of a nurse and

the belief of Standard Precautions as protection in the nursing field and how it relates to willingness to care for infectious patients.

Background

In the fall of 2014, Ebola was diagnosed on United States soil for the first time in recorded history (CDC, 2014). A Liberian man travelling to the United States arrived asymptomatic but within days presented feverishly ill with Ebola-like symptoms presented. After the isolation and confirmation of Ebola in the traveler, two nurses caring for the man contracted the disease. The traveler died of Ebola within days and the nurses were transported to care facilities and survived. Upon diagnosis of Ebola, the media provided information to the public which caused fear. Concurrently, the unprecedented fear of Ebola permeated the nursing profession. The ultimate question that arose was: How did this happen? How did 2 nurses caring for an ill patient contract Ebola if they were highly trained nursing staff following PPE protocol?

In the days following the transmission, speculation arose that the nurses did not follow PPE protocol (Dart, 2014). In an interview with the Associated Press (2014), one of the nurses expressed concern with her level of training in relation to donning and doffing PPE. Dr. Friedan, the CDC chief medical officer, implied in an interview with *Face The Nation* that "the fact that we don't know of a breach in protocol is concerning because clearly there was a breach in protocol. We have the ability to prevent the spread of Ebola by caring safely for patients" (Kaplan, 2014, para 2). However, since the mode of transmission to the nurses remained in question, the CDC provided new updated guidelines for health care personnel on the use of PPE (CDC, 2015). With the new

emphasis on the correct use of PPE by the nurse, the ultimate responsibility of infection protection rests on every nurse's knowledge of PPE and Standard Precautions.

As part of Standard Precautions, the CDC provides published guidelines for the proper use of PPE. The evolution of the guidelines has occurred over time and in relation to disease emergence and research findings. Safety precautions for limiting cross contamination of infectious disease between patients by nurses began in the late 1800s in isolation houses for sick patients (Bjerke, 2002). By the dawn of the 20th century, the cubicle system was introduced for isolation and nurses were using gowns as a barrier method, along with hand cleansing with antiseptic soap (Garner, 1996). As new infectious diseases emerged, the improvement of protection guidelines became evolutionary. In the early 1970s, the CDC issued the "Isolation Techniques for Use in Hospitals," which employed a color-coded system of isolation in response to influenza (CDC, 2009). In 1983, the CDC released new guidelines entitled, "Guideline for Isolation Precautions in Hospitals" which included a "Blood and Body Fluid Precaution" section that emphasized the use of barrier protection against blood and bodily fluids in patients with known infection (CDC, 1988).

In 1987, as the AIDS epidemic expanded, the CDC, for the first time, introduced "Universal Precautions" for all patients regardless of infection status (CDC, 1988). The Universal Precaution techniques required use of barrier protection and vaccination exposure for protection. Bodily Substance Isolation appeared shortly after Universal Precautions and proposed that all moist bodily substances were potentially infectious and gloves should be utilized to prevent transmission (Bjerke, 2002). Cumulatively, in 1996, the CDC combined Universal Precaution and Bodily Substance Isolation into the current

term, Standard Precautions. Standard Precautions applies to all patients and includes guidelines for hand hygiene, PPE, respiratory hygiene and cough, injection safety, medication handling, and cleaning of devices and environmental surfaces (CDC, 2011). The latest update from the CDC in relation to Standard Precaution guidelines was presented in response to the Ebola crisis in the United States and involves PPE.

The knowledge and use of PPE are paramount to safety in the healthcare environment. For nurses working with patients, understanding the components of PPE is essential. The components of PPE include a gown, gloves, mask, respirator, goggles, and face shield. Each component of PPE has recommendations for proper use, when to use, and how to use each item. Per the CDC, there are three components of use which are: anticipated exposure, durability and appropriateness for situation, and fit (CDC, 2010). Understanding the risk associated with each patient is related to the ability of the nurse to think critically and utilize the correct level of precaution and order of PPE. The sequential order of putting on (donning) and removing (doffing) PPE requires stringent technique to prevent contamination. The nurse must have a complete understanding of what areas of the body have been contaminated and what areas are clean. The process for removing PPE after contamination involves removal of gloves first, facial shields, gown, and mask (CDC, 2010). The process of removal should be sequential and monitored per new guidelines. The level of precaution is determined by the type of patient contact, amount of bodily fluid exposure, and the type of isolation. Types of isolation precaution include contact, droplet, and airborne per Standard Precaution guidelines (CDC, 2010). Standard Precaution guidelines were created to protect the nurse and the patient. Vital to protection, the nurse must possess precise knowledge of procedure and protocol to fully

protect himself/herself. The responsibility of understanding and implementing PPE guidelines is that of the individual nurse.

The availability of PPE in the work environment is mandated by the United States government via the Occupational Safety and Health Administration (OSHA). The *Needlestick Safety and Prevention Act of 2000* used the Occupational Safety and Health Administration to provide a Bloodborne Pathogen Standard (29 CFR 1910.1030) to protect employees against the dangers of working with bloodborne pathogens (OSHA, n.d.). According to OSHA regulation, the employer must (a) establish an exposure control plan, (b) update the plan annually, (c) implement use of Universal Precautions, (d) identify and use engineering controls, (e) identify and ensure the use of work practice controls, (f) provide personal protective equipment, (g) make Hep B vaccinations available to all workers, (h) make available post exposure evaluation and treatment, and (I) provide information and training to all workers with maintenance of records (OSHA, 2011). The development of a nationally recognized law for employers mandated the training of employees on Universal Precautions and supplied workers with protective barrier equipment. According to OSHA, the application of Universal Precautions applies to all patients every time (OSHA, 2008).

In the classroom, educational training involves the pathophysiology of disease transmission and etiology. However, specific training measures for Standard Precautions, as evidenced by college handbooks, relied on the CDC guidelines. The American Association of Colleges of Nursing stated, “The education of a nurse must transcend the traditional areas, such as chemistry and anatomy, to enable them to gain a deeper understanding of health promotion, disease prevention, screening, genetic counseling,

and immunization" (Amos, 2016, p. 7). The Nurse Practice Act governs and defines the scope of the professional nurse. In Georgia, the Georgia Registered Nurse Practice Act (2016) defines nursing as following protocols and delivering safe and effective nursing care. The development of a nurse depends on the ability to develop critical thinking skills in an ever-changing environment and apply sound judgment based on theoretical and clinical expertise.

Research Problem

Nursing is the largest healthcare profession with over 3.1 million registered nurses throughout the United States (American Association of College of Nurses, 2011). Exposure to infectious pathogens is a known risk of the profession. The implementation of Standard Precautions is imperative in the clinical setting to protect nurses from infectious disease transmission. Nurses are exposed to bodily fluids in the line of duty. OSHA (2011) mandated employers to provide equipment and training to all employees who are occupationally exposed to pathogens. Undergraduate preparatory guidelines provide the theoretical basis for infection prevention. The CDC sets forth the guidelines of Standard Precautions to protect the healthcare worker. Yet, studies show that healthcare workers, nurses, do not fully abide by the guidelines for many fundamental differences (Madeo, 2004). With the recent emergence of Ebola in the United States, the critical thinking ability of the nurse to recognize the need for understanding and implementing Standard Precautions and PPE procedures is paramount to individual and patient safety. There is little research regarding the perspectives of nurses in relation to PPE understanding, usage, and willingness to care for patients with infectious illnesses.

Research Purpose

The purpose of this descriptive study is to examine the beliefs of nurses in relation to current use of Standard Precautions and use of PPE for protection from infectious disease. Currently, there are no standards of competency to ensure that nurses are knowledgeable of Standard Precaution guidelines, especially PPE standards. By examining the current use of PPE and the nurses' confidence level of applying and removing PPE, one can better understand the degree of knowledge and compliance in relation to safety. The perceived confidence of utilizing PPE in situations where blood and bodily fluids are exposed will be a determinant of willingness to care.

Theoretical Framework

The theoretical framework for this study utilized Patricia Benner's Novice to Expert Theory (1984). Benner received funding for a study, *Achieving Methods of Intraprofessional Consensus, Assessment and Evaluation Project* (AMICAE Project), which she utilized to uncover and describe the knowledge of a nurse's practice (Altman, 2007). From the study, Benner published her book, *Novice to Expert*, which became widely influential in the nursing realm of research and theory. Her theory utilized the earlier work of Dreyfus and Dreyfus (1986) which described the five levels of competency in practice. Benner's (1984) theory proposed that individuals pass through five different stages of proficiency in nursing in relation to the individual ability to rely on past experiences versus abstract theory, from fragmented methodology to holistic thought, and from detached observation to direct action performer.

Within the theoretical framework, the nurse relies on experience as he/she progresses through the stages of competency. Benner's (1984) five stages include novice,

advanced beginner, competent, proficient, and expert. As the nurse progresses through the five stages, experience is crucial to the transition from one stage to the next. Benner (1984) described experience as "refinement of preconceived notions and theory through encounters with many actual practical situations that adds nuances or shades of differences to theory" (Benner, 1984, p.36). Each stage or transition adds competence and certainty in critical thinking skills of the nurse.

Novice nurses, as described by Benner, have basic knowledge of patient care but must focus on learning the specifics of the specialty in which he/she resides (Thomes, 2003). The fulfilling actions of the novice nurse are based on guidelines (Benner, 1984). As the nurse transitions into the advanced beginner stage of competency, experience begins to build. However, Benner (1984) stated, "advanced beginners can take in too little of the situation" (p. 24). The nurse, at this point, is very guideline driven in contextual situations but can apply critical thinking skills and grasp a more fluid understanding of the situation as a whole. Competent nurses are able to display deliberate action and achieve "feelings of mastery" (Lyneham, Parkinson, & Denholm, 2008). Yet, the competent nurse lacks speed and fluid action. The proficient nurse has become able to view the situation as a whole and modify the contextual aspects of the situation based on past experience. At the end of the spectrum, the expert nurse relies on past experience, empirics, and ethics (Altman, 2007). The expert nurse moves easily and subconsciously through the situation and relies on feelings of intuition and past experience.

Benner's theory explained the transition from novice to expert learning in nursing as a transitional process that is built on a firm educational base accompanied and transformed by experience. The development of knowledge in nursing "is composed of

the extension of practical knowledge (know how) through research and the characterization and understanding of the "know how" of clinical experience" (Dracup & Bryan-Brown, 2004). Benner's argument for achieving proficiency is profoundly related to actual practice over time and is context specific. Critical thinking ability is a large facet of experience and improves over time as proficiency is obtained. In relation to safety of the nurse and the patient, the nurse must have the ability to recognize and apply contextual cues to situations. Safety can be directly related to the critical thinking ability of the nurse (Fero, Westbirger, Wesmiller, Zulo, & Hoffman, 2009). Certainly, anxiety and uncertainty are powerful feelings that emerge as new situations arise.

Research Question/Hypothesis

What are nurses' beliefs about personal protective equipment? For this study, the researchers hypothesized that novice nurses will adhere more stringently to Standard Precautions than expert nurses. However, expert nurses will have more willingness to care for patients with an infectious disease. Also, the researchers hypothesized that all nurses believe that certification and competency training in Standard Precautions would be beneficial. The objective of this study was to explore and gain knowledge in relation to novice and expert nurses' beliefs on Standard Precaution and PPE efficacy and usage.

Operational Definitions

For this study, the following definitions were used.

1. Standard Precautions are evidence based infection prevention measures that apply to all patients in every healthcare environment and include hand hygiene, personal protective equipment, respiratory hygiene, medical device and environment decontamination and safe injection practices (CDC, 2011).

2. Personal Protective Equipment are “specialized clothing or equipment, worn by an employee for protection against infectious materials” (OSHA, n.d., para 1)
3. Novice nurse is a nurse with less than 1 year of experience post-graduation.
4. Expert nurse is a nurse with over one year of experience post-graduation.

Summary

In summary, nursing is a profession in which infection control is a top priority. Standard precautions are mandated by the CDC and are precautions that provide protection for nurses and patients from disease transmission. The purpose of this study was to examine the beliefs of nurses in regard to Standard Precautions, specifically PPE. It was hypothesized that novice nurses would adhere to following standard precautions, whereas expert nurses may have a more difficult time adhering to the standard precaution guidelines but would be more willing and confident in caring for a patient with infectious disease.

Chapter II

Literature Review

Introduction

The purpose of this chapter was to examine and to evaluate previously published research regarding a nurse's knowledge, practice, and competency of universal precautions and PPE. Infectious disease transmission continues to affect the way nurses care for patients. Occupational risks associated with healthcare workers include needle sticks, exposure to bloodborne pathogens, and exposure to other communicable diseases via contact, droplet, and airborne routes of exposure. PPE plays a pivotal role in preventing transmission of infectious disease. Various factors contribute to a nurse's willingness to care for patients with infectious disease. One of the major findings among healthcare workers is the lack of competency and understanding of the use of PPE and universal precautions. Research on healthcare worker's unwillingness to care for patients with infectious disease increased in the 1990s due to the threat of terrorism and the 1997 emergence of a virulent avian influenza (Martin, 2011).

Martin (2011) studied the factors affecting a nurse's willingness to work during the pandemic flu (PF). The willingness was reported through a mailed questionnaire in 2009 during the second wave of the A/H1N1 flu (Martin, 2011). A quantitative study was performed using cross-sectional design and MINITAB 15 for Windows 2006 was used for data analysis (Martin, 2011). Results showed 90.1% of nurses would work during the

pandemic flu (Martin, 2011). The study noted that as the access to personal protective equipment (PPE) declined, the willingness to care for patients with the pandemic flu also declined (Martin, 2011). The questionnaire focused on whether the nurses would care for a patient with PF using various combinations of PPE. Ninety-two percent said they would care for a PF patient with a gown, gloves, and N-95 mask; whereas, only 5.8% said they would care for a patient with PF with no PPE. Ultimately, it was concluded that certain factors could decrease the willingness of nurses to work during the PF and through proper preparation; managers can anticipate the needs of nurses during such emergencies (Martin, 2011).

Infection control practices are vital in preventing the spread of disease. It is imperative to evaluate and ensure compliance among healthcare workers. An integrative review conducted by Valim, Marziale, Richart-Martínez, & Sanjuan-Quiles (2014), valuated the compliance with infection control practices. The aim and objective of the review was to evaluate compliance of infection control practices and report which factors influence compliance (Valim et al., 2014). The review analyzed a total of 23 studies, identifying 18 instruments. The most common compliance topics were found to be hand hygiene, PPE, and safe handling of cutting material; not one of the instruments focused on all of the compliance concerns (Valim et al., 2014). Training, perception of a safe environment, and perception of obstacles to comply with standard precautions and knowledge were variables that were strong predictors of compliance (Valim et al., 2014). The study concluded that compliance rates for infection control practices were below the recommended levels and that health professionals seemed to be selective in which

standard precautions they followed based on psychosocial variables and institutional management (Valim et al., 2014).

When caring for a patient with infectious disease, there are always risks associated with delivery of care. The article, *Exploring risk in professional nursing practice: an analysis of work refusal and professional risk,* used qualitative research methods to explore the risks associated with nursing (Beardwood & Kainer, 2015). Nurse interviewees were chosen and open-ended interviews were conducted with a focus on refusing unsafe work (Beardwood & Kainer, 2015). One of the main focuses for the interview was on the SARS crisis and the concerns, anxieties, and fears of frontline nurses (Beardwood & Kainer, 2015). There were 1536 surveys conducted that focused on the impact of SARS and nurses' understanding of PPE as well as how health institutions prepared staff on the health and safety issues associated with healthcare risks (Beardwood & Kainer, 2015). One major focus of the study was nurse risk. It noted the importance of individuals being "expected to be knowledgeable of risks and manage them rationally" (Beardwood & Kainer, 2015, p. 52). Nurses are expected to possess basic nursing knowledge; however, the study deemed that knowledge was an incomplete alternative for professional assessments that required professional tacit knowledge (Beardwood & Kainer, 2015). The requirement of tacit knowledge in nursing showed the importance of on-going assessment, observation, and competency of nursing skills for healthcare workers. The study concluded that nurses face risks that are often said to fall under an umbrella of protocols; however, protocols cannot determine every discipline for at-risk profession nurses (Beardwood & Kainer, 2015). It is necessary to review protocols on a

regular basis and ensure appropriate training and assessment was being performed prior to the use of each protocol.

Healthcare workers are at a higher risk for contracting disease related to blood borne pathogen exposure. Hepatitis B and C, HIV, and Ebola are examples of diseases transmissible via blood and body fluids. Due to the occupational hazards associated with healthcare workers and the lack of ability to identify bloodborne pathogens by medical history and physical exam alone, the CDC recommends universal precautions to be used when taking care of every patient (Sadoh, Fawole, Sadoh, Oladimeji, & Sotiloye, 2006). The study *Practice of Universal Precautions among Healthcare Workers,* stated that the "term 'standard precautions' was replacing 'universal precautions'" (Sadoh et al., 2006). Standard precautions are thought to expand coverage of universal precautions by recognizing that any body fluid may contain contagious and harmful microorganisms (Sadoh et al., 2006). The study aimed to assess and observe universal precautions by healthcare workers in Nigeria. The workers were selected through a multistage sampling technique from public and private healthcare facilities and included doctors, nurses, domestic staff, and laboratory workers (Sadoh et al., 2006). An interviewer-administered questionnaire was used to evaluate the healthcare workers' practices of the use of barrier equipment, recapping and disposal of used needles, and hand washing and screening of transfused blood (Sadoh et al., 2006). Needle sticks were a main source of occupational hazards for healthcare workers, causing a large percentage of blood borne pathogen exposure. Of the 433 respondents, 48.7% were trained nurses and admitted to always recapping used needles (Sadoh et al., 2006). The highest compliance of not recapping needles was among trained nurses and the lowest compliance was among doctors (Sadoh

et al., 2006). Sixty-four percent of respondents always used personal protective equipment, 6.5% did not wear goggles during surgery or deliveries, and 94.6% of healthcare workers were observed hand washing after caring for patients (Sadoh, et al., 2006). The study concluded recapping used needles was prevalent in healthcare facilities and noncompliance of universal precautions placed Nigerian healthcare workers at substantial higher health risks (Sadoh et al., 2006). The study determined a need for training programs on universal precautions and other measures such as written plans and posters in healthcare facilities to promote apposite use of PPE for Nigerian healthcare workers (Sadoh et al., 2006). Students in the healthcare profession were also at an increased risk of exposure to blood and body fluids. Proper practice and knowledge of standard precautions can significantly reduce the occupational exposure among students.

The article *Do nursing students know and practise the Universal Precautions to prevent transmission of infectious agents?* used a descriptive quantitative method to evaluate the knowledge and practice of undergraduate nursing students between the second and fourth year of nursing school (Van der Berg & Daniels, 2013). The main objective of the research was to establish whether there was a correlation between undergraduate nurse's knowledge of universal precautions and their practice. Two hundred fifty-three participants were selected using stratified random sampling. The study concluded there was a lack of knowledge of universal precautions and poor self-reported practice of using universal precautions (Van der Berg & Daniels, 2013). It was determined that more education was needed to improve knowledge and practice of universal precautions among students (Van der Berg & Daniels, 2013). Educational programs for universal precautions should be offered throughout nursing school as well

as upon graduation to ensure nursing professionals feel prepared to enter the healthcare profession independently (Van der Berg & Daniels, 2013).

Summary

In summary, health care workers are at an increased risk for occupational hazards. It was found that nurses and student nurses lacked competency and understanding of PPE and standard precautions. Infectious disease transmission is preventable using the appropriate precautions. The lack of understanding of the proper use of PPE and standard precautions influenced nurses' willingness to care for patients with transmissible diseases. Ultimately, further training and education on standard precautions and personal protective equipment was deemed necessary to bridge the gap in the knowledge deficit.

Chapter III

Methodology

Introduction

The purpose of this chapter was to define the research design, setting, population and sample used for the research. The researchers provided the Internet survey rationale. Response rate and the process of data collection and storage were discussed in detail. Along with limitations, protection of human subjects was maintained judiciously.

Research Design

This study utilized a descriptive analysis design. A descriptive design enabled the researchers to view a situation in the natural setting (Grove, Burns, & Gray, 2013). A descriptive analysis design enabled the researchers to access two different subject groups in relation to a phenomenon with the intent to explore actions across varying stages of nursing. Grove et al. (2013) state that studying subjects in varying stages of development allows an intrinsic understanding of a phenomenon over time when time is naturally limited in the research.

Setting

The study was conducted using Registered Nurses across the country, particularly in Georgia. The participants were placed into two groups depending on their level of experience as a nurse. One group was comprised of RNs with one year of experience

or less and the other group included RNs with over one year of experience in nursing. The first 15 RNs with less than one year of experience and the first 15 RNs with more than one year of experience who responded to the survey and met the qualifications were included in the study. All nurses were required to hold a valid nursing license and have employment in nursing.

Population and Sample

The study utilized snowball sampling. Network or snowball sampling enables the researcher to use "social networks and the fact that friends tend to have characteristics in common" to find participants for research (Grove et al., 2013, p. 366). For this study, the researchers plan was to examine nurses from two distinct levels of experience in relation to beliefs and use of PPE. The population consisted of Registered Nurses in the United States with varying levels of years of experience currently working in the field of nursing. The sample contained at least 30 RNs drawn from the population. Initially, the researchers contacted peers who were RNs to participate in the study. Additionally, the researchers recruited more participants by networking with the peers for additional participants who were RNs. The study examined the willingness to care for patients with pathological infectious disease processes, which warranted the use of snowball sampling to protect confidentiality in relation to employment.

Instrument

The researchers created the instrument used for the study through careful analysis of questions that employed closed-ended questions with a dichotomous yes/no answer. With careful deliberation, the researchers developed a survey containing 3 demographic and 5 PPE questions (Appendix A). Excluding double negative, double, and double

negative questions, the researchers developed the questionnaire with careful forethought. Content validity, specifically, face validity was utilized for the instrument. The researchers determined the elements to be measured via the study definitions, literature review, peer interpretation, and advisement of committee members. Face validity is considered a subjective assessment with no clear guidelines of measurement and thus is determined to be the weakest form of validity (Grove et al, 2013). The instrument was examined for all major elements related to the content and deemed appropriate by the researchers. The instrument was determined to measure the theoretical construct it alleged to measure, indicating probable construct validity. The instrument was reviewed by the faculty advisor for the research at Albany State University. Additionally, each researcher had one peer review the instrument for readability and clarity. Reliability of the instrument was not determined prior to the study.

Research Study

The survey was presented through an online platform and sent to the participants via email. Upon receiving approval from the International Review Board (IRB) and the Albany State University Thesis Chair, participants in the study received a cover letter via Appendix B email, explaining the purpose of the research as well as the qualifications to participate. The letter also explained the anonymity of the participants and their ability to refrain from answering any question on the questionnaire and that they may withdraw from participating in the study at any time without penalty. After reviewing the cover letter, there was an attached link that directed them to www.surveymonkey.com, where the questionnaire was located. It explained in the cover letter that by clicking the Survey Monkey® link, the participant voluntarily agreed to participate in the study. There were 3

demographics questions that were used solely for research purposes, followed by 5 questions regarding PPE in nursing.

Data Collection

A total of at least 30 Registered Nurse participants via snowball sampling were contacted via email with a Survey Monkey® link to a dedicated questionnaire that consisted of 5 PPE questions in addition to 3 demographic questions. Data were collected over a 4-week span with a reminder email sent 2 weeks after the initial survey link was sent. The information collected was stored on a jump drive in one of the researcher's office under lock and key.

Assumptions

Assumptions for the study included that the participants provided honest answers to the questions. It was assumed that the novice nurses possessed more knowledge of recent communicable diseases such as Ebola and the proper use of PPE when exposed to such communicable disease and that expert nurses felt more comfortable donning and doffing PPE properly as well providing care for patients with communicable diseases.

Data Analysis

The research was analyzed according to number of years of nursing experience in correlation with knowledge and competency of standard precautions and personal protective equipment; therefore, the researchers used a nominal level of measurement. Nominal level of measurement is "used when data can be organized into categories of a defined property but the categories cannot be ordered" (Groves et al, 2013, p. 386).

Protection of Human Subjects

Approval for this study was obtained from the Albany State University IRB before data collection began. The participants were informed that the link provided via email served as their consent. A cover letter was provided for each participant prior to being provided access to the survey. The consent stated that participation was voluntary with the ability to decline to answer any particular question. There were no known risks associated with completing the survey. The survey was anonymous and did not ask for any personal information other than years of nursing experience, age, and if the participant held a valid nursing license. The participants were provided with the researchers' names and numbers if they had any questions regarding completion of the survey.

The researchers completed CITI training prior to beginning research. The researchers and faculty had access to the data via a flash drive that will be deleted following the data collection and reporting of findings.

Limitations

Limitations included the population and sample size. The nurse must be a licensed RN with a valid nursing license. According to Grove et al., "the response rate to questionnaires is generally lower that that with other forms of self-reporting" (2013, p. 429). Another potential limitation also included the willingness of participants to complete the survey.

Summary

In summary, this chapter defined the research design, setting, population and sample that was used for the research. A descriptive analysis design was utilized for the

study. The study was conducted using currently licensed Registered Nurses across the country, particularly in Georgia. Snowball sampling was used for the data collection. The sample consisted of at least 30 Registered Nurses. The instrument used for the study was created by the researchers and used careful analysis of questions that employed closed-ended questions with a dichotomous yes/no answer. Data was collected from at least 30 RN nursing participants who were contacted via email with a Survey Monkey® link to a dedicated questionnaire that consisted of 5 PPE questions in addition to the 3 demographic questions. It was assumed that participants would provide honest answers to the survey questionnaire. The limitations of the study were subject to voluntary completion of the survey and networking availability.

Chapter IV

Research Findings

Introduction

The purpose of this study was to determine the knowledge base and proficiency of nurses and their use of personal protective equipment (PPE). The aims of the study were to analyze nurses' beliefs and knowledge of Standard Precautions and the use of PPE. The data were gathered using snowball sampling via email and Survey Monkey®. The survey was available between January 15, 2017 and February 22, 2017. This chapter reviewed the statistical findings.

Description of Demographics

Snowball sampling was used to obtain two samples of registered nurses who held a current Registered Nursing (RN) license, lived in the United States, and were between the ages of 20 and 65. One group consisted of registered nurses with less than one year of experience and one group consisted of registered nurses with greater than one year of experience. Of the 31 subjects who completed the study, 100% were active, registered nurses who were between the ages of 20 and 65. There were 14 nurses (43.75%) who had been a nurse for less than one year and 17 nurses (53.25%) who had been a nurse for over one year. See Figure 1 and Figure 2 below.

Figure 1

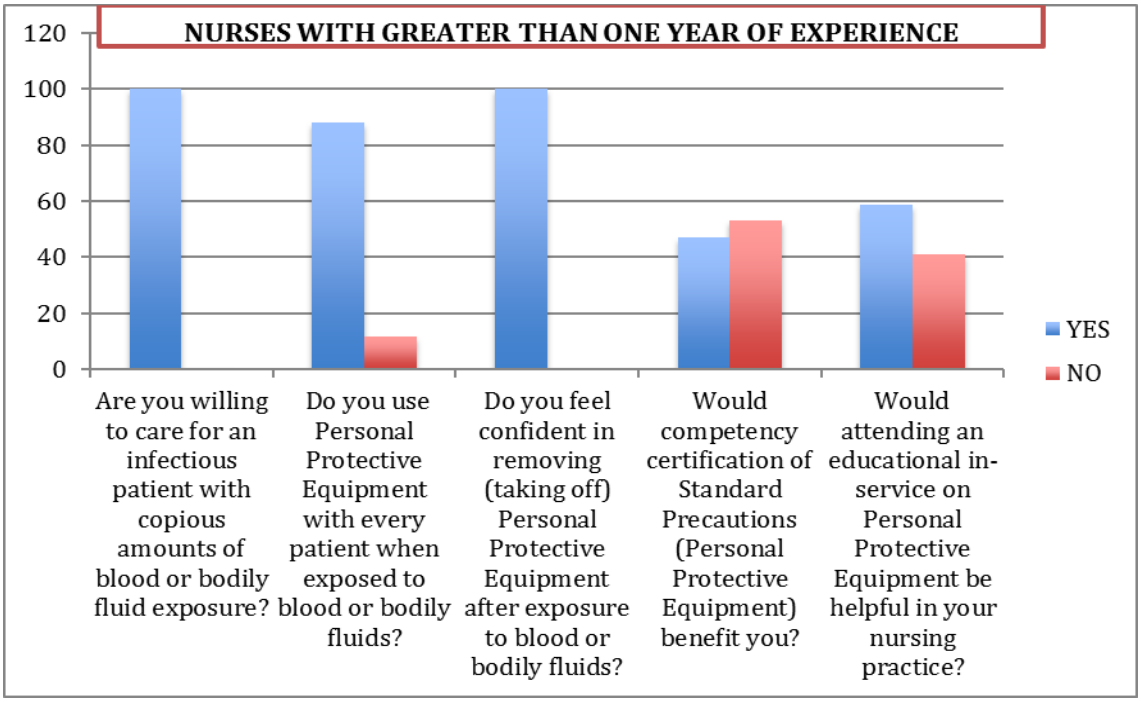
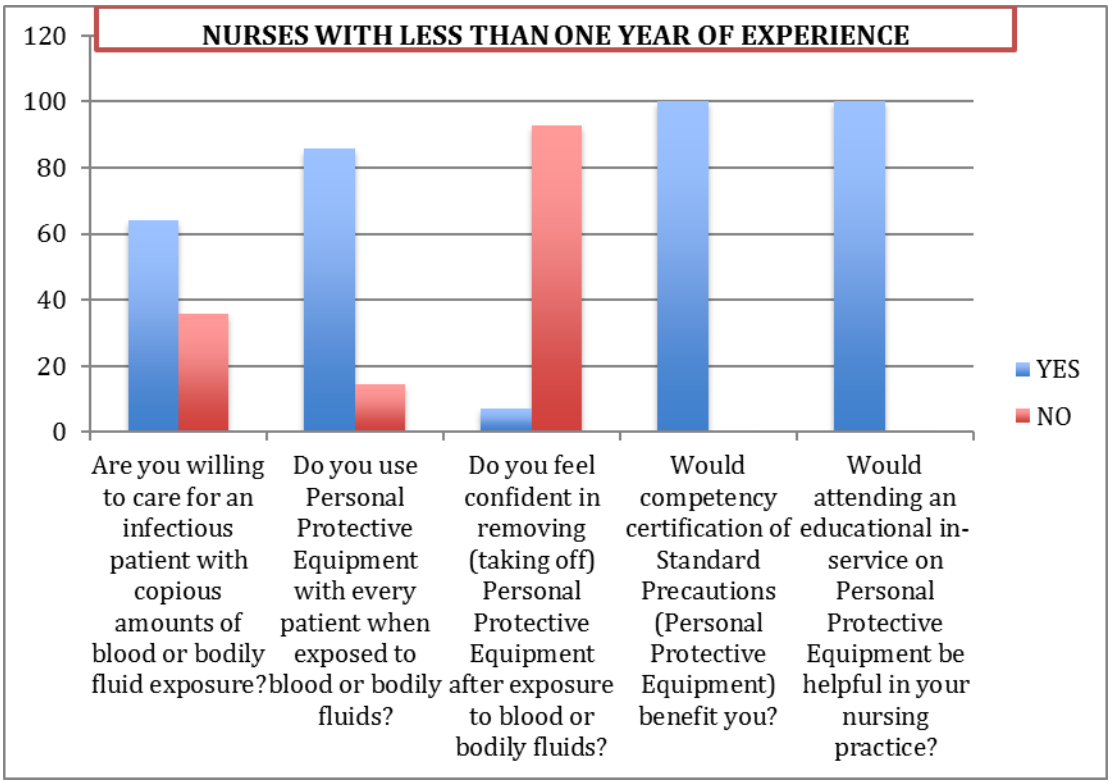


Figure 2



Description of Statistical Findings

Descriptive statistics were used to analyze these data. The findings were in correlation with the researchers' hypothesis that nurses with more experience would feel more confident with PPE and standard precautions. The data showed 88.24% of nurses with more than one year of nursing experience used PPE with every patient when exposed to blood or bodily fluids; whereas 85.71% of nurses with less than one year of experience used PPE with every patient. It was found that 100% of nurses with more than one year of experience were willing to care for an infectious patient with copious amounts of blood or body fluid exposure and 64.29% of nurses with less than one year of experience were willing to care for an infectious patient. It was also found that 100% of nurses with more than one year of nursing experience felt confident with donning and doffing PPE after exposure to blood and body fluids but only 7.14% of nurses with less than one year of experience were confident in donning and doffing PPE.

There were 47.06% of nurses with more than one year of experience and 100% with less than one year of experience who felt a competency certification of standard precautions and PPE would benefit them. There were 58.82% of the nurses with more than one year of experience who felt they would benefit from attending an educational in-service on PPE but 100% of nurses with less than one year of experience felt they would benefit from an educational in-service.

Summary

These nursing data were obtained through Survey Monkey®, using participants who were registered nurses between the ages 20-65 years old and held a valid nursing license. The data were ultimately found to determine nurses' beliefs about standard

precautions and their knowledge and competence using PPE. Nurses were separated into two different categories: nurses with greater than one year of experience and nurses with less than one year of experience. It was hypothesized and supported that nurses with greater than one year of experience felt more comfortable and competent with PPE and standard precautions. Though the nurses with experience felt more competent with PPE than nurses with less experience, the majority (77.42%) of the nurses surveyed felt they would benefit from more training and education about PPE and standard precautious.

Chapter V

Discussion and Conclusions

Introduction

The purpose of this study was to examine the beliefs of nurses in relation to the current use of Standard Precautions and use of PPE for protection from infectious disease. This chapter includes a discussion of findings, correlation to nursing theory, implications for nursing practice, and suggestions for future nursing practice. Novice nurses were more unwilling to care for infectious patients and did not feel comfortable in donning and doffing PPE correctly. Only 64% of novice nurses showed willingness to care for an infectious patient and 7% felt comfortable in donning and doffing PPE. Inversely, expert nurses were more willing to care for an infectious patient and felt comfortable donning and doffing PPE. The expert nurses were 100% in both areas. These findings were congruent with the researchers' hypothesis.

One previous study analyzed nurses' willingness to care for patients during the Pandemic Flu (PF). Martin (2011) noted that as availability and access to PPE declined nurses' willingness to care for patients with the flu also decreased. A higher percentage, (92%), were shown as willing to care for a patient when given access to a gown, gloves, and an N-95 mask; whereas only 5.8% participants said they would care for a patient with PF with no PPE (Martin, 2011). Another study analyzed work refusal and professional

risk with emphasis on nurses' willingness to care for patients during the SARS crisis. That study showed a correlation in the lack of nursing knowledge of PPE and an increased risk to the nurses (Beardwood & Kainer, 2015). A similar study analyzed health care workers in Nigeria and their compliance with standard precautions and using PPE. The study found 63.8 % of respondents always used PPE (Sadoh et al., 2006). The researchers found this percentage to be lower than their findings; 85.71% of nurses with less than one year of experience used PPE with every patient; whereas, 88.24% of nurses with more than one year of nursing experience used PPE with every patient when exposed to blood or bodily fluids. The use of PPE with every patient when exposed to blood or bodily fluids was not at 100%.

The study findings were comparatively equal for adherence to PPE protocol when encountering blood or bodily fluids. The researchers felt that novice nurses would surpass expert nurses in this domain of the questionnaire. However, expert nurses were 3% higher in usage of PPE with blood or bodily fluids. Also, the researchers hypothesized that all nurses would believe that education in the form of in-service or competency would be beneficial. The study found that 100% of novice nurses believed that competency certification and educational in-services would be beneficial. Only 47% of expert nurses believed that a competency certification would be beneficial and 59% believed that an educational in-service would be beneficial. The researchers' hypothesis was not correct in this domain.

Connection to Nursing Theory

This study utilized Patricia Benner's Novice to Expert Theory to explore the relationship of PPE beliefs and use in relation to the years of experience as a nurse.

Within the theoretical framework, novice nurses rely on protocol/guideline-driven standards while experienced nurses rely on experience in nursing to govern decision-making. Experienced nurses use previous experience and have developed the ability to view the situation as a whole.

Of the novice nurses (n = 14), 9 of the respondents (64.29%) would care for an infectious patient, 12 (85.71%) used PPE with every patient, and only 1 (7.14%) novice felt confident in removing PPE post infectious exposure. These findings correlated well with Benner's Theory. Benner's theory proposed novice nurses as guideline-driven but lacking in experience, which provided uncertainty in situational exposures.

The survey findings suggested a direct correlation with years of experience and confidence in removing PPE after caring for an infectious patient. Of the experienced nurses (n = 17), 17 of the respondents (100%), would care for an infectious patient, 15 (88.24%) use PPE with every patient, and all 17 (100%) experienced nurses believed that they could remove post infectious PPE correctly. Benner's theory proposed that experienced nurses possessed an intrinsic ability to apply experience with intuition when caring for a patient.

Additionally, Benner's Theory implied that novice nurses were more guideline-driven. Of the novice nurses who completed the PPE survey, all 14 (100%) felt that they would benefit from an educational in-service or competency certification. Of the expert nurses, 8 (47.06%) desired a competency certification and 10 (58.82%) desired an educational in-service.

Implications for Nursing Practice

There were several implications for nursing practice identified in this study. This study quantified that neither novice nor expert nurses used PPE with every infectious patient as recommended by the CDC. Failure to use PPE with infectious patients is detrimental to both the nurse and the patient. Additionally, the findings of the study demonstrated a large gap between novice and expert nurses' perceived ability to care for an infectious patient and confidence in removing PPE. Also, this study provided quantifiable data to show the refusal of novice nurses to provide care for infectious patients, which is a violation of the Nightingale Pledge. By identifying that lack of confidence and knowledge was occurring and affecting the novice nurses' willingness to provide care, this study verified the need for further education and training

The findings of the study demonstrated that both novice and expert nurses desired additional educational opportunities in relation to Standard Precautions and PPE. Novice nurse's survey responses indicated a gap in knowledge and perceived ability to apply PPE in a contextual situation. Expert nurses responded with confidence of use of PPE and the ability to care for an infectious patient. However, both study groups showed interest in additional educational opportunities. Opportunities to advance knowledge of Standard Precautions and PPE should occur in the classroom prior to graduation. Opportunities to practice using PPE and applying Standard Precautions should be a concern of the faculty of nursing programs. Additionally, in the workplace, continuing education in the form of in-services should be readily available. In-services that are provided via employers should be up-to-date and provided annually. Since there are no governing bodies to

provide standardized information, competency certification remains a viable option to ensure that PPE protocols and education provided are evidence-based and up-to-date.

Suggestions for Future Nursing Research

Standard Precautions and the use of PPE are an intrinsic part of nursing that safeguards the patient and the nurse. Future nursing research should focus on educational platform design and implementation at the college level to ensure that new graduates of nursing are prepared and confident in use of Standard Precautions. Additionally, future research should focus on barriers to use of Standard Precautions and PPE in nurses across the span of experience.

Limitations

This study had multiple limitations. The size of the study was small. Snowball sampling was used which limited the respondents to colleagues and friends of colleagues. Racial and ethnic variations, degree of education, age, and sex of the participants were not identified. The sampling used was not indicative of all nurses and thus cannot be generalized to all nurses. The scope of the study was very broad. An increased number of participants and extensive data collection are indicated when the scope of a study is broad (Grove et al., 2013).

Conclusion

Standard Precautions and the use of PPE have seen many changes over the last 100 years as new diseases have emerged. Consequently, guidelines have changed and improved as knowledge of disease transmission improved. At this time, there is no governing body to ensure that both novice and expert nurses are equipped with the latest guidelines on Standard Precautions and PPE. Therefore, the responsibility of education

attainment rests on each individual nurse. Understanding Standard Precautions and PPE are critical to providing safe and effective care to the patient and safeguarding the nurse from disease. An environment of uncertainty in relation to proper usage of PPE creates fear and intimidation in healthcare, which results in a breakdown of procedure causing harm to the patient and the nurse.

The theoretical framework that was utilized to examine beliefs about PPE was Patricia Benner's Novice to Expert Theory. This theoretical perspective allowed the investigators to understand the varying beliefs between novice and expert nurses and provided causation for behavioral patterns.

At this time, educational opportunities are at the mercy of workplace administration or self-study. Although the CDC publishes updated guidelines, the extent that nurses follow those guidelines is unknown. Education is the key to increased confidence in both novice and expert nurses. There is a need to determine whether Standard Precautions and PPE education should be mandated by employers via in-services or governed by a certification via an accrediting body. An annual educational in-service would reinforce competencies in PPE use. A competency certification would provide evidence-based knowledge in Standard Precautions with a certifying body governing the content and passing rate. In a time where patient safety is paramount, the lack of knowledge and skill must be addressed on a national level.

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Appendix A

Personal Protective Equipment Survey

1. Are you a Registered Nurse in the United States with an active RN license?

○ Yes ○ No

2. Are you between the ages of 20 and 65 years? ○ Yes ○ No

3. Have you worked as a Registered Nurse greater than one (1) year? ○ Yes ○ No

4. Are you willing to care for an infectious patient with copious amounts of blood or bodily fluid exposure? ○ Yes ○ No

5. Do you use Personal Protective Equipment with every patient when exposed to blood or bodily fluids? ○ Yes ○ No

6. Do you feel confident in removing (taking off) Personal Protective Equipment after exposure to blood or bodily fluids? ○ Yes ○ No

7. Would competency certification of Standard Precautions (Personal Protective Equipment) benefit you? ○ Yes ○ No

8. Would attending an educational in-service on Personal Protective Equipment be helpful in your nursing practice?

○ Yes ○ No

Appendix B

Informed Consent Letter

Personal Protective Equipment in Nursing

You are being invited to participate in a research study about *Personal Protective Equipment in the field of nursing.* This study is being conducted by Lauren Warren and Amie Mitchell in consultation with Albany State University as part of a graduate student project at Albany State University.

You were selected as a possible participant in this study because you hold a valid RN license and work in the field of nursing. Initially, the researchers reached out to peers to participate in the study. From those peers, your name was received as a valid candidate to participate in the study.

There are no known risks if you decide to participate in this research study. There are no costs to you for participating in the study. Additionally, you will receive no monetary compensation for participating in the survey. The questionnaire will take about 3 minutes to complete. The information collected may not benefit you directly, but the information learned in this study should provide more general benefits.

This survey is anonymous. The survey will be provided to you via www.surveymonkey.com and the link acceptance will serve as your consent. Since this is a web-based survey, absolute anonymity cannot be guaranteed. However, no one will be able to identify you or your answers, and no one will know whether or not you participated in the study. Individuals from Albany State University and the Institutional Review Board may inspect these records. Should the data be published, no individual information shall be disclosed.

Your participation in this study is voluntary. By clicking on the link and completing the survey, you are voluntarily agreeing to participate. You are free to decline to answer any particular question you do not wish to answer for any reason.

If you have any questions about the study, please contact Lauren Warren, 478-973-5464 or Amie Mitchell at 478-391-1684.

The Albany State University Review Board has reviewed my request to conduct this project. If you have any concerns about your rights in this study, please contact Albany State University at 229-430-4600.

Sincerely,

Lauren Warren, BSN, RN & Amie Mitchell, BSN, RN

Albany State University Graduate Students