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Nursing Student's Breast Cancer Knowledge and Breast- self Examination Technique Confidence

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Abstract

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Lydia E. Gaud

MSN, Puerto Rico University, 1974

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Breast cancer is the second leading cause of cancer death in women in the United States. Several factors have been identified that interfere with women's breast cancer screening practices, including lack of knowledge and confidence in the breast self-examination (BSE) technique, and lack of information provided by health care provider. One of the reasons nurses do not teach breast cancer detection could be the little emphasis given to breast cancer examination in nursing schools. The BSE is a measure of significant value in detecting cancer of the breast. However, less than half of the women in the United States are participating in breast cancer screening. The purpose of this quantitative study was to investigate the relationship between the freshman and senior nursing students' breast cancer knowledge (BCK) and breast self-examination technique confidence (BSE_TC). An online survey was administered to measure the students' BCK and their BSE_TC. The social cognitive theory guided this study. A sample 100 nursing students (54 senior and 46 freshman) were included for hypothesis testing. The study results indicate that senior nursing students had higher mean scores on the BCK and BSE_TC, as would be expected. However, senior nursing students' BCK_BSE_TC scores were also very low. This is a concern for the future of breast cancer detection. This study provides data showing breast cancer screening concepts are unclear to freshman students, and remain unclear with senior students. Nursing educational curricula in breast cancer screening should be revised to affect improvements in nurses' role in advising and educating patients.

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Chapter 1: Introduction to the Study

Introduction

The National Cancer Institute (2013) estimated that there would be 231,840 new cases of breast cancer in women in the United States in 2015, and 40,290 resulting deaths (NCI, 2013). Breast cancer is the second leading cause of death in women in the United States (American Cancer Society, 2012a). In 2010, the medical costs associated with breast cancer were projected to reach $16.5 billion (Mariotto, Yabroff, Shao, Feuer, & Brown, 2011). Thus, breast cancer management has a significant impact on health care resources and the affected individuals. The rising costs associated with the treatment of breast cancer, and their concurrent impact on women and their families, indicate how important it is to emphasize preventive medicine (National Women Law Center, 2010). In addition, the identification of patients' health risk and effective application of knowledge in counseling patients on risk reduction are viewed as essential (Halloway & Watson, 2002). Patient education is one strategy that has been recognized to reduce risk and, consequently, the cost associated with breast cancer (National Institute of Health, 2011).

Background of the Problem

According to the American Cancer Society (2011b), the key to surviving breast cancer is early detection and treatment. However, less than half of the women in the United States follow the recommendations for breast cancer screening established by the American Cancer Society (2011). Nurses need to engage in health education regarding

breast cancer and must be knowledgeable about breast cancer management and confident in their application of that knowledge to patient education.

Several researchers have identified factors that interfere with breast cancer screening practices. These studies have shown that the factors that interfere with breast cancer screening practices are: fear, perceived susceptibility, perceived barriers, forgetfulness, lack of knowledge, and lack of confidence by women to carry out their own breast self-examination (Banegas et al., 2012; Hall et al., 2005; Lawvere et al., 2004; Leslie et al., 2003; Kratzke, Amatya, & Vilchis, 2015; Sunil et al ., 2014; Taioli, Joseph, Robertson, Eckstein, & Ragin, 2014). Banegas et al., (2012); Curtis (2010) and Hall et al. (2011) suggested that breast cancer is still often fatal despite the efficacy of early detection techniques. This indicates the need to study each one of the factors that interfere with breast cancer screening practices in order to understand why more women are not participating in these screenings.

Nurses have a unique opportunity to increase knowledge, correct misperceptions, and reduce fears related to breast cancer (Powe, Underwood, Canales, & Finnie, 2005). Investigations have shown that nursing textbooks focus little attention on these psychological aspects and they are not included in nursing educational programs (Powe et al., 2005). According to Powe et al. (2005), nurses do not teach detection of breast cancer, perhaps because the breast promotion content is not part of the educational program or perhaps due to the lack of emphasis on the breast health promotion content.

There is a need to explore the breast cancer knowledge of nursing students (Grindel, Brown, Caplan, & Blumenthal, 2004; Powe et al., 2005; Roth et al., 2011; Spence, Fasser, McLaughlin, & Holcomb, 2010). Nursing educators are responsible for the practice requirements of a rapidly changing, market-driven health care environment, and for preparing nurses to function effectively in the health care system (Liderman, 2000). Breast cancer knowledge and breast-self-examination technique confidence is an appropriate characteristic to investigate in the nursing student population to determine if they have the required clinical knowledge and skill necessary to take care of patients in the clinical setting.

Problem Statement

Breast cancer is the second leading cause of death in women in the United States (ACS, 2012). The cause of breast cancer remains unknown and thus the disease cannot be prevented. Approximately 90% of breast cancer is curable if treated in its early stages. Detection of breast cancer at an early stage improves treatment options, specific opportunities for treatment, and survival. Therefore, it is critical that women follow the breast examination guidelines recommended by the American Cancer Association before symptoms develop. However, less than half of women in the United States participate in breast cancer screening.

Purpose of the Study

The purpose of this study was to investigate the relationship between freshman and senior nursing students' BCK and their BSE_TC in the nursing program at Seminole

State College of Florida. The dependent variable in this study was the nursing students' BCK and their BSE_TC. The independent variable for this study was the grade level (freshman or senior) of nursing students. The freshman nursing students were included in this study because they might be enrolled in the University of Central Florida Concurrent Program. The senior and freshman students have to take a Health Assessment nursing course and are exposed to the BSE content and technique. Also both groups have been exposed to public educational campaigns (e.g., television, radio, print media, internet, health fairs) that are intended to educate women about breast cancer screening and early detection .This quantitative study explored the freshman and senior nursing students' BCK level and The BSE_TC through a questionnaire constructed using three different principles: Bloom's taxonomy, the nursing process, and the National Council Examination for Registered Nurses (Billings & Hensel, 2014; Ignatavicius & Workman, 2010; Okman, 2010; Rupert, 2014). The questionnaire included questions that measured the nursing student's breast cancer knowledge and breast self-examination technique confidence. Demographic questions were part of the questionnaire (Appendix A). The outcomes of this study will provide data to nursing programs that indicate that breast health concepts are unclear to freshman students.

Research Questions and Hypotheses

Two research questions formed the foundation of the study.

RQ1: To what extent do freshman and senior nursing students differ in their levels of breast cancer knowledge?

H_a1 There is a statistically significant mean difference in breast cancer knowledge scores between freshman and senior nursing students.

H_o1 There is not a statistically significant mean difference in breast cancer knowledge scores between freshman and senior nursing students.

RQ2: To what extent do freshman and senior nursing students differ in their levels of breast self-examination technique confidence?

*H*a2: There is a statistically significant mean difference in breast self-examination technique confidence scores between freshman and senior nursing students.

H_o2: There is not a statistically significant mean difference in breast self-examination technique confidence scores between freshman and senior nursing students.

Theoretical Framework

The theoretical model selected for this research was Bandura's (1986) social cognitive theory. According to Bandura (1997) social cognitive theory presents a model "of interaction in which the events of the environment and personal behavior act as reciprocal determinant factors of one another" (p. 6). The theory places emphasis on autodirection, autoregulation, and perception of self-efficacy. According to Glanz, Rimer, and Lewis (2002), social cognitive theory proposes that a human being possesses the following capabilities: (a) symbolization (processing and transformation of short term experiences into internal models that serve as guidelines for future actions), (b) advanced thought (the ability to anticipate consequences, which is similar to future actions and future planning of courses of action to attain valued goals), (c) vicarious learning

(acquiring rules for generation of action to attain valued goals), (d) auto-regulation (using internal rules and the auto-evaluation of reactions as a means of encouraging and regulating the behavior and fixing the external environment to create incentives for action), and (e) auto-reflection (thinking of one's own process of thinking and actively modifying the thoughts).

Given these capabilities, human behavior is shaped by the interaction between acquiring knowledge, gaining experience, and the individual's environment. The social cognitive theory is characterized by reciprocal determinism. Reciprocal determinism refers to the notion that cognition (perceived ability to perform the task), environment (the setting), and behavior (the task being performed) are bidirectional; that is, the components influence and are influenced by one another. The degree of influence that each of the three components has is contingent upon the type of activity, the individual, and the situation (Bandura, 1989).

According to social cognitive theory, beliefs are formed through observation and reflective thinking. These beliefs include self-attribution, self-assessment, and self-efficacy. A person's perceived self-efficacy is a belief in their abilities to carry out a particular action. Opinions concerning self-efficacy can develop through experiences, learning, verbal persuasion, and somatic responses to particular situations. Low self-esteem can result in failure and a lack of competition and growth. Belief in themselves makes it possible for an individual to complete tasks that build their competence and confidence. A greater perceived efficacy can cause more vigorous and persistent

individuals to engage actively in a particular behavior, even if they face obstacles and adverse experiences (Bandura, 1997).

Many factors influence self-confidence (White, 2009). Knowledge acquisition is required before self-confidence can be achieved (Nokeelainen, Tirri, & Merenti-Valimakiet, 2007). No amount of self-confidence can result in success if the required knowledge and some level of skill are absent (Schunk & Pajares, 2005). To achieve knowledge, formal or informal education must occur. Lidsey and Kleiner (2005) argued that there must be an understanding of information, skills, and procedures before an individual can build their confidence. Self-efficacy can lead to positive changes in conduct (Gramling, Nash, Siren, Eaton, & Culpepper, 2004). The ability of students to acquire a knowledge base, self-administration, and interpersonal skills required to succeed in an occupation is partially determined by their perception of their own efficacy (Opacic, 2003).

The promotion of knowledge, experience, achievements, and support systems comes before the acquisition of self-confidence. Eventually, graduates from nursing programs will enter the professional nursing field with high levels of self-confidence. This will allow nurses to develop: (a) clinical performance, (b) the ability to produce change, (c) the power to execute tasks or handle situations that test their own skills, (d) professional collaboration, and (e) the ability to motivate others. The resulting self-confidence among nurses will be beneficial to the consumer of the nursing care as well as his or her families (White, 2009).

Nature of the Study

Breast cancer is the second leading cause of death in women in the United States and breast cancer screening practices play a primary role in the early detection of the disease (ACS 2012). However, less than half of all women in the United States participate in breast cancer exams. Women may not choose to participate in breast cancer screening due to the lack of knowledge about breast cancer and the lack of confidence in breast self-examination techniques. Investigations have shown that nurses do not teach breast health promotion and breast cancer screening to their patients (Powe et al., 2005). One of the reasons for this could be the lack of preparation in the nursing programs.

This study used a quantitative research design to explore nursing students' BCK and BSE_TC in the nursing program at Seminole State College of Florida. This research used the social cognitive theory principles to determine the relationship between variables. The dependent variable was the nursing student's BCK and BSE_TC. The independent variable was the grade level (freshman or senior) of the nursing student.

I obtained the data from a group of freshman and senior nursing students enrolled in the associate degree nursing program at Seminole State College of Florida. A questionnaire was administered on content related to BCK and BSE_TC and on demographic data (Appendix A). The questions were constructed using three different sources of principles: (a) Bloom's taxonomy, (b) nursing process, and (c) The National Council Licensure Examination for Registered Nurses (NCLEX-RN) (Billings & Hensel, 2014; Ignatavicius & Workman, 2010; Okman, 2010; Rupert, 2014). The data were

collected from freshman nursing students enrolled in the nursing course Fundamentals of Nursing or Basic Medical - Surgical Nursing and senior nursing students enrolled in Complex Medical Surgical or Practicum Client Care Management nursing course. The data were analyzed using the Statistical Package for the Social Sciences (SPSS for Windows) (IBM SPSS 20.0, SPSS Inc.). The descriptive statistics were used to evaluate the demographic characteristics. A MANCOVA was used to address the research questions and hypotheses of this study.

Definition of Terms

For the purpose of this study, the key terms have been defined as follows:

Associate Degree Nursing Program: a comprehensive curriculum designed to prepare graduates to take the examination for registered nurse through the State Board of Nursing. This program has a two-year duration (4-5 academic semesters) (Kurzen, 2001).

Associate nursing students: identified as those nursing students who have completed a single nursing course.

Breast cancer: a malignant disease characterized by uncontrolled growth and spread of abnormal cells of the breast tissue (Phipps, Monahan, Sands, Marek, & Neighbors, 2011).

Breast cancer screening procedures: these include breast self-examination, clinical breast examination, and mammography (ACS, 2011).

Breast self-examination (BSE): performed by the woman herself doing inspection and palpation of her own breast tissue (ACS, 2011).

Clinical breast examination (CBE): breast exam performed by a health care provider (doctor or nurse) using the inspection and palpation techniques (ACS, 2011).

Environment: defined as all external conditions to the individual that affect behavior (Bandura, 1997). In this study, environment is identified as the breast cancer and breast-self-examination content provided by the associate degree nursing program.

Freshman nursing students: those students enrolled in the nursing course Fundamentals of Nursing or Basic Medical – Surgical Nursing in the associate nursing program at Seminole State College of Florida who voluntarily agreed to participate in the study.

Knowledge in breast cancer: information obtained through education or experience on (a) breast anatomy and physiology, (b) pathology of common breast tumors, (c) American women's' breast cancer risks, (c) symptoms of breast cancer, and (d) benefits of breast cancer screening in breast cancer early detection (Phipps et al., 2011). Student breast cancer knowledge was measured using a questionnaire (Appendix A).

Mammogram: breast tissue radiographic examination with the purpose of detecting cancer of the breast (ACS, 2011).

Metacognitive knowledge: knowledge of cognition, in general, as well as awareness and knowledge of one's own cognition (Duan, 2006).

Nursing students' self-confidence: defined in this study as associate nursing students' perceived capability to perform the breast-self-examination technique.

Students' self-confidence to perform the breast-self-examination technique was measured using a questionnaire (Appendix A).

Practice: commitment to regular procedures or breast cancer screening.

Procedural knowledge: knowledge of how to do something, methods of inquiry, and criteria using skills, algorithms, techniques, and methods (Duan, 2006).

Self-confidence: a significant predictor of individual performance developed and supported by the self-efficacy sources (mastery experiences, role modeling, and verbal persuasion (Bandura, 1997).

Self-efficacy: defined as "beliefs in one's capabilities to organize and execute the course of action required producing given attainments" (Bandura, 1997, p.3).

*Senior nursing student*s: those students who successfully completed the Advanced Medical and Surgical Nursing enrolled in the Complex Medical Surgical Nursing or Practicum Client Care Management nursing course in the associate nursing program at Seminole State College of Florida who voluntarily agreed to participate in the study.

Assumptions of the Study

This research was based on the following assumptions:

1. The data sources that were used in the studies were reliable and valid.
2. Breast cancer will continue to be a leading cause of death among women unless corrective actions are taken.
3. There is a need to increase the use of breast cancer screening by women.

4. It has already been determined by nursing education agencies and other investigators that the nurses' role includes client health education on breast cancer screening and that nursing education must prepare the associate nurse for that role/function.
5. Cognitive competence and self-confidence are an expectation of the nurse's role in health education and are considered one of the nursing program student's outcomes.

Limitations of the Study

I selected study participants from the Seminole State College of Florida. This posed certain limitations because the study focused on nursing students enrolled in a specific list of classes (Fundamentals of Nursing or Basic Medical and Surgical and senior nursing students enrolled in the Complex Medical Surgical or Practicum Client Care Management). Other limitations, such as potential nonrandomness within the collected sample, may have arisen upon data collection. I could have an effect on both internal and external validity in many different ways, none of which able to be seen beforehand.

Significance of the Study

Breast cancer is the secondary cause of disease and death among women in the United States (ACS, 2011). The efficacy of breast cancer screening practices has been demonstrated by the reduction of death in breast cancer; however, less than 50% of American women follow the breast cancer recommendations given by the ACS (Phipps et

al., 2011). In 2010, the Office of Research on Women's Health (ORWH) introduced the new agenda in women's health. One of the goals of this new agenda for the next decade included development of successful strategies for breast cancer diagnosis, prevention, and treatment (Pinn, Clayton, Begg, & Sass, 2010). This affects nursing practice because nurses have the responsibility to assist patients in achieving and maintaining healthy preventive behaviors. Studies indicate the nurses can educate women about the importance of being informed and performing routine breast cancer screening (Ackerson & Preston, 2009; Hall et al., 2005). Several studies show that nurses do not teach breast cancer detection (McCready et al., 2005; Powe et al., 2005). Therefore, it was necessary to investigate whether nurses' basic education provides the necessary preparation to enable them to educate patients about breast cancer.

Breast cancer continues to be a leading cause of death among women. The purpose of this research was to explore if the associate degree nursing program at Seminole Community College of Florida educates nursing students concerning breast cancer detection and BSE technique. The study results may help the nursing profession design interventions needed to develop health behavior related to breast cancer. This may contribute to increasing breast cancer screening practices in women and reducing breast cancer morbidity and mortality.

Summary

Breast cancer is the most common form of cancer in women (ACS, 2011; Memis, Akdolun, Balkaya, & Demirkiran, 2009). The rate of breast cancer continues to rise as a

result of steady aging of the population and the improvement of the diagnosis techniques. Examination for the disease should be an essential part of each woman's health routine. Women who appear to be at high risk for the disease (by personal or family history, or because of other risk factors) are encouraged to begin their assessment at an early age and to have the assessment done more frequently. Early detection of cysts and tumors of the breast is important because early detection can provide the opportunity for treatment and recovery from breast cancer. However, less than half of all women in the United States comply with the breast cancer screening recommendations established by the ACS (ACS, 2011).

I identified the lack of BCK as an important factor that prevents women from participating in breast cancer screening (Hall et al., 2005; Lawvere et al., 2004; Leslie et al., 2003). Nurses are in a key position to significantly increase women's BCK, and to encourage the adoption of breast health behavior. However, the educational role that nurses can perform depends on their own knowledge of breast cancer. There is no available information on nursing students' BCK, nor information on whether their education is sufficient to provide adequate information to women or the skills needed to perform breast cancer detection education and the BSE technique. Therefore, it is necessary to explore if the associate degree nursing program at Seminole State College of Florida teaches nursing students the appropriate content on breast cancer detection and the BSE technique. Assessments of BCK and BSE_TC will assist to review curricula and

instructional content for nurses and other health care provider to improve patient education regarding breast cancer.

Chapter 2 discusses the literature pertaining to theoretical background of the study, including: (a) Breast cancer; (b) BCK; (c) BSE technique; (d) breast cancer screening practices; (e) social cognitive theory; (f) Bloom's taxonomy; (g) factors for why women do not follow the breast cancer screening recommendation given by the ACS; (h) nurse and patient education on breast cancer and BSE; and (i) preparation of nursing students on BCK and BSE technique.

Chapter 3 describes the research design, instrumentation, sampling procedures, and data analysis protocol. Chapter 4 presents the research findings and analyses. Chapter 5 focuses on the results, conclusions, and recommendations for future studies that will help to promote breast cancer screening.

Chapter 2: Literature Review

Introduction

The purpose of this study was to investigate the relationship between freshman and senior nursing students' BCK and their BSE_TC. This chapter examines the literature related to the variables of interest to establish the foundations of this research: the freshman and senior nursing students' BCK and BSE_TC. The *Breast cancer, BCK, BSE_TC, breast cancer screening practices, social cognitive theory, Bloom's taxonomy, The National Council Licensure Examination for Registered Nurses (NCLEX-RN)* and *the nursing process* were used as keywords in a search of the literature in the disciplines of psychology, education, and nursing from 1956 to 2014, using PsyInfo, CINAHL, ProQuest Central, ProQuest Nursing, MEDLINE, and Academic Search databases.

The review of the literature is divided into four sections. The first section explains the literature related to the theoretical background, Breast cancer, BCK, BSE, breast cancer screening practices including social cognitive theory and Bloom's taxonomy. The second section reviews the literature related to the factors that prevent women from following the breast cancer screening recommendations given by the ACS. The third section reviews the literature related to nurses and patient education on breast cancer and BSE. The fourth section includes information on the preparation of nursing students in BCK and BSE_TC.

Theoretical Framework

Breast cancer

Breast cancer is the most cancer diagnosed in women (ACS, 2011); Memis, Akdolun, Balkaya, & Demirkiran, 2009). The National Cancer Institute (2013) estimated that a woman has a 1 in 8 chance of developing breast cancer during her lifetime in the United States (Howlader et al., 2012; Lawvere et al., 2004). Breast cancer is one of the most prevalent and most fearful malignancies among women (Yaren, Ozkilinc, Guler, & Oztop, 2007).

African American women have the highest breast cancer mortality rate of all ethnicities (Hall et al., 2005). The cancer incidence is low in young women; however, when young women are diagnosed, the cancer tends to progress rapidly (Memis et al., 2009). The high occurrence of breast cancer in women can create anxiety; and because of this fear, many women prefer to not know and thus avoid breast cancer examinations. Others have concerns about the screening procedures themselves (Curtis, 2010). Therefore, it is necessary to emphasize breast cancer education and early detection through the use of breast cancer screening.

Breast cancer is a disease in which malignant cells are formed in cells of ducts or lobules of the breast. Damage to the DNA of these cells results in growth and uncontrolled cell division (Curtis, 2010; Ricci, 2009). When breast cancer is large enough to be felt, the most common physical sign is a painless mass. Occasionally, the disease can spread to underarm lymph nodes, causing a mass before the main tumor in the breast

is large enough to feel. Less likely signs of breast cancer include pain or heaviness; differences in the breast tissue; such as swelling, hardening or reddening of the skin; and abnormalities such as draining from the nipple (especially if bloody), erosion, or irritation. Pain or absence of pain is not an indication of breast cancer presence. Breast cancer usually does not produce symptoms when the tumor is small and can be treated. For this reason, it is critical that women follow recommended guidelines for early detection of breast cancer (ACS, 2011).

The American Cancer Society (ACS) guidelines (2013) for the early detection of breast cancer vary depending on the age of the women. In women 20-39 years, the clinical breast cancer examination (CBE) should be done at least once every three years; BSE is optional. For women 40 and older an annual mammography is recommended as in an annual CBE preferably before a mammography; BSE is optional. In 2007, the ACS recommended the use of magnetic resonance imaging (MRI) in addition to mammography in women with high risk.

The ACS no longer recommends the monthly BSE, but indicates that women should be informed about the potential benefits and limitations associated with BSE. Women wishing to perform the BSE should be instructed by the health care provider with the technique employed to be reviewed periodically (ACS, 2011). According to McCready, Littlewood, and Jenkins (2005), women need to know their own breasts and understand that having a mass may be normal for them. A woman's anxiety level when performing the BSE technique may reduce the effectiveness of the procedure. Other

attitudes that affect the practice of the BSE include age, family history, fear, lack of knowledge, shame, ethnicity, and the lack of teaching in proper techniques by a professional health care provider. According to the recommendations given by ACS, women should be aware of how their breast usually feels and report any abnormal breast change immediately to their health care provider. BSE is a viable option for women in their early 20s (ACS, 2005c; Lee, 2003). Furthermore, BSE can be a reliable substitute available in rural areas where health care resources are scarce and access to the CBE and mammography are uncommon (Yarbrough & Braden, 2001).

The BSE is a measure of significant value in detecting cancer of the breast. There is evidence that women who practice monthly BSE correctly tend to detect masses in the early stage of development, and the early diagnosis has been reported to affect treatment time and survival rates (Shalini, Varshese, & Nayak, 2011). For this reason, it is necessary to make efforts to increase women's BCK and confidence in their ability to do BSE by providing BSE education (Hall et al., 2005). This can be done by educating women on cancer risks, the benefits of breast cancer screening, and the procedures involved (Ackerson & Pearson, 2009).

Social Cognitive Theory

In this study, social cognitive theory provided the theoretical framework. The study was developed from the works of Alberto Bandura and Benjamin Bloom. Social learning theory was put forth by Bandura in the early 1960s, as an outgrowth of Piaget's developmental modeling theory. Bandura (1997) noted that: "Virtually all learning

phenomena resulting from direct experience occur on a vicarious basis by observing other people's behavior and its consequences for them" (p. 12). Bandura believed social cognitive theory could predict behavior based on the presence or lack of examples or models. Bandura places less emphasis on motivation and reinforcement and more on vicarious observational learning and on beliefs and perceptions of casualty and personal control over events (Bandura, 1989). This vicarious modeling provided faster and safer learning than having to master behavior through trial and error. According to Bandura (1989), individuals learn from models. Modeling can be defined as people learning by observation and imitation of others (Bandura, 1989).

Bandura (1986) did not neglect the impact of cognition on behavior. As his work evolved, he renamed his theory "social cognitive theory," positing that cognition mediates behavior. Behavior is the outcome of the interaction between cognition, modeling, practice, and feedback, which develops self-efficacy and the ability to identify and enlist social supports in the environment (Bandura, 1986). Along with cognitive information, modeling is an effective method for developing the social and self-regulative skills needed to translate information into action (Bandura, 1994). As Bandura (1997) stated, "after the capacity for observational learning has fully developed, one cannot keep people from learning what they have seen" (p. 38). By taking students in an environment where BSE technique is the norm and demonstrating how to promote and teach the BSE skill to patients, knowledge will be more easily transformed into behavior.

According to Bandura (1986), another component of an effective behavioral program is skill enhancement to develop resilient self-efficacy, which is the perceived ability and confidence to perform a specific behavior (Bandura, 1986). Providing opportunities for guided practice and consistent feedback helps to initiate the development of self-efficacy and confidence. Nursing faculty need to plan clinical time for student practice and return demonstration with feedback. BSE is a learned skill for the student, patient, and the heath care professional staff. The final component is that of identifying and enlisting social supports for the individual desired change as the ACS and health care providers. These will give the individual the requisite for maintaining his or her behavior.

Bandura created the theory of self-efficacy in 1997. This theory was originally derived by Bandura from his social learning theory (Bandura, 1977). Bandura has changed the theory classification under which self-efficacy falls from social learning theory to social cognitive theory (Bandura, 1986). This theory states that the interactions among human beings are the main source of information that people have about themselves and the world they live in. Self-efficacy theory was originally developed and used in psychotherapy to treat clinical problems such as phobias (Bandura, 1977). Bandura's early studies revealed that changes in self-efficacy were associated with changes in behavior and that self-efficacy predicted the outcome of therapy (Bandura, Adams, & Beyer, 1977). This change emphasizes the importance of cognition; that is, the

individual's ability to process information, use memory, and attribute meaning to situations and behaviors.

Bandura focused on psychological methods to understand and change behavior. The social cognitive theory describes an individual's behavior as the product of the interaction among cognitive, affective, and biological internal factors and the person's external environment (Bandura, 1986). Behavior is defined as the intentional acts of the individual (Bandura, 1997). Self-efficacy is a key concept in Bandura's social cognitive theory (Bandura, 1986). Social cognitive is characterized by reciprocal determinism. Reciprocal determinism refers to the notion that cognition (perceived ability to perform the task), environment (the setting), and behavior (the task being performed are bidirectional (Bandura, 1989). Bandura's theory of reciprocal determinism specifies that the three components of cognition (the person's understanding of a task), environment (the person's surroundings), and behavior (the manner in which the person performs the task) influence and are influenced by one another. The degree of influence that each of the three components has is contingent upon the type of activity, the individual, and the situation (Bandura, 1989). Figure 1 presents a diagram of Bandura's social cognitive theory.

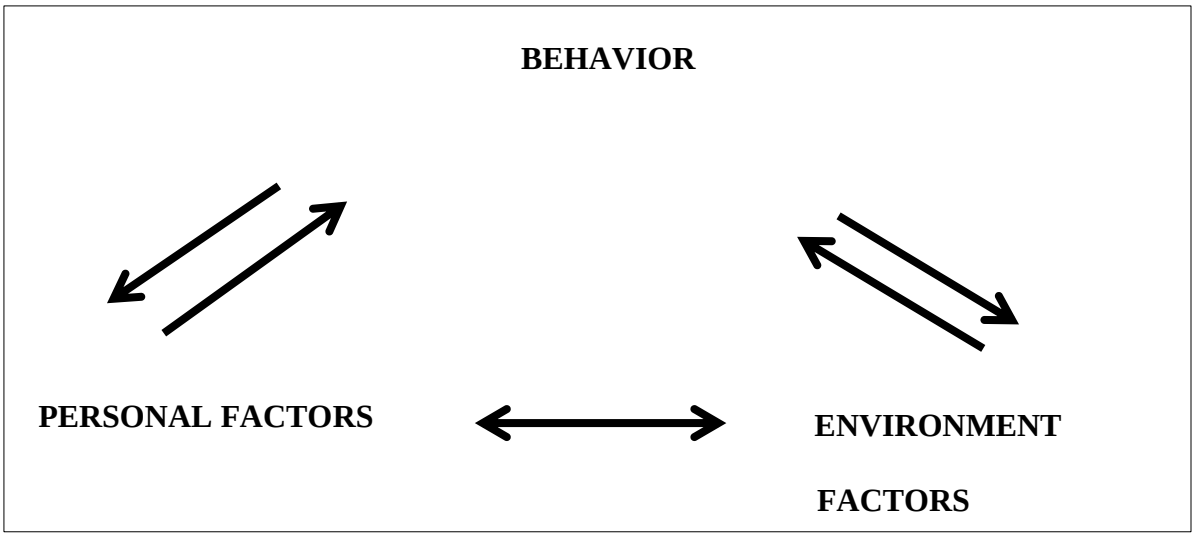

Figure 1: The relationship between Bandura's social cognitive theory's three major components. From the book *Self-efficacy: The Exercise of Control,* by Albert Bandura published in 1997, p.6. Reprinted with permission.

Self-efficacy is an individual's perception of their capability to perform tasks. Individuals' judgments about capabilities regarding performing specific tasks determine how they behave. Bandura's theory highlights the role of self-referent evaluation of capability as an important mediator in guiding human action and change.

Bandura (1989) stated that people get information to access confidence from four sources: performance accomplishments, physical indexes, forms of persuasion, and vicarious experiences. According to Bandura, performance accomplishments are the most effective of the four sources of information on efficacy (Bandura, 1989). Performance

accomplishments alter a person's confidence assessment regarding completing tasks based on previous accomplishments. Commonly, success will make a person feel confident and failure will lower feelings of confidence. Vicarious experiences refer to both the ability of people to observe others and learn about their own capabilities as well as make comparisons with others' performance. Vicarious experiences include observing other students' performance, or role models such as teachers, clinical instructors, and nurses in the clinical settings (Bandura, 1989).

Forms of persuasion refer to the external influences of others' opinions of an individual's performance, and can include verbal persuasion. Physiological indexes imply physiological arousal such as rapid heartbeat and high blood pressure. Bandura's self-efficacy theory claims that physiological arousal is an effect of inefficacy, not a cause. A person typically experiences physiological arousal in stressful conditions. Information acquired from these sources efficacy sources does not influence self-efficacy automatically but rather is cognitively appraised. The person weight and combine the contributions of such personal and situations of situational factors as their perceived ability, the difficulty of the task, amount of effort expended, amount of external assistance received, task outcomes, patterns of successes and failures, perceived similarity to models, and persuader credibility (Schunk & Pajares,2005).

The self-efficacy theory suggests that the two forms of behavior expectancy are outcome expectations and competence expectations. Outcome expectations are described as the belief that a response will generate about the results (Bandura, 1977). Self-

expectations are the beliefs an individual has about their ability to successfully perform the behavior in question. According to Bandura (1977), self-efficacy expectations are a more dominant cause of behavior than outcome expectations. Self-efficacy is related to feelings of confidence in performing the behavior, as opposed to feelings regarding outcomes.

The expectation of efficacy is active in nature and it can be altered by different behaviors and circumstances (Bandura, 1977). The relationship between outcome expectation and efficacy expectation has been commonly omitted from self-efficacy theory research. The majority of self-efficacy exploration has focused on the connection between a person's behavior and his or her self-efficacy. Several studies noted that higher degrees of performance, persistence, thought patterns, and low reactions to stress in challenging positions are related to a higher sense of self-efficacy (Bandura, 1982, 1986; Bandura & Cervone, 1986; Bandura & Schunk, 1981).

Bandura (1977) classified efficacy expectations covered by perceived self-efficacy into three levels: (a) magnitude (how difficult the task is), (b) strength (a person's confidence in his or her ability to perform the task), and (c) generality (domain of the action). Bandura hypothesized that self-efficacy influences a person's choice of activities. Additionally, individuals may misjudge their self-efficacy. In this respect, Bandura (1986) cautioned that both overestimation and underestimation of personal self-efficacy can lead to negative consequences. Bandura defined overestimation as an

individual having a strong sense of efficacy to perform specific tasks without the ability or skills to perform that task.

Social Cognitive Theory and the Nursing Student's Education

Nursing education is responsible for preparing nursing personnel to practice in different clinical settings. It is imperative that the knowledge and skills taught be relevant to the health needs of the population. According to Potter and Perry (2005), the World Health Organization (WHO) defines health as a "state of complete physical, mental, and social well-being not merely the absence of disease" (p. 91). Attaining the goal of health requires preparing competent nurses. Since nurses provide and will continue to provide a large part of health care, their training and role in health care must be enlarged and enriched. To be able to accomplish this goal a change in health education must take place, and teaching and learning must be adapted so that graduates of basic schools of nursing are prepared for the curative and preventive care of individuals. The emphasis must be on the acquisition of knowledge and skills most relevant to the health care needs of the community. The nursing programs are responsible for providing the knowledge and skills relevant to the health needs of the population. Therefore, students' competency and achievement of knowledge and skills must be related to their future roles.

The role performance behaviors of nursing graduates will be influenced by appropriate educational input and processes. It is necessary to assist in acquiring the knowledge, attitudes, and skills necessary to meet client needs. A student's personal sense and/or feeling of self-efficacy in performing a task could be another behavioral

determinant. According to Bandura's self-efficacy theory (1984), "There is substantial difference between possessing cognitive, social, and motor sub-skills and being able to use them effectively for diverse purposes under diverse circumstances" (p. 233).

Perceived self-efficacy, or the student's confidence that he or she can successfully organize and perform some action, is believed to represent substantial influence on overall competence (Bandura, 1977, 1982). The student's future success is partly dependent on his or her self -perceived confidence to perform essential behaviors required by a future role. Therefore, a study of students' self-perceived ability and the level of cognitive knowledge concerning breast health education will be valuable and will contribute to the goal of health. Researchers (Lauder et al., 2008; Leight, 2008; Liderman, 2000) in nursing education agree that nurses' development of higher levels of cognition and self-efficacy in health education is a critical role of undergraduate nursing programs. For undergraduate nurses to be effective practitioners, their learning experience must incorporate activities that facilitate the building of self-efficacy and confidence.

Bandura (1995) proposed that self-efficacy is derived from four sources: (a) actually performing a behavior, (b) seeing another person performs the behavior, (c) verbal persuasion, and (d) emotional arousal. Of the four factors, Bandura believed that performance or practice of behavior has the strongest influence on self-efficacy. Self-confidence is developed and supported by the self-efficacy sources.

Competence to provide health education requires the acquisition of higher-level behavior in the cognitive, affective, and psychomotor domains of learning. In other words, students need a cluster of cognitive, affective, and psychomotor skills for competent performance of the expected behavior. For nursing students, there is an interaction between the events of the environment, personal, and behavioral that functions as determinants factors of each one. These three factors provide information to the student. Figure 2 presents a diagram of the application of Bandura's Social Cognitive Theory to BCK and BSE_TC.

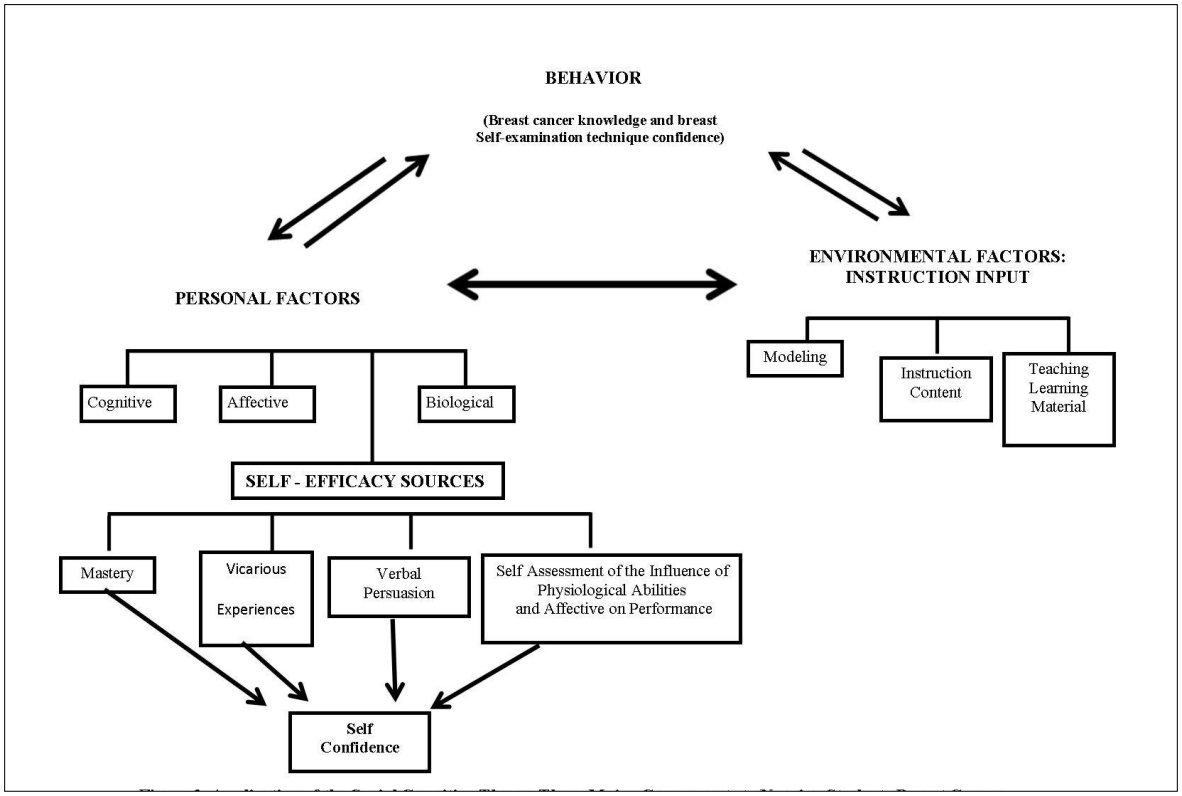

Figure 2: Application of the social cognitive theory three major components to nursing students' breast cancer knowledge and breast self-examination technique confidence.

From the book Self-*efficacy: The Exercise of Control*, by Albert Bandura published in 1977, p.6. Reprinted with permission.

Personal Factors

According to Bandura (1986), behavior is the outcome of the interaction between cognition, modeling, practice, and feedback that develops self-efficacy. Senior nursing students can be given the cognitive rationale for breast cancer content and BSE_TC and this may support their behavior to promote breast cancer content and BSE_TC despite the lack of consequences for their behavior. The practice instills the belief that they can influence others to practice breast cancer screening and instruct them in how to perform the BSE_TC.

Self-efficacy Sources

Self-efficacy is considered a cognitive factor influencing a person's behavior. Self-efficacy is influenced by an individual's affective state and biological events (Bandura, 1997). Bandura described self-efficacy as the individual's perception of his or her capacity for successful performance of a given behavior. He noted that self-efficacy beliefs differ as to the level, strength, and generality of the belief and that the level of the self-efficacy belief relates to the complexity of the intended performance. The strength of the self-efficacy belief will influence which performances are actually attempted, how much time and effort will be expended in that performance, and the likelihood of the individual attempting other similar tasks in the future (Bandura, 1989). The generality of the belief indicates the range of an individual's view of self-efficacy. A person may exhibit efficacious beliefs for many tasks or a few specific tasks (Bandura, 1997).

Bandura (1997) proposed four sources of efficacy information and described how they influence an individual's behavior. This indicates that individual nursing students will differ in their perceptions of their ability to care for clients with varied needs, including those with teaching needs, as well as their willingness to persevere in accomplishing difficult behaviors. The four principal sources of self-efficacy are enactive mastery experience, vicarious experience, verbal persuasion, and self-assessment of the influence of physiological abilities and affective state on performance (Bandura, 1997).

Enactive mastery experience. Enactive mastery experience is identified as the successful performance of a task that requires considerable effort by the individual (Bandura, 1997). Mastery experiences are one of the most influential means of developing a strong sense of confidence. When people successfully complete a task, they become convinced about their success and are more likely to persevere when faced with future difficulties (Bandura, 1995). These experiences result in efficacy beliefs that are stronger and more generalized than those beliefs produced through the use of simulation or verbal instruction.

Skill demonstration experience is a significant source of students' self-efficacy beliefs. Thus, educators must create an opportunity for learners to develop the capacity to carry out patient education within their undergraduate programs. Successful BCK and BSE skill behaviors serve as a positive influence on self-efficacy beliefs. However, depending on the strength of an individual student's self-efficacy beliefs, unsuccessful

BCK and BSE_TC can also be an incentive for continued effort and perseverance (Bandura, 1997).

Vicarious experience. Vicarious experience is acquired through observing others. People who observe others who are similar to themselves successfully completing an action develop perseverance and build the confidence to succeed in the completion of similar tasks (Bandura, 1995). The more similar the model is to the observer, the greater the level of influence on the observer. Thus, participating in peer-teaching situations should have a positive effect on students' application of health education.

Verbal persuasion. Verbal persuasion by itself will not support strong efficacy beliefs. However, if the verbal encouragement is realistic and is received from meaningful sources in an individual's environment, perseverance and the ultimate perception of efficacy will be enhanced (Bandura, 1997). Learning through effective and constructive feedback increases students' self-efficacy. Faculty feedback can influence student's self-efficacy on BCK and BSE_TC. The context and the purpose of the feedback provided to the students will dictate the effect of the feedback.

Self-assessment of the influence of physiological abilities and affective state on performance physiological feedback received from internal processes has been used to evaluate success and failure. Some people associate increased physiological stimulation – for example, increased heart rate and sweating – with decreased performance, whereas success has been linked to the absence of such internal arousal (Bandura, 1995). An individual's physiological and affective status exerts significant influence on the

individual's self-efficacy for a task (Bandura, 1977). However, it is the individual's cognitive assessment of the effect of these altered states on performance, not the actual physiological or affective state that exerts the greatest influence on self-efficacy. Individuals with strong efficacy beliefs regarding a specific task will be less affected by negative physiological or affective states than people with lower self-efficacy for that same task (Bandura, 1997). Students may view BCK and BSE technique as challenging or threatening, depending on their interpretation of their physiological and effective response. Self-efficacy will be enhanced in those students who perceived the experiences as challenging. Conversely, students who view the experiences as threatening may exhibit diminished self-efficacy on BCK and BSE-TC.

Successful performance depends on the possession of required skills and knowledge and the appropriate self-efficacy beliefs to motivate the behavior. Individual performance is not the result of the number of skills people have, but rather performance results from what people believe they can do with the skills that they have (Bandura, 1997). Self-efficacy beliefs affect a person's choice of behaviors and the degree of effort that will be exerted to accomplish the performance of those acts (Bandura, 1997). Individuals with strong self-efficacy beliefs set subsequent goals at more challenging levels. Individuals with weaker self-efficacy beliefs may require successful completion of less challenging goals to enhance those beliefs. The individual reflects on actual performance and modifies future goals. Depending on the measure of success of the performance, the individual sets more or less challenging goals (Bandura, 1997). Self-

efficacy beliefs encompass a complex set of personal capabilities that exceed a set of motor skills. These beliefs include the individual's cognitive ability to adapt to changing environmental conditions. Nursing students are required to learn a core set of motor skills, including BSE technique. This is necessary to provide competent preventive professional care.

Environmental Factors

The environment encompasses all conditions external to the individual (Bandura, 1997). In the teaching / learning process the environment includes modeling, instruction content, and teaching / learning material. The environment was represented by the level of the nursing students' BCK content and BSE experience in the associate program. It was anticipated that senior nursing students enrolled in the nursing course Complex Medical Surgical Nursing or Practicum Client Care Management have had greater BCK and BSE_TC than freshman nursing students who had completed only an initial nursing and health assessment course.

Along with cognitive information, modeling is an appropriate method of developing the social and self-regulative skills needed to translate information into action (Bandura, 1994). Nursing students who observe their instructors and other health care professionals, practice evidence-based BSE will have this experience to reflect upon when individually challenged by a less informed colleague or when faced with a BSE situation that tests their creativity or skill. As Bandura (1977) stated: "After the capacity for observational learning has fully developed; one cannot keep people from learning

what they have seen" (p. 38). By immersing students in an environment where BCK is the norm, and demonstrating how to promote and teach the skill of BSE to others, knowledge will be more easily transformed into behavior.

Behavior

Behavior is defined as the intuitional acts of the individual (Bandura, 1997). The reciprocal relationship among behavior, internal personal factors, and the environment is not static because the strength of each of the determinants varies with existing circumstances (Bandura, 1997). For the purpose of this study, student behavior was identified as BCK and BSE_TC. In this context, the behavior or BCK and BSE_TC is the result of the interaction between the environment (BCK and BSE) and content provided in the associate program and the internal personal factors of each individual nursing student. However, the performance of individual students varied according to their perceptions of their knowledge and their interpretations of the affective and biological events that they experience.

Bloom's Taxonomy Theory

Taxonomy is defined as "…a classification system that establishes the hierarchy of the parts to other parts and the parts to the whole. It is an orderly classification of things according to their presumed natural relationships" (Hauenstein, 1998, p. 61). These classification systems are created to explain the learning procedure to educators. Educational classification systems provide foundations that categorize abstract psychological processes evidenced by a person's behavior to help with the design of

educational goals. Taxonomies introduce practical approaches to help educators systematize learning principles, goals, and evaluations to get students to think at a higher level. Bloom's taxonomy is the only taxonomic structure that has persevered since 1956.

Bloom's Taxonomy of Educational Objectives

Bloom's original theory (Bloom et al., 1956) was established as a hierarchical transformation from simple facts to problem solving. This taxonomy institutes a ranking of skills and abilities that educators need to comprehend in order to help students gain an applicable level of intellectual processing and performance. Bloom's taxonomy is… "an attempt to build a taxonomy of educational objectives with the intention to provide for classification of the goals of our educational system. It is expected to be of general help to all teachers, administrators, professional specialists, and research workers who deal with curricular and evaluation problems" (p.1).

This scheme of classification is fairly straightforward. The first level is knowledge, followed by the more complex levels of comprehension, application, analysis, synthesis, and lastly, evaluation. (Forehand, 2005; Huitt, 2004). The level of knowledge includes routine memorization of facts and recollection in the same form in which it was learned. The level of comprehension progresses the knowledge level by requiring students to reword facts in different general meanings. This level is typically associated with concept bias. The students need to know the rules and concepts in order to apply them. This information is simplified into components at the level of analysis. Synthesis requires students to take the components of information and find a way to

reconstruct them (Karns, Burton, & Martin, 1983; Woods, 1999). Lastly, the level of evaluation (a student's ability to evaluate and analyze the information) comprises all of the levels below it.

Some students have the ability to know which level of the thought process is required in certain situations. These students are usually more successful in accomplishing the goals that are set for them (Paziotopoulos & Kroll, 2004). Teachers who can prepare lessons that challenge their students to progress through classifications will generate a group of students who can use information to solve problems and think for themselves (Evans, 1999; Granello, 2000). Bloom's original taxonomy primarily concentrates on which processes are important to the cognitive learning process. Educators can help their students be successful by understanding each thought process and its application. Bloom understood that the learning process is more involved than the repetition of facts. His original taxonomy explored ways to help students get a deeper understanding of real-life problems and utilize logic-based thought processes.

Anderson (a former student of Bloom) and Krathwohl (Bloom's co-author for the original taxonomy), Airasian, Cruikshand, Mayer, Pintrich, Raths, and Wittrock, published a revised version of the original taxonomy in 2001: *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. Anderson et al. (2001) sought to "help teachers make sense of the curriculum, plan instruction, and design assessments that are aligned with the objectives inherent in the curriculum and ultimately improve their teaching quality" (p. 11). The two most obvious

changes in the revision of Bloom's taxonomy are: (a) the use of a two-dimensional framework (the dimensions of knowledge and cognition), and (b) dimensions five (synthesis) and six (evaluation) were switched. A revision of Bloom's taxonomy of educational objectives can be used to help formulate better learning standards for learners. With improved learning standards, students can become better at analyzing, solving problems, and thinking critically.

The cognitive, affective, and psychomotor behaviors have been identified as distinct components. Self-efficacy, in terms of providing health education, requires the acquisition of higher level behavior in the cognitive, affective, and psychomotor domains of learning. In others words, students need a cluster of cognitive, affective, and psychomotor skills for competent performance and confidence in the expected behavior. Figure 3 is a diagram of the application of the social cognitive theory and Bloom's taxonomy with nursing students' BCK and BSE_TC.

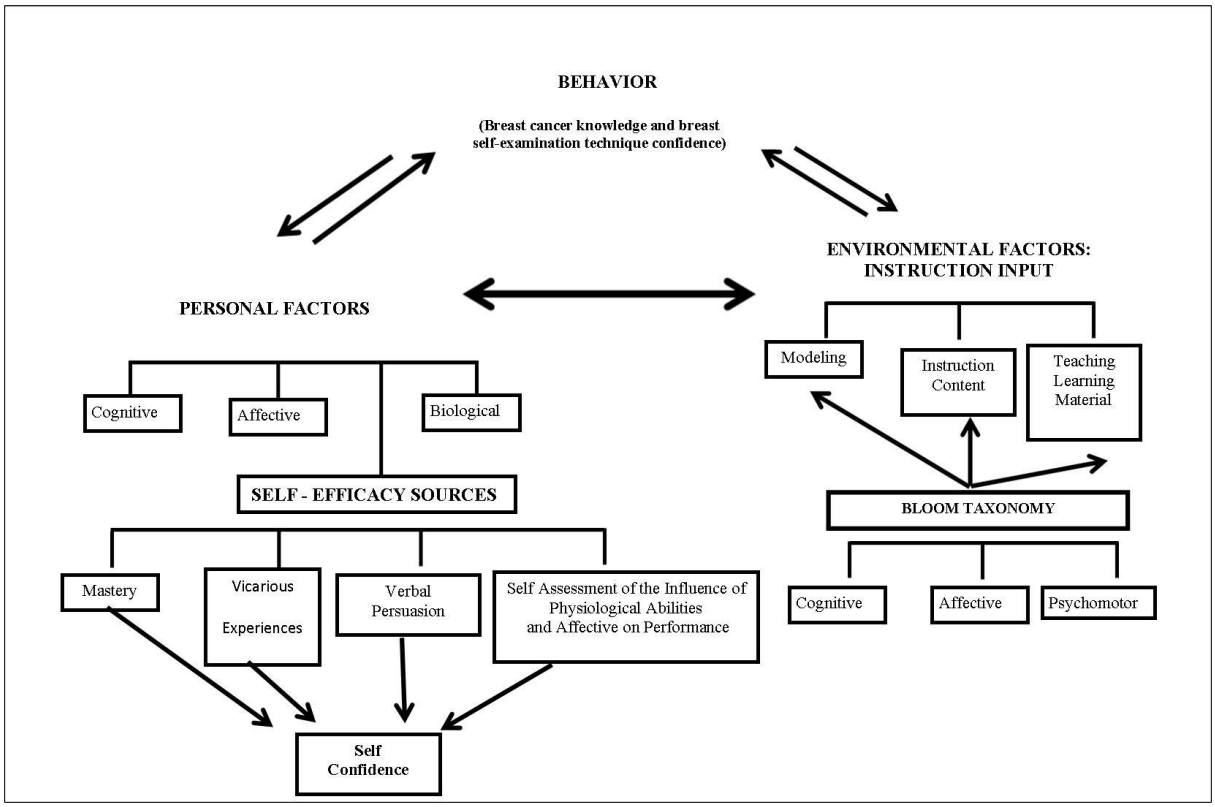

Figure 3: Application of the social cognitive theory three major components to nursing student's breast cancer knowledge and breast self-examination technique confidence. From the book *Self-efficacy: The Exercise of Control*, by Albert Bandura published in 1977, p. 6. Reprinted with permission.

Knowledge and skills about how to perform a behavior are required in order for a behavior to occur. Although knowledge and skills are prerequisites to positive self-efficacy or the perception of confidence in his or her ability to perform an action, they are not sufficient; that is, knowledge and skills alone do not make behavior occur (Bandura, 1977). For example, nursing students may have enough knowledge and skills to perform one of the primary health care role's specific behaviors, but have low self-confidence in their ability to perform such specific behaviors. Therefore, perceived self-efficacy is important in performing the breast cancer teaching role.

Self-efficacy and cognitive knowledge are considered desired nursing students' outcomes. The basic result sought through the learning process is the kind of behavior that will be accepted as appropriate by both the educators and the reference groups. It is the purpose of education to assist students in acquiring the knowledge, skills, and attitudes that will allow them to function as able members of the profession. In other words, cognitive abilities and high self-efficacy can be described as indicators of successful performance of the expected role activities (Bandura, 1989).

The classifications that are linked to educational objectives are particularly useful in establishing goals and creating test questions. The cognitive domain is especially suitable for the classroom. In nursing classes, test questions are most effective when written for a higher level of intellect. In fact, the majority of questions in the NCLEX-RN are created for higher levels of intellect (National Council of State Boards of Nursing, 2003). Linn and Gronlund (2000) and McDonald (2001) suggested that a taxonomy is helpful in the development of the list of objectives and the creation of test questions.

In this study, a measure of students' knowledge related to breast cancer teaching and BSE technique indicated the students' baseline cognitive knowledge of learning and teaching principles. A measure of self-efficacy indicated the extent of perceived confidence students possess in performing the breast cancer teaching role. The nursing student's BCK and BSE skill was measured through a questionnaire.

Nursing researchers have measured self-efficacy in relation to students' academic performance. A study was done on nursing students who have experienced hardship with

science subjects in the nursing program. An adequate process of anticipating a student's academic performance in the sciences will simplify the expansion of certain educational strategies created to help students get past any obstacles. The Self-Efficacy for Science (SEFS) is an instrument that was developed by Andrew (1998), tested, and designed to anticipate a student's academic performance in the field of science of a first-year undergraduate nursing course. A survey was sent to associates of the five-year nursing students who were enrolled in a Bachelor of Science in Nursing (BSN) course. Students' grades for two first-year science subjects were collected and used as a reference for the study. Principal component factor analysis revealed the SEFS contained six factors, not four factors as hypothesized in the beginning of the study. These six factors explained about 70% of students' self-efficacy for science. Cronbach alpha of the SEFS was 0.9, indicating the instrument was reliable. The SEFS predicted 24% of the associate's academic performance in the subject of physical science and 18.5% for the subject of bioscience. Studying sciences in the final year of high school was not statistically significant when related to the SEFS (Andrew, 1998).

Nursing is a major that continues to intrigue students. Students admitted to an undergraduate nursing course with a limited science background are more likely to be unsuccessful in the course. By using the SEFS to determine a student's self-efficacy in the sciences, it could be possible to establish which students might be unsuccessful. Then, certain strategies can be developed to help these students improve their academic performance in the science-based areas of their nursing course (Andrew, 1998).

Jeffreys and Smodlaka (1998) explored the factorial design of the transcultural self-efficacy tool (TSET). The TSET was an 83-item questionnaire constructed to examine and determine a student's self-efficacy for conducting a general transcultural nursing operation among different client populations. The content validity and reliability were established by a six-member expert panel review. To assess the instrument's stability, the test-retest method yielded coefficients between 0.63 and 0.84 for the subscales ($p<0.001$). The target population for the study included undergraduate nursing students who were enrolled in a clinical nursing course. All students were part of a Northeastern public university system. In order to explore the factorial composition of the TSET, an exploratory principal components analysis (PCA) was performed. The exploratory PCA estimated how well the data reflected the multidimensional nature of transcultural nursing. The results of the PCA indicated that the TSET instrument assesses the multidimensional nature of transcultural self-efficacy. The instrument also explores the three dimensions of learning: cognitive, practical, and affective.

Leigh (2008) conducted a literature review focused on nursing research to examine the available research findings relating to the effectiveness of high-fidelity patient simulation (HPS) as a teaching modality and self-efficacy using Cooper's integrative approach. Electronic databases were examined for prospective sources using keyword searches. The search was refined to include only the most relevant nursing research. Quantitative and qualitative studies were both included, however the majority of the relevant published studies were qualitative research studies. Sample size in the

studies ranged from five to 403 subjects, and subjects included undergraduate and graduate nursing students as well as staff nurses. This review of the literature revealed a limited amount of research related to nursing students' and new graduates' levels of efficacy and the effect of HPS. Research is needed to investigate the permanence of increased self-efficacy. The stability of nursing students' self-efficacy is unknown, and therefore it is not known whether confidence is lasting or will decrease when students transition to a new graduate role. Future research is needed to determine the number of times participating in a high-fidelity simulation will produce the optimum level of self-efficacy and confidence.

Cardoza and Hood (2012) examined the confidence of senior nursing students from two independent graduating classes. The students in each of these classes had never participated in computer programmed manikin simulation scenarios. A descriptive correlation design was used to address the goals of the study. The general self-efficacy scale (GSE) was used to measure self-efficacy. A repeated measures analysis of variance (ANOVA) was used to determine if self-efficacy scores differed between the two groups of nursing students on pre-test and post-test measures of pediatric simulation interventions. Overall, the study demonstrated that the students had previously acquired transferable knowledge and that there was a difference between their actual performance and their ideal performance. Neither of the groups of students could remember previously acquired nursing knowledge, process crucial patient changing situations, nor could they implement the corresponding nursing interventions in simulated patient scenarios.

A pilot study was done by Swenson-Britt and Reinech (2009) to evaluate the Critical Reading of Research Publications Plus course with intensive care unit (ICU) nurses to ascertain whether this experience would have an effect on a student's research self-efficacy. The researchers utilized a non-experimental, descriptive design. A sample of only 17 ICU nurses from a scholarly environment that serves as a hospital in the United States was tested. The Nursing Research Self-Efficacy Scale (NRSES) was given to students as a pre-test (before the course) and a post-test (after the course). The Statistical Package for the Social Sciences (SPSS) was used to analyze the data. Descriptive summaries and paired *t* tests were performed on self-efficacy data and all results were determined at the 1% significance level. Paired *t* test results indicated a significant increase on three of the four subscales in research self-efficacy as measured by the NRSES. The study showed that taking a course along with help from advisors may increase the self-efficacy research of practicing nurses.

Haas (2000) reviewed published articles, abstracts, books, and consultations to explain self-efficacy in research and in practice. The researcher founded that self-efficacy is a beneficial concept in guiding oncology nursing research and practice. Self-efficacy is a good predictor for estimating the chances of a person having healthy habits in a non-oncology population. In the field of oncology, self-efficacy is proven to be an effective determinant in predicting the prevention of disease and cancer adaptation. According to Haas, self-efficacy gives precision to direct clinical interventions that advocate health for

cancer patients. The author indicated that there is an emphasis on using self-efficacy to advocate healthy behavior for cancer patients.

Lauder et al. (2008) examined different levels of competency, support, and self-efficacy in students before they became registered nurses. A limited test of social cognitive theory was offered to students. Each student filled out a questionnaire that included measures of self-reported competency, support, and self-efficacy. Following the questionnaire, they attempted a three-station objective structured clinical examination (OSCE). The author recommended that the educators who designed the curriculum should be careful when stating that self-efficacy is the method by which all competence-related changes are affected.

A study was done by Qi, Resnick, Smeltzer, and Bausell (2011) to examine the initial influence of an academic intervention established on the self-efficacy theory. The study was aimed at expanding osteoporosis-related knowledge and certain preventive behaviors, such as routine exercising and an adherence to medication for osteoporosis. It was designed for Chinese immigrants who were residents of the United States, age 45 years and older. This was a controlled pre-test/post-test design. Participants were randomly assigned to receive the self-efficacy based osteoporosis preventive educational intervention (SEOPE). Descriptive statistics were used to inspect the demographic variables of the study. Independent-sample *t* tests were performed for the continuous variables of the study and chi-square analyses were performed for categorical and dichotomous variables of the study. The objective of these analyses was to compare the

two groups at the pre-test level. The participants who received the intervention had statistically significant improvements ($p < .05$) at the post-test time with respect to knowledge of osteoporosis, confidence for exercise, and an adherence to medication for osteoporosis. Furthermore, the treatment group participants had other experiences compared to the control group such as more time exercising, higher energy expenditure during the exercise, and more medication for their osteoporosis at the post-test level.

Extensive research has been published on self-efficacy and confidence. Unlike most studies, which focus mainly on clients, chronic health problems, and participation in health-promoting activities, this study focused on a student's BCK and BSE_TC.

Breast Cancer Screening Practices Barriers

Breast cancer presents a serious health issue for women. In the United States a woman has approximately a 13% chance of developing breast cancer at some point in her lifetime. Statistically, breast cancer is proven to be the second leading cause of cancer deaths in all women in the United States. It is critical that women follow the recommended ACS guidelines for identifying breast cancer at an early stage, before any symptoms have time to develop. Early discovery of breast cancer can improve the different options for treatment, the chances for successful treatment of the cancer, and can lead to a greater chance of survival. Healthy People 2020 set goals to support monitoring trends in cancer incidence, death rate, and survival in order to better serve the purpose of lowering the burdens of cancer in the United States. These objectives show how important it is to promote evidence-based screening for breast cancer by measuring

how often screening tests are used (CDC, 2010; U.S. Preventive Services Task Force, 2012).

Diagnosing cancer at an early stage and treating cancer quickly are essential steps in lowering the breast cancer mortality rate (Jemal et al., 2008; Smith, Cokkinides, & Eyre, 2003). The prognosis for breast cancer is heavily dependent on early detection. When breast cancer is detected and diagnosed at an early stage, the chance of long-term survival and quality of life increases (Memis et al., 2009). It is important to recognize and treat the disease in the earliest stages. "Screening is related to perceptions of risk, benefit, and barriers through a reasoning process that includes personal and social influences and attitudes" (Yarbrough & Braden, 2001). There are three screening methods BSE, CBE, and mammograms. Mammograms are an effective method of detecting breast cancer and can detect 85% to 90% of all breast cancers. The three breast cancer screening methods complement each other and should be utilized together. The ACS (2008) suggested that all women, age 20 and over, practice BSE monthly; CBE should be performed every three years in women between the ages of 20 and 30 and annually for women 40 and older. Yearly mammogram is recommended beginning at age 40. Benefits have been found with screening mammography, yielding a reduction in breast cancer for women over 50 years of age (Spence et al., 2010). Mammograms contribute to much of the increased survival rate post-diagnosis (Roth et al., 2011).

Many women report finding breast cancer using methods outside of mammograms. The effectiveness of the BSE method in the early discovery of breast

cancer is presently being challenged. There are multiple studies that suggest the method of BSE does not lower the rate of mortality from breast cancer (Thomas et al., 2002). However, a study in Japan found a positive relationship between the frequency of the BSE and early detection of breast cancer. This relationship results in a more promising outcome of the disease (Leslie et al., 2003). Other researchers in Canada found a positive relationship between effective BSE abilities such as proper palpation method, visual examination of the breasts, and a lower breast cancer mortality rate (Leslie et al., 2003). The success rate of BSE in discovering masses in breast tissue largely depends on the thoroughness of the examination, regular inspections, and use of proper palpation techniques (Memis et al., 2009). Even though the effectiveness of BSE in the detection of breast cancer is challenged, mammograms are not typically recommended for younger women (below the age of 40). Similar to mammograms, a CBE is not usually performed more than once a year (Leslie et al., 2003).

According to advice from the ACS (2014), women should be familiar with their breasts. It is recommended that women normally feel their breasts and report any inconsistencies to their health care providers as soon as possible. A BSE is an uncomplicated method that can be performed by a woman on herself. Women who complete regular BSE are more familiar with their breasts, potentially making them more apprehensive of any complications with their breasts. When a BSE is performed correctly and frequently, it gives a woman the chance to observe any inconsistencies in breast tissue and to find lumps at an early stage (Wheeler, 2002). BSE is a viable option for

women as young as their early twenties (ACS, 2005; Lee, 2003). Additionally, a BSE is a significant substitute available in all locations, particularly where there aren't as many resources for public health care (Yarbrough & Braden, 2001). Furthermore, related expenses discourage some women from getting a mammogram annually. It is possible for breast cancer to develop in the time between a mammogram and CBE or in women younger than 40, which is the age that doctors recommended starting the annual mammogram screening. In these situations, BSE could be a supplement to a mammogram and CBE. BSE might also be the most convenient method for women without access to other methods of breast cancer screening (Leslie et al., 2003). BSE is an affordable, patient centered, noninvasive way to screen for breast cancer (Shalini et al., 2011).

Detecting breast cancer through the different methods of screening is the best hope for all American women (Han, Williams, & Harrison, 2000). Unfortunately, fewer than 50% of women in the U.S. take part in these screening processes. It is possible to lower the number of deaths caused by breast cancer if the cancer is detected early enough (Ravert & Huffaker, 2010).

There are many reasons why women do not follow the breast cancer screening recommendations given by the ACS. While there are ample health benefits for detecting cancer at an early stage, many women with the means to get screened do not go through with the process. There are many social and cultural boundaries preventing women from getting screened such as a low socioeconomic status, ethnicity, lack of access to health care/insurance, or lack of education (ACS, 2007; Center for Disease Control and

Prevention (CDC), 2007; Davis, Emerson, & Husaini, 2005). Therefore, to increase the breast cancer screening rates it is important to understand the factors that influence patient screening behaviors (Ackerson & Preston, 2009). For this reason, several studies have been done to identify the factors that interfere with the participation of women in breast cancer screening and to increase these practices to reduce breast cancer incidence and mortality.

Several studies have indicated factors that interfere with breast cancer screening practices. According to Curtis (2010), the high number of breast cancer incidents in women is causing them anxiety. Some women are so afraid of breast cancer that they would rather not know the truth and they avoid breast screening altogether. Hall et al. (2005) conducted a study to measure how influential a particular breast cancer education program was for African American women in the Arkansas region. The study involved a post-test control group that consisted of 53 African American women age 40 and older. These women were living in the Arkansas Mississippi River area. Results showed that there is a relationship between inferior health care and poverty in the African American community and late diagnoses of the cancer, which relates to negative outcomes in regards to breast cancer (Glanz et al., 2003). Mammography rates were lowest in the Mississippi River Delta area. This may be partially attributed to lack of education and a misunderstanding of breast cancer. The fact that women do not regularly get checked for cancer has an impact on late diagnoses. Late diagnoses then lead to a higher mortality rate in African American women (Hall et al., 2005).

The Agency for Healthcare Research and Quality recognized that even when low-income African American women understand the screening process and the mammograms are free, they often fail to keep their appointments. There are other important factors that have an impact on whether or not these women keep their appointments such as knowledge of mammograms and personal beliefs (Hall et al., .2005). It has been shown that women feel anxious and afraid of the mammography procedure if they don't understand it entirely (Hall et al., 2005). According to Laing and Makambi (2008), it is necessary to explore the impact of socioeconomic factors on routine mammography screening for African-American women. It is important to encourage women who do, in fact, use screening mammography to do so on a regular and consistent basis.

Leslie et al. (2003) conducted a study to investigate women and their knowledge of breast cancer, screening methods, and the factors that have an effect on the different methods of breast cancer screening. There were 185 females who volunteered for the study. Their knowledge, practices, and beliefs about breast cancer and the different screening methods were analyzed. Leslie indicated that many of the women, particularly women with low incomes, inadequate health care insurance, and a lack of education, are the ones who do not use a formal breast cancer screening often enough.

The breast screening literature suggested that psychological aspects other than background and structure can add to the variance in how often women get screened. The three factors that are essential in predicting whether a woman will get screened for cancer

are: fundamental (demographic factors), cognitive (intellectual factors), and socio-emotional (social and emotional factors). Each of these factors makes its own contribution to the screening rates, separate from the other factors. The review was limited to cognitive and socio emotional variables. Research showed that there is a relationship between an unawareness of cancer and cancer treatments and inadequate screening methods (Magay, Consedine, Neugut, & Hersh, 2009).

McCready, Littlewood, and Jenkins (2005) conducted a literature review to illustrate breast awareness and BSE. Results of the review were split into four sections: (a) the value of BSE in lowering the death rate, (b) educational intervention, (c) attitudes toward BSE and breast awareness, and (d) opinions of BSE and breast awareness. The review indicated that there are many different variables that affect the use of BSE such as a woman's age, her family history, fear, embarrassment, coping styles, race, professional knowledge of BSE, and education level.

A study was done to analyze the association between an African American woman's understanding that breast cancer can be fatal and breast cancer screening. The results indicated that African American women are not as likely to participate in regular breast cancer screening when compared to Caucasian women. One reason African American women are hesitant to get screened for cancer is the belief that a cancer diagnosis will lead to death (Spurlock & Cullins, 2006).

Lawvere et al. (2004) examined nurse practitioners and their different approaches to breast cancer screening methods. The variations were related to inconsistencies in the

guidelines for breast cancer screening across different institutions. This study identified that the lack of BCK is the main factor that prevents women from getting screened.

The National Breast and Cervical Cancer Early Detection Program (NBCCEDP) conducted a study to explore physicians' practices. Demographic variables were studied along with the physicians' beliefs, their willingness to try new technology to perform the cancer screening, and their recommendations for cancer screening. The U.S. Preventive Services Task Force (USPSTF 2009) made changes to the guidelines for breast cancer screening after they administered the 2006-2007 survey. The updated guidelines state that the average woman could wait and get screened at age 50, as opposed to age 40. Women could be screened less often, although yearly was still recommended (Smith, Saslow, & Sawyer, 2003). According to this study, 61% of participating physicians, and 72% of non-participating physicians recommend that a woman in her 40s should get a mammogram annually. Many revisions have been made to screening recommendations and this causes disputes among different organizations. The results from this study imply that interventions are needed at the patient level as well as the provider level. This might help promote an adherence to breast cancer screening for women (Benard et al., 2010).

Another study was done on Chinese American immigrants who were are least 40 years of age and were born outside of the United States. The purpose of this study was to explore knowledge and beliefs of participants as they relate to mammography screening practices. This descriptive study showed that 85% of respondents had at least one mammogram. The study also showed that only 48.5% of respondents had a mammogram

within one year of the study. The strongest determinant of getting a recent mammogram was if a woman had an immediate family member diagnosed with breast cancer. This preceded a patient having adequate insurance followed by having insurance that covered a mammogram and anything leading up to the procedure. Respondents of this study were unaware of the screening guidelines and they anticipated a low level of vulnerability to cancer.

Of all the ethnicities in the United States, Asian American women have the lowest mammography rates. Multiple studies done in the United States provide evidence that the number of mammograms performed in the past couple of years is highest in Caucasians and African Americans, lower in Hispanics, and lowest in Asian Americans (Center for Disease Control & Prevention, 2007; Chen, Diamant, Pourat, & Kawaga-Singer, 2005).

A study's findings indicated that the Caucasian American Women (CAW) reported a higher rate of ever having had a mammogram (MMG) (86%) compared to CAW from other studies (Tang, Solomon, & McCraken, 2000; Tu et al., 2003; Yu, Kim, Chen, & Brintnall, 2001). According to Lee-Lin et al. (2007), it is important to educate Caucasian women on the importance of the ACS guidelines and of receiving an annual mammogram. A frequent hindrance to breast cancer screening for Caucasian women includes not remembering to get checked, lack of time, lack of knowledge, language barriers, pricing, lack of symptoms, lack of physician recommendation, or lack of recent physical examination (Lee-Lin & Menon, 2005).

A study was done to determine the learnings on breast cancer and the different screening practices for a sample of 185 women in the Appalachian region. Researchers wanted to examine which variables had an influence on women's breast cancer screening practices. The results showed that public education campaigns such as TV, radio, newspapers, magazines, etc. aimed to inform women about breast cancer screening methods influenced screening practices. These campaigns also intended to explain to women that early detection is not proven to be effective for all women (Leslie et al., 2003). The women lacked knowledge of breast cancer screening pertaining to proper timing, performing a BSE, breast cancer risk factors, and detection habits. The majority of women over 40 proclaimed to have had a minimum of one mammogram in their life. Additionally, only about 1 in 5 of these women followed the yearly screening guidelines of the ACS. This data is analogous to data from other studies in which women do not follow suggested guidelines for breast cancer screening (Leslie et al., 2003). Similar to findings from previous studies, breast cancer information for women in this study was connected to a higher rate of mammograms over BSE. Women's beliefs in mammography may be the reason for the higher rate of mammograms. Some women believe that BSE is unnecessary because mammograms are enough to discover a mass in the breast tissue. Certain educational campaigns have improved understanding of the necessity of mammograms, but women are still not educated on breast cancer and BSE methods that are basic in the promotion of a woman's health.

There are reports that contradict each other about how effective BSE can be in early detection of breast cancer, and despite the fact that women have been informed about the risks of breast cancer and the urgency for early cancer screening, there seems to be a lack of motivation to go through all aspects of screening using ACS guidelines (Leslie et al., 2003). Participant scores for the knowledge factor of this study appeared to be influenced by the method in which women learned about breast cancer and screening methods. Women taught by a doctor or nurse were more knowledgeable, indicating that direct care providers must continually teach their clientele about breast cancer. Health care professionals should use literature in addition to existing educational methods to help teach women about breast cancer (Leslie et al., 2003). Despite campaigns to educate women on breast cancer and early detection, women in this study demonstrated a lack of knowledge about proper screening methods. Only women who had been educated by a health care professional showed a better understanding of the disease and the screening guidelines (Leslie et al., 2003).

Some health care providers underestimate the amount of information patients actually need, believing that if patients need information, they will ask for it. In reality, some patients are unsure of what to ask for (Rimal & Real, 2003). In order to solve this problem, health care providers should be honest with patients about cancer risks and the effectiveness of steps that prevent cancer. This will stimulate patients' knowledge and motivate them to get screened (Rimal & Real, 2003). Health care providers should aim their attention on shifting patients to a progressive, preventive level of health. The most

feasible plan is making sure the patient understands the risks of cancer, understands the benefits of different screening methods, and considers the fear of the unknown. Health care providers need to keep women informed during routine check-ups, visits for special conditions, or visits regarding recurring prescriptions (Ackerson & Preston, 2009). Therefore, patients should be informed consistently about breast cancer screening, even if it is irrelevant to their doctor visit. Information should be presented to patients in a manner that encourages them to communicate with their health care provider, rather than one that can be overlooked. With their comprehensive understanding of health care and frequent interactions with patients, nurses are in a particularly good position to promote breast cancer screening. Nurses should help to educate patients on the benefits and risks of screening methods, even if the patient does not ask for information. People trust nurses, and nurses should use this trust as an opportunity to engage women about their fears, misunderstandings, and uninformed decisions. The main objective should be helping women understand the screening process, so that they can make informed decisions about breast cancer screening (Ackerson & Preston, 2009).

Improving knowledge and altering the perceptions of breast cancer screening methods are important factors in the attempt to increase the rate of mammograms and BSE among African American women. Higher rates of breast cancer screening can lead to early detection of the disease. This is critical because treatment is more successful when the cancer is detected at an early stage. These attempts could help lower the high rate of mortality (Dignam, 2000). According to Lu (2001), education affects the transition

to positive beliefs about the efficiency of BSE and other breast cancer screening methods. Health care professionals play a large part in inventing and enforcing interventions to educate women about screening methods (Hall et al., 2005).

It is important to focus on this system-wide hindrance to breast cancer screening. Until this happens there are alternate approaches to improve screening methods (Lawvere et al., 2004). It is necessary to study the social, personal, psychological, and environmental factors that interfere with breast cancer screening. This may assist in the creation of interventions that promote women's participation in screening methods to reach the optimal health for this population.

Nurses and Patient Education on Breast Cancer Screening

Nurses have the ethical responsibility to teach their clients. The Patient Care Partnership, formally known as Patient's Bill of Rights and the American Hospital Association indicates that patients should have a say in decisions regarding their own care. The required information to be able to make decisions should be correct, complete, and relevant to the patient's needs. The nurse's responsibility is to teach the information needed for the client to be able to make the decision.

Nurses clarify information provided by the physician and other health care providers and can be the primary information source related to the patient's problems (Potter & Perry, 2005). As an effective educator, the nurse should assess the client educational needs. When the nurse values patient education and meets their educational needs, the clients are better prepared to take responsibility for their health. Nurses play an

important role in helping women maintain their breast health through education on breast cancer screening. Nurses need to have a complete knowledge of health, breast cancer, early detection, diagnosis, and treatment options to be able to meet this role.

Nurses should understand the many reasons why women choose not to be screened for breast cancer. If nurses understand these reasons, they may be able to improve the rate of compliance with the screening guidelines (Ackerson & Preston, 2009). The benefits of cancer prevention are highly accepted among health care providers. A lack of knowledge or skill often leads to poor evaluations in primary care (Spence et al., 2010). Although the mortality rate of breast cancer is lower because of screening methods, many women still refuse to get screened. The majority of women's preventive health care visits do not result in enough cancer screenings (Wallace, Mackenzie, & Weeks, 2006). Women's' top reason for never being screened for breast cancer was a lack of clinical recommendation (Lawvere et al., 2004). Insufficient provider knowledge and skills often lead to inadequate assessment and management (Spence et al., 2010).

The lower mortality rate for breast cancer could be a result of the early detection of breast cancer through the use of mammograms. It is crucial that the public is educated on the necessity of screening methods that lead to early detection of the disease (Tigka, Kleanthi, Loannis, & Katerina, 2009). The 2003 National Health Interview Survey (NHIS) provides a nationwide source of data to find out how women found their breast cancer (Roth et al., 2011). The survey involved 361 female breast cancer survivors who

were diagnosed any time between 1980 and 2003. Almost half of the survivors (43%) found their cancer themselves (18% were accidental and 25% by BSE), 13% of survivors found their cancer through CBE by a health care provider, and 43% of survivors reported mammography detection. There is an emphasis on mammograms in breast cancer education programs, whereas BSE and CBE appear to be not as important. This is due to the fact that mammograms are the most understood of all screening methods as well as the only method associated with a lower mortality rate. Methods other than mammograms have been used to detect most breast cancers. Women should be informed of the seriousness of breast abnormalities. Study data shows that women are almost as likely to see the preliminary signs of breast cancer as their health care professionals. Women continue to detect their own breast abnormalities as they enter the recommended age range for cancer screening. These self-detected abnormalities typically lead to a diagnosis of breast cancer (Roth et al., 2011).

The mammography rate in Chinese American women can be influenced by the nurses who educate them and their family members about breast cancer. Nurses have the ability to lower women's inhibitions about the disease and help these women find other methods of payment for patients who need screening, but don't have insurance coverage (Lee-Lin et al., 2007). Smith et al. (2003) performed a randomized study that examined the lower mortality rate resulting from mammograms. Related studies did not show the same benefits. Other related studies showed that the suggested benefits do not take place until women are at least in their 50s. Franco, Duarte-Franco, and Rohan (2002) assessed

the screening process and discovered that mammograms or a combination of mammograms and CBE had no significant effect on the mortality rate for women in their 40s. It is still being determined whether or not mammograms have an effect on the diagnosis of cancer at an early stage. The majority of breast abnormalities are self-detected, even by women in countries with a high screening rate (Ringash & Canadian Task Force on Preventive Health Care, 2001).

A prospective, randomized study was performed on a sample of 123,748 women. This study showed that, when compared to a control group, the detection rate of tumors (cancerous and non-cancerous) increased through BSE (Memis et al., 2009). BSE has not been proven to reduce the mortality rate from breast cancer, but it has resulted in an increased rate of biopsies. Abnormalities in the breast tissue are usually identified by women when they perform a screening method on themselves. The effectiveness of BSE has been doubted throughout the past 10 years, particularly after organizations like the Canadian Task Force on Preventive Health Care (CTFPHC) lowered the standards of their BSE recommendations. According to the CTFPHC (2001), there was no proof of any benefits (Anyanwu, 2008; Lepecka-Klusek, Jakiel, Krasuska, & Stanislawek, 2007; Tara, Agrawal, & Agrawal, 2008). Thus, health care providers and the policymakers are advised to take a cautious approach when promoting BSE. The majority of women can detect their own breast abnormalities, even if they live in an area where practicing BSE is not common (Baig & Ali, 2006; Kearney & Murray, 2009). Research provides evidence

that there is a significant association between nurses' confidence in performing BSE and whether or not they will promote BSE to patients (Bailey, 2000).

The association of health workers who can accurately provide breast cancer information to the public is made up of nurses. Nurses can be encouraging and informative when it comes to the screening process (Yaren et al., 2007). Nurses can use their health care knowledge to help teach women about the risks of breast cancer (Tesaro & Herman, 2000). The majority of people in the nursing field are female, and they should be the ones to encourage women to perform screening methods such as BSE. Nurses are perceived as role models, and they should be able to provide patients with reliable information. Nurses should have a positive outlook when it comes to regularly performing BSE (Memis et al., 2009). It is not difficult for health care professionals to teach women about BSE. There are certain perks to BSE; there is no money involved and it could lower the mortality rate of the disease (Hall, Hall, Pfriemer, Wimberley, & Jones, 2007; Peregallo, Fox, & Alba, 2000). People in the nursing field play an important part in informing women about detecting breast cancer at an early stage. Nurses work very closely with their patients for long periods of time in many different environments. They are also in the position to encourage women to pay close attention to their health with regard to breast cancer (Bailey, 2000; Chong, Krishnan, Hong, & Swah, 2002). It has been shown that educated health care professionals routinely practice CBE and inform women of the risks of cancer, more so than health care providers without adequate knowledge of breast cancer (Coleman et al., 2003; Odusanya & Tayo, 2001). Nurses and

health communication experts should create an environment that promotes a positive attitude, increases knowledge about the screening processes, and encourages women to participate in screening methods according to ACS guidelines (Grindel et al., 2004).

There are a few methods that have been used to try to detect breast cancer at an early stage. These methods include BSE, mammography (MMG), and CBE. Many studies discredit the benefits of BSE with regard to the mortality rate caused by breast cancer, but there are others that insist BSE reduces the risk of death from the disease (Ku, 2001; Miller et al., 2000; Thomas et al., 2002) Therefore, it is crucial that nurses give women information on how to detect breast cancer at an early stage, along with advice and education related to preventative actions. This could be effective in the prevention of cancer and decreasing the rate of mortality (Yaren et al., 2007). To encourage women to regularly get checked for breast cancer, a nurse should be aware of additional educational programs related to the disease. Studies may provide essential information about the factors that contribute to the risk of breast cancer and screening methods in health professions (Yaren et al., 2007).

Future research should be aimed at improving and growing examination processes for women with masses in their breast tissue. Women younger than 40 should be advised about the importance of examining masses in the breast tissue-- even before they begin any official screening processes (Roth et al., 2011). Additional studies could indicate how serious this problem is, and could possibly help create more useful breast cancer screening programs. These studies would examine people who are close to women, such

as nurses, teachers, and other health care professionals. Their knowledge and beliefs about the promotion of good health would be the focus of the study (Yaren et al., 2007). Efforts should be made in future studies to discuss the reason for the lack of counseling by health care professionals for BSE in female patients. An essential component of improved efforts to control cancer, according to the Center for Disease Control and Prevention (CDC), should involve enhanced professional education on cancer risk and risk management (Spence et al., 2010). Future health care providers must be afforded learning experiences designed to develop the knowledge, skills, and attitudes requisite to cancer risk assessment and management (Spence et al., 2010). In order to build the confidence of nurses and make them more aware of how important the screening processes are, we must first try to understand how much nurses know about the disease. Also, we should be aware of their perceptions of the disease and detection at an early stage through different screening methods.

Nursing Students Breast Cancer Knowledge

Based on the rising rate of breast cancer and lack of knowledge of BSE in younger women, the researcher felt the need to help educate these women about BSE and to reduce the number of women with the disease in future generations (Shalini et al., 2011). It is necessary to devote greater attention to training health care providers in routine screening risk assessment and risk management skills (Spence et al., 2010).

Students in the nursing field need to be aware of all of the details pertaining to BSE. Their educators should demonstrate the process and help them practice it correctly

so that they can show women the proper way to perform BSE after they graduate and become nurses (Memis et al., 2009). Professions in the nursing field make up a large, important part of all health care professionals. For the growth and maintenance of public health, trained people in the nursing profession are the most capable of effectively informing women about breast cancer. Nurse practitioners are essential in cancer preventative processes and the delivery of care (Lawvere et al., 2004). Nurses should understand the different breast cancer screening methods and be able to establish which method is the best fit for their patients (Ravert & Huffaker, 2010). By giving information and reassurance, health care assistants and assistant practitioners can encourage women to accept their invitations for regular screening. Health care assistants can also be useful by explaining the statistics to the patient, answering a patient's questions about the screening process, and reminding patients that screening procedures can save their lives (Curtis, 2010). It is important that practitioners providing comprehensive health care inform women of the disease and the different screening guidelines. Nurses should remember how important it is to help all women understand their bodies and the screening guidelines for their age group (Leslie et al., 2003).

Although there have been many advances in the treatment of breast cancer, detection at an early stage of the disease is still important for increasing the rate of survival. The plan to eliminate the disease is dependent on the integration of specialties in order for all health care professionals to be skilled in cancer prevention methods (Madan, Colbert, Beech, & Beech, 2003). Because of the settings in which they work, nurses have

a significant effect on women. Nurses can increase knowledge, reduce fears, disprove myths, and correct any misperceptions about the disease. They can also encourage women to start practicing healthy behaviors in relation to their breasts. However, the role that nurses can play depends on their own knowledge, beliefs, and perceptions (Powe et al., 2005). Nurses' knowledge, beliefs, and perceptions are shaped by their educational preparation, their training after graduation, and their lived experiences (Galaychuk, 2000; Powe et al., 2005). According to Powe et al. (2005), it is necessary to assess nursing curricula issues that influence these perceptions and general knowledge of breast cancer among the students. The importance and distinctions between BSE and mammography must be clearer to nursing students so they can accurately relay this information to their patients (Powe et al., 2005). For nursing students, in particular, the amount of cancer content within their nursing curricula could potentially influence their perceptions and, ultimately, how this information is communicated to their patients. Content within nursing curricula must be able to look past the physiology and epidemiology of the disease in order to care for their patients when it comes to education, risk reduction, early detection, treatment, and survivorship (Powe et al., 2005).

This researcher was not able to find current information on the knowledge or practice of BSE of students in the nursing field. It is unsure whether the education they receive is adequate for them to be able to pass the information on to patients. It is also questionable whether they have positive attitudes and any necessary BSE skills (Memis et al., 2009). Proper BSE training for students is not sufficient. Additional research should

be done to examine methods of education for nursing students and the effectiveness of this education. Students in the nursing field need to be carefully trained on how to perform BSE so they can raise breast cancer awareness in women. Unfortunately, there have only been a few studies about the effects of educational interventions on the knowledge and opinions of breast cancer and health in nursing students (Balkaya, Nemis, & Demirkiran, 2007).

In order to fully understand a nursing student's views about breast cancer, we need to research and conduct more studies (Powe et al., 2005). It is imperative that nursing curricula include content across the continuum of cancer care. Nurses can enhance a patient's knowledge, straighten out any misperceptions, and calm fears related to the disease. However, there is little attention paid to these psychological problems in nursing literature, and it is uncertain to what extent these issues are covered within nursing curricula.

While many nursing textbooks address the physiological and epidemiological aspects of breast cancer, few challenge the common perceptions women have about the disease. Although nursing students may learn about the physiology of the disease, the knowledge they gain does not automatically challenge their existing perceptions (Powe et al., 2005). Educators in the nursing field are encouraged to keep their cancer-related educational decisions on a continuation of care and attending to a student's breast cancer beliefs when presenting cancer information. Such efforts will improve the cancer care provided to patients, while also addressing the health needs of the students themselves.

Current research that explores BCK among nursing students is limited. Given the current nursing shortage and the emergence of accelerated nursing programs, research also needs to examine cancer-related knowledge and content in nursing programs.

Objective

An essential goal of nursing education is preparing students for the transfer of their acquired BSE knowledge to actual practice. In order to achieve this, knowledge of thinking paradigms is required. Educators can assist a student's progress of this transfer by creating instructional models that combine the content of the course with the intellectual processes related to the use of the course content. To achieve this goal, curricular designs must go beyond the basic understanding of facts and concepts (Anderson et al., 2001). The transfer includes both specific content knowledge and the knowledge of application of cognitive processes. The educators should expand learning objectives to include the application of procedural knowledge (Su & Osijek, 2011). For independent learning, awareness of one's own cognition is essential. Learners who act on metacognitive awareness tend to learn better than those who do not (Bransford, Brown, & Cocking, 1999). To help learners understand and have control over their education, educators should include objectives for teaching metacognitive knowledge explicitly (Su & Osisek, 2011).

The objectives have an important part in educating nursing students. These objectives are used to implement guidelines for learning, instructions, and a foundation for learning assessment. They symbolize learning outcomes including knowledge,

principles, and skills. The learning assessment assessed the quality and quantity of the student's learning experience as it relates to the outcomes listed above. In order to establish evaluation strategies, educators need to understand what it is they are assessing. The educators' need for clarity is realized when they are writing test questions. These questions should accurately and completely measure the behavior in identifying, describing, applying, and analyzing course content. Objectives of these questions may be examined to describe the three domains of learning: cognitive, affective, and psychomotor. Each of these domains has its own classification system.

Cognitive Domain

The cognitive domain handles intellectual skills. Learning from the cognitive domain involves the underlying information regarding nursing practice concepts, theories, and principles about nursing; along with the intellectual skills of decision making, problem solving, and critical thinking. The most extensive cognitive classification was created by Bloom and his colleagues in 1956. It consists of six different levels of cognitive learning in order from least complex to most complex: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom et al., 1956).

A more recent revision of this classification by Anderson et al. (2001) includes the same levels, but the names were action words instead of nouns. A benefit of this updated classification is that educators are encouraged to consider higher learning levels because of the instructions they need to follow when designing the test questions. In this

classification, the educator first decides on the level of cognitive learning expected and then he or she must create goals and assessment methods for that level.

Affective Domain

The affective domain handles the growth of values, attitudes, and beliefs consistent with professional nursing standards. Affective domain standards are related to the knowledge of learners. There are two key dimensions in the evaluation of certain outcomes. The first dimension is associated with a student's knowledge, attitudes, and beliefs about nursing. Before students internalize a value and use it as a foundation for their behavior, they should understand the essential nursing values. There is a cognitive foundation for the creation of a value system. The affective domain focuses mainly on knowledge, attitudes, and beliefs consistent with professional nursing practice. The second dimension of the affective domain examines whether or not students have accepted these values, attitudes, and beliefs. The domain also examines if students are internalizing the behaviors for their personal decisions and actions. Test questions are not suitable for these levels because the educator is more concerned with the student's motivation to practice values regularly in patient care. A list of the five levels of learning in the affective domain includes: receiving, responding, valuing, organization, and characterization by a value.

Psychomotor Domain

The psychomotor domain is concerned with skill development and technological competency. This domain consists of movement oriented activities, which require a

certain degree of physical coordination. Motor skills have a cognitive foundation and an affective element that reflects the nurse's values. The psychomotor domain is made up of the five levels of imitation, manipulation, precision, articulation, and naturalization. Methods for evaluating psychomotor skills show evidence of a nurse's knowledge of the underlying principles. The majority of performance evaluations are performed either in the clinical setting or in learning and simulation laboratories. The test questions can still be used for evaluating principles related to skill performance.

The revised Bloom's taxonomy presents the groundwork for meeting a student's educational needs (Su & Osisek, 2011). As reported by Anderson et al. (2001), the main focus of the original taxonomy was on developing evaluations for the assessment of the performance of the student, whereas the revised version focuses more on the learning of the student. By classifying objectives, the revised version emphasizes the use of the groundwork to design learning objectives, instructional activities, and assessment methods in order to attain an alignment of these elements. The revised framework was created to expand the classifications of the educational goals to incorporate the transfer of knowledge. The classification of learning goals by the knowledge category associated with cognitive processes gives educators a more comprehensive understanding of possible learning, teaching, and assessment designs. The revised Bloom's taxonomy is arranged in such a way as to provide the groundwork for classifying cognitive learning objectives through six levels of cognitive processes that were suggested in the original version, but also through the four knowledge types of: factual, conceptual, procedural,

and metacognitive (Anderson et al., 2001). As stated by Anderson et al. (2001), "factual knowledge is 'knowledge of isolated content elements'; conceptual knowledge is 'more complex, organized knowledge'; procedural knowledge is 'knowledge of how to do something'; and metacognitive knowledge is 'knowledge about cognition in general as well as one's own cognition'" (p. 27). The revised version helps educators gain a more comprehensive understanding of the learnings and allows them to create more efficient evaluation methods (Anderson et al., 2001).

Use of Objectives for Assessment and Testing

The revised taxonomy presents the groundwork for educators to plan and create evaluation strategies at different learning levels. The taxonomy is important when assessing a student's performance to the anticipated level of learning. The level of outcome should match the test questions. For example, if the learning outcome is application, then the test questions also need to be at the application level. If the learning outcome is value, then the evaluations need to study a student's behavior over an extended period of time to decipher whether or not he or she is committed to practicing the same values. If the learning outcome is precision, then the evaluation should focus mainly on performance accuracy, as opposed to the time it takes to perform the skill. Bloom's taxonomy lays the groundwork for educators to create test questions and evaluation methods that are appropriate for the student's intended learning outcome.

When educators develop test questions and other types of evaluation methods, he or she must first identify the outcome that will be evaluated. The performance of the

student at a specific level is specified by the objective. There are educators who choose to create test questions and assessments from course content, as opposed to the objectives of the revised taxonomy. For this method, the educator analyzes the areas that need to be evaluated. The educator tests, then samples, knowledge of this content. In this process, the educator needs to reference the course results and course placement in the curriculum for decisions about the complexity of each test question and other methods of evaluation.

Test Construction

Nursing faculties need to remember that students who think for themselves will make better clinical judgments compared to students who are only committed to the memorization of facts. To meet the clinical practice demands, graduates of nursing programs should be capable of applying nursing concepts learned throughout the nursing program curriculum to the variety of clinical situations that will happen during their nursing career. According to Morrison and Free (2001), the Commission on Collegiate Nursing Education did not specifically refer to the measurement of critical thinking in nursing education, but stated that "expected results are the measurable indicators of a program, student outcomes may be demonstrated as attained competencies, knowledge, skills, and attitudes" (p. 14). Accrediting agencies are concerned with measurement of student outcomes demonstrated by the ability to think critically when making clinical judgments.

Morrison, Smith, and Britt (1996) developed a model to describe the process of developing critical thinking multiple-choice test items. When multiple-choice questions

are written properly, they might be discriminating. The questions might only judge whether or not a student is capable of applying certain concepts to clinically oriented situations. Multiple-choice test questions can be graded by a machine, which expedites the scoring process. Morrison et al. (1996) proposed four principles for critical-thinking multiple-choice questions: (a) each test item should include logic, (b) questions should be written above the cognitive level, (c) multilogical thinking should be required in order to correctly answer questions, and (d) a high amount of discrimination should be required when choosing between the plausible alternatives (p. 21).

Test Item Rationale

The primary reason for testing is to evaluate the student, but testing can also be used as a tool for learning. Providing rationalization for each test question answer promotes a positive learning experience for the student; this can also serve a purpose for assessing the design of the exam. Educators should encourage students to analyze their thought processes by explaining their reasons for choosing their answers. Test item rationales should contain information on the reasons a choice would be correct as well as why the opposing choices are wrong.

Cognition at the Application Level and Above

Critical-thinking test items should focus on the application of concepts. Memorizing implies "habitual thinking," described by Bloom et al. (1956) as knowledge, the lowest level of cognition. Comprehension, Bloom's second level of cognition, is

essentially a restatement of memorized facts. Based on Bloom's original taxonomy (1956), critical-thinking test questions should be written at the application level or higher.

Multilogical Thinking

Morrison et al. (1996) defined multilogical thinking as thinking that requires a vast knowledge of information in order to logically implement the concepts in a clinical environment (p. 28). To challenge students to think critically, test questions should require the ability to apply concepts in clinical situations while taking care of a patient. The multilogical test questions promote clinical thinking as well as measure a student's critical-thinking ability in nursing practice.

High Level of Discrimination

To promote critical thinking skills, multiple-choice test questions need to require a higher level of discriminating answers so that the students can choose between different possible, correct answers. This way, the student is presented with multiple likely answers, and he or she must choose the best fit. These types of questions require the student to calculate a formula or ask the question on a scale such as: what is the best, what is the most important, what is the first, which has the highest priority, etc. These types of questions require an answer at a very high level of discrimination, and therefore promote strong critical thinking skills.

Multiple-choice Items

Multiple-choice questions can be used to measure different types of learning outcomes such as: (a) knowledge of facts, specific information, and principles; (b)

definitions of terms, (c) understanding of content, (d) application of the contents, principles, and theories in clinical and other situations; (e) analysis of the data and clinical situations, (f) comparison of varied interventions, and (g) decisions on which actions to take in situations.

Multiple-choice questions are particularly useful in nursing to measure outcomes at application and analysis levels. In these types of questions, the educator can show the students new information that requires analytical thinking skills in order to answer the questions. Items at this level are effective for assessing critical thinking. There is evidence that multiple-choice testing is good practice for students. Many of these students will come across these types of items on licenses, certificates, and other commercially prepared exams. Also, multiple-choice test questions make it possible for a teacher to gather information from the course content more easily than in essay questions, which requires a longer response time for the student. In addition, multiple-choice tests can be scored electronically.

Although there are many advantages to multiple-choice testing, there are also certain disadvantages. First, these questions are not easy to write, especially at a higher level of cognitive thinking. It is easier for an educator to create questions that simply test a student's memorization of facts, rather than questions that test a student's use of his or her knowledge and analytical skills. As such, many multiple-choice items are written at the lower cognitive levels, focusing only on recall and comprehension. Second, teachers often experience difficulty developing plausible distractors. These distractors are the

incorrect alternatives that seem plausible for students who have not acquired a complete understanding of the content. If a distractor is not plausible, it hints to the test-taker that it is not the correct response. Third, it is often difficult to identify one correct answer when the test-taker is provided with four or five different answers. For these reasons, multiple-choice questions take a long time to construct.

Writing Multiple-choice Items

There are three parts to a multiple-choice question; each part has its own set of standards: (a) stem, (b) answer, and (c) distractors.

Stem. The first part, the stem, is the lead-in phase in question form. It can also be a statement with a blank that relies on one of the different choices to complete the statement. These different choices are made up of two types: the answer (the correct or best response to fill in the blank) and distractors (incorrect alternatives to the correct answer). The distractors are meant to distract students who are not sure what the correct answer may be.

It does not matter if the stem is in question form or statement form; the most important quality of the stem is that it can be clearly read. A student should be able to read a stem and know which answer to look for in the multiple choice options without having to read through each one. Thus, the stem should stand alone. One other important consideration in writing the stem is to make sure that it presents an illustration of the learning outcome that is being examined. Guidelines for writing the stem are:

- The stem should clearly present the problem that needs to be solved.

- The stem should not contain unnecessary information unless the question is developed for the purpose of identifying significant or insignificant information.
- The educator should avoid putting instructional information in the stem.
- If words need to be repeated in each of the multiple choice answers in order to complete the statement, the repeated words should be moved to the stem.
- Words in the stem should not give the student a clue as to what the correct answer may be.
- Negative statements such as “no,” “not,” and “except” should not be used in the stem.
- The stem and multiple-choice options that follow the stem should be grammatically consistent.
- Stems should not be ended with “a” or “an” because this can give the student a hint of the correct answer.
- If the stem is in statement form with a list of choices to complete the statement, each multiple-choice option should begin with a lower-case letter and finish with a period so that it forms a complete sentence when added to the stem.
- Each multiple-choice option should be independent of the other options.
- The stem should be written so that the options are placed at the end of the incomplete statement, as opposed to the middle or beginning of the statement.

Alternatives. Following the stem in a multiple-choice item is a list of options, which include: (a) the correct or best answer, and (b) distractors. Five options reduce the

chance of guessing the correct answer to 1 in 5 (Miller, Linn, & Gronlund, 2009). For this reason, four options typically are used, allowing for one correct or best answer and three plausible distractors. General principles for writing the alternatives are:

- The multiple-choice options should be similar in length, detail, and complexity.
- The multiple-choice options should also include the same number of parts.
- The multiple-choice options should be grammatically consistent.
- The multiple-choice options should be made up of the same domain.
- Multiple-choice options with responses that contradict each other should be avoided.
- The multiple-choice options should be organized in a logical order; the order can be alphabetical, numerical, or chronological (Gaberson, 1996; Nitko & Brookhart, 2007).
- Multiple-choice options that include numerical values should be listed in a sequence, either increasing or decreasing in value, without overlapping values.
- All multiple-choice options should be listed on separate lines to make them easier for the student to read.

Correct answer. In a multiple-choice question, there is only one correct answer to be chosen from the different alternatives. The following suggestions for writing the correct answer are guided by the principle that students should not be able to identify the correct response and eliminate distractors because of the way the stem or alternatives are written (Oermanm & Gaberson, 2009):

- Go over the multiple-choice options carefully to make sure that there is only one correct answer.
- Be careful when interpreting terminology in the stem to avoid giving the student a clue of what the right answer may be.
- The right answer should be assigned to a random position among the multiple-choice alternatives to avoid a bias towards a particular response choice.
- Answers should not be a reflection of the educator's opinion, but should be possible answers with which experts agree or responses which make the most sense.

Distractors. The most difficult part of developing good multiple choice test items is writing distractors. Distractors are the incorrect but plausible options offered. Distractors should be appealing to students who lack the knowledge for a correct response to the question, but at the same time does not confuse students who understand the content (Oermann & Gaberson, 2009). Suggestions for creating distractors are:

- Be grammatically consistent; each distractor should be similar in length, detail, and complexity with each other and with the correct answer.
- The distractors should be taken from the same content as the correct answer.
- Try not to use options such as "all of the above" and "none of the above."
- Try not to use terms such as "always," "never," "sometimes," and "occasionally."
- Avoid the use of distractors that are too similar to each other.

Validity

There are a variety of sources that provide evidence of the validity of the interpretation and use of assessment results. The strongest case for validity can be made when evidence is collected regarding four major considerations for validation: content, construct, assessment-criterion relationships, and the consequences of assessment (Miller et al., 2009).

Content construct. Content construct focuses on the extent to which the sample assessment items or tasks represent the domain of content or abilities that the teacher wants to measure. Content validity may be obtained during the assessment-development process as well as by appraising a completed assessment. Construct considerations are seen as the unifying concept of assessing validity, representing the extent to which score-based inferences about the construct of interest are accurate and meaningful. Methods used in construct validation include defining the domain to be measured, analyzing the task-response processes required by the assessment, comparing assessment results of known groups, comparing assessment results before and after a learning activity, and correlating assessment results with other measures.

Assessment-criterion relationship. Assessment-criterion relationship considerations for obtaining validity evidence focus on predicting future performance (the criterion) based on current assessment results. Obtaining this type of evidence involves a predictive validation study. If the assessment results are to be used to estimate student performance on another assessment (the criterion measure) at the same time, the

evidence is concurrent, and obtaining this type of evidence requires a concurrent validation study. Teachers rarely study the correlation of their own assessment results with criterion measures, but for tests with high-stakes outcomes, such as licensure and certification, this type of validity evidence is critical.

Considerations of the consequences. The concept of validity thus has expanded to include consideration of the consequences of assessment use and how results are interpreted to students, teachers, and other stakeholders. Consideration of consequences must include both intended and unintended effects of assessment, particularly when assessment results are used to make high-stakes decisions.

National Council Licensure Examination for Registered Nurses (NCLEX-RN)

At the entry level for professional nursing, graduates take the NCLEX-RN Examination. As students progress through a nursing program, they should have experience with similar tests that will prepare them for taking licensure and certification examinations when they graduate. The focus of the NCLEX-RN is on nursing practice. It is important to incorporate teacher-made tests to provide a way of measuring whether students can apply their theoretical learning to clinical situations. Teachers can develop items that present new and complex clinical situations for students to critically analyze. Items can focus on collecting and analyzing data, setting priorities, selecting interventions, and evaluating outcomes related to the content taught in the course. Test items on the NCLEX-RN are categorized by patient needs: (a) safe and effective care

environment, (b) health promotion and maintenance, (c) psychological integrity, and (d) physiological integrity. Two of the categories, safe and effective care environment and physiological integrity, also have subgroups.

Safe Effective Care Environment and Health Promotion

Two subcategories of content are tested on the NCLEX-RN: (a) management of care, and (b) safety and infection control. In the management of care subcategory, the questions focus on nursing care and delivery of care that protects patients, families, significant others, and health care providers. The safety and infection control subcategory test items focus on prevention of accidents, disaster planning and emergency response plans, error prevention, and others (Wendt, Kenny, & Anderson, 2007). There are no subcategories of needs. Examples of content tested in this category are developmental stages and growth and development, disease prevention, health and wellness, health promotion and screening, immunizations, physical assessment techniques, sexuality, and teaching and learning principles (Billings & Hensel, 2014).

Psychosocial and Physiology Integrity

Psychosocial integrity also has no subgroups. This category focuses on nursing care that promotes the emotional, mental, and social well-being of patients, families, and the care of patients with acute and chronic mental illness (Wendt et al., 2007). This is a significant content area tested on the NCLEX-RN. Items in this category focus on nursing care that promotes physical health and comfort, reduces risk potential, and manages health alterations of patients. Four subcategories of content are examined: (a) basic

patient care and comfort, (b) pharmacological and parenteral therapies, (c) reduction of risk potential, and (d) physiological adaptation (Billings & Hensel, 2014; Ohman, 2010).

Integrated Processes

The NCLEX-RN test plan is also organized according to four integrated processes. Integrated throughout the client needs categories and subcategories are four key processes that are fundamental to the practice of nursing. These include: (a) nursing process, (b) caring, (c) communication and documentation, and (d) teaching and learning. The nursing process approach to client care includes assessment, analysis, planning, implementation, and evaluation. Caring refers to an atmosphere of mutual respect and trust between the nurse and the client in which the nurse provides encouragement, support, hope, and compassion to help the client achieve desired outcomes. Communication refers to the nonverbal and verbal exchanges or interactions between the nurse and the client as well as the validation of client care in written and electronic records that reflect standards of practice and accountability in the provision of care. Teaching and learning make it possible to gain the knowledge, attitudes, and skills to promote a change in behavior (Ohman, 2010; Rupert, 2013).

Cognitive Levels

The NCLEX-RN test uses Bloom's taxonomy to develop items. Items are developed at the knowledge, comprehension, application, and analysis levels, with the majority of items at the application and higher cognitive levels (Wendt et al., 2007). Faculty members should avoid preparing only recall and comprehension items on their

tests. Although some low level questions are essential to assess knowledge and understanding of facts and basic principles, test items also need to ask students to use their knowledge and think critically to arrive at an answer. Test blueprints can be developed to list not only the content and number of items in each content area but also the level of cognitive complexity at which items should be written (Ohman, 2010).

Nursing Process

One of the processes integrated into the NCLEX-RN test plans is the nursing process. The nursing process is a useful framework for developing test questions. Items can examine assessment of patients with varied needs and health problems, analysis of data, nursing, and other diagnoses, priorities of care, nursing interventions, treatments, and evaluation of the outcomes of care. Developing items on the nursing process that are based on clinical scenarios provides an opportunity to examine these outcomes of learning. McDonald (2007) identified an advantage of nursing process testing as promoting the development of unique situations, which then allows for testing at a higher cognitive level.

Summary

The purpose of this study was to investigate the relationship between the freshman and senior nursing students' BCK and their BSE_TC. The chapter provided information on the social cognitive theory and Bloom's taxonomy. Self-confidence was identified as a significant predictor of individual performance and perseverance. A person's sense of self-confidence is developed and supported by self-efficacy sources: (a)

mastery experiences, (b) role modeling, and (c) verbal persuasion. Strategies that enhance self-confidence have been shown to be effective moderators of behavior in health promotion, sports, and education. In nursing education, self-confidence has been useful in preparing students for practice with diverse populations. However, the relationship between BCK and BSE_TC on associate degree program nursing students remains unexplored.

Despite the lower mortality rate of breast cancer patients through the use of screening processes, many women do not receive cancer screening services. The top reason women provided for never using breast cancer screening tools was the fact that there was no clinical recommendation. Nursing students need to be informed about BSE in detail and should be able to show a patient the correct method of performing this screening process. If nurses learn this in school, they will be able to educate patients after they graduate. Nurses are in a key position to teach patients about breast cancer and adoption of breast cancer behavior. The role that nurses can play depends on their own knowledge. Nurses' knowledge is shaped by their educational preparation and training. Nursing students should receive BSE training so that they can help train others. There is a lack of information on the BSE knowledge of nursing students, their practice of BSE, and whether or not they are receiving an adequate education to impart reliable information and the skills needed to perform BSE. Chapter 3 presents the research methods and explains the instrumentation, sample selection process, eligibility criteria, and data analysis.

Chapter 3: Research Method

Overview of the Study

Chapter 3 presents the research methods, design, population and sampling, data collection procedures, validity, and data analysis. Included is the rationale for the choice of methodology. The purpose of this causal-comparative quantitative study was to investigate the relationship between the freshman and senior nursing students' BCK and their BSE_TC.

The primary research question of this study was: Does the associate degree nursing program at Seminole State College of Florida provide knowledge in breast cancer and breast self-examination technique? A questionnaire was given to nursing students to assess two areas that would assist nurses in breast cancer detection: (a) BCK and (b) BSE_TC.

Research Questions and Hypotheses

RQ1: To what extent do freshman and senior nursing students differ in their levels of breast cancer knowledge?

H_a1: There is a statistically significant mean difference in breast cancer knowledge scores between freshman and senior nursing students.

H_o1: There is not a statistically significant mean difference in breast cancer knowledge scores between freshman and senior nursing students.

RQ2: To what extent freshman and senior nursing students differ in their levels of BSE technique confidence?

*Ha*2**:** There is a statistically significant mean difference in BSE technique confidence scores between freshman and senior nursing students.

*Ho*2**:** There is no statistically significant mean difference in BSE technique confidence scores between freshman and senior nursing students**.**

Research Design and Approach

A causal-comparative research method was appropriate for this study due to the nature of the variables of interest. In a causal comparative study, at least two independent groups are compared on at least one dependent variable or measure of performance, but the independent variable (the cause) has already occurred or cannot be manipulated (Polit & Beck, 2006). In causal-comparative methodology it is necessary that the independent variable is categorical and that dependent variables are continuous. For this study, the categorical independent variable was grade level (freshman or senior) and continuous dependent variables were BCK and BSE_TC scores. Causal-comparative methodology is used to determine if there are significant mean differences in dependent variables, depending on group. However, in comparison to experimental research, confidence levels cannot be assumed for this methodology (Polit & Beck, 2006). An experimental design was not appropriate for this study due to the inability to manipulate the grade level and classes of the nursing students.

Quantitative research discusses relationships between measured variables to explain, predict, and control events (Leedy & Ormrod, 2005). By using the quantitative approach, this study reduced biases that could exist within this model by focusing on direct responses without interpretation. Quantitative research involves the use of specific and narrow questions targeted toward measuring and explaining variable relationships (Cooper & Schindler, 2005; Creswell, 2005). Qualitative research design was not an appropriate choice for this study. This is because qualitative research analyzes words or texts from participants and inquiries are conducted in a more subjective and biased manner (Creswell, 2005).

Table 1 provides different variables that were used in the study and their variable types. Further information on each of these variables can be found in later sections of this chapter.

Table 1

Variables for MANCOVA Analysis

Variable Name	Variable Type	Variable Level
Breast Self-Examination Technique Confidence	Dependent	Continuous
Breast Cancer Knowledge	Dependent	Continuous
Grade Level	Independent	Categorical
Age	Covariate	Continuous
Grade-Point Average	Covariate	Continuous
Country of Origin	Control	Categorical
Ethnicity	Control	Categorical
Marital Status	Control	Categorical

Population and Sample Selection

Population

The data were obtained from a group of freshman and senior nursing students enrolled in the associate degree nursing program at Seminole State College of Florida (*N*=196). The inclusion criteria for the population was freshman nursing students enrolled in the nursing course Fundamentals of Nursing or Basic Medical and Surgical Nursing and senior nursing students enrolled in the Complex Medical Surgical or Practicum Client Care Management nursing course.

Power Analysis

I performed an a priori power analysis in order to determine the required sample size for this study. GPOWER 3.1.9.2 software (Faul et al., 2007) was used to make this determination. Power is defined as (1-β), where β is the chance of Type II error (i.e., one accepts the null hypothesis when it is, in fact, false). At a power of .80, one has an 80% chance of seeing significance that is truly in the data. Effect size is usually defined as small, medium, or large; for eta squared, which is appropriate for the MANCOVA analysis of this study, the effect size is defined as small (*eta squared* = 0.01), medium (*eta squared* = 0.06), or large (*eta squared* = 0.14) (Cohen, 1992). GPOWER does not offer the option of MANCOVA, so a MANOVA was used to estimate the sample size. The power analysis was performed for a MANOVA with one independent variable with two levels of (a) freshmen, and (b) seniors, and two dependent variables of (a) BCK, and (b) BSE _TC. Criteria for the a priori power was set at an alpha level of .05, power of .80, and a medium effect size of eta squared = .06. A total sample of $n = 164$ was required to power the MANCOVA analysis.

Because findings were significant for the MANCOVA analysis, a series of ANCOVA analyses were performed as post hoc tests. Cohen (1992) determined the effect sizes (f) for ANCOVA as small ($f = .10$), medium ($f = .25$), and large ($f = .40$). Criteria for the power of the ANCOVA analyses was set at alpha level of .05, power of .80, and a medium effect of $f = .25$. A total sample of $n = 128$ would be required to power the ANCOVA analyses. It was anticipated that 196 students in total would be available

for participation in the study. Therefore, all attempts were made to include enough students to achieve enough power to detect a medium effect (n= 164). If less than n = 164 students were recruited, a large effect size would have needed to be seen to detect statistical significance. The large effect size criterion for the MANCOVA (eta squared = 0.14) and ANCOVA (f = .40) with 80% power and alpha level of .05 would necessitate sample sizes of n = 72 and n = 52 respectively. The final sample size analyzed in this study was n =100 nursing students.

The participants for the study included 100 freshman students enrolled in Fundamentals of Nursing or Basic Medical and Surgical Nursing. The total number of senior nursing students enrolled in the Complex Medical Surgical was 90. The Practicum Client Care Management nursing course was not offered in this term. Subject recruitment often proceeds at a slower pace than researchers anticipate, in part because not everyone who is approached agrees to cooperate. It is good idea to develop a contingency plan for recruiting more subjects. My contingency plan if the minimum sample was not collected in the time frame of the data collection was to extend the time frame to a second term. Comparisons could only be made between student nurses who sign informed consent forms.

Sample

The sample was taken from the population defined above. Students were recruited via a convenience sampling approach. A convenience sampling approach is a sample that is either wholly or partially taken at the convenience of the researcher (Polit & Beck,

2006). I selected the convenience sampling method due to the nature of the situation. Volunteers were taken from the classes in which these students were enrolled; this leads to the convenience sampling approach. Since the most appropriate way to perform this study was using a volunteer approach, convenience sampling was the necessary choice for sampling method.

Sampling Procedures

My study participants were recruited on a volunteer basis. The first step was receiving informed consent from both the Seminole State College of Florida (Appendix D) and the school Institutional Review Board. Walden University's approval number for this study is 10-30-15-0012645. Upon receiving this consent form, individuals in each of the nursing courses required for inclusion (freshman nursing students enrolled in the Fundamentals of Nursing or Basic Medical and Surgical course and senior nursing students enrolled in the Complex Medical Surgical or Practicum Client Care Management nursing course) were asked to volunteer for the study. They were asked to participate in an online survey (Appendix A). The survey included an informed consent that explained the purpose of the study, its anticipated benefits and potential risks, the rights of the subjects regarding participation, and the required time commitment to complete the online survey. The informed consent explained that participation was voluntary and refusal to participate would not result in any penalty or harm to the subject, and assured participant confidentiality and anonymity. Anonymity of survey results was not an issue since names were not required for the survey. A statement of consent was

part of the informed consent. The informed consent forms and the research survey will be stored in a password-protected computer file. These forms will be kept for 5 years and then destroyed.

Inclusion Criteria

In order to be included in the study, participants had to have met the following criteria: first, the participants were required to be at least 18 years of age, and second, the participants had to be enrolled in any of the following classes: Fundamentals of Nursing or Basic Medical and Surgical and senior nursing students enrolled in the Complex Medical Surgical or Practicum Client Care Management. If someone refused or declined participation in the study no information would be included about them. All participants had to sign an informed consent form to be included in the study and had to give their permission to use their information in the study.

Instrumentation and Operationalization of Variables

Instrumentation

I developed a questionnaire for this study to provide understanding of and measurements for the research questions (Appendix A). This questionnaire focused on measuring the students' BCK and their BSE_TC. The survey questionnaire method was most appropriate for this study. By using a questionnaire, I was able to list all the questions that the study required the respondents to answer and record the responses of participants. The questionnaire had two purposes: to extract accurate information from the respondents and to provide a standard format on which the answers and attitudes

could be recorded. Survey research was chosen as one of the most effective forms of data collection in the study of human emotion and opinion, and because it provided me with a variety of techniques and sampling options. The survey was broken down into three different sections, each having its own qualities: demographic characteristics, BCK, and BSE_TC.

Demographic Characteristics

Demographics provided the descriptive data on the following: academic level, whether they have always been Seminole State College of Florida students, whether they are part of the University of Central Florida concurrent program, ethnicity, country of origin, marital status, age, and grade point average. Descriptive statistics for the sample were calculated with this section and provided possible controls and covariates that were used in the analysis.

Breast Cancer Knowledge

This section tested the participant's knowledge in the form of questions with correct and incorrect answers. The score the participants received on this section helped to answer Research Question 1 (RQ1). The BCK questions were constructed using three different sources of principles: (a) Bloom's taxonomy, (b) Nursing process, and (c) NCLEX-RN Examination (Appendix E).

The BCK section was composed of 30 questions, some retrieved from:

- Billings & Hensel (2014). *Lippincott's Q& A Review for NCLEX-RN*, questions #25, 26, and 27, p. 549 (see Appendix F for permission document).

- Ignatavicius & Workman (2010). *Clinical Decision-making Study Guide: Medical-surgical Nursing: Patient-centered Collaborative Care,* (6th ed.), questions #9, 10, 12, 13, 15, and 16, pp. 651-653 (see Appendix H for permission document).
- Ignatavicius & Workman (2014). *Medical-Surgical Nursing: Patient-centered Collaborative Care (*8th ed.*),* questions #19, 20, 21, 22, and 23, pp. 1660-1663 (see Appendix G for permission document).
- Ohman, K. (2010). *Davis' Q & A for the NCLEX-RN*, questions #6, 7, and 8, pp. 427-429 (see Appendix I for permission document)
- Rupert, D. (2013). *Lippincott's NCLEX-RN* Alternate-*format Questions*, question #29, p. 148 (see Appendix J for permission document).

The questions were not altered or adjusted. Permission was granted by the publishers to use questions as part of this research. The subject matter of the questions was breast cancer.

Breast Self-Examination (BSE) Technique Confidence

This section provided a measurement of the participant's confidence with the BSE technique. This portion of the survey was made up of six items, two of which were used to calculate the BSE_TC. These two items were scored using a 5-point Likert scale. Participant scores in this section assisted in testing the hypotheses of research question 2 (RQ2). The questionnaire contained 36 items (not including the demographic portion of the survey) and took approximately 20 minutes to complete. The questions were created

using three different sources of principles: Bloom's taxonomy, the nursing process, and the NCLEX-RN.

Survey Validity and Reliability

It is important for a survey instrument to have reliability and validity. An instrument is valid when it measures what it is intended to measure. Reliability indicates that the survey instrument is providing a consistent measure (Creswell, 2009). When evaluating studies, there are several methodological concerns that emerge. Perhaps the most important of these concerns is reliability and validity. It is critical that good internal and external validity be established for social validation procedures. One way to determine validity is to require the social validation assessment to be reviewed by a panel of experts or judges who are not directly involved with the research (Creswell, 2009). Another method of determining validity is to perform a social validation assessment on the social validation instrument. For example, after responding to the main questionnaire, participants would respond to a second questionnaire that explained the purpose of the first questionnaire. The second questionnaire would also ask them to rate how well they thought the questions assessed the objective of the first questionnaire. Furthermore, researchers need to be aware of any halo effects biases have toward leniency or severity, central tendency responses, and position or proximity biases of raters that could artificially enhance the reliability of measurement without improving accuracy or validity (Creswell, 2009).

For validation purposes, a sample questionnaire was submitted to a panel of experts who were not involved directly in the research (Appendix K). The opinion of the experts was assessed using the Expert Questionnaire Criteria Form and the content validity was calculated using the Calculating a Content Validity Index Procedure (Appendix L). After their approval, shown by acceptable content validity index scores, the survey was conducted with two respondents. When they had completed the survey, respondents were asked for any suggestions to ensure further improvement and validity of the instrument. The researcher repeated the examination of the questionnaire's content to ascertain the reliability of the instrument. The researcher kept irrelevant questions out of the survey and changed any vocabulary or questions that were deemed difficult to comprehend by the respondents. As noted in Chapter 4, the reliability of the survey was tested using Cronbach's alpha coefficients. From Cronbach's alpha, the results showed that the survey contained internal consistency.

Operationalization of Variables

An operational definition means that the researchers must do to measure the concept and collect the needed information (Polit & Beck, 2006). The researcher must define concepts to decide how the variables will be observed and measured. The dependent variable is the outcome the researcher is intended to explore or predict. The independent variable is the presumed cause of an influence on the dependent variable. The purpose of this study was to compare differences between the freshman and senior nursing students on factors of BCK and BSE_TC, which may lead to detection of breast

cancer in future patients. A MANCOVA was used to address the research questions and statistical hypotheses of this study.

Independent Variables

There was only one independent variable used for this study. The independent variable was grade level. Grade level is a categorical variable with two categories: (a) freshman nursing students, and (b) senior nursing students.

Dependent Variables

Two dependent variables were assessed in this study: (a) BCK, and (b) BSE_TC. These two dependent variables were operationalized as follows:

Breast cancer knowledge. BCK is a continuous dependent variable calculated using the BCK portion of the questionnaire. It is composed of 30 items, each scored as 1 for correct and 0 for incorrect. The range of possible scores for the BCK variable is from 0 to 30, with higher scores indicative of higher levels of BCK.

Breast self-examination technique confidence. BSE_TC is a continuous dependent variable derived from the BSE_TC portion of the questionnaire. This portion was made up of 6 items, two of which were used to calculate the BSE_TC. These two were scored using a 5-point Likert scale with the following possible values: 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Agree; and 5 = Strongly Agree. The range of possible scores for the BSE_TC variable is from 2 to 10, with higher values indicating greater confidence with the BSE_TC.

Covariates

There were two covariates used in this study, age and grade-point average. Age was a continuous variable that measures the age of the nursing student in years. This variable has a range of 18+. The students are not in the same age group. Because there is a wide range of ages this characteristic should be included. It was included as a continuous variable. According to Reineccius (1999), "count data are usually treated as ordinal if the counts take on only a few values; if the counts can take on a wide range of values, the data are usually treated as continuous" (p. 746). This citation provided evidence for using this score as a continuous variable (since having a count of 30 provides a wide range of values). We can use a transformation of the score and treat it as continuous that way, but it would be much better to use the raw scores as they are. Using a MANOVA was the appropriate approach for the study.

Using other than a continuous variable would mean the researcher would have had to decide how to separate the ages, which may have changed the outcome of the study depending on the grouping selected. As a continuous variable, the researcher's touch remains off the data and no information is lost due to the grouping of the data. Gender was not included because there are not enough males in the program. GPA was a continuous variable measuring the overall grade-point average of the student. This variable had a range from 0 to 4.

Controls – Variables

There are a total of three controls used in this study: ethnicity, marital status, and country of origin.

Ethnicity. Ethnicity is a categorical variable that tells the ethnicity of the nursing student. There are five possible categories: White (non-Hispanic), Black (non-Hispanic), Hispanic, Asian, or Other with specification.

Marital status. This categorical variable described the marital status of the student. Five possible categories included: Single, never married; Married; Married**,** living apart; Divorced; and Widow.

Country of origin. Country of origin is a categorical variable with two possible categories: United States and Other with specification. If there were specific countries which provided high enough frequencies within the sample, this variable would have been separated into a larger amount of categories for this variable. Country of origin was chosen since there may be a difference in the study habits of foreign students compared to students from the United States.

Data Analysis

Statistical analyses were performed using SPSS for Windows (IBM SPSS 20.0, SPSS Inc., Chicago, IL). Demographic characteristics of the descriptive variables of the study sample obtained from the questionnaire were illustrated using the mean, standard deviation, and range for continuous scaled variables, and frequency and percent for categorical scaled variables. The frequencies of each of the control variables used were

tested and any variable that was predominantly described by a single category was not used in the analysis.

Multivariate analysis of covariance is an extension of ANOVA that is appropriate when there is more than one, related, continuous dependent variable, one or more categorical independent variables, and one or more continuous covariates (Tabachnik & Fidell, 2007). MANCOVA is used to test whether or not there is a significant mean difference in scores on more than one dependent variable, depending on levels of one or more independent variables after controlling for one or more continuous covariates. If the multivariate test in MANCOVA is significant, the individual dependent variables can be assessed separately. In this study, the categorical independent variable is grade level (freshman or senior), and the continuous dependent variables are BCK and BSE_TC. In addition to the independent variable of grade level, a total of five additional variables were included as three independent control variables (ethnicity, country of origin, and marital status) and two covariates (GPA and age) in the MANCOVA analysis.

There are several assumptions that must be met in order to use MANCOVA (Tabachnik & Fidell, 2007). First, the observations are independent, meaning that observations are not influenced by other observations. When the observations are independent, this reduces Type I error or incorrectly rejecting the null hypothesis in favor of the alternative hypothesis. Second, multivariate dependent variables are normally distributed for each group, meaning that any linear combination of the variables is normally distributed. This includes an assessment of the normality of each level of each

variable for each group, which also reduces Type I error. Another assumption is that the covariance matrices for dependent variables are equivalent. This assumption reduces Type I error and increases statistical power. Additionally, there must be a linear relationship between the dependent variables and the covariate, and the slope of the regression line for the covariate is the same in each group.

As long as there are at least 20 participants in each cell of the design, MANCOVA is relatively robust to violations of normality, based on the central limit theorem (Tabachnik & Fidell, 2007). If univariate non-normality proves to be an issue, the variables can be transformed to enhance normality. Violations of linearity reduce the power of MANCOVA. If curvilinear relationships exist, the variables may be transformed to increase power. When sample sizes are equal the assumption of homogeneity of variance-covariance matrices is assumed. When sample sizes are not equal violation of this assumption can result in increases in both Type I errors as previously discussed and Type II errors, as well as false acceptance of the null hypothesis. If assumptions cannot be met for the MANCOVA analysis, a series of four ANCOVA analyses are performed and include one analysis for each of the dependent variables. If ANCOVA analyses are necessary, an adjustment to the level of significance is done via a Bonferroni correction to compensate for a possible inflation of Type I error due to multiple testing (Tabachnick & Fidell, 2007). The Bonferroni correction is easily computed by dividing the alpha level of the study (.05) by the number of inferential tests performed (2). If the series of four ANOVA analyses are performed in place of the

MANOVA, the alpha level for rejection of the null hypothesis will be decreased from .05 to .025.

Ethical Considerations

The researcher was conscious of possible ethical issues that may be involved in this work. Names were collected during the survey process and all collected surveys were safely stored. The informed consent forms and the research survey were stored separately in a password protected computer file. These forms will be kept for five years and then destroyed. Prior to data collection, the study was submitted for approval to the Institutional Review Board (IRB). The survey process was done in accordance with the regulations of Seminole State College of Florida. The survey included an informed consent that explained the purpose of the study. The dignity, privacy, and interests of the participants were under constant consideration by the researcher. This study had the participants and their future patients in mind, so the researcher ensured the utmost care to their situation in response to informed consent.

Assumptions and Limitations

It is assumed that the data sources used in the studies were valid and reliable. Participants were selected from the Seminole State College of Florida. There are certain limitations because the study focused on freshman nursing students enrolled in a specific list of classes (Fundamentals of Nursing, Basic Medical and Surgical nursing courses and senior nursing students enrolled in the Complex Medical Surgical or Practicum Client Care Management). Other limitations, such as potential non-randomness within the

collected sample, could have arisen upon data collection. Since the sampling was not truly random, there is a threat to the external validity of this study, and results should be carefully evaluated when relating back to the population.

Threats to Validity

Internal validity is threatened by the instrumentation used in the study. Since this survey had never been tested, we cannot know the true validity of the test. This was addressed by increasing the face validity of the survey by speaking with experts in an attempt to perfect the questions being asked. Internal validity may also be threatened by students learning from other sources. Since this study focused on BCK which is learned from Seminole State College of Florida, students learning about breast cancer and BSE technique for reasons other than the material being a class requirement would prove to be a threat to the internal validity of the study. This was addressed in the BSE_TC section by a question that asked where they learned the BSE technique, which will control this possible confounding variable. In the BCK section this was addressed by asking if they have always been a student at Seminole State College of Florida, or if they transferred from another program.

External validity may be threatened by the volunteers who are recruited into the study. The type of student who volunteered may prove to be only the best or worse students, which would make them less representative of the population. This was addressed by including the GPA of the student into the study in the form of a covariate.

Summary

This study was designed to provide additional insight into the detection of breast cancer through breast cancer education of future nurses. The study explored the relationship between factors relating to BCK and BSE_TC between freshman and senior nursing students. The hypotheses were formed with a single thought in mind: Furthering BCK and BSE_TC in future nurses will lead to future breast cancer detection. Strengthening BCK and BSE_TC in nurses will provide them with the self-assurance necessary to lead the way in the detection of breast cancer.

Analysis of the data is shown in Chapter 4 and the supporting results are discussed in the following sections as they answer each research question. Conclusions follow and then implications for further research is recommended.

Chapter 4: Results

Introduction

In Chapter 4, the results of this study are presented in a narrative format as well as with tables. The results of Chapter 4 are divided into five sections: (a) population and descriptive findings, (b) instrumentation and reliability, (c) investigation of assumptions as they relate to inferential analysis, (d) inferential analysis, and (e) tests of hypotheses. The chapter concludes with a summary of the results. SPSS v22.0 was used for all descriptive and inferential analyses. The inferential analyses were set at a 95% level of significance.

This study utilized a causal-comparative research design to determine if there were significant mean differences in dependent variables (BCK and BSE_TC), depending on grade level. The research questions addressed in this study and their associated statistical hypotheses were as follows:

RQ1**:** To what extent do freshman and senior nursing students differ in their levels of breast cancer knowledge?

H_a1**.** There is a statistically significant mean difference in breast cancer knowledge scores between freshman and senior nursing students.

H_o1**.** There is not a statistically significant mean difference in breast cancer knowledge scores between freshman and senior nursing students.

RQ2**.** To what extent do freshman and senior nursing students differ in their levels of breast self- examination technique confidence?

*H_a*2. There is a statistically significant mean difference in BSE technique confidence scores between freshman and senior nursing students.

*H_o*2**.** There is not a statistically significant mean difference in BSE technique confidence scores between freshman and senior nursing students.

Population and Descriptive Findings

The collected sample of this study included freshman and senior nursing students enrolled in the associate degree nursing program at Seminole State College of Florida. Students were recruited via a convenience sampling approach that involved taking volunteers from the classes in which they were enrolled. The data collection was initiated in fall 2015 and extended to the spring term of 2016 due to low response rate. The online survey was sent to freshman nursing students enrolled in the nursing course Fundamentals of Nursing in Fall 2015. The senior nursing students who were surveyed were enrolled in the Practicum Client Care Management nursing course in Fall 2015. Email invitations were sent to the same freshman students enrolled in Basic Medical and Surgical in Spring 2016. The survey was also sent to the new freshman students enrolled in Fundamentals of Nursing in Spring 2016. The survey was subsequently sent to senior nursing students enrolled in the Complex Medical Surgical nursing course in Spring 2016 given that the Practicum Client Care Management nursing course was not offered that term.

Convenience sampling can result in a type of selection bias that occurs when participants who are easy to select are not typically representative of the harder-to-select

population (Lohr, 2010). However, it is possible to produce reasonable results with a convenience sample (Heeringa, West, & Berglund, 2010). Since the sampling in this study was not truly random, there is a threat to its external validity, and results needed to be carefully evaluated regarding their applicability to the general population. An attempt was made to gather as much data as possible, up to $n = 164$, as discussed in Chapter 3. However, the response rate slowed considerably after $n = 131$ records were collected. Furthermore, many records were removed prior to analysis due to missing or incomplete data. The final sample size analyzed in this study was $n = 100$ nursing students. The demographic characteristics portion of the questionnaire (Appendix A) was used to gather descriptive information on the nursing student participants.

Slightly more than half of the participants were senior nursing students (54%). Nearly the entire sample of students began the program at Seminole State College of Florida (99%). Slightly more than two-thirds of the sample was part of the University of Central Florida Concurrent Program (68%), while the remaining one-third of the sample was not part of the program (32%). A large percentage of the sample was White/non-Hispanic (69%). Fewer than half of the participants were married (44%). The majority of the sample was born in the United States (85%), and the remaining participants were born elsewhere (15%). Participants were required to be at least 18 years of age to participate in this study. Participants ranged in age from 20 years to 56 years ($M = 30.70$ years, $SD = 10.20$ years). Participants' grade point average (GPA) ranged from 2.74 to 4.00 ($M = 3.35$, $SD = 0.29$). Table 2 presents the frequencies and percentages of the categorical

descriptive variables of the study. Table 3 presents the measures of central tendency for the two continuous descriptive variables of the study.

Table 2

Frequency Counts and Percentages of All Categorical Descriptive Variables (n = 100)

Variable	Frequency	Percent
Grade level		
Freshman nursing students	46	46.0
Senior nursing students	54	54.0
Have you always been a Seminole State College of Florida student?		
Yes	99	99.0
No	1	1.0
Are you part of the University of Central Florida Concurrent Program?		
Yes	68	68.0
No	32	32.0
Ethnicity		
White (non-Hispanic)	69	69.0
Black (non-Hispanic)	9	9.0
Hispanic	13	13.0
Asian	6	6.0
Other	3	3.0
Marital status		
Single, never married	50	50.0
Married	44	44.0
Married, living apart	0	0.0
Divorced	6	6.0
Widow	0	0.0
Country of origin		
United States	85	85.0
Other	15	15.0

Table 3

Measures of Central Tendency for Continuous Descriptive Variables (n = 100)

Variable	*M*	*SD*	*Mdn*	Sample Range
Age	30.70	10.20	26.00	20.00 – 56.00
Grade-point average (GPA)	3.35	0.29	3.30	2.74 – 4.00

Note. *M* = Mean; *SD* = Standard Deviation; *Mdn* = Median.

Instrumentation and Reliability

I developed a questionnaire to collect measurements for the research questions. This questionnaire focused on measuring the students' BCK and their BSE_TC. The questionnaire was broken down into three different sections, each having its own qualities: (a) Demographic characteristics, (b) BCK, and (c) BSE_TC.

The BCK section of the instrument was used to measure nursing students' BCK. The BCK is a 30-item multiple choice measure. Each of the 30 items was coded as 1 = correct answer and 0 = incorrect answer. The coded scores for each participant were then added together to derive a total score. The total score was measured on a continuous scale, with scores for the participants of this study ranging from 4 to 28 (the possible range of the coded BCK is 0-30). Lower total scores indicated lower levels of BCK, while higher total scores indicated higher levels of BCK.

The BSE_TC section of the instrument was used to measure nursing students' confidence in their BSE technique. This portion of the instrument was made up of six items, two of which were used to calculate the BSE_TC: "I feel confident in my BSE technique knowledge," and "I feel confident in my ability to perform a BSE." These two

items were scored using a 5-point Likert scale with the following possible values: 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Agree; and 5 = Strongly Agree. The possible scores for the BSE_TC variable ranged from 2 to 10. Lower scores were indicative of less confidence in the BSE technique, while higher scores were indicative of greater confidence in the BSE technique.

Table 4 presents the measures of central tendency and the Cronbach's coefficient alpha coefficients for the two dependent variables of this study. Cronbach's coefficient alpha is a measure of internal consistency reliability. A Cronbach's coefficient alpha value of .70 or greater indicates good reliability in an instrument with data collected (Tabachnick & Fidell, 2007). Both of the coded instruments were found reliable for the data set used in this study. Therefore, both instruments were retained for use in inferential analysis.

Table 4

Measures of Central Tendency and Cronbach's Alpha Coefficients for the Dependent Variables (n = 100)

Variable type/ construct	M	SD	Mdn	Sample range	*a*
Breast Cancer Knowledge (BCK)	20.39	4.59	21.00	4-28	.766
Breast Self-Examination Technique Confidence (BSE_TC)	7.26	2.12	8.00	2-10	.918

Note. *M* = Mean; *SD* = Standard Deviation; *Mdn* = Median

Assumptions

The dataset (*n*=100) was investigated for the multivariate analysis of covariance (MANCOVA): (a) assumption of absence of missing data, (b) assumption of adequate sample size, (c) assumption of absence of outliers, (d) assumption of univariate and multivariate normality, (e) assumption of homogeneity of variance-covariance matrices, (f) assumption of linearity and homoscedasticity, and (g) assumption of absence of multicollinearity.

Any records missing data were removed from the dataset prior to analysis; therefore, this assumption was met. A requirement for adequate sample size in MANCOVA is that there should be more research units in the smallest group than there are dependent variables (Tabachnick & Fidell, 2007). Such was not the case for this study. Since the desired sample size of *n*= 164 could not be collected, it was determined that a large effect size ($\eta_p^2 \geq .14$) was needed in order to detect statistical significance. Some statistical significance was found in this study. Therefore, the smaller sample size

was considered acceptable with a larger effect size, and the assumption of adequate sample size was met.

Outliers in a dataset have the potential to distort the results of an inferential analysis (Polit & Beck, 2006). A check of boxplots for the two dependent variable constructs was performed to visually inspect for outliers. The boxplots indicated that the BCK variable contained one outlier (1%). The BSE_TC variable contained 18 outliers (18%). The variables were standardized to check for the presence of extreme outliers (*z*-score of +/- 3.3). One outlier in the BCK variable was extreme. No extreme outliers were found in the BSE_TC variable. However, the values for both of the dependent variable scores were within the range of possible values. Therefore, since all outliers were in the acceptable range of the variables and data were not missing on either of the dependent variable scores, it was determined that the outliers were not adversely affecting the dataset (McKnight et al., 2007). All records were retained for analysis and the outlier assumption was met.

I investigated the univariate normality for the scores of the two dependent variables using SPSS Explore. The Kolmogorov-Smirnov test (K-S) for normality indicated that neither of the dependent variables was normal at the $p = .01$ level. However, the K-S test is sensitive to larger sample sizes, with significant findings returned with larger sample sizes ($n > 50$) (Pallant, 2007). A visual check of the histogram and Normal Q-Q plot for the dependent variable of BCK indicated a distribution close to normal, with a slight left skew. The histogram and Normal Q-Q plot

for the dependent variable of BSE_TC indicated a distribution with a left skew. The mean and median values for each of the variables were relatively close (see Table 4), suggesting that the skews were not adversely affecting the distribution from normality. Therefore, the assumption of normality was met.

Multivariate normality for the scores of the two dependent variables was investigated with SPSS using Mahalanobis distance criteria. Mahalanobis distance is the distance of a particular case from the centroid of the remaining cases, where the centroid is the point created by the means of all the variables (Tabachnick & Fidell, 2007). The Mahalanobis Distance Test for multivariate normality indicated that none of the cases had a *z*-score greater than 13.82, the critical value for concluding a violation of multivariate normality (Pallant, 2013). Therefore, the assumption of multivariate normality was met.

Investigation of homogeneity of variance-covariance matrices is not necessary if sample sizes are equal (Tabachnick & Fidell, 2007). The sample sizes for the freshman and senior grade levels groups were not markedly different (n = 46 and n = 54, respectively). Therefore, investigation of the assumption of homogeneity of variance-covariance matrices was not performed and this assumption was met.

Assumptions of linearity between study variables and homoscedasticity and requirements for the MANCOVA were checked with scatterplots of the data. The assumptions of linearity and homoscedasticity were met.

Multicollinearity diagnostics for the MANCOVA were performed using SPSS via correlational analysis. Multicollinearity may be assumed if there is a high correlation

between the dependent variables, (Pallant, 2013). Correlations of .10 to .29 are considered weak, .30 to .49 are considered moderate, and .50 to 1.0 are considered strong (Pallant, 2013). The correlation coefficient between the two dependent variables of BCK and BSE_TC was moderate (r = .385). Therefore, the assumption of absence of multicollinearity was met.

Inferential Analysis

A total of 100 records were included for inferential analyses. The results of the MANCOVA analysis are presented first, followed by the tests of hypotheses. The results of the hypothesis tests are presented according to the research questions and associated statistical hypotheses. Tables 5 and 6 present the findings of the MANCOVA analyses performed to address Hypothesis 1 and Hypothesis 2. Table 7 presents the estimated marginal means for the categorical independent variables of study.

A MANCOVA was performed to test the statistical hypotheses of this study related to the effects of nursing student grade level on BCK and BSE_TC. Two dependent variables were included in the MANCOVA, the BCK score, and the BSE_TC score. The independent variable was two grade level including freshman nursing students and senior nursing students. Three independent control variables of: (a) ethnicity with two levels of White (non-Hispanic) and other; (b) marital status with two levels of married and not married; and (c) country of origin with two levels of United States and other were also included. Furthermore, two covariates were included in the MANCOVA: age and GPA.

Results indicated that there was significance for the independent variable of grade level, Wilks' Lambda = 0.62, F (2, 92) = 27.77, $p < .0005$, $\eta_p^2 = .376$, indicating significant difference between the two grade levels in terms of at least one of the two dependent variable scores. According to generally accepted criteria (Cohen, 1988) the strength of effect sizes for η_p^2 can be classified as small (.01), medium (.06), and large (.14). The effect size for grade level was large, and indicated that approximately 38% of the variance in the two dependent variables as a whole was explained by the grade level variable. Furthermore, significance was found for the independent covariate of age, Wilks' Lambda = 0.93, F (2, 92) = 3.26, $p = .043$, $\eta_p^2 = .066$; indicating a significant difference between participants' ages in years in terms of at least one of the two dependent variable scores. The effect size for the significant effect of age was medium, and indicated that approximately 7% of the variance in the two dependent variables as a whole was explained by the age variable. None of the other factors were statistically significant main effects of the combined BCK and BSE_TC variables.

Table 5

Results of the Multivariate Tests of the MANCOVA Performed (n = 100)

Independent variable	Wilks' Lambda	*F*	*df1*	*df2*	*p*-value	η_p^2	Power
Grade level	0.82	27.77	2	92	<.0005	.376	1.000
Ethnicity	0.62	0.09	2	92	.918	.002	.063
Marital status	1.00	0.21	2	92	.815	.004	.081
Country of origin	0.99	0.37	2	92	.695	.008	.107
Age	0.93	3.26	2	92	.043	.066	.608
GPA	0.99	0.72	2	92	.489	.015	.169

Note. F = F-statistic; *df1* = Hypothesis Degrees of Freedom; *df2* = Error Degrees of Freedom; η_p^2 = Partial Eta Squared.

A series of ANCOVA analyses were included as part of the output from the MANCOVA performed. These ANCOVAs were in the form of between-subjects effects, and were examined to further investigate the significant results found for grade level in relations to each of the individual dependent variables, while controlling for ethnicity, marital status, country of origin, and the covariates of age and GPA. Significant differences in the mean scores were found between the freshmen and senior grade levels for both the BCK variable, $F(1,93) = 55.22$, $p < .0005$ $\eta_p^{2=}$.373, and the BSE_TC variable, $F(1,93) = 7.25$, $p = .008$, $\eta_p^{2=}$.072. An investigation of the estimated marginal means for grade level classifications for the BCK variable indicated that seniors had significantly higher BCK scores ($M = 22.53$, $SEM = 0.60$) than freshmen ($M = 17.31$, $SEM = 0.60$). An investigation of the estimated marginal means for grade level

classifications for the BSE_TC variable indicated that seniors also had significantly higher BSE_TC scores (M = 7.77, SEM = 0.37) than freshman (M = 6.62, SEM = 0.37).

Between-subjects effects were also examined to further investigate the significant results found for the covariate of age as related to each of the individual dependent variables, while controlling for grade level, ethnicity, marital status, country of origin, and the covariate of GPA. Significance for the covariate of age was found on the BCK variable scores, $F(1) = 6.51$, $p = .012$, $\eta_p^2 = .065$. An investigation of the parameter effects for age on the BCK variable indicated that for each 1-year increase in age, participants' mean BCK scores increased by 0.12 points (B = 0.12, SEB = 0.05, t = 2.55, p = .012). Table 5 presents the tests of between-subjects effects included as part of the MANCOVA output in SPSS.

Table 6

Results of the Between-Subjects Effects of the MANCOVA Analyses Performed to Investigate Effects for the Independent Variables Related to Each of the Dependent Variables of Study (n = 100)

Dependent variable / Independent variable	Type III Sum of Squares	*df*	Mean Square	*F*	*p*	η_p^2	Power
Breast Cancer Knowledge (BCK)							
Grade level	627.68	1	627.68	55.22	<.0005	.373	1.000
Ethnicity	0.05	1	0.05	<0.005	.948	<.0005	.050
Marital status	2.52	1	2.52	0.22	.639	.002	.075
Country of origin	7.22	1	7.22	0.64	.427	.007	.124
Age	74.01	1	74.01	6.51	.012	.065	.714
GPA	5.47	1	5.47	0.48	.490	.005	.105
Error	1057.15	93	11.37	---	---	---	---
Breast Self-Examination Technique Confidence (BSE_TC)							
Grade level	30.37	1	30.37	7.25	.008	.072	.760
Ethnicity	0.62	1	0.62	0.15	.702	.002	.067
Marital status	0.41	1	0.41	0.10	.754	.001	.061
Country of origin	0.07	1	0.07	0.02	.900	<.0005	.052
Age	3.33	1	3.33	0.80	.375	.008	.143
GPA	5.28	1	5.28	1.26	.264	.013	.199
Error	389.55	93	4.19	---	---	---	---

Note. df = Degrees of Freedom; *F* = F-Statistic; *p* = p-value; η_p^2 = Partial Eta Squared.

Table 7

Estimated Marginal Means for the Categorical Independent Variables Included in the MANCOVA Model, According to the Dependent Variables (n = 100)

	BCK scores				BSE_TC scores			
			95% C.I.				95% C.I.	
Variable	M_{Est}	*SE*	Lower bound	Upper bound	M_{Est}	*SE*	Lower bound	Upper bound
Grade level								
Freshman	17.31	0.60	16.12	18.50	6.62	0.37	5.90	7.35
Senior	22.53	0.60	21.34	23.73	7.77	0.37	7.05	8.49
Ethnicity								
White (non-Hispanic)	19.89	0.62	18.66	21.13	7.29	0.38	6.54	8.04
Other	19.95	0.65	18.66	21.23	7.10	0.39	6.32	7.88
Marital status								
Married	20.13	0.70	18.74	21.53	7.11	0.43	6.26	7.96
Other	19.71	0.63	18.47	20.95	7.28	0.38	6.53	8.04
Country of origin								
United States	20.34	0.43	19.50	21.19	7.16	0.26	6.64	7.67
Other	19.50	0.93	17.66	21.34	7.24	0.56	6.12	8.35

Note. M_{Est} = Estimated Marginal Mean; *SE* = Standard Error of the Mean; 95% C.I. = 95% Confidence Interval.

Tests of Hypotheses

A total of 100 records were included for hypothesis testing. The statistical hypotheses for both research questions were addressed using findings derived from the multivariate analysis of covariance (MANCOVA). The results of the hypothesis tests are presented according to each statistical hypothesis.

RQ1: To what extent do freshman and senior nursing students differ in their levels of breast cancer knowledge?

*Ha*1**.** There is a statistically significant mean difference in breast cancer knowledge scores between freshman and senior nursing students.

*Ho*1**.** There is not a statistically significant mean difference in breast cancer knowledge scores between freshman and senior nursing students.

Significant differences in the mean scores were found between the freshmen and senior grade levels for the BCK variable, $F(1) = 55.22$, $p < .0005$, $\eta_p^2 = .373$. An investigation of the estimated marginal means for grade level classifications for the BCK variable indicated that seniors had significantly higher BCK scores ($M = 22.53$, $SEM = 0.60$) than freshmen ($M = 17.31$, $SEM = 0.60$). These findings indicated that senior nursing students were significantly more knowledgeable about breast cancer than freshman nursing students.

Conclusion regarding null hypothesis 1. Null hypothesis 1 is rejected. Results of the inferential analyses performed indicate that senior nursing students had significantly higher mean scores on the BCK portion of the instrument than freshman nursing students. Therefore, there is sufficient evidence to indicate that there is a statistically significant mean difference in BCK scores between freshman and senior nursing students. This could be because the senior nursing students were exposed to more nursing courses content.

RQ2: To what extent do freshman and senior nursing students differ in their levels of BSE technique confidence?

*Ha*2: There is a statistically significant mean difference in BSE technique confidence scores between freshman and senior nursing students.

*Ho*2**.** There is not a statistically significant mean difference in BSE technique confidence scores between freshman and senior nursing students.

Significant differences in the mean scores were found between the freshmen and senior grade levels for the BSE_TC variable, $F(1) = 7.25$, $p = .008$, $\eta_p^2 = .072$. An investigation of the estimated marginal means for grade level classifications for the BSE_TC variable indicated that seniors had significantly higher BSE_TC scores (M = 7.77, SEM = 0.37) than freshmen (M = 6.62, SEM = 0.37). These findings indicated that senior nursing students were significantly more confident in their BSE_TC than freshman nursing students.

Conclusion regarding null hypothesis 2. Null hypothesis 2 is rejected. Results of the inferential analyses performed indicate that senior nursing students had significantly higher mean scores on the BSE_TC portion of the instrument than freshman nursing students. Therefore, there is sufficient evidence to indicate that there is a statistically significant mean difference in BSE_TC scores between freshman and senior nursing students. This could be related to senior nursing students were exposed to more clinical hours.

Summary

Chapter 4 began with a description of the demographics of the participants in the study. Following the report of demographics, instrumentation and inferential analysis variable constructs were briefly defined. Information pertaining to required assumptions for the inferential analyses were presented and discussed. Following the demographic and assumption sections, inferential analysis was performed to investigate the two research questions of study. A statistically significant difference was found between the demographic factor of grade level and the outcome of BCK. It was determined that senior nursing students (M = 22.53, SEM = 0.60) had significantly greater BCK scores than freshman nursing students (M = 17.31, SEM = 0.60), indicating that the senior nursing students were more knowledgeable about breast cancer than the freshman nursing students. Furthermore, a statistically significant difference was found between grade level and the outcome of BSE_TC. It was determined that senior nursing students (M = 7.77, SEM = 0.37) had significantly greater BSE_TC scores than freshman nursing students (M = 6.62, SEM = 0.37), indicating that the senior nursing students were more confident about their BSE technique than the freshman nursing students.

Table 6 and 7 indicate that grade level is a significant finding bet freshman and seniors, however table 7, confidence levels overlaps. This may allow for an interpretation of not significance. As for the confidence intervals overlapping and non-significance, that is a common mistake people make in statistics. What is true is that if the confidence intervals do not overlap, then you have significance. However, the other way around,

having confidence intervals that do overlap meaning not significant, is not true (Barry, 2014 & Knezevic, 2008)

Additionally, a statistically significant difference was found between the covariate of age and the outcome of BCK. An investigation of the parameter effects for age on the BCK variable indicated that for each 1-year increase in age, participants' mean BCK scores increased by 0.12 points ($B = 0.12$, $SEB = 0.05$, $t = 2.55$, $p = .012$). This finding indicated that older participants performed better on the BCK portion of the instrument.

Overall results of the analyses performed provide sufficient evidence that both Alternative hypothesis 1 and Alternative hypothesis 2 were supported. Chapter 5 will present a discussion of the results as well as implications of the findings in relation to the literature review and further research.

Chapter: 5 Summary, Conclusions, and Recommendations

Introduction

Despite the fact that breast cancer is the second largest cause of death among women in the United States, less than half of the U.S. female population participates in breast cancer exams. Nurses are on the front line of patient care, yet research has shown that they do not discuss breast health promotion and breast cancer screening with their patients. It is possible that this lack of patient education by nurses is due to insufficient preparation during nursing school. The purpose of this quantitative research study was to examine the relationship between Seminole State College of Florida senior and freshman nursing students' BCK and BSE_TC.

A total of 100 freshman and senior nursing students enrolled in the associate's degree nursing program at Seminole State College of Florida completed a researcher designed questionnaire composed of three different sections: (a) demographic characteristics, (b) BCK and (c) BSE_TC. This study found that freshman nursing students demonstrated lower scores on BCK and BSE_TC than senior students.

This chapter focuses on examining the implications of these results. It begins with a discussion and interpretation of the findings. The implications of the study findings, and their relationship to nursing education are then presented. Conclusions drawn from the data are also included, as well as the limitations of the study. Finally, recommendations for further research, nursing education, and practice are presented.

Interpretation of the Findings

The study's main findings that freshman student demonstrated lower scores on BCK and BSE_TC than senior students suggest that a knowledge gap exists between freshmen vs. senior students. That knowledge gap make sense given that freshman students have not received as much instruction and training as seniors, so their knowledge should increase incrementally over the course of the program. This information may indicate that some faculty do not believe in the need for such content in the associate's degree nursing program, or, at least in the first year of the program. In all likelihood, senior students were exposed to content related to breast cancer and BSE_TC in their nursing courses in the later years of the program, thus ensuring that they were able to easily answer the relevant questions on the study questionnaire. The specific findings in relation to the two main research hypotheses are discussed in more detail below.

Breast Cancer Knowledge

Based on the findings of the study, *Ho*1 positing that there is not a statistically significant mean difference in BCK between freshman and senior nursing students was rejected. The results of the inferential analyses performed indicate that senior nursing students (M = 22.53, SEM = 0.60) had significantly higher scores than freshman nursing students (M = 17.31, SEM = 0.60).

The factors contributing to this knowledge deficit remain unclear. However, this finding is important as a central issue in nursing education associate programs. Patients learn more effectively from nurses who have an understanding of breast cancer content,

so inadequate teaching preparation is a barrier to future nurses' involvement in educating health clients (Powe et al., 2005). Previous research has demonstrated that health care practitioners with sufficient education regarding breast cancer detection routinely practice CBE and inform their patients regarding the risk of cancer compared to health care providers with insufficient education regarding breast cancer (Coleman et al., 2003; Odusanya & Tayo, 2001). In a related study, Spence et al. (2010) warned that insufficient provider knowledge and skills often leads to inadequate assessment and management. The fact that senior nursing students' BCK scores, while higher than those of freshman students, remain relatively low, is therefore especially concerning for the future of breast cancer detection.

Breast Self-Examination Technique Confidence

Based on the findings of the study, *Ho*2, positing that there is not a statistically significant mean difference in BSE_TC scores between freshman and senior nursing students, was rejected. The results of the inferential analyses performed indicate that senior nursing students had significantly higher mean scores ($M = 7.77$, $SEM = 0.37$) in the BSE_TC of the instrument than their freshman counterparts ($M = 6.62$, $SEM = 0.37$). Despite senior students' higher BSE_TC scores, their confidence level still remained relatively low, which points to the possibility that current nursing program curricula is insufficient in adequately educating students to instill higher self-confidence regarding the BSE technique.

Spence et al. (2010) stressed the importance of practitioner self-efficacy for effective cancer risk assessment and management. Specifically, the researchers asserted that future health care providers must be presented with learning experiences that are designed to develop the self-efficacy that is conducive to such work in addition to the knowledge and skills it requires. The researchers' conclusion thus indicates the importance of practitioner confidence in their cancer screening and detection abilities.

Bandura (1989) examined the critical relationship between knowledge and self-efficacy, indicating that basic knowledge was essential but not sufficient for a high level of self-efficacy. In this study, students did not demonstrate basic knowledge given their low BCK scores, suggesting that the behaviors associated with performing the BSE technique were not within their abilities. As a result, students had a low sense of efficacy related to that task. Low self-efficacy among nursing students related to performing a health education skill may lead them to avoid future teaching situations, which could result in their failure to educate their clients about breast cancer.

Bandura (1989) stated: "the school functions as the primary setting for the cultivation and social validation of cognitive competencies…Here students' knowledge and thinking skills are continually tested, evaluated, and socially compared" (p.46). It would therefore appear that nursing school education is a major contributor to inadequate confidence in BSE technique. Nursing school plays an important role in the development of self-confidence in relation to specific domains of health. However, implications drawn

about curriculum must be limited to the data collected in this study, which did not focus on the nursing program itself.

Another approach to interpretation of the study findings reconsiders its theoretical model (see Figure 3). Bandura's (1996) theory proposes that cognitive appraisal components in learning are essential to self-efficacy. To be specific, changes in behavior are not effective if a student's beliefs, attitudes, sense of efficacy, and sense of purpose are not congruent with the learning task. Change in behavior of any kind usually indicates that a change in cognition has taken place. For example, students may think about health education and promotion tasks and roles, and subsequently think about what they do and what teachers want them to do, thus potentially affecting what the students ultimately choose to do. These elements are essential components of the self-efficacy theory, and must be considered when interpreting the study results. Based on this framework, it appears important for students to value the task to be mastered prior to learning it. The associated implications of these findings are discussed in detail in a later section.

Combined Knowledge and Confidence Outcomes

It is important to note that the purpose of this study was to assess students' BCK and BSE_TC, not to collect data about curriculum specific instructional content regarding breast cancer. The specific reasons for the technique confidence levels among the sample population remain unclear. The study's instrument has adequate reliability and validity results, suggesting that the instrument was a successful tool in measuring cognitive knowledge related to breast cancer. Because the purpose of this investigation was to

study students' knowledge and confidence, not to evaluate the nursing program curriculum, the recommendations presented later in this chapter will address the need for research in the area of breast cancer instructional content.

To reinforce the importance of the health education role of the nurse, Healthy People 2020 set goals to support monitoring trends in cancer incidences, death rates, and survival in order to better serve the purpose of lowering the number of cancer cases in the United States. These objectives reveal how important it is to promote evidence-based screening for breast cancer by measuring how often screening tests are used (CDC, 2010; U.S. Preventive Services Task Force, 2012). Nurses in particular have a critical responsibility to educate clients regarding early detection. If the students in the nursing program investigated in the present study are expected to teach such content, however, they must have adequate BCK and confidence in performing the BSE technique. The theoretical framework instruction inputs considered in this study indicate that mastery of educational outcomes and competence require individualized instruction that meets students' needs, understands students' characteristics, identifies the behavioral objective, offers formative and summative evaluation of the objectives, provides adequate time for students to perform learning tasks, and uses appropriate teaching methods and teaching practices techniques (Bloom et al., 1956; Schunk & Pajares, 2005). The related recommendations for practice associated with this framework in light of the study's findings are presented later in this chapter.

Limitations of the Study

There are several limitations associated with this study, which include:

1. The relatively small sample size given the researcher difficulty obtaining more participants during the data collection process.
2. The use of a convenience sample, which preludes generalizability of the study findings beyond the study sample.
3. Freshman students in this study may not have responded accurately to the questionnaire items.

Recommendations

The researcher recommends the following directions for future research based on the findings of this study:

1. When nurses have low self-confidence regarding a task, they will try to avoid it. As such, future studies are needed to identify the learning needs of nurses and the types of resources they require to improve their practice in the area of breast cancer education.
2. There is a need to evaluate the effectiveness of breast cancer content in nursing school curriculum.
3. Further investigation is needed into nursing students' knowledge of precise roles and responsibilities in the area of breast cancer content.
4. Assessment of the contribution of the individual sources of self-efficacy in the clinical environment is needed.

5. It would be useful to replicate the study using a larger sample size from associate's nursing programs in a wider geographical area.
6. Further studies should discuss the reasons for the lack of clinical recommendation by physicians and nurses.

Implications for Nursing Education

This study's social change implications include the possibility to assess students' BCK and their confidence regarding performing the BSE technique using the researcher-designed questionnaire. More accurate assessments of these variables will enable improved curricula and instructional content, which will likely lead to nurses' (and potentially other health care providers) improved patient education regarding breast cancer. The demonstrated validity and reliability of this new questionnaire presents it as a useful survey for application by nursing educators for nursing students' learning and performance assessments. Specifically, the results of the survey's BCK section could assist nursing instructors in planning classroom activities developing different teaching strategies or evaluating the extent to which students have learned course content. The results of the survey's BSE_TC section, in turn, could be used to determine which students underestimate their confidence and, conversely, which might overestimate their confidence, allowing instructors to plan specific clinical experiences to help students achieve normal confidence levels.

The study findings indicate that learning activities related to breast cancer content should be presented in a manner that increases knowledge and promotes the development

of confidence. It is important to assist students with understanding the nurse education role in breast cancer detection and provide opportunities in the curriculum for practice to increase students' confidence in their abilities to perform these desired behaviors. As discussed earlier, knowledge and skills regarding how to perform particular behaviors are required in order for a behavior to occur. Although knowledge and skills are prerequisite for positive self-efficacy, they are not sufficient, as knowledge and skills alone do not influence the initiation of a behavior (Bandura, 1977). For example, nursing students may possess sufficient knowledge and skill to perform one of the primary health care role's specific behaviors, but still have low confidence in their abilities to perform these specific behaviors. Therefore, perceived self-efficacy is an important factor in successfully performing the breast cancer teaching role.

According to Bandura (1989), the development of efficacy expectations derives from four sources, the most powerful of which is personal experience. As such, an important implication of this study is that it appears to be important for nurse educators to build confidence through health education skills that emphasize roleplaying in the classroom and practice in the clinical setting. Other relevant sources of efficacy are vicarious experiences, observation of models, and verbal persuasion. In particular, Bandura (1977, 1986) recognized that the exposure to a model can affect a student's behavior by teaching them new behaviors. This suggests that another implication of the study may be that demonstrations by valued, highly competent role models would also be useful in elevating student confidence in performing the BSE technique.

Conclusions

The main findings of this study provide evidence that freshman nursing students are not being afforded the educational experiences needed to build confidence in the application of breast health education as one aspect of their primary nurse educator role. Freshman nursing students in the current study have low BCK scores and low scores on confidence with respect to the BSE_TC. One conclusion to be drawn from these results is that there is a need to develop a sense of strong efficacy with respect to the student's role in health education early in nursing programs. Another finding of this study was that senior nursing students' scores on both variables were still lower than would be desired, indicating the need for increased emphasis of breast cancer education/detection throughout the nursing program. It is important to be cautious about the generalization of this study's findings because there is no previously reported research related to BCK and BSE_TC in nursing associate's degree programs.

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Appendix A: Research Tool – Questionnaire

Introduction: This questionnaire is based on breast cancer knowledge and breast self-examination (BSE) technique confidence. The purpose of this study is to explore the breast cancer knowledge and breast self-examination technique confidence in nursing students. Completion of this questionnaire should take approximately 20 minutes.

I. Demographic Characteristics

Instructions: Please answer every question by placing a mark (X) in the enclosed parentheses:

Characteristics:

Academic Level:

( ) Freshmen

( ) Senior

Did you start the program at Seminole State College of Florida?

( ) Yes

( ) No. Please indicate where you began your nursing program._____

University of Central Florida Concurrent Program:

( ) Yes

( ) No

Ethnic group that you identify yourself with:

( ) White, non-Hispanic

( ) Black, non-Hispanic

( ) Hispanic

( ) Asian

( ) Other (specify): _____

Country where you were born?

( ) United States

( ) Other (specify): _____

Marital Status:

( ) Single, never married

( ) Married

( ) Married, living apart

( ) Divorced

( ) Widow

Age: _____

Grade Point Average: _____

II. Breast Cancer Knowledge

Instructions: Please read the following multiple choices questions carefully and select the correct answer or select all that apply as indicated on the question.

1. Which assessment finding should be reported to the physician?

   A. breast tenderness prior to menses

   B. dimpling of the breast skin

C. one breast slightly larger than the other

D. retracted nipples bilaterally

2. A nurse is working at a community health center. Which finding, if discovered on a breast assessment, would concern the nurse the most?

   A. an irregular shaped, non-tender lump that can be palpated in one breast

   B. complaint of breast tenderness during palpation

   C. bilateral breast nodules in the upper outer quadrant

   D. a rubbery feeling in one breast that can be palpated and which is freely mobile

3. A community health nurse is instructing a group of females about breast self-examination (BSE). When does the nurse instruct the female to perform this task?

   A. every other month

   B. every month during ovulation

   C. one week after menstruation

   D. weekly at the same time of the day

4. At what stage in a women's life does the American Cancer Society recommend that she begin performing monthly breast self-examination (BSE)?

   A. at menarche

   B. at onset of sexual activity

   C. at onset of menopause

   D. at onset of young adulthood

5. Which statement made by the client who recently had a mammogram indicates a need for clarification regarding the importance of this procedure?
   A. “Now that I have had a mammogram, my risk of getting breast cancer is reduced.”
   B. “Now that I have had a mammogram, I will still do breast self-examination monthly.”
   C. “Yearly mammograms can reduce my risk of dying from breast cancer.”
   D. “The amount of radiation exposure from a mammogram is very low.”
6. A nurse is preparing to conduct a women’s wellness seminar at a local civic center. What information should the nurse plan to include about risk factors for development of breast cancer?
   A. Breast cancer occurs most frequently in women younger than 30 years.
   B. The longer the interval between menarche and menopause, the more the risk increases.
   C. Nulliparous women are at increased risk.
   D. Risk is increased in postmenopausal women with body mass indexes below 20.
   E. Women whose sisters or mothers have had breast cancer are at increased risk.
   F. B, C, and E.
   G. A, B, D, and E.

7. A nurse is conducting a breast cancer awareness seminar at a local church. After the seminar, a 40-year-old female tells the nurse that she is at high risk for developing breast cancer and her health-care provider suggests that she begin taking tamoxifen (Soltamox). She asks the nurse to explain how this drug will help her avoid developing breast cancer. The nurse's response should be based on the knowledge that tamoxifen is:
   A. a potent anti-inflammatory drug that prevents the body's inflammatory response to the tumor growth.
   B. a type of chemotherapy agent that has minimal side effects if taken prophylactically.
   C. a drug that will decrease the risk of endometrial cancer, which is related to breast cancer development.
   D. a drug that blocks estrogen receptors on tumor cells and causes tumor regression.
8. A nurse is conducting a health history interview with a 20-year-old college sophomore when the client starts crying and says, "I'm so worried. I found a lump in my breast last night and I'm scared I might have cancer!" Which fact should the nurse consider when formulating a response to the client?
   A. Young women are at increased risk to develop breast cancer.
   B. A non-discrete possible mass or thickening has a high index of suspicion for breast cancer.

C. Benign fibroadenomas are the most frequent cause of breast masses in women under 25 years.

D. College students often develop infectious breast disorders due to the close personal contact required in dormitory living.

9. According to the latest studies, which woman has the greatest risk of developing breast cancer?

A. physician, age 56, who had her first child at age 38

B. ballet dancer, age 20, who has a 5-year-old son

C. radiation technician, age 24, who had her menarche at age 13

D. postmenopausal woman, age 52, who had breast reduction surgery at age 26

10. Which factor is the incidence of breast disease most closely related to?

A. weight

B. age

C. ethnic background

D. socioeconomic status

11. Which factor makes the mammogram a more sensitive screening tool than other tests?

A. higher compliance rate than BSE because it is less painful

B. less expensive than other tests that identify tumor markers

C. able to reveal masses too small to be palpated manually

D. able to differentiate between fluid and solid masses

12. The nurse is teaching a 24-year-old patient about BSE. When does the nurse tell her to perform BSE?
    A. the day before her menstrual flow is due
    B. on the third day after her menstrual flow starts
    C. when ovulation occurs
    D. one week after her menstrual flow starts
13. A patient stopped having menses about a year ago. When does the nurse advise the patient to perform BSE?
    A. the first day of every other month
    B. continue on schedule even though menses have ceased
    C. the last day of each month
    D. any day as long as the schedule is consistent
14. The nurse is teaching a young patient about BSE. Which statement by the patient indicates a need for further instruction?
    A. “I should perform BSE on a monthly basis from now on.”
    B. “I see my health care provider annually, but I should perform BSE.”
    C. “BSE is a self-care measure that I can use to prevent breast cancer.”
    D. “The best time to perform BSE is 1 week after my menstrual period.”
15. During a CBE, the examiner observes a discharge from the nipple. What is most important to include in the documentation of this finding?
    A. area of “the clock” that was compressed when the discharge was released

B. amount of pressure required for the discharge to be released

C. frequency and technique the patient uses for BSE

D. history of difficulty or pain when attempting to breast-feed

16. Upon performing a CBE, the patient with which symptom suggests advanced disease?

A. gynecomastia

B. oval-shaped, mobile, rubbery mass

C. thin, milky discharge from the nipple

D. skin change of peau d'orange

17. Women who have a personal history of breast cancer are at high risk for developing a reoccurrence or new breast cancer with the presence of which factors?

A. BRCA 3 genetic mutation

B. strong family history

C. BRCA 2 genetic mutation

D. BRCA 1 genetic mutation

E. occupation

F. A, B, and E

G. B, C, and D

18. Which are characteristics of patients with a high risk for breast cancer?

A. early menarche

B. multiple births

C. late menopause

D. nullipara

E. first pregnancy after 30 years of age

F. A and C

G. A, C, D, and E

19. Which statement about early detection of breast masses is true?

A. A yearly breast examination by a health care provider can substitute for breast self-examination (BSE).

B. Detection of breast cancer before axillary node invasion yields the same survival rate.

C. Mammography as a baseline screening is recommended by the American Cancer Society at 30 years of age.

D. The goal of screening for breast cancer is early detection because BSE does not prevent breast cancer.

20. Which techniques are correct in teaching breast self-examination?

A. Discuss the client's fears, beliefs, and concerns about breast disease and BSE.

B. Ensure that the setting in which you demonstrate BSE is private and comfortable.

C. Ask the client to remove her shirt. The bra may be left in place.

D. Ask the client to demonstrate her own method of BSE.

E. Use the finger tips, which are more sensitive than the finger pads, to palpate the breast.

F. A and D.

G. A, B, and D.

H. A, B, D, and E.

21. For women at high genetic risk for breast cancer, which option for early detection is the option of choice?

A. breast self-examination beginning at 20 years of age

B. hormone replacement therapy combination of estrogen and progesterone

C. magnetic resonance imaging (MRI) and mammography every year beginning at age 30

D. prophylactic mastectomy

22. Which client has the highest risk for breast cancer?

A. 66-year-old woman with high breast density

B. 66-year-old nullipara woman

C. 66-year-old obese male with gynecomastia

D. 46-year-old woman with high breast density

23. Which assessment finding in the client indicates the highest risk of a malignant breast lesion?

A. 1-cm freely mobile rubbery mass discovered by the client

B. ill-defined painful rubbery lump in the outer breast quadrant

C. backache and breast fungi infection

D. nipple discharge and dimpling

24. A nurse is palpating a female client's breast while assessing for breast disease. In which area of the breast are tumors most commonly found?

A. nipple

B. lower inner quadrant

C. lower outer quadrant

D. upper inner quadrant

E. upper outer quadrant

25. A postmenopausal woman is worried about pain in the upper outer quadrant of her left breast. The nurse's first course of action is to:

A. do a breast examination and report the results to the physician.

B. explain that pain is caused by hormonal fluctuations.

C. reassure the client that pain is not a symptom of breast cancer.

D. teach the client the correct procedure for breast self-examination (BSE).

26. The nurse teaches a female client that the best time in the menstrual cycle to examine the breast is during the:

A. week that ovulation occurs.

B. week that menstruation occurs.

C. first week after menstruation.

D. week before menstruation occurs.

27. A 76-year-old client tells the nurse that she has lived long and does not need mammograms. Which is the nurse's best response?

    A. "Having a mammogram when you are older is less painful."

    B. "The incidence of breast cancer increases with age."

    C. "We need to consider your family history of breast cancer first."

    D. "It will be sufficient if you perform breast examination monthly."

28. A nurse is teaching a community program on breast self-examination (BSE). The nurse demonstrates the proper procedure for palpating each breast. In what sequence should the following actions be performed for self-examination?

    I. Place the hand over the breast to be examined (use the right hand for the left breast and vice versa).

    II. Lie down with one arm behind the head.

    III. Palpate the breast in a perpendicular motion, going across the breast from side to side and top to bottom.

    IV. Use a circular motion to feel the breast tissue (with light, medium, and firm pressure).

    V. Use the finger pads of the three ways to discover early breast changes.

    A. I, III, II, V, IV

    B. II, I, V, IV, III

    C. II, I, IV, III, V

    D. IV, II, I, V, III

29. The nurse is teaching a client about breast self-examination (BSE). Which pattern of palpation would the nurse encourage based on American Cancer Society (ACS) recommendations?
    A. circular pattern
    B. wedge pattern
    C. up-and-down vertical pattern
    D. horizontal pattern
30. Of the following women, which one would be most at risk for breast cancer?
    A. age 23, two children
    B. age 33, never pregnant
    C. age 45, very thin
    D. age 64, positive family history

III. Breast Self-examination (BSE) technique confidence:

For this questionnaire on self-confidence, refer to your personal, subjective evaluation of your own ability or competence. In other words, your self-confidence depends on the distance you perceive between your "actual" ability to perform and the "ideal" performance expected. Self-confidence can certainly vary with situations or settings. This questionnaire focuses on your self-confidence in a particular situation. Please focus your answers on your breast self-examination (BSE) technique knowledge and skill performance confidence.

Instructions: Please answer every question by placing a mark (X) in the enclosed parentheses:

1. How many times in the past six months did you perform BSE?

   None ( )

   Daily ( )

   Monthly ( )

   Twice a month ( )

2. I feel confident in my BSE technique knowledge.

   Strongly agree ( )

   Agree ( )

   Neither agree nor disagree ( )

   Disagree ( )

   Strongly disagree ( )

3. I feel confident in my ability to perform a BSE.

   Strongly Agree ( )

   Agree ( )

   Neither agree nor disagree ( )

   Disagree ( )

   Strongly Disagree ( )

4. How did you learn about BSE? Mark all that apply.

   American Cancer Society Course ( )

Internet ( )

Nursing School ( )

Clinical ( )

At my job ( )

Health fair ( )

Doctors' office ( )

Videotape ( )

Practiced on a breast model ( )

Instructor supervised practice ( )

Other _____

5. Who taught you how to do BSE? Mark all that apply.

   Doctor ( )

   American Cancer Society instructor ( )

   Faculty from nursing school ( )

   Other _____

6. How were you tested on your knowledge of BSE? Mark all that apply.

   Exams ( )

   Return demonstration required ( )

Appendix B: Dr. Albert Bandura Permission Request

December 5, 2013

Dr. Albert Bandura

Dear Dr. Bandura,

I am a doctoral student in the Health Services Program at Walden University. My dissertation topic is "The Impact of the Associate Degree Nursing Program on a Student's Breast Cancer Knowledge and Breast Self-examination Confidence." I will use the Social Cognitive Theory as the study's theoretical framework.

I would like to obtain permission from you to use the Triadic Reciprocal Causation figure found in your book: *Self-efficacy: The exercise of control* published by W.H. Freeman in 1997, p. 6.

Thank you for your time.

Sincerely,

Lydia E. Gaud MSN, RN

Appendix C: Dr. Albert Bandura Permission Granted

Permission granted to use the Triadic Reciprocal Causation figure.

Albert Bandura

From: Lydia E Gaud

Hi Dr. Bandura,

I'm enrolled at Walden University in the PhD Health Services Program. I'm working on my dissertation. My dissertation topic is "Nursing student's breast cancer knowledge and breast self-examination technique confidence." I will use the Social Cognitive theory as the study's theoretical framework. I would like your authorization to use the Triadic Reciprocal Causation figure founded in your book: *Self-efficacy: The exercise of control* published in 1997, p. 6. Please see attachment for the letter mailed to you.

Thanks for your attention.

Lydia E. Gaud MSN, RN

Appendix D: Seminole State College Institutional Board Permission Request

January 29, 2015

Dr. Ann McGee

Dear Dr. McGee:

The doctoral program at Walden University requires the student to conduct a research study as part of the curriculum requirements. The purpose of this study is to investigate the relationship between the associate degree freshman and senior nursing students' breast cancer knowledge and the breast self-examination technique confidence. Findings from this study should help to reduce breast cancer incidence, mortality, and health care costs by disease prevention through health promotion strategies and the increase in breast cancer screening practices in women.

I would like to request your permission to administer a questionnaire on breast cancer questions. The collected data will be kept confidential. The study will be reviewed by Dr. Mark Morgan, Director of Institutional Research at Seminole State College of Florida.

Enclosed are the Research Packet Cover Letter, the Documentation of Informed Consent Form, the Questionnaire, and the Permission to Collect Data at Seminole State College of Florida Letter.

Sincerely,

Lydia E. Gaud, MSN, RN

Lydia,

Thank you for forwarding materials for your proposed survey for your doctoral study.

It all looks great, but we will need to complete an IRB review and approval for you to administer your survey to Seminole State students.

Please take a moment and complete the attached IRB Review Form, providing details on your target audience and the purpose of your study.

When you return the form, please include electronic copies of your consent form, survey, and any other documents you wish to include.

When I receive your request, I'll forward the information to our IRB for review. It only takes a few days to complete the review.

Let me know if you have questions – thanks!

Mark

Dr. Mark W. Morgan

Appendix E: Breast Cancer Knowledge Questions Construction

1. Which assessment finding should be reported to the physician?

   A. breast tenderness prior to menses

   B. dimpling of the breast skin

   C. one breast slightly larger than the other

   D. retracted nipples bilaterally

      Correct Answer: B

   Explanation/Rationale: Skin dimpling may be the result of fibrosis or breast cancer and should be reported. Retracted nipples on both sides are a normal finding in some women.

   Keywords:

   Nursing Process: Assessment

   NCLEX Test Plan: Management of Care

   Cognitive Level: Knowledge / Remember

2. A nurse is working at a community health center. Which finding if discovered on a breast assessment would concern the nurse the most?

   A. an irregular shaped, non-tender lump that can be palpated in one breast

   B. complaint of breast tenderness during palpation

   C. bilateral breast nodules in the upper outer quadrant

   D. a rubbery feeling in one breast that can be palpated and which is freely mobile

Correct Answer: A

Explanation/Rationale: An irregular shaped lump that is not tender that can be palpated is consistent with breast cancer. Breast tenderness during palpation may occur and is not worrisome. It is not unknown for females to have nodules in the breast and not unusual especially since it is bilateral. A rubbery feeling lump that is freely mobile is often a sign of fibroadenoma and not something that would concern the nurse the most. Even though all of the answers require some further investigation, answer A, an irregular shaped lump, would be of most concern.

Keywords:

Nursing Process: Intervention

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Analysis

3. A community health nurse is instructing a group of females about breast self-examination (BSE). When does the nurse instruct the female to perform this task?
   A. every other month
   B. every month during ovulation
   C. one week after menstruation
   D. weekly at the same time of the day

Correct Answer: C

Explanation/Rationale: The BSE should be performed monthly several days after the menstrual period. It is not recommended to perform the examination weekly. At the onset of menstruation and during ovulation, hormonal changes occur that may alter breast tissue.

Keywords:

Nursing Process: Planning

NCLEX Test Plan: Basic Care and Comfort

Cognitive Level: Knowledge / Remember

4. At what stage in a women's life does the American Cancer Society recommend that she begin performing monthly breast self-examination (BSE)?

A. at menarche

B. at onset of sexual activity

C. at onset of menopause

D. at onset of young adulthood

Correct Answer: D

Explanation/Rationale: The American Cancer Society recommends that all women begin performing monthly breast self-examination no later than age 20. The onset of menarche, sexual activity, or menopause will not necessarily change the outcome of breast self-examination.

Keywords:

Nursing Process: Assessment

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Knowledge / Remember

5. Which statement made by the client who recently had a mammogram indicates a need for clarification regarding the importance of this procedure?
   A. "Now that I have had a mammogram, my risk of getting breast cancer is reduced."
   B. "Now that I have had a mammogram, I will still do breast self-examination monthly."
   C. "Yearly mammograms can reduce my risk of dying from breast cancer."
   D. "The amount of radiation exposure from a mammogram is very low."

      Correct Answer: A

Explanation/Rationale: Regular or yearly mammography does not decrease the incidence of breast cancer. The client should be instructed that the mammogram uses a very small amount of radiation in the test, and that consistent scheduling of a mammogram, along with breast self-examination performed at least monthly, can reduce the client's risk of dying from breast cancer.

Keywords:

Nursing Process: Evaluation

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Application

6. A nurse is preparing to conduct a women's wellness seminar at a local civic center. What information should the nurse plan to include about risk factors for development of breast cancer?
   A. Breast cancer occurs most frequently in women younger than 30 years.
   B. The longer the interval between menarche and menopause, the more the risk increases.
   C. Nulliparous women are at increased risk.
   D. Risk is increased in postmenopausal women with body mass indexes below 20.
   E. Women whose sisters or mothers have had breast cancer are at increased risk.
   F. B, C, and E
   G. A, B, D, and E

      Correct Answer: F

   Explanation/Rationale: Early menarche and/or late menopause increase the risk of developing breast cancer. Childless women are at increased risk as are women with first-degree relatives, such as a mother or sister, who had breast cancer. Breast cancer is diagnosed most commonly in women older than 50 years. Postmenopausal women who are obese are at increased risk and fibrocystic breast disease is not related to breast cancer development.

Keywords:

Nursing Process: Planning

NCLEX Test Plan: Health Promotion and Disease Prevention

Cognitive Level: Application

7. A nurse is conducting a breast cancer awareness seminar at a local church. After the seminar, a 40-year-old female tells the nurse that she is at high risk for developing breast cancer and her health-care provider suggests that she begin taking tamoxifen (Soltamox). She asks the nurse to explain how this drug will help her avoid developing breast cancer. The nurse's response should be based on the knowledge that tamoxifen is:

   A. a potent anti-inflammatory drug that prevents the body's inflammatory response to the tumor growth.
   B. a type of chemotherapy agent that has minimal side effects if taken prophylactically.
   C. a drug that will decrease the risk of endometrial cancer, which is related to breast cancer development.
   D. a drug that blocks estrogen receptors on tumor cells and causes tumor regression.

      Correct Answer: D

Explanation/Rationale: Tamoxifen is recommended as a primary prevention modality for women at high risk for breast cancer. It blocks estrogen receptors on tumor cells, thus the cell growth declines and the tumor regresses. It does not have anti-inflammatory properties, and it is a hormonal rather than a chemotherapeutic agent. A major side effect is that it increases the risk of endometrial cancer.

Keywords:

Nursing Process: Planning

NCLEX Test Plan: Health Promotion and Maintenance / Prevention and Early Disease Detection

Cognitive Level: Application

8. A nurse is conducting a health history interview with a 20-year-old college sophomore when the client starts crying and says, “I’m so worried. I found a lump in my breast last night and I’m scared I might have cancer!” Which fact should the nurse consider when formulating a response to the client?
   A. Young women are at increased risk to develop breast cancer.
   B. A non-discrete possible mass or thickening has a high index of suspicion for breast cancer.
   C. Benign fibroadenomas are the most frequent cause of breast masses in women under 25 years.

D. College students often develop infectious breast disorders due to the close personal contact required in dormitory living.

Correct Answer: C

Explanation/Rationale: Fibroadenomas are the most common benign breast neoplasm and most often occur in women younger than 25 years. Breast cancer is diagnosed most commonly in women older than 50 years. A non-discrete possible mass or thickening has a lower (not higher) index of suspicion for breast cancer. Mastitis is a bacterial infection of the breast tissue and is not contagious and therefore would not be spread by dormitory living. Most cancerous tumors are usually not tender.

Keywords:

Nursing Process: Planning: Psychosocial Integrity/Crisis Intervention

NCLEX Test Plan: Reproductive Management

Cognitive Level: Application

9. According to the latest studies, which woman has the greatest risk of developing breast cancer?

A. physician, age 56, who had her first child at age 38

B. ballet dancer, age 20, who has a 5-year-old son

C. radiation technician, age 24, who had her menarche at age 13

D. postmenopausal woman, age 52, who had breast reduction surgery at age 26

Correct Answer: A

Explanation/Rationale: Women are 100 times more likely to have breast cancer than are men, with the risk increasing with age. Two out of three invasive breast cancers are found in women aged 55 and older. Although the incidence of breast cancer is increasing among premenopausal women, it is still primarily a disease of older woman.

Keywords:

Nursing Process: Analysis

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Application

10. Which factor is the incidence of breast disease most closely related to?

A. weight

B. age

C. ethnic background

D. socioeconomic status

Correct Answer: B

Explanation/Rationale: Breast cancer risk increases with age.

Keywords:

Nursing Process: Assessment

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Application

11. Which factor makes the mammogram a more sensitive screening tool than other tests?

A. higher compliance rate than BSE because it is less painful

B. less expensive than other tests that identify tumor markers

C. able to reveal masses too small to be palpated manually

D. able to differentiate between fluid and solid mass

Correct Answer: C

Explanation/ Rationale: Mammography is a low-dose x-ray procedure that allows visualization of the internal structure of the breast. Modern, dedicated screen-film units result in higher quality images with a considerably lower x-ray dose than the general-purpose x-ray equipment used in the past. Newer digital mammography systems appear to be even more accurate for women under 50 years of age with dense breast tissues.

Keywords:

Nursing Process: Assessment

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Application

12. The nurse is teaching a 24-year-old patient about BSE. When does the nurse tell her to perform BSE?

    A. the day before her menstrual flow is due
    B. on the third day after her menstrual flow starts
    C. when ovulation occurs
    D. one week after her menstrual flow starts

    Correct Answer: D

    Explanation/Rationale: Premenopausal woman should perform BSE 7 to 10 days from the first day of their menstrual period, because hormonal changes increase breast tenderness and lumpiness prior to menses.

    Keywords:

    Nursing Process: Planning / Intervention

    NCLEX Test Plan: Basic Care and Comfort

    Cognitive Level: Knowledge / Remember

13. A patient stopped having menses about a year ago. When does the nurse advise the patient to perform BSE?

    A. the first day of every other month
    B. continue on schedule even though menses have ceased
    C. the last day of each month
    D. any day as long as the schedule is consistent

Correct Answer: D

Explanation/ Rationale: Post-menopausal women should choose one day of the month (for example, the first day of the month) for BSE.

Keywords:

Nursing Process: Planning / Intervention

NCLEX Test Plan: Basic Care and Comfort

Cognitive Level: Knowledge / Remember

14. The nurse is teaching a young patient about BSE. Which statement by the patient indicates a need for further instruction?

A. "I should perform BSE on a monthly basis from now on."
B. "I see my health care provider annually, but I should perform BSE."
C. "BSE is a self-care measure that I can use to prevent breast cancer."
D. "The best time to perform BSE is 1week after my menstrual period."

Correct Answer: C.

Explanation/Rationale: The purpose of screening is early detection. BSE does not prevent breast cancer.

Keywords:

Nursing Process: Assessment

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Application

15. During a CBE, the examiner observes a discharge from the nipple. What is most important to include in the documentation of this finding?

    A. area of "the clock" that was compressed when the discharge was released
    B. amount of pressure required for the discharge to be released
    C. frequency and technique the patient uses for BSE
    D. history of difficulty or pain when attempting to breast-feed

    Correct Answer: A

    Explanation/Rationale: The nipple is gently compressed to detect the presence of a discharge. If a discharge is produced, note the "area of the clock" where the breast was compressed when the discharge was released.

    Keywords:

    Nursing Process: Assessment / Intervention

    NCLEX Test Plan: Health Promotion and Maintenance

    Cognitive Level: Analysis

16. Upon performing a CBE, the patient with which symptom suggests advanced disease?

    A. gynecomastia
    B. oval-shaped, mobile, rubbery mass
    C. thin, milky discharge from the nipple
    D. skin change of peau d'orange

Correct Answer: D

Explanation/Rationale: Two atypical types of breast cancer are inflammatory carcinoma and Piaget's disease. Inflammatory carcinoma of the breast, *is the most malignant form of breast cancer. Edema with dimpling of the skin those results in the skin looking like the peel of an orange (peau d'orange) is usually present.*

Keywords:

Nursing Process: Assessment/ Intervention

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Application

17. Women who have a personal history of breast cancer are at high risk for developing a reoccurrence or new breast cancer with the presence of which factors? (Select all that apply.)

A. BRCA 3 genetic mutation
B. strong family history
C. BRCA 2 genetic mutation
D. BRCA 1 genetic mutation
E. occupation
F. A, B, and E
G. B, C, and D

Correct Answer: G

Explanation/Rationale: Possible causes of breast cancer include environmental, hormonal, reproductive, and hereditary factors. Two breast cancer susceptibility genes have been identified: BRCA 1 on chromosome 17 and BRCA 2 on chromosome 13. These genes may be responsible for approximately 10% of women with hereditary breast cancer, with genetic mutations causing up to 80% of breast cancer in women younger than 50 years of age.

Keywords:

Nursing Process: Assessment

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Knowledge / Remember

18. Which are characteristics of patients with a high risk for breast cancer? (Select all that apply.)

A. early menarche

B. multiple births

C. late menopause

D. nulliparous

E. first pregnancy after 30 years of age

F. A and C

G. A, C, D, and, E

Correct Answer: G

Explanation/Rationale: Prolonged hormonal stimulation (e.g., early menses, late menopause) increases a woman's risk, as do birth of the first child often after 30 years of age and null parity (having no children).

Keywords:

Nursing Process: Assessment

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Knowledge / Remember

19. Which statement about early detection of breast masses is true?

A. A yearly breast examination by a health care provider can substitute for breast self-examination (BSE).
B. Detection of breast cancer before axillary node invasion yields the same survival rate.
C. Mammography as a baseline screening is recommended by the American Cancer Society at 30 years of age.
D. The goal of screening for breast cancer is early detection because BSE does not prevent breast cancer.

Correct Answer: D

Explanation/Rationale: The purpose of screening is early detection. BSE does not prevent breast cancer. A yearly breast examination by a health care provider

cannot substitute for BSE. Detection of breast cancer before axillary node invasion increases the chance of survival. The American Cancer Society recommends a baseline screening mammogram at 40 years of age and yearly screening for women beginning at age 40.

Keyword:

Nursing Process: Evaluation

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Analysis

20. Which techniques are correct in teaching breast self-examination? (Select all that apply.)

A. Discuss the client's fears, beliefs, and concerns about breast disease and BSE.
B. Ensure that the setting in which you demonstrate BSE is private and comfortable.
C. Ask the client to remove her shirt. The bra may be left in place.
D. Ask the client to demonstrate her own method of BSE.
E. Use the finger tips, which are more sensitive than the finger pads, to palpate the breast.
F. A and D
G. A, B, and D
H. A, B, D, and E

Correct Answer: G

Explanation/Rationale: Before teaching BSE, assess the psychological factors influencing the client's motivation to practice it. Lack of knowledge about the technique and the benefits of early detection, uneasiness about self-assessment, and lack of confidence in self-assessment may be reasons why women fail to perform BSE regularly. Discussing the client's fears, beliefs, and concerns about breast cancer disease and BSE with her is an important step. A private and comfortable setting is important for the client's comfort and ease. Ask the client to undress completely from the waist up and provide a gown and sheet. Before teaching breast palpation, ask the client to demonstrate her own method. If she is unsure or has not performed BSE before, slowly lead her through the examination while explaining the rationale for the technique and answering questions. The finger pads, which are more sensitive than the fingertips, are used when palpating the breasts.

Keywords:

Nursing Process: Intervention

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Application

21. For women at high genetic risk for breast cancer, which option for prevention and early detection, is the option of choice?

A. breast self-examination beginning at 20 years of age
B. hormone replacement therapy combination of estrogen and progesterone
C. magnetic resonance imaging (MRI) and mammography every year beginning at age 30
D. prophylactic mastectomy

Correct Answer: C

Explanation/Rationale: BSE is recommended for everyone, not just those at high genetic risk for breast cancer. An increase in the risk for breast cancer has been shown in postmenopausal women receiving hormone replacement therapy (HRT) after 5 or more years of use. HRT that includes the combination of estrogen and progesterone carries the highest increased risk. The American Cancer Society recommends that high-risk women also have an MRI and mammography every year beginning at age 30. Prophylactic (preventive) mastectomy (surgical breast removal) is an option for reducing the risk of breast cancer, but is a highly controversial practice. Even though women may decide to have a prophylactic mastectomy, there is a small risk that breast cancer will develop in residual breast glandular tissue because no mastectomy reliably removes all mammary tissue.

Keywords:

Nursing Process: Evaluation

NCLEK Test Plan: Health Promotion and Maintenance

Cognitive Level: Analysis

22. Which client has the highest risk for breast cancer?

A. 66-year-old woman with high breast density

B. 66-year-old nullipara woman

C. 66-year-old obese male with gynecomastia

D. 46-year-old woman with high breast density

Correct Answer: A

Explanation/Rationale: People at high increased risk of breast cancer include women aged 65 years and older with high breast density. Nullipara women are at a low increased risk for breast cancer. Men are not at high increased risk for breast cancer; obesity can cause gynecomastia. An age of 46 years, even with high breast density, does not designate a high increased risk for breast cancer.

Keywords:

Nursing Process: Assessment

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Application

23. Which assessment finding in the client indicates the highest risk of a malignant breast lesion?

A. 1-cm freely mobile rubbery mass discovered by the client

B. ill-defined painful rubbery lump in the outer breast quadrant

C. backache and breast fungi infection

D. nipple discharge and dimpling

Correct Answer: D

Explanation/Rationale: On clinical examination, fibroadenoma are oval, freely mobile, rubbery masses usually discovered by the woman herself. Their sizes vary from smaller than 1cm in diameter to as large as 15cm in diameter. Although the immediate fear is that of breast cancer, the risk of it occurring within a fibroadenoma is very small. Breast pain and tender lumps or areas of thickening in the breasts are typical symptoms of a fibrocystic breast condition. The lumps are rubbery, ill defined, and commonly found in the upper outer quadrant of the breast. Many large-breasted women develop fungal infections under the breasts, especially in hot weather, because it is difficult to keep this area dry and exposed to air. Backaches from the added weight are also common. Nipple discharge and dimpling are high-risk assessment findings for malignant breast lesion.

Keywords:

Nursing Process: Assessment

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Application

24. A nurse is palpating a female client's breast while assessing for breast disease. In which area of the breast are tumors most commonly found?

    A. nipple
    B. lower inner quadrant
    C. lower outer quadrant
    D. upper inner quadrant
    E. upper outer quadrant

    Correct Answer: E

    Explanation/Rationale: The upper outer quadrant is the area of the breast in which most breast tumors are found. This area should be palpated thoroughly. Although breast tumors can be found in any area of the breast, including the nipple, the tumors are most often in the upper outer quadrant.

    Keywords:

    Nursing Process: Assessment

    NCLEX Test Plan: Health Promotion and Maintenance

    Cognitive Level: Application

25. A postmenopausal woman is worried about pain in the upper outer quadrant of her left breast. The nurse's first course of action is to:

    A. Do a breast examination and report the results to the physician.
    B. Explain that pain is caused by hormonal fluctuations.

C. Reassure the client that pain is not a symptom of breast cancer.

D. Teach the client the correct procedure for breast self-examination (BSE).

Correct Answer: A

Explanation/Rationale: This information warrants the nurse performing an examination and reporting the results to the physician. Hormone fluctuation does cause breast discomfort, but an examination must be done at this time to assess the breast. Although pain is not common with breast cancer, it can be a symptom. Teaching the client to perform a breast exam is important, but it is not the priority action in this case.

Keywords:

Nursing Process: Intervention

NCLEX Test Plan: Physiological Adaptation

Cognitive Level: Synthesize

26. The nurse teaches a female client that the best time in the menstrual cycle to examine the breast is during the:

A. week that ovulation occurs

B. week that menstruation occurs

C. first week after menstruation

D. week before menstruation occurs

Correct Answer: C

Explanation/Rationale: It is generally recommended that the breasts be examined during the first week after menstruation. During this time, the breasts are least likely to be tender or swollen because estrogen is at its lowest level. Therefore, the examination will be more comfortable for the client. The examination may also be more accurate because the client is more likely to notice an actual change in her breast that is not simply related to hormonal changes.

Keywords:

Nursing Process: Planning/Intervention

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Application

27. A 76-year-old client tells the nurse that she has lived long and does not need mammograms. Which is the nurse's best response?

A. "Having a mammogram when you are older is less painful."

B. "The incidence of breast cancer increases with age."

C. "We need to consider your family history of breast cancer first."

D. "It will be sufficient if you perform breast examination monthly."

Correct Answer: B

Explanation/Rationale: Advancing age in postmenopausal women has been identified as a risk factor for breast cancer. A 76-year-old client needs monthly self-examination and a yearly clinical breast examination and mammogram to

comply with the screening schedule. While mammograms are less painful as breast tissue becomes softer, that is not the reason the nurse should advise the woman to have the mammogram. Family history is important, but only about 5% of breast cancers are genetic.

Keywords:

Nursing Process: Intervention

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Synthesize

28. A nurse is teaching a community program on breast self-examination (BSE). The nurse demonstrates the proper procedure for palpating each breast. In what sequence should the following actions be performed for self-examination?

I. Place the hand over the breast to be examined (use the right hand for the left breast and vice versa).

II. Lie down with one arm behind the head.

III. Palpate the breast in a perpendicular motion, going across the breast from side to side and top to bottom.

IV. Use a circular motion to feel the breast tissue (with light, medium, and firm pressure).

V. Use the finger pads of the three ways to discover early breast changes.

A. I, III, II, V, IV

B. II, I, V, IV, III

C. II, I, IV, III, V

D. IV, II, I, V, III

Correct Answer: B

Explanation/Rationale: Although the America Cancer Society (ACS) states that monthly BSEs are optional, it remains an important way to discover early breast changes. BSE is a standard procedure described by national organizations designed to ensure palpation of all breast tissue. Examination can begin when lying down, in the shower, or standing before a mirror. The examination also includes a visual inspection of the breasts while pressing the hands firmly against the hips and examining the underarm of each breast with the arms slightly raised.

Keywords:

Nursing Process: Assessment

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Application

29. The nurse is teaching a client about breast self-examination (BSE). Which pattern of palpation would the nurse encourage based on American Cancer Society (ACS) recommendations?

A. circular pattern

B. wedge pattern

C. up-and-down vertical pattern

D. horizontal pattern

Correct Answer: C

Explanation/Rationale: The ACS recommends an up-and-down vertical pattern as the most effective pattern for covering the whole breast. Option A (circular pattern) and option B (wedge pattern) are alternate methods but may not be as effective. Option D (horizontal pattern) is not a recognized method used in BSE.

Keywords:

Nursing Process: Intervention

NCLEX Test Plan: Physiological Integrity

Cognitive Level: Analysis

30. Of the following women, which one would be most at risk for breast cancer?

A. age 23, two children

B. age 33, never pregnant

C. age 45, very thin

D. age 64, positive family history

Correct Answer: D

Explanation/Rationale: Risk factors for breast cancer are doubled for the 64-year-old with a positive family history.

Keywords:

Nursing Process: Assessment

NCLEX Test Plan: Health Promotion and Maintenance

Cognitive Level: Application

Appendix F: Billings & Hensel Permission Document

Recently you requested personal assistance from our on-line support center. Below is a summary of your request and our response.

Subject

Diane Billings & Desiree Hensel Book Permissions Request

Discussion Thread

Response Via Email (Caren Erlichman) 08/11/2015 11:53 AM

Thank you Lydia.

Your request to use questions 21, 22 and 25 from page 549 of Billings: Lippincott's Q&A Review for NCLEX-RN in your thesis *Nursing Student's Breast Cancer Knowledge and Breast Self-examination Technique Confidence* is granted for both print and e-formats.
I am attaching a copy of our Terms and Conditions. Please consider those, and this email, your official grant of permission. Thank you.

Sincerely,

Caren Erlichman

Appendix G: Ignatavicius & Workman Permission Document

Dear Lydia Gaud

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Yours sincerely
Jennifer Jones

Type of Publication: Book
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Quality of material:
Excerpts: 278 words
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Information about proposed use: Reuse in a thesis/dissertation
Proposed use text: My online dissertation will be password protected.
Additional Comments / Information: I refer to the 8th edition which includes those questions on the evolve website, not a CD.

Appendix H: Ignatavicius & Workman Permission Request

• City:	Altamonte Springs
• State/Territory:	Florida
• Country:	United States
• Telephone:	3212878314
• Email:	gaudl@seminolestate.edu
• Please select the type of publication:	Book
• Book - Title :	Medical-Surgical Nursing: Patient-Centered Collaborative Care- Clinical Decision-Making Study Guide
• Book - ISBN :	978-1-4160-5479-5
• Book - Author(s) :	Donna D. Ignatavicius and M. Linda Workman
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• Book - Pages from :	page 651, questions: 28, 31; page 652, questions: 35, 37; page 653, questions: 42, 43.
• Book - Pages to :	Page 653, questions: 42, 43
• Book - Chapter Num :	Chapter 73
• Book - Chapter Title:	Care of Patients with Breast Disorders
• Journal - Title :	
• Journal - ISSN :	
• Journal - Volume :	

- Journal - Issue :
- Journal - Year :
- Journal - Pages from :
- Journal - Pages to :
- Journal - Author :
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- Book/Product - Title :
- Book/Product - ISBN :
- Book/Product - Author(s) :
- Book/Product - Year :
- Book - Pages from :
- Book - Pages to :
- Book - Chapter Num :
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- I would like to use (please select one of the following options) : Excerpt(s)
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Kind regards,
Elsevier Permissions

Appendix I: Ohman Publisher Permission Request

July 17, 2015

Kathleen A. Ohman, RN, CCRN, MS, EdD

Dear Dr. Ohman,

I am a doctoral student enrolled in the Health Services Program at Walden University. My dissertation topic is "Nursing Student's Breast Cancer Knowledge and Breast Self-examination Technique Confidence". I will use a questionnaire to collect the data. The questionnaire was constructed using different sources of principles: Bloom Taxonomy, Nursing Process, and the National Council Examination for Registered Nurses (NCLEX-RN) questions and answers review.

I would like to obtain permission from you to use the breast cancer multiple-choice test items published in your book:" Davis's Q & A for the NCLEX-RN Examination, Test 24: Adult Health: Reproductive Management section, page 427.

Thank you for your time.

Sincerely,

Lydia E. Gaud MSN, RN

Appendix J: Rupert Permission Document

Recently you requested personal assistance from our on-line support center. Below is a summary of your request and our response.

If you are receiving this in response to a request you made, a summary is below. If you have not made a request, the following is a communication on behalf of your LWW Sales Representative.

Thank you for allowing us to be of service to you.

To access your question from our support site, click here.

Subject

Diana Rupert Book Permissions Request

Caren Erlichman

Thank you Lydia.

Your request to use question 14 from page 148 of Lippincott's NCLEX-RN Alternate Format Questions 5e in your thesis *Nursing Student's Breast Cancer Knowledge and Breast Self-examination Technique Confidence* is granted for both print and e-formats. I am attaching a copy of our Terms and Conditions. Please consider those, and this email, your official grant of permission. Thank you.

Sincerely,

Caren Erlichman

Appendix K: Expert Questionnaire Criteria Form

Expert Written Survey Evaluation Criteria

Expert Name _____

Please evaluate each written survey section using the following criteria:

1=not relevant (NR)

2=somewhat relevant (SR)

3=quite relevant (QR)

4=very relevant (VR)

Section I:

Questions	NR (1)	SR (2)	QR (3)	VR (4)	Comments
Introduction: This questionnaire is based on breast cancer knowledge and breast self-examination (BSE) technique confidence questions. The purpose of this study is to explore the breast cancer knowledge and breast self-examination technique confidence in nursing students. Completion of this questionnaire should take approximately 20 minutes.					
Demographic Characteristics					
Directions: Please answer every question by placing a mark (X) in the enclosed parentheses:					
Characteristics:					

Academic Level:

( ) Freshmen

( ) Senior

Did you start the program at Seminole

State College of Florida:

( ) Yes

( ) No, please indicate where you

began your nursing

program_____

University of Central Florida

Concurrent Program:

( ) Yes

( ) No

Ethnic group that you identify yourself

with:

( ) White, non-Hispanic

( ) Black, non-Hispanic

( ) Hispanic

( ) Asian

( ) Other (specify):

_____

Country where you were born?

( ) United States

( ) Other

(specify):_____

Marital Status:

( ) Single, never married

( ) Married

( ) Married, living apart

( ) Divorced

( ) Widow

Age: _____

Grade Point Average: _____

Section II:

Questions	NR (1)	SR (2)	QR (3)	VR (4)	Comments
Breast cancer knowledge					
Directions: Please read the following multiple choices questions carefully and select the correct answer or select all that apply as indicated on the question.					
1. Which assessment finding should be reported to the physician?					

A. breast tenderness prior to menses
B. dimpling of the breast skin
C. one breast slightly larger than the other
D. retracted nipples bilaterally

2. A nurse is working at a community health center. Which finding if discovered on a breast assessment would concern the nurse the most?
    A. an irregular shaped, non-tender lump that can be palpated in one breast
    B. complaint of breast tenderness during palpation
    C. bilateral breast nodules in the upper outer quadrant
    D. a rubbery feeling in one breast that can be palpated and which is freely mobile

3. A community health nurse is instructing a group of females about breast self-examination (BSE). When does the nurse instruct the female to perform this task?
    A. every other month
    B. every month during ovulation
    C. one week after menstruation
    D. weekly at the same time of the day

4. At what stage in a women's life does the American Cancer Society recommend that she begin performing monthly breast self-examination (BSE)?

A. at menarche

B. at onset of sexual activity

C. at onset of menopause

D. at onset of young adulthood

5. Which statement made by the client who recently had a mammogram indicates a need for clarification regarding the importance of this procedure?

   A. "Now that I have had a mammogram, my risk of getting breast cancer is reduced."

   B. "Now that I have had a mammogram, I will still do breast self-examination monthly."

   C. "Yearly mammograms can reduce my risk of dying from breast cancer."

   D. "The amount of radiation exposure from a mammogram is very low."

6. A nurse is preparing to conduct a women's wellness seminar at a local civic center. What information should the nurse plan to include about risk factors for development of breast cancer?

   A. Breast cancer occurs most frequently in women younger than 30 years.

   B. The longer the interval between menarche and menopause, the more the risk increases.

   C. Nulliparous women are at increased risk.

   D. Risk is increased in

postmenopausal women with body mass indexes below 20.

E. Women whose sisters or mothers have had breast cancer are at increased risk.

F. B, C, and E

G. A, B, D, and E

7. A nurse is conducting a breast cancer awareness seminar at a local church. After the seminar, a 40-year-old female tells the nurse that she is at high risk for developing breast cancer and her health-care provider suggests that she begin taking tamoxifen (Soltamox). She asks the nurse to explain how this drug will help her avoid developing breast cancer. The nurse's response should be based on the knowledge that tamoxifen is:

   A. a potent anti-inflammatory drug that prevents the body's inflammatory response to the tumor growth.

   B. a type of chemotherapy agent that has minimal side effects if taken prophylactically.

   C. a drug that will decrease the risk of endometrial cancer, which is related to breast cancer development.

   D. a drug that blocks estrogen receptors on tumor cells and causes tumor regression.

8. A nurse is conducting a health history interview with a 20-year-old college sophomore when the client starts crying and says, "I'm so worried. I found a lump

in my breast last night and I'm scared I might have cancer!" Which fact should the nurse consider when formulating a response to the client?

A. Young women are at increased risk to develop breast cancer.

B. A non-discrete possible mass or thickening has a high index of suspicion for breast cancer.

C. Benign fibroadenomas are the most frequent cause of breast masses in women under 25 years.

D. College students often develop infectious breast disorders due to the close personal contact required in dormitory living.

9. According to the latest studies, which woman has the greatest risk of developing breast cancer?

A. Physician, age 56, who had her first child at age 38

B. Ballet dancer, age 20, who has a 5-year-old son

C. Radiation technician, age 24, who had her menarche at age 13

D. Postmenopausal woman, age 52, who had breast reduction surgery at age 26

10. Which factor is the incidence of breast disease most closely related to?

A. weight

B. age

C. ethnic background

D. socioeconomic status

11. Which factor makes the mammogram a more sensitive screening tool than other tests?

    A. higher compliance rate than BSE because it is less painful

    B. less expensive than other tests that identify tumor markers

    C. able to reveal masses too small to be palpated manually

    D. able to differentiate between fluid and solid masses

12. The nurse is teaching a 24-year-old patient about BSE. When does the nurse tell her to perform BSE?

    A. the day before her menstrual flow is due

    B. on the third day after her menstrual flow starts

    C. when ovulation occurs

    D. one week after her menstrual flow starts

13. A patient stopped having menses about a year ago. When does the nurse advise the patient to perform BSE?

    A. the first day of every other month

    B. continue on schedule even though menses have ceased

    C. the last day of each month

    D. any day as long as the schedule is consistent

14. The nurse is teaching a young patient about BSE. Which statement by the patient indicates a need for further instruction?

    A. "I should perform BSE on a monthly basis from now on."

    B. "I see my health care provider annually, but I should perform BSE."

    C. "BSE is a self-care measure that I can use to prevent breast cancer."

    D. "The best time to perform BSE is I week after my menstrual period."

15. During a CBE, the examiner observes a discharge from the nipple. What is most important to include in the documentation of this finding?

    A. area of "the clock" that was compressed when the discharge was released

    B. amount of pressure required for the discharge to be released

    C. frequency and technique the patient uses for BSE

    D. history of difficulty or pain when attempting to breast-feed

16. Upon performing a CBE, the patient with which symptom suggests advanced disease?

    A. gynecomastia

    B. oval-shaped, mobile, rubbery mass

    C. thin, milky discharge from the

nipple

D. skin change of peau d'orange

17. Women who have a personal history of breast cancer are at high risk for developing a reoccurrence or new breast cancer with the presence of which factors?

    A. BRCA 3 genetic mutation
    B. strong family history
    C. BRCA 2 genetic mutation
    D. BRCA 1 genetic mutation
    E. occupation
    F. A, B, and E
    G. B, C, and D

18. Which are characteristics of patients with a high risk for breast cancer?

    A. early menarche
    B. multiple births
    C. late menopause
    D. nullipara
    E. first pregnancy after 30 years of age
    F. A and C
    G. A, C, D, and E

19. Which statement about early detection of breast masses is true?

    A. A yearly breast examination by a health care provider can substitute for breast self-examination (BSE).

B. Detection of breast cancer before axillary node invasion yields the same survival rate.

C. Mammography as a baseline screening is recommended by the American Cancer Society at 30 years of age.

D. The goal of screening for breast cancer is early detection because BSE does not prevent breast cancer.

20. Which techniques are correct in teaching breast self-examination?

A. Discuss the client's fears, beliefs, and concerns about breast disease and BSE.

B. Ensure that the setting in which you demonstrate BSE is private and comfortable.

C. Ask the client to remove her shirt. The bra may be left in place.

D. Ask the client to demonstrate her own method of BSE.

E. Use the finger tips, which are more sensitive than the finger pads, to palpate the breast.

F. A and D

G. A, B, and D

H. A, B, D, and E

21. For women at high genetic risk for breast cancer, which option for prevention and early detection, is the option of choice?

A. breast self-examination beginning

at 20 years of age

B. hormone replacement therapy combination of estrogen and progesterone

C. magnetic resonance imaging (MRI) and mammography every year beginning at age 30

D. prophylactic mastectomy

22. Which client has the highest risk for breast cancer?

A. 66-year-old woman with high breast density

B. 66-year-old nullipara woman

C. 66-year-old obese male with gynecomastia

D. 46-year-old woman with high breast density

23. Which assessment finding in the client indicates the highest risk of a malignant breast lesion?

A. 1-cm freely mobile rubbery mass discovered by the client

B. ill-defined painful rubbery lump in the outer breast quadrant

C. backache and breast fungi infection

D. nipple discharge and dimpling

24. A nurse is palpating a female client's breast while assessing for breast disease. In which area of the breast are tumors most commonly found?

A. nipple
B. lower inner quadrant
C. lower outer quadrant
D. upper inner quadrant
E. upper outer quadrant

25. A postmenopausal woman is worried about pain in the upper outer quadrant of her left breast. The nurse's first course of action is to:
    A. do a breast examination and report the results to the physician.
    B. explain that pain is caused by hormonal fluctuations.
    C. reassure the client that pain is not a symptom of breast cancer.
    D. teach the client the correct procedure for breast self-examination (BSE).

26. The nurse teaches a female client that the best time in the menstrual cycle to examine the breast is during the:
    A. week that ovulation occurs
    B. week that menstruation occurs
    C. first week after menstruation
    D. week before menstruation occurs

27. A 76-year-old client tells the nurse that she has lived long and does not need mammograms. Which is the nurse's best response?
    A. "Having a mammogram when you are older is less painful."

B. "The incidence of breast cancer increases with age"

C. "We need to consider your family history of breast cancer first."

D. "It will be sufficient if you perform breast examination monthly."

28. A nurse is teaching a community program on breast self-examination (BSE). The nurse demonstrates the proper procedure for palpating each breast. In what sequence should the following actions be performed for self-examination?

I. Place the hand over the breast to be examined (use the right hand for the left breast and vice versa).

II. Lie down with one arm behind the head.

III. Palpate the breast in a perpendicular motion, going across the breast from side to side and top to bottom.

IV. Use a circular motion to feel the breast tissue (with light, medium, and firm pressure).

VI. Use the finger pads of the three ways to discover early breast changes.

A. I, III, II, V, IV

B. II, I, V, IV, III

C. II, I, IV, III, V

D. IV, II, I, V, III

29. The nurse is teaching a client about breast self-examination (BSE). Which pattern of palpation would the nurse encourage based on American Cancer Society (ACS)

recommendations?

A. circular pattern
B. wedge pattern
C. up-and-down vertical pattern
D. horizontal pattern

30. Of the following women, which one would be most at risk for breast cancer?

A. age 23, two children
B. age 33, never pregnant
C. age 45, very thin
D. age 64, positive family history

Section III:

Questions	NR (1)	SR (2)	QR (3)	VR (4)	Comments
Breast Self-examination (BSE) technique confidence: For this questionnaire on self-confidence, refer to your personal, subjective evaluation of your own ability or competence. In other words, your self-confidence depends on the distance you perceive between your "actual" ability to perform and the "ideal" performance expected. Self-confidence can certainly vary with situations or settings. This questionnaire focuses on your self-confidence in a particular situation. Please focus your answers on your breast self-examination (BSE) technique knowledge and skill performance confidence.					

Directions: Please answer every question by placing a mark (X) in the enclosed parentheses:

1. How many times in the past six months did you perform BSE?

   None ( )

   Daily ( )

   Monthly ( )

   Twice a month ( )

2. I feel confident in my BSE technique knowledge.

   Strongly agree ( )

   Agree ( )

   Neither agree nor disagree ( )

   Disagree ( )

   Strongly disagree ( )

3. I feel confident in my ability to perform a BSE.

   Strongly agree ( )

   Agree ( )

   Neither agree nor disagree ( )

   Disagree ( )

   Strongly disagree ( )

4. How did you learn about BSE? Mark all that apply.

   American Cancer Society Course ( )

   Internet ( )

Nursing School ( )

Clinical ( )

At my job ( )

Health fair ( )

Doctors' office ( )

Videotape ( )

Practiced on a breast model ( )

Instructor supervised practice ( )

Other _____

5. Who taught you how to do BSE? Mark all that apply.

   Doctor ( )

   American Cancer Society instructor ( )

   Faculty from nursing school ( )

   Other _____

6. How were you tested on your knowledge of BSE? Mark all that apply.

   Exams ( )

   Return demonstration required ( )

Appendix L: Calculating a Content Validity Index

Establishing content validity can also involve using more formal and quantitative procedures, such as calculating a content validity index (Norwood, 2000). This process is described as follows:

Instruct members of the expert panel to assess the relevancy of each item for the construct of interest using the following scale:

1 = not relevant

2 = somewhat relevant

3 = quite relevant

4 = very relevant

Calculate interrater agreement for item relevancy:

No. of items rated 3 or 4

Total number of items

The scores from each of the experts will then be used to find the average score between experts. If interrater agreement is .70 or higher, proceed to next step. If it is lower, consult with the panel to revise items or clarify the conceptual definition and rating scale being used. Recalculate interrater agreement after these revisions.

Calculate the content validity index (CVI) by determining the proportion of the items on the instrument that received a relevancy rating of 3 or 4.

Number of items with a rating of 3 or 4

CVI for Scale = _____

Total no. of items rated

Number of experts giving a rating of 3 or 4

CVI per Item = _____

Total number of experts

CVI for Scale is acceptable if it is .80 or higher. According to Lynn (as cited by Polit & Beck, 2006), CVI per item should be no lower than .78.