# UNDERGRADUATE NURSING FACULTY AND TEST DEVELOPMENT: AN EXPLORATION INTO THEIR UNDERSTANDING OF HIGHER ORDER THINKING TEST QUESTIONS

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UNDERGRADUATE NURSING FACULTY AND TEST DEVELOPMENT: AN EXPLORATION INTO THEIR UNDERSTANDING OF HIGHER ORDER THINKING TEST QUESTIONS (147 pp.)

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The purpose of this qualitative study was to explore nursing faculty's understanding of higher order thinking test questions and practices with test preparation for undergraduate baccalaureate nursing students. Data were collected from eight full time classroom, undergraduate nursing faculty participants. The main findings from this study include higher order thinking uses critical thinking with foundational knowledge, application and analysis principles; faculty need continuing education and peer collaboration with testing preparation; and the use of a clinical care, reality focus is necessary with higher order testing. These findings are significant due to the increasing demand for complex thinking required of nurses now and in the future. Additionally, as the nursing faculty shortage continues, teachers often come into education with inadequate training to prepare higher order thinking test questions. Implications for nursing education include preparing undergraduate nursing faculty with continuing educational programs for testing practices, recognizing and creating opportunities for faculty collaboration with testing, reviewing foundational knowledge expectations of student entering nursing programs and enriching student's transition to practice using reality, clinical based NCLEX style test questions.

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# CHAPTER I

## INTRODUCTION

Nursing today is complex, varied, and confronted with many challenges. As the nursing shortage continues, patient acuity rises, and technology grows, nurses are confronted with increasing daily demands. The healthcare environment is changing and evolving; therefore, nurses must be prepared to deal with these realities. The future generation of nurses must be educated for enhanced critical thinking and problem-solving skills. Nurse educators need to respond to these challenges by transforming undergraduate nursing education ensuring higher order thinking skills are used every day with the delivery of nursing care.

Nursing faculty are responsible to facilitate student learning for the development of thinking skills. Along with the knowledge of complex technology interventions, attentiveness and clinical reasoning abilities are skills critical to the safety and well-being of patients (Benner, Sutphen, Leonard, & Day, 2010; Billings & Halstead, 2016). The use of critical thinking skills, with reasoning, will lead to improved clinical judgments for safe, sound nursing practice. "Developing astute clinical judgment about complex clinical concepts and phenomena require deeper thinking" (Benner, 2018). Deeper thinking or higher order thinking must be reflective in undergraduate nursing curricula both in the classroom and clinical settings. These thinking skills must be assessed for prudent clinical care and patient safety. It is a nursing teacher's responsibility to assess students for such skills. Assessment for higher order thinking (HOT) commonly takes place on nursing examinations. Assessment through examinations is very common

practice in nursing programs. Preparing students to take examinations is important since progression in the program depends on successful test achievements. Moving into the registered nursing role cumulates with a high stake's examination, which determines the student's ability to become a nurse.

## Background

To become a registered nurse (RN) in the United States, nursing students must successfully graduate with a diploma or a college degree in nursing, pass a state licensing examination, and then obtain an RN license. The licensing examination or National Council Licensure Examination (NCLEX) is a computerized adaptive test each student must pass in order to function as a registered nurse. The National Council State Boards of Nursing (NCSBN) develops this examination and has a test plan available for both faculty and students (2015). The test plan (also called the test blueprint) provides information about the content areas tested on the NCLEX examination (NCSBN, 2019b). This test plan is reviewed every three years by the National Council of State Boards to ensure minimum competence and safe practice by new nurse graduates (Lavin & Rosario-Sim, 2013).

The test plan outlines general, broad content areas for the licensure examination and offers example test questions. The test plan states, "the majority of the questions are written at the application or higher levels of cognitive ability, which requires more complex thought processing" (NCSBN, 2019b, p. 4). Based on this statement from the NCSBN (2019b), nursing faculty need to prepare students using higher order test questions just as will be on the NCLEX. Educators need to prime their students to be

familiar with questions similar to those that will be used on the NCLEX (DeYoung, 2009). Nursing faculty are obligated to assist students with preparation for the NCLEX throughout their nursing program (Pressler & Kenner, 2012). A study by Bristol, Nelson, Sherrill, and Wangerin (2018) unfortunately reported few faculty use the test blueprint in their testing practices. Additionally, many faculty admit to not developing their own questions; rather use existing resources for test item creation (Bristol et al., 2018).

Prospective students are savvy about selecting a nursing program that has high success rates on the licensure exam. Knowing this, more pressure is on nursing schools and faculty to assist students in their preparation for passing the licensing examination (Pressler & Kenner, 2012). According to the National League for Nursing's (NLN) Fair Testing Guidelines for Nursing Education (2012a), "Faculty have the responsibility to assess students' abilities and assure they are competent to practice nursing" (p. 1). Part of this responsibility involves developing test items that promote higher-level thinking, such as application and analysis type questions (NLN, 2012a). Numerous resources are available with assistive criteria/guidelines for developing test items that promote higher level thinking in nursing students (Bristol & Brett, 2015; Clifton & Schriner, 2010; Morrison & Free, 2001; Su, Osisek, Montgomery, & Pellar, 2009; Sutherland, Schwartz, & Dickison, 2012; Tarrant & Ware, 2008, 2012).

While there is more than one preparation path to become a registered nurse, this study will focus on baccalaureate education. The educational framework for the preparation of baccalaureate nursing graduates is outlined in a document from the American Association of College of Nursing (AACN, 2008). This document is called

*The Essentials of Baccalaureate Education for Professional Nursing Practice* (AACN, 2008). Within *The Essentials* document are the fundamental aspects of nursing practice, which includes the curricular elements for the preparation of clinical and critical reasoning (AACN, 2008). Throughout this document are outcomes expected of graduates of baccalaureate nursing programs. Included are such skills as applying scientific knowledge to patient encounters, using decision making skills with nursing care, and integrating critical thinking during care delivery. Through achievement of these outcomes and skills, baccalaureate graduates will be able to integrate and apply knowledge to practice within the ever-changing and complex healthcare system (AACN, 2008).

Relevant to this discussion is the actual process or practice for creating test questions. Whatever practices guide faculty with the development of quality test questions, the process is challenging and time consuming (Bristol & Brett, 2015; Clifton & Schriner, 2010; Sutherland et al., 2012). The quality of the test question refers to those test items that assess thinking at a higher cognitive level (Bristol & Brett, 2015; Clifton & Schriner, 2010). Thinking at a higher level is important due to the multifaceted demands of the nursing profession. Nurses are expected to make sound clinical judgments daily, which require higher order thinking skills (NCSBN, Winter 2018).

Nursing faculty are often overwhelmed with the increasing workload in the academic world and their lack of formal education to develop test items (Bristol & Brett, 2015). Therefore, many faculty find test development a daunting task leading to frustration. This frustration can hinder the effectiveness of item construction. A study by

Tarrant and Ware (2008) examined nursing tests and found item-writing flaws in close to half of the test questions reviewed. Unfortunately, these flawed questions can affect student success with testing. The authors called for more research involving quality test question development as well as the effect it may have on student achievement academically and clinically (Tarrant & Ware, 2008). Educating faculty on effective test construction was a recommendation for reducing the number of flawed questions (Tarrant & Ware, 2008).

The literature with faculty and test question development lends to justification that research must continue to address undergraduate baccalaureate nursing faculty and the development of higher order test questions in order to meet the demands of clinical competence. I, as a researcher and fellow nurse educator, wanted to investigate this topic with my dissertation. Little qualitative research is found regarding nurse faculty and test development therefore, I plan to fill this gap with my qualitative study approach to testing in nursing education.

## Assessment Through Testing

The testing of students has been part of education for hundreds of years. Assessment describes the measurement of what an individual knows (Banta & Palomba, 2015). The measurement in this case is undergraduate nursing classroom tests. This approach to assessment includes a focus on thinking and skill acquisition, while highlighting the most important areas of content students need to learn for the preparation to become a registered nurse (Suskie, 2009).

Tests in nursing curricula are used as tools to assess the student nurse's knowledge. Success on tests allows the student to continue in the nursing program. Faculty use these assessments to make important educational judgments that will affect nursing students' future with becoming a registered nurse. Examinations must be carefully planned, properly constructed, appropriately administered, and scored accurately (Oermann, 2015). Although developing tests may seem like a fairly uncomplicated task, in reality it is "an involved process" (Billings & Halstead, 2016, p. 423).

The examination construction process must begin with qualified faculty who are trained to formulate appropriate nursing test questions. As previously mentioned, nursing is experiencing a nurse faculty shortage and often these positions are filled by practicing clinicians with limited teaching experience. These novice educators are filling a teaching void, but many struggle designing test items which necessitate students use higher order thinking skills (HOTS) (Bristol et al., 2018; Su et al., 2009; Tarrant & Ware, 2012). The need for higher order thinking in nursing is a necessary skill for nurses; therefore, students must be educated with the intent that higher order thinking skills will be used day one in their career.

Unfortunately, few nursing teachers have adequate preparation or knowledge of how to develop high quality test questions (Bristol et al., 2018; Su et al., 2009; Tarrant & Ware, 2012; Tarrant, Knierim, Hayes, & Ware, 2006). Test construction is a skill that nurse educators must develop. Since many faculty do not have formal preparation in test

question development, several guides have been created to help faculty through the testing process.

Writing quality test items is challenging and time consuming. Faculty in academia are often required to serve on committees, participate in and submit scholarly endeavors, as well as teach in the classroom and clinical areas. With this heavy workload and lack of training for question creation, faculty often look for shortcuts with test construction (Tarrant et al., 2006). Textbook companies commonly supply a bank of test questions (test bank) that complement the textbooks used in class. Unfortunately, these test bank questions frequently lack reliability and quality. Nursing literature has determined most textbook test banks are poorly written and most often assess at a lower cognitive level (Bristol, 2018; Clifton & Schriner, 2010; McDonald, 2018). "It is important to note that sometimes, these questions do not follow best practices in test writing for nursing education" (Bristol, 2018, p. 66). If test bank items are used, it recommended faculty edit or tweak the test questions making the items more realistic. Additionally, the items should be reworked to assess students at a higher cognitive level. Faculty also need to ensure test questions be reflective of established guidelines for appropriate test question development (Bristol, 2018; Clifton & Schriner, 2010).

Writing quality test questions requires a thoughtful plan. Sutherland et al. (2012) state, "Writing test items that measure safe, competent nursing practice presents unique challenges" (p. 35). Many articles exist in the literature to assist and guide nursing faculty with developing test items. Bristol and Brett (2015) consider creating examination questions both an art and science confirming, "Developing a quality test is

challenging" (p. 100). Quality test items require the student to use higher order thinking skills in order to be successful on the examination.

Throughout undergraduate nursing programs, faculty must facilitate these higher order thinking skills. Higher order thinking skills should be used with even the most basic content early in the nursing educational path as noted by McDonald (2018):

> The premise that students should be gradually introduced to items that require higher cognition skills is flawed. Students should be required to think critically all along the way as they progress in a nursing program, from the basic to the more complex. (p. 133)

Early exposure to higher order NCLEX-style questions enhances performance throughout the nursing program, and this achievement may lead to success on the licensure examination (Hill, Wong, & Thal, 2019). The stakes are high for nurses due to tremendous responsibilities with patients and healthcare systems in general. Therefore, creating a learning environment focusing on higher thinking skills as soon as possible is apparent and crucial. Lower order thinking test items cannot effectively assess the cognitive thinking processes associated with clinical reasoning and decision making that are required of nurses (McDonald, 2018). Nursing faculty must be cognizant of these facts when creating assessments for their students.

Assessments with higher order thinking elements takes time and necessitates knowledge about designing test items. Unfortunately, without appropriate training, most test writers develop lower quality items which focus on factual recall of content requiring little thinking skills (Tarrant & Ware, 2012). The literature abounds with countless

practices and guidelines that will help faculty to develop higher level thinking test questions (Billings & Halstead; 2016; Bristol & Brett, 2015; Clifton & Schriner, 2010; McDonald, 2018; Morrison & Free, 2001; Oermann, 2018; Oermann & Gaberson, 2014; Tarrant & Ware, 2008, 2012; Su et al., 2009; Sutherland et al., 2012). Test items assessing for higher order thinking are most effective when written at the application or higher cognitive level (McDonald, 2018).

As established, nursing examinations need to be able to assess for higher order thinking. Higher order thinking skills include test items that are written at a higher cognitive level such as application and analysis type questions. Nursing education test items should place an emphasis on higher level thinking skills (Billings & Halstead, 2016; Bristol et al., 2018; DeYoung, 2009; McDonald, 2018; Su et al., 2009). According to the National Council of State Boards of Nursing (NCSBN) test plan (2019b) for the licensure examination, "Since the practice of nursing requires application of knowledge, skills and abilities, the majority of items are written at the application or higher levels of cognitive ability which requires more complex thought processing" (p. 4).

There is no doubt the need for nursing examination items to be written at higher cognitive levels has been documented. Additionally, concern has been addressed that many nursing faculty members lack the necessary skills for developing such higher order thinking test questions. These facts, along with the nursing faculty shortage, have led Benner, Tanner, and Chesla (2009) to call for radical transformation of nursing education. Benner et al. (2009) argued faculty must help students make the connection between acquiring and using knowledge, so that students develop clinical reasoning skills

for the diverse, complex practice in nursing. Nursing students need to be assessed on their ability to make these connections for the 21st century's delivery of nursing care.

## Higher Order Thinking in Nursing

The terms most associated with higher order thinking in nursing include critical thinking, clinical reasoning, decision making, problem solving, clinical judgment, and higher cognitive level. In fact, many of the definitions found in the literature use one or more of these terms when defining higher order thinking. I will attempt to describe higher order thinking skills in such a way that the explanation aligns with essential nursing components found throughout nursing literature.

Creating one's own description and definition of a term requires deep research into the literature. There are many descriptions of higher order thinking; however, because many of the definitions are borrowed from other disciplines, they vary in usefulness for nursing. Higher order thinking requires more than recall; the learner must think critically about the information (DeYoung, 2009). The components in nursing education that are associated with HOTS are critical thinking and problem-solving skills, both of which lead to the development of sound clinical judgment (Benner et al., 2009; Muntean, 2012; NCSBN, Winter 2018). It is essential for the nurse to have reasoning skills in order to make sound, reliable clinical judgments (NCSBN, Summer 2018). Moving forward, I will discuss the three essential components necessary for higher order thinking skills in nursing: critical thinking, problem-solving, and clinical judgment.

**Critical Thinking**

Critical thinking has been a focus in nursing and nursing education since the late 1980s. It is considered one of the "expected outcomes" of the generalist baccalaureate nursing graduate according to *The Essentials* document (AACN, 2008, p. 5). High quality nursing care is delivered when good thinking or critical thinking occurs (Rubenfeld & Scheffer, 2015). Critical thinking occurs when a nurse exhibits creativity, flexibility, intellectual integrity, open-mindedness, perseverance, and reflection while practicing the cognitive skills of analyzing, applying, discriminating, reasoning, and transforming knowledge (Rubenfeld & Scheffer, 1999). In addition to these traits, the critical thinking nurse incorporates questioning into the nursing care provided (Clark, 2008; Fero, Witsberger, Wesmiller, Zullo, & Hoffman, 2009). Fero et al. (2009) identify critical thinking as an essential skill for the nurse providing care but also identifies critical thinking as necessary to advance the practice of nursing. Advances in nursing lead to innovation and continual learning (Newton & Moore, 2013). Clark (2008) also comments on the importance of critical thinking: "Noncritical thinking is costly in money and in quality of life" (p. 25). Therefore, nurse educators must teach nursing students how to critically think like a nurse. Critical thinking as described by the NCSBN (Fall 2017) "involves the skill of using logic and reasoning to identify the strengths and weaknesses of alternative health care solution conclusion or approaches to clinical or practice problems" (p. 3).

Clinical reasoning is the ability to reason using critical thinking while "capturing a patient's trends and trajectories" (Benner et al., 2010, p. 85) when a clinical situation

may change. Various literature sources as well as professional organizations often use critical thinking and critical reasoning interchangeably. For the intention of this plan of study, critical thinking will be considered necessary as a fundamental skill for clinical reasoning in nursing education as outlined in the Next Generation NCLEX Project (NCSBN, Fall 2018). Nurse educators need to help students with critical thinking skills early in the nursing program, whereby, problem-solving skills develop as the student moves throughout the curriculum.

**Problem-Solving Skills**

Problems are considered central to healthcare. Why do the majority of people seek healthcare? The answer, most commonly, involves a problem. The patient has encountered a problem which is limiting their abilities, activities, or well-being, and they want it taken care of. Nurses help to solve problems daily in healthcare.

Problem-solving in nursing includes developing and evaluating interventions to resolve complex problems within the context of nursing's scope of practice (NCSBN, Fall 2018, p. 3). Benner et al. (2010) referred to problem-solving in nursing education as using critical thinking and reasoning to "solve clinical puzzles" (p. 221). As noted with the definition of problem-solving by the NCSBN (Fall 2018), the problems in nursing are complex. Nurse educators need to work with students to develop problem-solving skills for the realities of challenging, acute patients requiring nursing care. With such complexities in the healthcare system, nurses must employ an array of skills and knowledge to provide appropriate, safe patient care. This care includes critical thinking

and problem-solving skills leading to the best clinical judgment possible (Benner et al. 2010).

**Clinical Judgment**

Clinical judgment refers to "the skill of recognizing cues about a clinical situation, generating and weighting hypotheses, taking action and evaluating outcomes for the purpose of arriving at a satisfactory clinical outcome" (NCSBN, Fall 2018, p. 3). This judgment is the observed outcome of critical thinking and decision making (Benner et al., 2009; NCSBN, Summer 2018). As noted, nurses are responsible for many decisions which requires sound clinical judgment (NCSBN, Fall 2017). This clinical judgment necessitates critical thinking at a deeper level of thought processing referred to as clinical reasoning (Bradshaw & Hultquist, 2017; Clark, 2008).

Clinical judgments form the basis of patient care (Rubenfeld & Scheffer, 1999). Nursing educators can help students develop clinical judgment through analyzing circumstances, reviewing consequences, and coaching about priorities (Benner et al., 2009; Benner et al., 2010). Nurse educators assess student's clinical judgment by observation of clinical care and performance on classroom tests. Since healthcare needs are multifarious and ever changing, the nurse must address these needs by thoroughly thinking through situations and setting priorities to make the best possible nursing judgment for safe patient care (Benner et al., 2010; NCSBN, Summer 2018). Graduate nurses are assessed on their judgment abilities on the licensure examination. Presently, this examination is undergoing modifications to ensure clinical judgment skills are assessed as to meet the current needs of the registered nurse.

## Next Generation NCLEX (NGN)

Upon graduation from a school of nursing, students must take a licensure examination. Graduate nurses take this high stake's licensing examination in order to practice as a registered nurse (RN). This examination, National Council Licensure Examination (NCLEX), is taken after successful completion of a nursing program. The test sets requirements that measure the competencies needed to safely and effectively function as a "newly licensed, entry-level RN" (NCSBN, 2019b, p. 3). The latest practice analysis reveals that today's nurses are responsible for a significant amount of the decisions made in healthcare and these decisions require sound clinical judgment skills (NCSBN, Fall 2017). In addition to clinical judgment skills, research finds that problem-solving, and critical thinking skills are reported as "top skills" or essential components required of current entry-level registered nurses (NCSBN, Fall 2018, p. 3).

Currently, research is being conducted regarding the future of the licensing examination. The Next Generation NCLEX project consists of several phases of research reviewing the future rigor and quality of the NCLEX based on practice analysis results (NCSBN, Fall 2017). This research is exploring test questions that would enhance the measurement of necessary nursing skills such as clinical judgment (NCSBN, 2019b). According to the NCSBN, the Next Generation NCLEX could take effect as early as 2023 (NCSBN, 2019b).

## Statements of Significance

Without question, being a nurse requires sound clinical judgment and problem-solving skills. Society expects that the registered nurse will provide the best nursing care

possible. Unfortunately, new registered nurses may not be prepared to make clinical decisions (Muntean, 2012; Rusch, Manz, Hercinger, Oertwich, & McCafferty, 2019; Saintsing, Gibson & Pennington, 2011). New graduates are entering the workforce without the necessary clinical judgment skills to apply the nursing care patients need today (Del Bueno, 2005; Kavanagh & Szweda, 2017; Saintsing et al., 2011). Practicing registered nurses who precept soon to graduate nurses revealed in a study that these future nurses lacked prioritization and management of complex patients (Rusch et al., 2019). Additionally, in another study hospital administrators report dissatisfaction with new nurses' judgment skills (Muntean, 2012). Poor clinical judgment skills may lead to patient safety issues and poor patient outcomes.

Many are looking to nursing education for a solution. The literature cites this lack of preparation as a probable gap within nursing education, calling it an education-practice gap. This gap refers to what is being taught in nursing education programs is not what is happening in the real practice world. Certainly, health care today offers challenges that did not exist in the 20th century. The rapidly changing, complex health care environment demands nurses who are better educated coupled with a high competency level of skills for this dynamic time (Benner et al., 2010; Del Bueno, 2005; Feller, 2018; Gibbens & Morton, 2010; Ruth-Sahd, 2013). Therefore, a considerable gap has been identified between what is taught, how it is being taught and what is practiced at the clinical bedside (Gibbens & Morton, 2010; Ruth-Sahd, 2013).

This education-practice gap must be addressed in nursing education. Conversations need to focus on how teachers are helping students learn for the healthcare

needs of today and in the future. Currently, the situation suggests that nursing education methods are reflective of past generations with a highly structured design of education. The learning needs of today require a modification of this structured approach to teaching while embracing, creating and encouraging an environment for learning (M. Adams & Valiga, 2009). Faculty must be prepared with the current healthcare needs as well as the evolving educational trends for the learners of today. Guiding students through the need for content knowledge leading to clinical application for nursing care requires faculty excel at teaching by example (Benner et al., 2010).

Couple the recognized education-practice gap with a shortage of nurses and nurse educators, nursing education must respond. While the nursing shortage has been traced back to the 1990s, the fact remains a shortage exists now and will continue into the future (AACN, 2017; Benner et al., 2010; Catalano, 2015). The projection is the shortage will intensify as the baby boomers age and their healthcare needs grow (AACN, 2017).

The Institute of Medicine (IOM) launched an initiative report to respond to the needs of nursing education heading into the future (IOM, 2010). This initiative considered the many challenges nursing education faces and presented recommendations to advance the educational system for nurses (IOM, 2010). The report suggests nursing education move from task-based proficiencies to higher-level competencies which provide the foundation for decision making skills and clinical judgment (IOM, 2010). The IOM report (2010) posed that nurses need to be educated in such a way as to best deal with the realities of healthcare in the 21st century by creating an action-oriented blueprint for the future of nursing. An example identified in the report which is pertinent

to this study references educating students to have higher level decision making skills in the care setting (IOM, 2010).

## Purpose of the Study

A review of literature and evaluation of the current state of healthcare have revealed that nurses now more than ever need to think using higher order skills. The use of higher order thinking leads to sound clinical reasoning and effective decision making. Nursing faculty must ensure students have these higher order thinking skills to operate in the complex field of professional nursing practice.

Assessing student ability to apply higher order thinking to nursing content is of utmost importance (Benner et al., 2010). While the licensure council (NCSBN) is currently conducting research involving higher order thinking assessment, nursing education needs this investigation as well (Benner et al., 2010; Bristol et al., 2018; Kavanagh & Szweda, 2017). Nurse educators need to accurately assess students to ensure they are developing the necessary thinking skills as they move towards the registered nurse role. Hence, this study aimed to explore nursing faculty's understanding of higher order thinking test questions and practices for preparing a test for undergraduate baccalaureate nursing students.

## Research Questions

Research questions are general questions that allow study participants to explain their ideas (Creswell, 2014). The following research questions guided this qualitative research:

1. What are undergraduate nursing faculty's understanding of higher order thinking test questions for the baccalaureate nursing student?
2. What practices are involved when undergraduate nursing faculty prepare a nursing test?

## Conclusion

In summary, nursing education must respond to the need for higher order thinking by registered nurses in the clinical area. Nurse educators are on the ground floor for assessing these thinking skills. If students are not effectively implementing higher order thinking skills while delivering nursing care, their future patients may suffer. Appropriate higher order test questions are necessary to assess the application of nursing knowledge for sound nursing decisions.

Assessing for higher order thinking takes time and necessitates knowledge about designing test items to evaluate for such competency. Unfortunately, without appropriate training, most test writers develop lower quality items which focus on factual recall of content using little thinking skills (Tarrant & Ware, 2012). The literature abounds with countless guides to help faculty with the development of higher level thinking test questions (Billings & Halstead; 2016; Bristol & Brett, 2015; Clifton & Schriner, 2010; McDonald, 2018; Morrison & Free, 2001; Oermann & Gaberson, 2014; Tarrant & Ware, 2012; Su et al., 2009; Sutherland et al., 2012). Since test items assessing for higher order thinking are most effective when written at the application or higher cognitive level (McDonald, 2018), gathering information from faculty about their higher order thinking

knowledge and test construction practices will be helpful to the nursing education community.

## Definitions of Terms

*Clinical care*: Nursing care that is preformed within the confines of a healthcare facility. This care can be delivered in an acute care hospital, long term care facility, in the home, free-standing clinic, or surgery center.

*Competency:* A nursing student displays competency when they are able to satisfactorily perform abilities/skills necessary for a student nurse. Being competent requires an integration of knowledge, skills, values and attitudes being applied to different situations (Fukada, 2018).

*Critical thinking*: A cognitive process involving the skill of using logic and reasoning to make appropriate decisions about what to do (Brookhart & Nitko, 2015; NCSBN, Fall 2017).

*Higher order thinking*: Deeper thinking that enhances construction of understanding. It requires the application of knowledge and skill in novel situations (Brookhart & Nitko, 2015).

*National Council of Licensure Examination (NCLEX)*: The licensing examination a graduate nursing student must pass successfully in order to practice as a registered nurse.

*National Council of State Boards of Nursing (NCSBN)*: An independent, not-for-profit organization through which nursing regulatory bodies act and counsel

together on matters of common interest and concern affecting public health, safety and welfare, including the development of nursing licensure examinations (NCSBN, 2019a).

*Next Generation NCLEX (NGN)*: Future innovations to support the rigor and quality of the NCLEX enhancing the measurement of entry-level nursing competency including clinical judgment (NCSBN, 2019b).

*Nurse faculty/educator*: The nurse educator is a teacher of nursing who is responsible to facilitate learning, use assessment and evaluation strategies and foster learner development and socialization (NLN, 2012b). For this study, the nurse educator will function within the educational, academic environment of an accredited four-year (baccalaureate) college of nursing within a university setting.

*Nursing education (for this study)*: This study will involve the collegiate four-year baccalaureate education for the registered nurse (RN). The education will be through an accredited college of nursing in which the successful graduate will have earned a Bachelor of Science in Nursing (BSN).

*Practice (noun-relating to test preparation):* A performance or action for doing something. This can refer to the action, manner, or conduct for completing an exercise or continuous work in a profession (Merriam-Webster, 2019).

*Test question:* Used within an assessment for learning. The question is generally comprised of a stem which asks the question followed by a set of responses or options from which a student would select an answer. Test questions are objective items that are scored correct or incorrect (Suskie, 2009).

## Abbreviations

HOT: Higher order thinking

HOTS: Higher order thinking skills

NCLEX: National Council Licensure Examination

NCSBN: National Council of State Boards of Nursing

NGN: Next Generation NCLEX Project

RN: Registered nurse

# CHAPTER II

# REVIEW OF LITERATURE

## Higher Order Thinking

Higher order thinking is composed of advanced thinking skills necessary for the nurse to make sound, prudent clinical decisions. This thinking moves beyond basic understanding of a concept. Using higher order thinking skills, the learner can "construct deeper, conceptually-driven understanding" (Schraw & Robinson, 2011, p. 2). Higher order thinking skills allow students to function within a world that is rapidly changing and driven by advancing technology (Brookhart & Nitko, 2015). In the profession of nursing, clinical judgment, problem-solving and critical thinking are reported among the top skills required of entry-level registered nurses (NCSBN, Winter 2018). These three skills are components of higher order thinking.

Recognizing higher order skills can be seen when the student is able to elaborate on a situation or concept while making inferences beyond what is presented. Analyzing and constructing further relationships with the situation occurs as the thinking process progresses (Lewis & Smith, 1993). Increasing demands to facilitate higher order thinking skills are occurring in higher education due to the perceived gap between what students are learning and what is valued by their future employers (Scully, 2017). "Changing economic and social trends are creating demands for HOTS in all citizens and schools are working to cultivate these thinking skills in students" (Resnick, 1987, p. 45).

Higher order thinking includes many terms involving cognitive learning. Such terms include critical thinking, reflective thinking, and sophisticated thinking (Schraw &

Robinson, 2011). It is the job of educators to teach for the development of higher order thinking; whereby, examinations will assess this thinking ability. Brookhart and Nitko (2015) asserted that when assessing for higher order thinking skills, the beginning knowledge would be understood in such a way as to build upon this knowledge within new situations.

In a 2015 study, it was found that knowledge alone is not enough to substantiate the clinical judgment essential to safe nursing practice (Muntean, 2015). The study concluded that no single element of clinical judgment predicts a nurse's clinical ability; it is a combination of higher thinking elements that add to the validity and reliability of a nurse's clinical judgment (Muntean, 2015). Thus, "having content knowledge does not always translate to having clinical judgment skills" (NCSBN, Winter 2019, p. 2). This research posits that testing must assess these thinking skills (clinical judgment, problem - solving and critical thinking) through higher order thinking test questions using the levels of application and analysis.

## Medical Errors

Concern continues to grow for the high rates of medical errors and injuries in healthcare. In a study by Schoen et al. (2005) between one-quarter to one-third of patients in acute care experienced medical errors. Fero et al. (2009) found that one in four nurses lacked critical thinking abilities necessary for tasks involving the performance of independent nursing care and problem identification. A John Hopkins study reports medical errors are the third-leading cause of deaths in the United States (McMains, 2016). The John Hopkins' researchers extrapolated all the data from

hospitalization deaths and found this data translates to nine and a half percent of all deaths each year in the United States are from medical errors (McMains, 2016). These facts and statistics are alarming.

One of the most serious nursing interventions preformed daily by a registered nurse involves the administration of medications. This task can lead to positive patient outcomes, or death. Understanding the complexities of the thousands of drugs available requires higher order thinking skills. The use of higher order thinking with medication administration leads to safe drug delivery. Medication errors harm an estimated 1.5 million people every year (da Silva & Krishnamurthy, 2016). Although this study will not address specific errors, it is important to realize the seriousness of nursing actions and why higher order thinking in education with assessment is necessary for nursing faculty to use in the classroom.

The literature teems with personal stories of errors in the healthcare environment. While these are difficult to comprehend, those working in the medical field must react. Nursing education needs to respond to such tragedy and ensure nurses are armed with higher order thinking skills to make effective, sound, safe clinical decisions. The distressing statistics presented support the need to implement higher order thinking skills in nursing education with ongoing assessment throughout nursing programs.

## Theoretical Framework

The principles of learning theory, specifically cognitive learning theory, can be noted throughout discussions within this study. As Grant and Osanloo (2014) remarked, "the framework undergirds your thinking with regard to how you understand and plan to

research your topic" (p. 13). Since my research involves higher order thinking, it is only fitting that my theoretical lens involve cognition.

A guiding tenet in this framework is the learning and change that occurs in the student (Bastable, 2019). Commonly used in education, cognitive learning theory is viewed as an active process building within the learner as information is continually processed (Bastable, 2019). Knowledge and thinking (cognition) while accenting understanding leads the learner to active performance, such as patient care (Billings & Halstead, 2016). With cognitive learning, the student must discover, understand and apply content by actively engaging with material (Billings & Halstead, 2016).

Mental processing and knowledge acquisition are the focus for cognitivism. The emphasis is on understanding content and constructing knowledge leading to and from experiences (Billings & Halstead, 2016). Additionally, cognitive theorists associate learning with the capability of the individual to respond to situations through their actions (Aliakbari, Parvin, Heidari, & Haghani, 2015).

My research focus involves higher order thinking and the need for faculty to assess for this thinking process. The guidance of cognitive theory is evident as the student nurse takes in information and uses this knowledge though the processes of application and analysis both in the classroom and clinical area. When a student is able to apply and analyze different situations, successful outcomes in clinical practice and on the licensure examination, will occur (David, 2015). This study will be referencing Dr. Patricia Benner's nursing theory (1984), *From Novice to Expert*, and Dr. Benjamin Bloom's cognitive domain theory (1956), *Bloom's Taxonomy of Educational Objectives*.

Both theories exemplify cognitive learning involving the thinking processes student nurses need to function in the dynamic world of healthcare.

## Theorist Dr. Patricia Benner

Dr. Patricia Benner is a nursing theorist whose theory, Novice to Expert (1984), proposed that the nurse develops skills and understanding of patient care over time with proper education, learning, and experience. The focus of the theory is how nurses acquire nursing knowledge (Petiprin, 2016). Novice to Expert has been used world-wide as a framework for assessing nurses' needs at different stages throughout their professional career as a registered nurse (Petiprin, 2016).

Dr. Benner's early personal nursing experience piqued her interest to the true realization of what nurses did in their own practice. Additionally, she was acutely aware of the lack of background knowledge necessary for clinical care (Benner, 2018). Benner went on to complete research which revealed that nursing knowledge is learned over time and nurses change their intellectual process for decision making based on awareness and experience. Dr. Benner's research led to the identification of five levels of nursing proficiency (Carlson, Crawford, & Contrades, 1989).

Benner's theory was driven by the Dreyfus Model of Skill Acquisition (Benner, 1984). The Model of Skill Acquisition was applied to the nursing theory, Novice to Expert, with the guidance of Drs. Dreyfus and Dreyfus (Benner, 1984). While neither Dreyfus brothers are nurses, Dr. Benner was able to adapt and use their model stages in her Novice to Expert theory development as well as subsequent research.

**The Influence Dreyfus' Model of Skill Acquisition had on Benner's Novice to Expert**

Siblings Stuart and Hubert Dreyfus developed their theory of skill acquisition in 1980 through research supported by the United States Air Force (Dreyfus & Dreyfus, 1980). The original goal for their study was to help understand how one develops skill performance as to better design training programs for Air Force pilots (Dreyfus & Dreyfus, 1980). Their findings revealed that training programs, materials, and experience are essential for the facilitation of higher order skills required for important positions, such as pilot.

The Dreyfus model is developmental and based on situated and experiential learning similar to nursing (Benner, 2004). As the Dreyfus model suggests, experiential learning requires an engaged learner with a well-established foundation of knowledge (Benner, 2004). Experiential learning requires openness to learning and responsiveness by the student to improve with practice and application of content over time (Benner, 2004).

Dreyfus and Dreyfus (1986) contend that learners "do not leap suddenly from rule-guided 'knowing that' to experience-based know-who" (p. 19). Their research reveals that skill acquisition is a skill learning process in which a person passes through stages as skills develop and improve (Dreyfus & Dreyfus, 1986). The Model of Skill Acquisition has "five stages of qualitatively different perceptions of his task and/or mode of decision making as his skill improves" (Dreyfus & Dreyfus, 1986, p. 19).

The Dreyfus model asserts that not all people achieve the highest level or stage in their skill acquisition model. The brothers state that the stages were developed because:

> (1) Each individual, when confronting a particular type of situation in his or her skill domain, will usually approach it first in the manner of the novice, then of the advanced beginner, and so on through the five stages, and (2) the most talented individuals employing the kind of thinking that characterizes a certain stage will perform more skillfully than the most talented individuals at an earlier stage in our model. (Dreyfus & Dreyfus, 1986, p. 21)

There are five stages in the Dreyfus Model of Skill Acquisition (Dreyfus & Dreyfus, 1980). The first stage is novice then follows advanced beginner, competent, proficient, and lastly expert (Dreyfus & Dreyfus, 1980). Dr. Patricia Benner used these five stages and their characteristics when developing her nursing theory, Novice to Expert (Benner, 1984). She considers the stages to be proficiency levels of nursing skills (Benner, 1984). Benner adheres to the nature of the Dreyfus model, whereby the situations encountered by the nurse reflect the level of competency for the individual. This model is reflective of nursing due to the many different situations a nurse encounters daily (Benner, 1984).

**From Novice to Expert**

Dr. Patricia Benner's book, *From Novice to Expert,* published in 1984 is considered one of the major contributions to the profession of nursing. The theory is still used today with the practice of nursing and nursing education and is commonly cited in nursing literature. The goal of this work examines skill acquisition based on clinical learning while using knowledge rooted in nursing practice (Benner, 2001). The student

nurse or nurse follows the path from novice to expert throughout his or her educational learning or nursing career.

The acquisition of practical experience and skills has been a critical feature for the development of professional expertise as outlined in Dr. Benner's theory (Benner, 1984; Hatlevik, 2011). Using the theoretical idea of moving from novice to expert in nursing, Benner (1984) emphasizes learning enhanced from experience with growing knowledge as the student/new nurse progresses through the stages (Davis & Maisano, 2016). The nurse's behavior and actions are expected to change based on what is learned with moving from one stage to the next.

Although the Novice to Expert theory was developed with nursing practice in mind, it is relevant to nursing students as they progress in levels of learning and knowledge acquisition throughout the nursing program (Billings & Halstead, 2016). Benner (1984) herself noted, "skilled nursing requires well-planned educational programs" (Benner, 1984, p. xix). I will designate the application of this theory within the classroom setting and with the assessment of higher order thinking skills while addressing the education-practice gap existing in nursing education today.

**Stage 1: Novice**

The novice is considered the beginner. Beginners have no experience with the situations in which they are expected to perform. Benner (1984) suggests students be taught about these situations and the features of the task or skills necessary for the situation. Generally, the behavior of the novice is limited and inflexible which stems

from their lack of experience (Benner, 1984). Since the novice has no experience, they must be given rules or frameworks to guide their performance (Benner, 1984).

For many students, entering a nursing program is the first time they have any exposure to caring for sick people. Many of their thoughts about nursing originate from what they have viewed on the television or in movies. Beginning nursing students are true novices; they have little to no knowledge of nursing. First level nurse educators are in the position to help novice students gain foundational nursing knowledge and foster learning about nursing situations.

It is imperative nurse faculty begin early teaching students higher order thinking skills which will be built upon throughout the curriculum. These early teachings provide the necessary skills nurses need in this time of dynamic, complex and fast-paced healthcare (Kavanagh & Szweda, 2017). These skills need assessed throughout a nursing program. Unfortunately, in a study by Kavanagh and Szweda (2017) only "twenty-three percent of new graduate nurses demonstrate entry-level competencies and nursing practice readiness" (p. 57). Many healthcare employers rank the preparation of new graduates as inadequate (Benner et al., 2009). These concerning findings call for nurse educators to revisit how and what is being taught and assessed in undergraduate nursing programs. Consequently, an education-practice gap exists in the profession of nursing (Benner et al., 2010; Feller, 2018; Gibbens & Morton, 2010; Ruth-Sahd, 2013).

In order to prepare the next generation of nurses, faculty need to focus not only on knowledge acquisition but also clinical reasoning skills leading to safe, sound clinical decisions (Benner, 2009; Kavanagh & Szweda, 2017). The education-practice gap is

exacerbated by increasing patient acuity and decreasing lengths of stay in the acute care setting both of which necessitate a higher level of thinking for patient care delivery (Kavanagh & Szweda, 2017).

Novice nursing students need classroom preparation for clinical reasoning and must be assessed on the ability to transfer/apply classroom knowledge and skills to nursing practice. This classroom assessment requires the use of higher order thinking test items. Higher order thinking test items need to be used in nursing education (Billings & Halstead, 2016; Bristol et al., 2018; DeYoung, 2009; McDonald, 2018; Su et al., 2009). According to the NCSBN test plan (NCSBN, 2019b), "Since the practice of nursing requires application of knowledge, skills and abilities, the majority of items are written at the application or higher levels of cognitive ability which requires more complex thought processing" (p. 4).

Nursing test questions are considered a new situation for beginning nursing students. They have not encountered such "thinking" questions before in their educational journey. Faculty must prepare them for this situation and work with students for the application and analysis of their new knowledge (NCSBN, 2019c). Each classroom encounter should reflect application of the content being taught using teaching methods, which encourage students to begin thinking like a nurse (McDonald, 2018).

**Stage 2: Advanced Beginner**

During the second stage of Benner's theory, the student nurse or new nurse demonstrates a marginally acceptable performance (Benner, 1984). Advanced beginners follow the guidance of their instructor/preceptor as they explain guidelines or instructions

to the student. Assistance is needed as students begin to identify recurrent patterns but cannot follow through. This group cannot determine or think through priorities independently (Benner, 1984). An advanced beginner will seek out feedback on performance and pays attention to other students at their level (Benner, 2004).

As the student progresses into the advanced beginner stage, they are using the knowledge acquired from their instructors to achieve a near average score on an examination. While they still struggle with determining priorities for client needs, they are starting to comprehend some of the less complex situations presented (Benner, 1984). It is difficult for the student to transfer classroom theoretical concepts into clinical care. Accurate higher order thinking skills are not applied to nursing exams in all situations nor clinical care experiences.

The instructor will continue to work with students to develop thinking skills in relation to possible clinical situations during classroom instruction (Billings & Halstead, 2016). Students continue to tightly adhere to the guidelines presented for nursing care. It is the faculty's job to help the student move beyond the instructor directives by working and thinking through a variety of situations. Assessing the student's ability to transfer the classroom learning to possible nursing care situations can be assessed with application style examination questions. Reviewing the test results will allow the faculty to adjust teaching methods as necessary to ensure students are beginning to develop the thinking skills required for clinical care. "Continued assessment of student performance in didactic settings is necessary to make adjustments to teaching" (Billings & Halstead, 2016).

**Stage 3: Competent**

A competent student nurse or new nurse begins to consciously see how to deal with a variety of situations. Conditions are deeply contemplated, and the student or nurse feels they are mastering skills (Benner, 1984; Davis & Maisano, 2016). This deliberate thinking helps to improve organization, but the student and new nurse still struggle with speed and flexibility (Benner, 1984). The competent nurse or student attempts to limit the unexpected by planning and forecasting the future (Benner, 2004). This stage warrants anxiety as they begin to realize situations require more thorough consideration about specific details (Benner, 2004).

Being competent in the classroom reveals that the student is able to think through different situations and anticipate what may come next. Priority skills are developing but take extra time to think through the process. Higher order thinking skills are applied to most nursing questions with above average success. Additionally, higher order thinking skills are transferred to some, but not all, clinical care situations.

At this point, examination questions based on real patient care scenarios that require analysis, engage and encourage the competent student. The more practice faculty gives which requires higher order processing skills, the more quickly the student can apply clinical reasoning to answer test questions. Being successful with the application of critical thinking skills, the student will be able to begin the transfer of thinking skills into clinical practice (Anderson & Krathwohl, 2001).

**Stage 4: Proficiency**

Proficient students or new nurses can understand and view a situation in totality (Benner, 1984). In this stage, the proficient student or nurse has learned from past experiences what to expect and plans accordingly (Benner, 1984). The nurse or student has the ability to contemplate the situation to guide nursing actions (Benner, 2004). There is a new comfort and confidence in dealing with nursing clinical care (Benner, 2004). A proficient nurse's performance is based on keen perception (Carlson et al., 1989).

A proficient nursing student can develop his or her *own* learning activities in which complex situations exist. Often the student relies on his or her own clinical experience to augment classroom conceptual learning. The student now has the reasoning skills necessary, along with critical thinking, to use higher order thinking for answering the majority of test questions correctly. Additionally, the student uses this higher order thinking when performing in the clinical setting (Koharchik, 2015).

Proficient students are getting ready to graduate from an undergraduate nursing program and are preparing to take the licensure examination. These students can identify their weakest content areas and study to deepen their understanding. It is important to note, not every nursing student progresses to this stage (Benner, 1984). There are students who struggle throughout their nursing program and just get by. The struggling student often uses test taking strategies to answer test questions without using higher order thinking skills (Billings & Halstead, 2016; Bristol et al., 2018; DeYoung, 2009; McDonald, 2018; Su et al., 2009). Unfortunately, this student may pass the licensure

examination to be a registered nurse. The nurse with poor thinking skills finds future clinical practice a hardship. Often, fellow nurses can identify the weak nurses and will report these nurses for poor quality nursing care (Kavanagh & Szweda, 2017). Frequently, these inadequate nurses seek non-clinical roles or leave nursing all together.

**Stage 5: Expert**

In this final stage of Benner's Novice to Expert theory, expert nurses connect their vast knowledge of concepts to the appropriate, safe nursing action (Benner, 1984). "The expert operates from a deep understanding of the total situation" (Benner, 1984, p. 32). With this expertise comes an enormous background of experience. This nurse can zero in on problems without wasting time on fruitless solutions or decisions (Benner, 1984).

Expert nurses are highly respected for their knowledge and nursing care. They are easily recognized by fellow health care professionals. Novice nurses tend to gravitate toward the expert nurse, often choosing the expert as their mentor. The expert nurse delivers highly proficient care while being flexible and adaptable to the complexities of today's health care needs (Carlson, Crawford, & Contrades, 1989). Furthermore, the expert nurse is confident in the nursing care delivered as well as the decisions made. As Dr. Benner (1984) points out, "not all nurses will be able to become experts" (p. 35).

It is extremely rare to have a nursing student progress to the expert stage. If this does occur, it is usually observed with a registered nurse who has years of experience (Benner, 1984) and returns to a college or university school of nursing to obtain a baccalaureate college degree in nursing. The expert nurse is generally a lifelong learner and seeks to continue their education to further the profession of nursing.

**Applying Novice to Expert to Nursing Education**

The use of the theory Novice to Expert has value within nursing programs. Carlson et al. (1989) reported positive student outcomes when the novice to expert levels were used with students. The students were able to identify their personal proficiency with content whereby improving clinical application of nursing care (Carlson et al., 1989). With many schools of nursing using simulation as clinical experience or an extension of clinical, the Benner theory is used for this educational avenue as well (Larew, Lessans, Spunt, Foster, & Covington, (2006).

As noted, clinical literature can be found to support Benner's work for students in the clinical environment, but there is no literature regarding her theory application regarding assessment in the classroom. My study will explore how nursing faculty work through the assessment process with students throughout a nursing program. Higher order thinking must be assessed with nursing students at every level therefore, faculty's testing practice should reflect the student's ability to use such thinking.

**Theorist Dr. Benjamin Bloom**

Benjamin S. Bloom is often credited with being the pioneer of higher order thinking skills. Bloom's taxonomy is a framework used by many for assessment and testing that encourages the development of complex reasoning and problem-solving skills (Guskey, 2012). Early on in his academic career, Benjamin Bloom was interested in the way students think. Much of his early research involved investigating the thinking process used by students for solving problems (Bloom, 1947). His research journey continued through the 1940s and early 1950s eventually leading to the development of a

taxonomy framework for educational objectives within the cognitive domain (Bloom, 1956).

Dr. Bloom worked with fellow College Examiners in the 1940s and 1950s who were concerned with the lack of communication between educators. This lack of communication led to a text in which educators could evaluate student learning using a common structure to promote the exchange of test materials (Anderson & Sosniak, 1994). Eventually the framework led to a "system of classifying the goals of the educational process while using educational objectives" (Bloom, 1956, p. 4). According to Bloom and the group, such a framework was necessary since they believed educational objectives provided the basis for building curricula and tests (Bloom, 1956).

By the time the *Taxonomy of Educational Objectives* was published in 1956, the group had worked eight years developing this handbook. It was proclaimed to be of "general help to all teachers who deal with curricular and evaluation problems" (Bloom, 1956, p. 1). This text includes a range of possible educational goals (or outcomes) in the cognitive domain of education. The term "cognitive" within this handbook refers to activities such as recalling knowledge, thinking, problem-solving, and creating (Bloom, 1956).

The taxonomy was designed to assist faculty with planning learning experiences and preparing assessments using different "intellectual abilities and skills" (Bloom, 1956, p. 7). A founding belief of this group was that education changes the behavior of the student (Bloom, 1956). Therefore, the taxonomy is considered a classification system of student behaviors. The handbook points out "We are not attempting to classify the

particular subject matter or content, instructional methods nor instructional material. What we are classifying is the intended behavior of students" (Bloom, 1956, p. 12). The behavior intention refers to the conditions or situations in which the student would demonstrate their learning while using cognitive processing or thinking skills (Anderson & Krathwohl, 2001).

**Bloom's Taxonomy**

Bloom's *Taxonomy of Educational Objectives* (1956) organizes six levels or classes within the cognitive domain. Each level progresses upward in complexity which Forehand (2010) depicted as a "stairway" to higher levels of thinking (p. 42). The six levels include: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956). Typically, a pyramid image is used to represent the taxonomy with knowledge being the bottom or foundation upon which the remaining levels rise above to the pointed peak of evaluation. This arrangement reflects rising from the specific and relatively concrete thinking to more complex and abstract learning (Anderson & Sosniak, 1994). "The objectives in one class are likely to make use of and be built on the behaviors found in the preceding classes" (Bloom, 1956, p. 18).

**Knowledge.** The beginning level or the most basic level is knowledge which emphasizes remembering either by recall or recognition (Bloom, 1956). The behavior focuses on the student's ability to recall content that has previously stored. Content remembered is most commonly isolated and recalled separately. Bloom (1956) commented the most basic content in any field is the terminology and knowledge of such terminology is the beginning of continual thinking. Having knowledge of specific

content is necessary for moving through the complex levels of the taxonomy (Anderson & Sosniak, 1994; Bloom, 1956).

**Comprehension.** Bloom (1956) identifies the comprehension class "as the largest general class of intellectual abilities and skills emphasized in schools and colleges" (p. 89). When a student is able to describe and/or explain their learned knowledge, comprehension has taken place (Scully, 2017). The comprehensive level is considered a lower level of learning (Zaidi et al., 2017). During comprehensive learning, the student can make sense out of what they have learned and is able to paraphrase content (Brookhart, 2010; Hayter, 1983.) Comprehension involves basic understanding and the ability to give meaning to the elementary content learned (Bloom, 1956; Brookhart, 2010).

**Application.** The third level of Bloom's taxonomy is application. Depending on the discipline, this level begins higher order thinking (Zaidi et al., 2017). Learning within this level includes the ability to understand content but in a new context (Suskie, 2009). During the application of knowledge, students can apply principles of knowledge (content) to new situations, whereby working through problems leading to the development of problem-solving skills (Bloom, 1956; Suskie, 2009). Evaluating students for the application of content is one of the most important aspects of the entire assessment process (Bloom, 1956).

**Analysis.** Analysis involves the breaking down of information into parts, then reasoning through the information (Anderson & Sosniak, 1994; Bloom, 1956; Brookhart, 2010; Suskie, 2009). An integration of learning takes place with relating new content to

what the student already knows (Suskie, 2009). Using analysis, the student often identifies patterns whereby they can better organize the content to improve their deeper thinking skills (Bloom, 1956). Relationships between ideas are formed as the organization of content is understood when a student analyses a situation (Bloom, 1956; Bloom, Hastings, & Madaus, 1971).

**Synthesis.** Moving up in the taxonomy to synthesis is where the learner can arrange elements and put them together to form a whole (Anderson & Sosniak, 1994; Bloom, 1956; Brookhart, 2010; Suskie, 2009). This new whole involves a pattern or idea that was not present before (Bloom, 1956; Suskie, 2009). Essentially a new product is formed (Su & Osisek, 2011). Synthesis provides for creative behavior, "creative learning" and "unique" expression on the part of the learner (Bloom, 1956, p. 165). Learning tasks involving synthesis provides a wider type of experience over the other classes of the taxonomy (Bloom, 1956).

**Evaluation.** The final level of Bloom's taxonomy is evaluation. Within the evaluation level, the learner is deciding the judgment of learned content by using specific criteria (Bloom, 1956; Scully, 2017). Judgments made are considered informed due to the ability to use cognitive abilities to extend from the other categories of the taxonomy (Anderson & Sosniak, 1994). Bloom (1956) stated, "evaluations are highly conscious and ordinarily are based on a relatively adequate comprehension and analysis of the phenomena to be appraised" (p. 186). Not all learners achieve the evaluation class of the taxonomy.

**The Revision of Bloom's Taxonomy**

Bloom's taxonomy was revised in 2001 by Lorin Anderson and David Krathwohl (Table 1). Both have a history with Benjamin Bloom, in that Anderson was a student of Bloom's and Krathwohl was a fellow creator of the original taxonomy (Wilson, 2013). The revision was created to "refocus educators' attention on the value of the original handbook . . . second there is a need to incorporate new knowledge and thought into the framework" (Anderson & Krathwohl, 2001, p. xxi-xxii).

There are notable differences between the original taxonomy and the revision. The original taxonomy viewed learning in a single dimension, whereas the revised version is two-dimensional. The two dimensions involved are cognitive process and knowledge (Anderson & Krathwohl, 2001). The knowledge dimension contains four categories of knowledge: factual, conceptual, procedural, and metacognitive (Anderson & Krathwohl, 2001). Additionally, in the revision, three of the categories were renamed, the order of two of the classes were interchanged, and a few of the level names were changed from the noun form to the verb form (Krathwohl, 2002). The change to the verb form better emphasizes the *active* behaviors faculty require of their students while meeting classroom objectives (Seaman, 2011).

Table 1

*Bloom's Taxonomy and the Revision*

| **Original (1956)** | **Revision (2001)** |
|---|---|
| Knowledge | Remember |
| Comprehension | Understand |
| Application | Apply |
| Analysis | Analyze |
| Synthesis | Evaluate |
| Evaluation | Create |

While the original taxonomy had a focus on hierarchical structuring for learning, the revision is not as rigid (Krathwohl, 2002). The revision allows for some overlap between categories and encourages teacher flexibility (Seaman, 2011). The revised taxonomy provides a table using the two dimensions which allows educators to visualize the content (Krathwohl, 2002). The revised taxonomy table can also provide a representation of curricular alignment and educational voids (Krathwohl, 2002).

**Applying Bloom's Taxonomy to Nursing Education**

Understanding the cognitive levels and how to effectively use them will help nursing faculty with the development of higher order thinking examination questions. Nursing test items need to be of higher cognitive levels for higher order thinking to be demonstrated with patient care (Su et al., 2009). These higher order thinking skills

(HOTS) can then be transferred and applied to clinical needs for a variety of patients (Su, Osisek, & Starnes, 2004).

The literature addresses the need for nursing programs to use Bloom's taxonomy for effective teaching. A goal for the use of the taxonomy in nursing is for positive outcomes with patient care (Bastable, 2019; Billings & Halstead, 2016). Phrasing learning goals within the classroom that are at higher cognitive levels encourages the student to gain a more rich understanding with deeper intellectual abilities (Bastable, 2019; Billings & Halstead, 2016). This understanding must be assessed at this higher level to ensure higher order thinking has taken place. Test items need to address the cognitive processes nurses use such as critical thinking, clinical judgment, and clinical decision making (Billings & Halstead, 2016). Evaluation, assessment, and testing of these thinking processes should "place an increasing emphasis on higher-level skills" (Billings & Halstead, 2016, p. 425).

## Consideration of Novice to Expert and Bloom's Taxonomy With the Next Generation NCLEX Project (NGN)

Nurse educators need to be informed about what future nurses need in their nursing programs in order to be competent in clinical care. Current research reveals concern with the ability of new graduates preforming in the clinical area. Research evidence supports the fact that novice nurses lack clinical judgment and decision-making skills necessary for today's patient care needs (NCSBN, 2019c). This research study looked at nursing faculty's understanding of higher order thinking skills with testing and

what practices are used when nursing tests are prepared for undergraduate baccalaureate nursing students.

**Novice to Expert and NGN**

The approach for this research considered Patricia Benner's theory Novice to Expert through the application of the levels to the nursing student in the classroom. Benner et al. (2010) called for the transformation of nursing education in which the dichotomy between classroom teaching and clinical realities are realized and changed. The integration of classroom and clinical teaching must be included in this transformation (Benner et al., 2010; Rubenfeld & Scheffer, 2015). The "good of the patient" is dependent on classroom faculty engaging students in clinical type situations where their higher thinking knowledge is applied (Benner et al., 2010, p. 14). This application of clinical conditions is evaluated through assessments in the classroom and patient care in the clinical area.

Student nurses arrive to nursing programs as true novices. Faculty must facilitate their learning of the *rules* of nursing early in nursing programs (Benner, 2001; Caputi, 2016, 2019). As students progress through the curriculum, nurse educators help them think through and apply these rules to all patients (Benner 2001; Caputi, 2016, 2019).

Nursing faculty need to initially share with students that nursing is not black or white, but grey (Caputi, 2016). This grey necessitates thinking beyond the rules. All components of various patient situations must be considered when working through the rules. If a student does not consider the context of different clinical and patient

situations, ineffective thinking and poor clinical decision making may occur (Caputi, 2016).

As the student moves beyond the novice stage, faculty guide the student with and in their thinking. This guidance leads to the application of principles, which will steer the student's actions (Caputi, 2016). As the student progresses, with the faculty's assistance, the student will begin to use clinical reasoning skills to make decisions that are "situation driven rather than rule driven" (Caputi, 2016, p. 5). These reasoning skills can be assessed on tests which employ various patient situations, whereby the student must apply the content learned. Examinations can aid faculty and students evaluate their progression through thinking skills using Benner's stages in the Novice to Expert theory (Caputi, 2016).

**Bloom's Taxonomy and NGN**

Benjamin Bloom's Taxonomy is concerned with the cognitive achievement of objectives. Nursing ultimately has a similar concern; the student must be able to think through nursing contexts in order to achieve positive patient outcomes. The taxonomy has hierarchal levels of cognitive learning. Knowledge is the first level and then the taxonomy progresses to the comprehensive level, both of which are considered lower order thinking levels. A lower cognitive level is considered basic, whereby basic recall and understanding are achieved. Once the levels move up to the application and above levels, higher order thinking begins (Bloom, 1956).

Bloom's Taxonomy is referenced in the NCLEX test plan (NCSBN, 2019b); "Since the practice of nursing requires application of knowledge, skills and abilities, the

majority of items are written at the application or higher levels of cognitive ability, which requires more complex thought processing" (p. 4). If the licensure examination uses higher order test questions, then nursing students need this level of assessment exposure throughout nursing programs.

Constructing higher order test items takes time and skill. Bloom's taxonomy is used as the guide in nursing literature to help with higher order assessment development. Throughout the literature, there can be found a list of verbiage recommended at each level to assist with constructing the desired level of question necessary for testing (Billings & Halstead, 2016).

## Summary

The importance of nursing students needing higher order thinking skills has been well documented within the literature. Using higher order thinking test questions in undergraduate baccalaureate nursing programs allows students to be familiar with the questioning format on the licensure examination. Furthermore, assessing for these skills will ensure students have the thinking ability to work through a variety of patient care situations requiring clinical reasoning for sound clinical decision making.

The literature has a plethora of how-to guides to assist faculty with assessment using effective, higher order test questions. This research investigated nursing faculty's understanding of higher order questions for their undergraduate nursing students. As documented from the literature, faculty often have limited experience with creating test questions; therefore, I explored what practices are used for test preparation.

# CHAPTER III

# METHODOLOGY

Nursing faculty routinely create examinations for students throughout the nursing curriculum. Assessment and evaluation, by testing, are often used as a measurement of students' learning and thinking. However, the developed test questions often fail to be of higher cognitive levels. The literature indicates the need for higher order thinking at the bedside for clinical competency. Therefore, nursing faculty need to ensure test questions require students to use a high level of cognitive thinking. The literature supports faculty generated test questions be of higher cognitive thinking ability to promote effective clinical judgment, reasoning, and decision-making skills. While the need exists for higher order questioning, the task of question development remains challenging and time-consuming for nursing faculty.

The following research questions gave direction for my study:

1. What are undergraduate nursing faculty's understanding of higher order thinking test questions for the baccalaureate nursing student?
2. What practices are involved when undergraduate nursing faculty prepare a nursing test?

## Design Method

A qualitative design was used for this research. According to Denzin and Lincoln (2003), qualitative research is considered an interpretive, naturalistic approach to research. The researcher attempts to interpret or make sense of findings (data) in terms of the meanings people bring to them (Denzin & Lincoln, 2003). Qualitative research

studies the experiences of real people, and in this study, the real people were nurse educators (Hatch, 2002).

The use of qualitative research fit perfectly with the plan for this research study. The goal was not to generate a specific theory rather to gain understanding and explore a practice or experience of selected undergraduate nursing faculty. This qualitative research approach permitted me to collect data which identified selected nurse faculty's meaning or understanding of higher order test questions within a classroom setting. Additionally, through the use of a qualitative approach, this allowed for the exploration of nurse faculty's experience with developing tests. "Basically, qualitative researchers are interested in understanding the meaning people have constructed, that is, how people make sense of their world and the experiences they have in the world" (Merriam, 2009, p. 13). One characteristic of qualitative research that was very important to me is that the researcher is the key instrument (Creswell, 2013, 2014; Hatch, 2002). I was the one who collected and analyzed the data. Data take on no significance until they are processed using the human intelligence of the researcher (Hatch, 2002).

**Basic Qualitative Research**

While there are several different types of qualitative research, in applied fields such as nursing, the most common "type" of qualitative research is a basic study (Merriam, 2009, p. 22). Additionally, Merriam (2009) supports that basic qualitative research is "probably the most common form of qualitative research found in education" (p. 23). Basic qualitative research has the overall purpose to understand how people make sense and experience the subject which is studied (Merriam, 2009). Percy, Kostere,

and Kostere (2015) referred to basic qualitative research as “generic” qualitative inquiry (p. 76). “Researchers considering any study of people’s subjective ‘take’ on actual external happenings and events should consider generic qualitative inquiry as their approach” (Percy et al., 2015, pp. 78-79).

**Rationale**

The rationale for using a basic qualitative methodology for this study was multifaceted. First, this research was a combination of both nursing and education disciplines, which Merriam (2009) commented is most common in both of these fields. Second, basic qualitative study is interested in understanding of how participants make meaning of a situation (Merriam, 2002). Through my research, I was able to gain an understanding of higher order thinking skills with testing from the undergraduate nursing faculty perspective.

Moving on to number three, a basic qualitative study can be used to uncover techniques and practices of educators (Worthington, n.d.). This information was very helpful once the data were analyzed regarding the practices faculty have with test development. These findings can then be reviewed and disseminated to other nursing faculty. A fourth rationale for the use of basic research includes the interpretation people reveal about their experience(s) which ultimately leads to their construction of the world in which they live/work (Merriam, 2002; Worthington, n.d.). This rationale exemplified the importance of my research. Understanding what nursing faculty know about higher order questions and how they develop them will open doors for future identification of faculty needs involving higher order thinking and testing.

Next, basic or generic qualitative research includes "real life" situations/experiences (Merriam, 2002). Gathering real-life data was the last rationale for why using a basic qualitative research approach was important to me. I collected data through one-on-one interviews and analyzed test questions to obtain real-life data. Both of these data collection types are common with basic qualitative study (Merriam, 2002; Percy et. al., 2015). Using two forms of data collection along with systemic analysis enhanced my goal for understanding within this inquiry.

**Purposeful Sampling and Participants**

Patton (2015) contended, "the logic and power of qualitative purposeful sampling derives from the emphasis on in-depth understanding of specific cases: information-rich cases" (p. 53). This information is where the researcher can learn a great deal about issues that are central to the purpose of the study; thus, the term *purposeful sampling* (Patton, 2015). Additionally, purposeful sampling is based on the belief that the researcher wants to gain rich understanding, hence selects a sample in which the most learning will occur (Merriam, 2009). I used purposeful sampling to obtain study participants who provided me with a rich perception of their understanding of higher order thinking test questions and their practice used for preparing tests.

My study population was Kent State University nursing faculty teaching in the undergraduate baccalaureate nursing program. This group of educators prepares nursing students for a career as a registered nurse (RN). All Ohio nursing faculty teaching in the classroom setting must have two years' experience as a registered nurse, a nursing license

in the state of Ohio, and a master's degree in nursing (Ohio Board of Nursing [OBN], 2017).

Testing is a large component in most undergraduate, classroom nursing courses. I included faculty that teach in the undergraduate classroom setting and use test questions within their courses. Study participants shared with me the meaning they bring to my research questions. This meaning exposed multiple perspectives on my topic.

I solicited nursing faculty through the faculty email listserv after obtaining permission from the Kent State College of Nursing Dean. Since I collected and analyzed data during the summer, emailing faculty members was an appropriate option due to the limited presence on campus. The email request addressed nursing faculty members within the Kent State University system who teach in an undergraduate classroom. Additionally, the course in which they teach must employ classroom examinations in which the student's cognitive knowledge is assessed. The email invitation informed the faculty member of the study obligations: one on one interviews and examination review. Online courses were not considered a classroom course in this study, therefore, those educators teaching an online course were not be considered.

Kent State University has five campuses which offer the baccalaureate nursing program. I had participants from four out of the five campuses with nine faculty interested in participating. Due to time constraints and schedule conflicts, one faculty member was unable to commit to the study. Eight faculty members participated in my study after signing the informed consent (Appendix B). All participants were female

with varying years of experience as a nurse and nurse educator. All eight participants were informed of the use of pseudonyms for this study.

**Study Setting**

In order to accomplish the purpose of this research, individual participant interviews were conducted. Interviewing was necessary in this study, since observing faculty as they work with higher order test questions would not yield the intention of understanding which was desired. As Hatch (2002) recommended, I asked the participants about an appropriate, desired location and time for the interview. I was flexible and traveled to the location the participant offered at their convenient time. All the interview locations were secure and private; allowing for ease of audio recording and discussion. None of the interview sites required permission of a gatekeeper. The interview locations were in personal offices or conference room type environments. I completed all eight interviews the first two weeks of June.

Participants provided an examination in which we looked at various test questions at the end of the interview process. Using a document for data collection does not alter other strategies of data collection (Merriam & Tisdell, 2016). Additionally, documents are a ready-made source of data that are easily accessible and provide a great resource to the researcher (Merriam & Tisdell, 2016). The participants and I reviewed test questions focusing on the higher order and lower order thinking characteristics of the questions.

## Data Collection

Traditionally, interviews, observations, and documents are possible sources of data collected in qualitative research (Merriam, 2002). This study used the following

sources to collect data: interviewing and document analysis. Qualitative data consists of in-depth, individualized meanings from the sample studied (Patton, 2015). Within the data collection, the researcher is able to capture the understanding of people's perspectives and experiences (Patton, 2015). Merriam (2009) added, "data collection is about asking and reviewing" (p. 85).

**Interview**

Interviewing involves special conversations, used by researchers, which allow for the exploration of the study participant's experiences (Hatch, 2002). I completed individual interviews with my participants in order to gather information relating to my research questions. The interviews ranged from 25–38 minutes in length. Each participant was informed that if follow up interview questions or clarification were necessary; they will be contacted in the future.

After confirmation of signatures on the informed consent, I reminded each participant of audio taping and that they may decline answering any question, at any time. Furthermore, they were reminded they may withdraw from the study at any time. In addition to audio taping, I also took notes during the interview. As Patton (2015) remarked, "The use of the recorder does not eliminate the need for taking notes, but you take strategic and focused notes, not verbatim notes" (pp. 472–473). These notes will facilitate analysis, serve as a backup in case there is recorder malfunction and will help with the development of new questions or the need for clarification (Patton, 2015). My note taking was abbreviated and limited to key points with reminders for me that I felt I needed to document.

According to Merriam (2009), “The main purpose of an interview is to obtain a special kind of information” (p. 88). Patton (2015) expanded on this adding that an interview allows us to enter into the participant’s perspective while finding out what is on his or her mind. Realizing that the quality of the data obtained during an interview is largely dependent on the interviewer (Patton, 2015). I had interview questions available (Appendix A). I was not bound to these questions; rather used them to keep myself on track with important concepts I wanted to reference. I strived to let the interview process guide the questions. A good interview is an interaction in which a relationship forms and the art of listening occurs; establishing a rapport matters (Hesse-Biber & Leavy, 2006; Maxwell, 2013; Patton, 2015). Even though the participants were fellow Kent State faculty members, I felt I created a professional interview atmosphere while promoting a comfortable environment. This comfort was important to me as I strived for positive rapport building.

A semi-structured type of interview was completed using a basic outline of the concepts along with predetermined, possible questions (Kvale & Brinkmann, 2009). This type of interview does not have a specific order for the questions, rather a mutual dialogue between the researcher and interviewee moves through the questions (Kvale & Brinkmann, 2009). Subsequently, “your research questions formulate what you want to understand; your *interview* questions are what you ask to gain that understanding” (Maxwell, 2013, p. 101).

I used the format of responsive interviewing as suggested by Rubin and Rubin (2012). “Main questions provide the scaffolding of the interview. They ensure the

research questions are answered from the perspective of the conversational partner [participant]" (Rubin & Rubin, 2012, p. 116). Along with main questions, responsive interviewing encourages follow-up questions that explore the given answers to obtain depth and details (Rubin & Rubin, 2012). Follow-up questions can ask for clarification as needed. This investigation provides the researcher with an understanding perspective from the participant (Rubin & Rubin, 2012). This understanding was what I obtained from my interviews.

While main questions and follow-up questions can by themselves provide rich data, intrusive interviewing also employs the use of probes. "Probes are questions, comments and gestures used by the interviewer to help manage the conversation" (Rubin & Rubin, 2012, p. 118). In addition, probes can be simple and short such as "go on" or "can you expand?" These simple phrases encourage elaboration which is helpful to gather the full extent of the inquiry. Planning and working through the interview questions with possible follow-ups and probes helps to keep the interview on track and productive (Hatch, 2002).

**Document Data**

Analyzing documents specifically, faculty constructed tests added value data to this research study. These documents were a reliable source of data concerning the participant's view of higher order thinking within tests. Hatch (2002) remarks using unobtrusive data, such as documents, allows for comparisons to be made with other sources of data which is a process call triangulation. Additionally, document analysis can provide an "alternative perspective" on the study topic (Hatch, 2002 p. 119). Using

document review with an interview allowed for participant reflection as well as interpretation as suggested by Hatch (2002).

## Data Analysis

Data analysis involves working with the collected data, organizing findings into manageable units, and identifying patterns and connections, which best addresses the research questions (Bogdan & Biklen, 1998). Maxwell (2013) said that for novice researchers, "data analysis may be the most mysterious aspect of qualitative research" (p. 105). As Ravitch (2011) pointed out, data analysis is a way in which the researcher interacts with the data collected. This analysis of collected research data provides a way to inform the research questions and study purpose; it offers a way to make sense out of the data (Merriam, 2002).

I followed the advice of Miles, Huberman, and Saldana (2020) and Creswell (2014) and started data analysis along with data collection. The idea by holding off analysis until after all the data has been collected seemed overwhelming to me. Additionally, analysis occurring throughout collection can help to fill in gaps and generate strategies for collecting new data "often better data" (Miles et al., 2020, p. 62). I started reviewing the interview and interview notes within six hours after the actual interview. This way my thoughts were fresh. I organized my data collection by focusing on the analysis of one participant as a time. I found my notes were valuable and added to the deep reflection and early interpretations of the data's meaning for me. As Miles et al. (2020) commented, this early reflection and interpretation is coding, and coding is analysis.

Concentrated data analysis began once the final transcriptions of the digital audio interviews were received. I used the transcription services provided to graduate students at the Kent State Research and Evaluation Bureau Data Lab. Once I received the transcription results, I began to thoroughly read though each interview transcript, one at a time. To ensure completeness, I read the transcripts line by line, underlining key concepts and ideas. I re-read the transcripts making notes, comments, and queries in the margins. I used these notes as a "conversation with the data" as Merriam (2002, p. 178) recommended. I did not follow one prescribed method for analysis; rather I merged several ideas. I really wanted to connect with the data; therefore, I used a hands-on approach for analysis. I used color coding of the participant data. Also, I made lists for each participant through Excel spreadsheets or tables to help with pattern identification, coding, and constructing themes. The spreadsheets were reviewed (and reviewed) for matching findings, consistencies, or similarities.

Bogdan and Biklen (1998) admitted that analysis is complicated but can be accomplished by breaking it down into stages, making it more manageable. Breaking down the analysis task was what I did. The use of organized stages made sense to me. Being a visual organizer, I like to use colors, lists, and tables to keep me on track and focused as I work through projects.

As I labored among the data, my analysis plan was to notice, collect, and think about the data. This qualitative data analysis (QDA) process by Seidel (1998) appealed to me. This analysis thinking process is similar to the way a nurse is taught to think about patient problems. The process nurses use is called the nursing process and

encompasses five steps for the development of a plan of care. While the nursing process deals with nursing care, some of the same ideas are present within Seidel's (1998) process of noticing, collecting, and thinking. For this reason, I referred to Seidel's three step process as I reviewed the collected data repeatedly since it seemed familiar to me.

Looking through my notes, tables, and lists for both the interview and test review, I began to assign codes to the data collected based on the interview questions. I transferred the codes, by hand, onto colored notecards in reference to the appropriate research question. Often these codes emerged from marginal notes and key ideas in addition to the interview data (Merriam, 2002). Codes are labels that give meaning to the information compiled during data collection (Miles et al., 2020). Saldana (2016) commented that codes can be a word or short phrase that assigns a topic to the collected data. Codes are then categorized into constructs that help to "translate" data as it may pertain to a particular research question (Saldana, 2016). Each code I identified had groupings of comments/quotes, notes, patterns, and/or themes, which were on colored note cards as well. Examples of these codes included critical thinking, foundational knowledge, and student level. Code creation is when true analysis takes place; in other words, according to Miles et al. (2020), "coding is analysis" (p. 63). Clustering the codes sets the stage for further analysis and drawing of conclusions for the study findings (Miles et al., 2020).

Basically, what I have explained above refers to description coding or topic coding according to Miles et al. (2020) and Saldana (2016). Descriptive coding is considered appropriate for novice researchers since it is straightforward (Saldana, 2016).

The literature overflows with information on codes and coding. I frequently needed to remind myself that "coding is not a precise science; it is primarily an interpretive act" (Saldana, 2016, p. 5).

Identifying patterns within the established codes helps the researcher solidify findings into concrete examples of meaning (Saldana, 2016). Looking for patterns within participant data and codes helped to develop explanations. The patterns that emerged laid the groundwork for my theme development. Early in the analysis phase, I was able to see patterns of consistency within my data. These discoveries gave meaning to my research purpose and questions. Once I saw consistency within the data, I knew I could create themes for each of my research questions.

## Validation and Verification

The intent of trustworthiness in qualitative research informs the reader that the "findings of an inquiry are worth paying attention to, worth taking account of" (Lincoln & Guba, 1985, p. 290). The rigor or trustworthiness ensures the quality of a study whereby the representation of findings is as accurate as possible revealing confidence in data interpretation and methods (Polit & Beck, 2010). For my study, I utilized Lincoln and Guba's (1985) criteria of credibility, transferability, dependability, and confirmability to establish trustworthiness.

### Credibility

Instituting credibility within a study involves the ability to be confident in demonstrating the "truth value" (Lincoln & Guba, 1985, p. 294) for the findings and their representation. Lincoln and Guba asked, "Are the accounts brought forth from the study

stemming from the reality of the findings and are they believable?" I know my findings stemmed from the reality of the data collected. Several techniques were used to establish credibility in my research.

**Member-checking.** The process of the researcher sharing data or specific descriptions with participants to ensure accuracy is referred to as member-checking (Creswell, 2014). The voices of the participants were validated, and this was accomplished by member checks for my study. The transcripts, along with my marginal notes, were shared with each participant for review. Member-checking asked the participants to review or "check" the data for accuracy and validation that the conversational notes were accurate representations of their meanings and understandings.

**Triangulation.** The use of different data collection methods helps to increase the credibility of the research findings through triangulation of the data (Creswell, 2014). Converging sources of data add to the validity of a study (Creswell, 2014). Participant interviews and faculty created test question reviews were used for triangulation in my study. Since the conclusions from each of these methods were consistent, validity was established.

**Peer debriefing.** The review or examination of sections of transcripts and identified codes was completed by a nursing peer experienced in qualitative research to enhance the accuracy of data obtained. This process was completed through secure email accounts without using any identifiable characteristics as well as two one-on-one meetings. Our communication was valuable and confirmed what I analyzed from the data. Additionally, two nursing peers educated in test construction were consulted to

discuss higher order testing as I worked through the literature review and test question reviews. I communicated with one via telephone and the other through secure emails. The test construction experts were utilized to make sure I had included the information necessary for my research questions as well as making sure I was on a manageable path. The process of peer debriefing helps "keep the inquirer 'honest'" according to Lincoln and Guba, (1985, p. 312).

**Transferability**

Although qualitative research does not seek generalization, Guba and Lincoln (1982) affirmed that "some degree of transferability is possible under certain circumstances" (p. 247). These circumstances should be similar in conditions and situation to the research considered. Therefore, I made sure to report my process for data collection and analysis with rich, thick descriptions and explanations from this research. This transparency exemplified the transferability of my study. It is important to note that the transfer of a study's findings is considered the responsibility of the readers not the researcher as this is not the goal of qualitative research (Merriam & Associates, 2002). As Lincoln and Guba (1985) remarked, the researcher is responsible to "provide the data base that makes transferability judgments possible on the part of the potential appliers" (p. 316).

**Dependability**

Dependability and credibility go hand in hand; "no credibility without dependability" (Lincoln & Guba, 1985, p. 316). To ensure dependability, an audit trail was employed. This trail included documenting all data such as recordings, notes, and

documents as well as findings. Methodical note keeping and detailing was necessary. Completing such a trail revealed the possibility of reproduction with specifics throughout the process as noted by Creswell (2014).

**Confirmability**

Confirmability refers to the extent that the study's results are determined by the participants, not the researcher; "the findings are grounded in the data" (Lincoln & Guba, 1985, p. 323). As mentioned above, an audit trail of activity was documented whereby findings can be traced back, via this trail, to the raw data. Additionally, a reflexive journal was kept reflecting on the happenings throughout the research process with regard to my position and values as an educator involved with developing test questions. I wanted to be sure I was being cognizant to address any biases or assumptions that could possibly affect the findings (Merriam & Tisdell, 2016). For me, this was particularly important and helpful. There were times when I struggled with my biases and/or pre-study thoughts, but journaling was helpful. My 20 plus years in nursing education and my interest in testing kept me motivated to move forward with the inquiry process about higher order testing. Journaling allowed me to critically examine my perspectives as they evolved through this process without influencing the study. Keeping the interview questions consistent with each participant helped with confirmability as well.

## Summary

This chapter discussed the methodology and theoretical frameworks used for this qualitative study involving higher order thinking test questions. Rationale was provided as to the importance of such a study as well as why a qualitative approach worked for this

research. Included was an explanation of the participant selection, setting, design and analysis of data, as well as the rationale for the justification of a trustworthy research study.

# CHAPTER IV

# FINDINGS

This research explored nursing faculty and their understanding of higher order thinking test questions. It also investigated test development practices by baccalaureate, undergraduate nursing faculty. In the previous chapters, the rationale for this study, a review of relevant literature, and the methodology for this study were presented. In this chapter, the findings of this study are discussed. The research questions that guided this qualitative study were:

1. What are undergraduate nursing faculty's understanding of higher order thinking test questions for the baccalaureate nursing student?
2. What practices are involved when undergraduate nursing faculty prepare a nursing test?

Bloom's Taxonomy (1956) and Patricia Benner's theory of Novice to Expert (1984) framed this study and helped to explain the findings. Study participants teaching in a nursing baccalaureate program were interviewed to gain insight into their understanding of higher order thinking with testing. In addition, a review of test questions was completed on a participant provided course examination.

The findings of this study are organized within this chapter by the research questions. This chapter reveals positive findings regarding higher order testing such as a desire to mimic NCLEX, consideration of Bloom's taxonomy, preparing students safely for clinical practice, and a desire for collaboration with peers for developing test questions. It also examines challenges with question development, such as varying levels

of faculty knowledge with test creation and keeping up with continuing education for test item development in the future.

Even with data collection occurring during the summer session, I was fortunate to secure eight participants for my study. Each participant was very open and wanted to be heard. All participants were given a pseudonym for this study. Everyone answered all questions without hesitation, elaborating while sharing valuable data with me. The participants willingly provided a course exam for review and two participants supplied two "just in case."

## Participant Profiles

Eight participants completed the study requirements (Table 2). I was able to secure one-on-one interviews with each faculty member at a time and site of their convenience. The participants varied in years of nursing experience from seven to the most seasoned with 38 years as a registered nurse. The average years as a nurse was 23.5 years. Additionally, there was variance in the years as a nurse educator from two to 28 years with an average of 17.75 years. Of the eight participants, three of them actively work clinically at the bedside and one works as a nurse practitioner. These positions are in addition to their full-time academic employment.

Table 2

*Participant Profiles*

| Name | Years as a Registered Nurse | Years as an Educator | Per Diem Employment | Formal Preparation in Nursing Education | Level of Students Taught (Classroom) |
|---|---|---|---|---|---|
| Nicole | 25 | 15 | Yes | No | Sophomore and Junior |
| Peggy | 7 | 2 | Yes | Yes | Senior |
| Maggie | 38 | 28 | No | No | Pre-nursing and Sophomore |
| Beth | 11 | 3 | Yes | Yes | Sophomore and Junior |
| Emily | 21 | 6.5 | No | Yes | Sophomore, Junior and Senior |
| Regina | 19 | 6 | Yes | Yes | Pre-nursing and Sophomore |
| Linda | 34 | 10 | No | Yes | Sophomore and Senior |
| Judy | 33 | 13 | No | Yes | Sophomore, Junior and Senior |

**Nicole**

Nicole entered the room after just teaching her second class of the day and commented what a "great" teaching day this was, smiling. Since she was not trained as an educator, she develops test questions with the assistance of colleagues and the use of test banks. She described writing test questions as "frustrating." Nicole commented she has "been teaching a long time and I think the ideal test question has to be at a higher level in Blooms."

**Peggy**

Peggy was the most novice of all participants as both a registered nurse and educator. She commented, "I really try to bring a clinical picture to the test questions." She admitted she had test question writing content scattered throughout her formal graduate education and does write her own questions. Peggy admitted writing test questions is something she struggles with and needs to work on.

**Maggie**

Maggie was the most seasoned nurse and educator of all the participants. She did not have formal training in education but commented her "years of experience with testing helps her develop new questions." Maggie presented herself with confidence and abounds with enthusiasm regarding teaching. She admitted to a "moderate" level of comfort with writing test questions stating it is "more challenging than I anticipated."

**Beth**

Even with only three years as an educator, Beth was "very comfortable" with developing test questions. She commented she "loves making test questions" and finds it enjoyable. Beth creates her own questions as well as occasionally tweaks those from test bank resources. It is evident from her demeanor that she is excited about the topic of test writing and strives to make her questions mimic the NCLEX.

**Emily**

Emily had formal preparation in test question writing but admits it was very difficult to learn and understand at that time. Since then, she has attended continuing education programs on test question writing and now says, "I'm average to above

average" with developing test questions. Emily writes her own test questions and admitted "it is one of the hardest aspects of my job."

**Regina**

Within her course group, Regina and fellow peers add questions to a collective pool of test questions. This collection of questions serves as the source for her class examinations. Regina's comfort level with developing test questions is "not there" even though she did have formal training in her nursing education. She admitted she is fond of the collaboration with her peer group for test development and has more experience with editing test questions than creating her own.

**Linda**

Linda writes her own test questions but also utilizes test bank resources and will tweak them to fit her needs. She was the second most experienced nurse (34 years as an RN) but has only been in nursing education for 10 years. Linda stated, "I have a pretty good understanding of test writing" and is "fairly comfortable" with developing test questions. She believes writing test questions is time consuming and that faculty need to have a knowledge background in test development.

**Judy**

Post graduate education, Judy went on to obtain a certification for nursing education which helped her to prepare examinations. She admitted she does write some of her own questions but will tweak "borrowed" test questions from peers. She does not use test bank resources. Judy admitted she started out in her teaching career very weak

with creating test questions. It was through the help of a great mentor that she is now "fairly comfortable" with developing test questions.

The interviews were conducted at the participant's preferred time and location using planned semi-structured interview questions (Appendix A). All interviews concluded with a test review whereby each participant supplied one of her course examinations. During this review, participants were asked to identify three questions they considered higher order and three they considered lower order. Then participants were asked to explain what about these questions made them higher or lower order. When identifying the lower order questions, they were asked what might be done to rework this question making it higher level for the student. This task was particularly difficult for the participants to consider. In fact, the majority of participants did not provide an answer to this question.

I took brief notes during the audio-typed interviews, then wrote notes after each encounter. The interview data were transcribed by Kent State University's transcription services. I compared the actual interview recordings with the typed transcription multiple times. After I was comfortable with the typed transcriptions, I began to read the conversation for analysis. It was during this time, I noticed patterns, collected codes, and thought deeply about how the findings related and answered my research questions. Further analysis led to the formulation of themes. All of the study contents and data were securely stored on a private, password-protected computer in a private location. I did print off the transcriptions and the Excel tables so I could spread out the hard copies for a complete view. As previously mentioned, I used a hands-on approach to analysis which

included looking through these printed papers many, many times, until they were tattered and dog-eared. All of the papers and notecards were kept in a secured office location, which was locked when not in use.

## Research Question One

Research question one: What are undergraduate nursing faculty's understanding of higher order thinking test questions for the baccalaureate nursing student?

To investigate research question one, I prepared interview questions (see Table 3) that revolved around the participants' understanding or how she give/have meaning of higher order thinking involving test questions for the nursing student. Specifically, I wanted to know what criteria she recognized within test questions that makes them higher order. Additionally, I explored what she understood to be an ideal higher order test question.

Table 3

*Research Question One and Interview Questions*

| Research Question One | Related Interview Questions |
|---|---|
| What are undergraduate nursing faculty's understanding of higher order thinking test questions for the baccalaureate nursing student? | a. Describe your understanding of the phrase 'higher order thinking.'<br>b. What is your experience with higher order test items?<br>c. What criteria do you understand a test question needs in order to be higher order?<br>d. What is your understanding of NCLEX-style questions and higher order thinking for test questions? |

I identified three major themes in response to research question one (see Table 4):

1. Undergraduate nursing faculty understand higher order questions require the student to use critical thinking.

2. Students need to use foundational knowledge for higher order thinking within test questions.
3. Higher order test questions employ the principles of application and analysis.

Table 4

*Research Question One: What are Undergraduate Nursing Faculty's Understanding of Higher Order Thinking Test Questions for the Baccalaureate Nursing Student?*

| Themes from Research Question One | Participants |
|---|---|
| Undergraduate nursing faculty understand higher order questions require the student to use critical thinking. | 8 out of 8 |
| Students need to use foundational knowledge for higher order thinking within tests. | 6 out of 8 |
| Higher order test questions employ the categories of application and analysis. | 8 out of 8 |

**Critical Thinking**

For the purpose of this dissertation, the following definition of critical thinking was used: critical thinking is a cognitive process involving the skill of using logic and reasoning to make appropriate decisions about what to do (Brookhart & Nitko, 2015; NCSBN, Fall 2017). Critical thinking is considered an operative example of higher order thinking (Miri, David, & Uri, 2007). In a study by Renaud and Murray (2007), it was found that using higher order test questions acts as an evaluative indicator as to a student's critical thinking skills. "Critical thinking in nursing is an essential component of professional accountability and quality nursing care" (Rubenfeld & Scheffer, 1999, p. 5). Oermann (2015) added, "Educators highly value critical thinking and aim to foster the development of critical thinking abilities" (p. 41). With the abundance of literature

on critical thinking, it was not surprising all participants referenced critical thinking with their understanding of higher order thinking.

Nicole understands that in order for a test to be higher order, it should highlight the student's ability to critically think through scenarios. "I am interested in the students developing the skill to critically think. That's my focus." She went on to add that she has really started to use the "fill in the blank" type of questions to bring out the student's ability to think through "more complex concepts." Additionally, Nicole added:

> I think it [higher order] is being able to use clinical reasoning and critical thinking to analyze a problem, apply knowledge to that problem in order to answer a question. I think that there has to be some complexity, I think there has to be parts of the question that really have nothing to do with the question so students—so I think that really being able to critically think and question responses that are very similar.

Peggy believes her questions require critical thinking, "it has to make them think." She added:

> Like it can't just be a "gimme," like an easy—the student has to be able to—I know we say critically think, but that's exactly what they have to be able to do. Like, here's the situation . . . maybe initially this is what I'm going to do. But, say I give a drug . . . then they have to be able to understand what response (good or bad) could come from that drug.

When Peggy was discussing her higher order thinking questions from the review test, she understands that to make them think critically, you must use priorities and anticipate what might come next in your questions.

Maggie agreed with Peggy in that critical thinking questions involves identifying priorities. She understands that priority-based questions as higher order since they require critical thinking. Additionally, she believes as Nicole that fill in the blank questions "make the student critically think are a lot better than having options." Maggie believes higher order thinking questions requires the student to do more critical thinking when answering the question.

"Nursing school isn't easy," says Beth, "so we need to teach them from the beginning to work through and critically think through the question." Getting the student to think is her ultimate goal. "So, I think the best test questions are ones that make them [students] stop and have to critically think." Beth commented:

> But I really think of it as you aren't given the answer in the question, you have to think about it. You have to understand parameters. You have to understand concepts. You need to be able to look beyond and understand to be able to answer the question. Put yourself in a sticky situation—what am I gonna do first? To really make you critically think and assess the question.

Beth understands test questions are higher order by the way the question is worded, and the approach taken for the student to critically think.

Emily believes test questions should be short without "extra information that is not required in there. You shouldn't try to teach with your test question." She also

believes students should be able to critically think through a question and come to an answer within a minute. Emily understands that critical thinking for higher order testing requires the student to "go through a lot of thinking" and to "think about the processes that are involved." Emily believes that in order to expect students to use critical thinking, the teacher must teach through the lower thinking levels first; "I need to start teaching them to take it to some higher, critical thinking levels."

Regina agreed with Emily and takes a straight-forward approach to test questions; "I don't deliberately put in distracting material for students." She understands that students use critical thinking to work through questions in an "indirect fashion" to deduce the answer. She commented:

> Nobody's ever gonna leave nursing school knowing everything but having the ability to make sound decisions and know what you know and own it. I think that's what to test. I think if it demonstrates a student's ability to make sound judgment and critically think, I think it's—I think ultimately that's what we're trying to accomplish.

The ideal nursing test question for Regina requires thinking skills for priority interventions and thinking through what would happen next.

Having a test question which requires students "to think a great deal" is the understanding of higher order thinking for Linda. She added, "Since the NLCEX requires critical thinking, then we need to that as well." For Linda, higher order thinking means critical thinking. As far as her experience with students and critical thinking abilities, Linda remarked:

> I think they start out a little rough. I think they want to merely memorize. I don't know that have very sharpened critical thinking skills. However, and I tell them—I think I tell them this a lot. That it's like playing the piano. It's not easy to do when you start but if you practice that will help.

Practice with many test questions, Linda believes, will help students develop critical thinking skills. Linda believes preparation with practicing test questions will eventually pay off for the student. Additionally, Linda stated, "Give them concepts, ask them questions, make them critically think how to answer it" should be "tools" faculty use with students when testing.

In contrast to Nicole, Judy pares down her test questions similarly to Emily and Regina; "not putting a lot of extra, what I call 'fluff' in the question." They just need to be able to critically think. She added that using lab values, symptom identification, and patient education encourages students to critically think when testing their knowledge. She thinks that students should be able to look at a question and then be able to [critically] think through it to get to the correct answer. Judy commented:

> As far as thinking, I think they, NCSBN (needed help with the letter sequencing) do need to make sure that—and we need to prepare our students better for that higher order thinking just because they're getting more and more responsibility in the hospitals and on the floors and they need to be prepared for that.

**Foundational Knowledge**

When discussing foundational knowledge as identified in theme two, this refers to the student's use of knowledge that was presented in early coursework. These

foundational courses could be considered prerequisites to the nursing program such as anatomy and physiology, mathematics, nutrition, and microbiology. Safe nursing practice relies heavily on the foundation of the sciences (Oermann, 2015). Once admitted into a nursing program, the first year of course work is considered to lay the "foundation of nursing" in which all the remaining course will build upon.

Theorist Patricia Benner emphasizes the importance of establishing a strong foundation of knowledge in order to provide appropriate care as a registered nurse. Her theory can easily relate to the nursing student using foundational knowledge progressing in a nursing program (Benner, 1984). Similarly, Dr. Bloom's Taxonomy (1956) uses foundational levels to build up to the higher levels of thinking. Most of the participants understood the importance of students having and using prior knowledge with foundational concepts in order to answer higher order test questions.

Heliker (1994) discusses the challenge with students and their lack of recall from basic science. Faculty have reported science knowledge from prior science courses, necessary for nursing courses, is not retained. This absence of retention does not allow for the application of necessary scientific concepts as the student moves into courses such as pharmacology and medical surgical nursing.

Nicole identified a higher order question, from the test provided, in which the student must recall the basic functions of the skin. This content came "from basic anatomy and physiology" which some students should have "got back in high school." She understands having some background information or knowledge helps to answer test questions. One concern Nicole mentioned is that students are "not studying" and are ill

prepared. This makes it difficult to rely on foundational knowledge since this habit of not studying often is a continuation from the students' past practices. The knowledge was not obtained in previous courses; therefore, there is nothing to build upon to answer and reason through higher order thinking questions.

Beth's understanding of using prior knowledge with test questions coincided with Nicole. When discussing a test question, she commented, "They should know that by now," and that the students should come with some knowledge. Additionally, she believes faculty need to put a component in higher order questions which makes students use past knowledge to answer the question. While reviewing an identified higher order question about atrial fibrillation, Beth said, "They have to have prior knowledge and they need to be able to look at a phrase and say, 'okay what makes this important' in this condition."

Encouraging students to use fundamental knowledge is what Emily strives to do with her students. She works with them to "go through the thinking process." Emily understands that if a student comes with basic knowledge then she can challenge them with the higher order thinking test questions. Emily called these types of questions "higher-level at a basic level." The question looks like a basic, foundational question when in reality the student must use foundational knowledge thinking through the question to arrive at the correct answer.

While Regina understands students need foundational knowledge to think at a higher level, she realizes many do not have even basic, everyday knowledge. She commented, "I think kinda meeting the student where they are at that point and not

making huge assumptions about what is known." Not recognizing this lack of knowledge exists can lead to a "disconnect" with test construction for faculty. Regina understands higher order thinking to involve "the use of what you know, those fundamental items, those kind of memorized facts." Test questions should require students to use this "background knowledge" when answering according to Regina.

Linda agreed with Nicole regarding the lack of student preparedness. She commented that students are "not reading" their textbooks. While reviewing her provided exam, Linda pulled out a question and identified it as higher order. She said, to answer this question, the student must first know the "basics" of the gastrointestinal tract. Linda understands "students have to use prior knowledge and build on it to answer this higher order thinking question." At one point, when referencing another selected higher order question which also required the use of prior knowledge, Linda remarked, "simple, simple concept," while shaking her head.

Judy also understands a test question should use prior knowledge to be higher order. She stated:

> Yeah, yeah, prior knowledge. Like taking information that they learned in anatomy and physiology and working that to the body system that we are working on at that point in the class. Taking their information, they learned in Foundations and Interventions [sophomore classes in the nursing program] and building on that information.

She also commented about the lack of students being prepared. In fact, she mentioned she has some students "do not even buy the textbook." Additionally, when referencing a

higher order test question from her exam, Judy commented the students needed to use background knowledge regarding grief in order to answer the question.

**Application and Analysis**

The third theme from research question one references the cognitive domain categories of application and analysis from Bloom's Taxonomy (Bloom, 1956). The taxonomy represents a cumulative hierarchy from simple to complex. The application and analysis categories are considered higher thinking levels within the taxonomy. As McDonald (2018) pointed out, "The cognitive levels of the items should always be at a higher level throughout a nursing program. Application and analysis level items are appropriate throughout a nursing program. Thinking is essential in nursing" (p. 146).

In order to enhance student learning, instructional goals need to include teaching for knowledge application (Hung, 2013). Being able to apply information is demanded by employers and the workplace. Hung (2013) commented, learning with application "is not just a higher order cognitive ability; it is a survival skill" (p. 36).

Perkins and Salomon (2012) discussed the challenges of application of learning for continued knowledge growth. The phrase "failure-to-transfer" has been coined when the application of knowledge does not occur. Potential relationships or connections with earlier knowledge are lacking; therefore, future situations are affected (Perkins & Salomon, 2012). Mathematics is cited as one example where often a disconnect occurs, whereby students can not apply past math skills to future educational endeavors (Perkins & Salomon, 2012). In nursing, math skills are necessary for medication administration.

Often, students have difficulty applying even basic math skills to dosage problems essential with medication delivery.

All eight participants understand the need for application and/or analysis questions on nursing examinations. Often, they used the terms interchangeably and a few even mentioned the category of synthesis along with application and analysis. It is evident nursing faculty understand the need for this higher level thinking in the nursing program. In fact, Nicole, Maggie, Beth, and Linda want to "mimic the NCLEX" with their examinations since the NCLEX uses application and above higher order questions.

When preparing an exam, Nicole wants to evaluate if students have the ability to analyze and apply their knowledge to a scenario. She commented:

> I think the ideal nursing exam question has to be at a higher level in Bloom's Taxonomy so it should all be analysis/application. I think it is being able to use clinical reasoning and critical thinking to analyze a problem, apply knowledge to that problem in order to answer a question.

Peggy added including priorities and anticipation in test questions is her understanding of the application and analysis discussion. She stated, "I guess when I think of application, I think as 'what is my next step.'" To her, anticipating effects and where to go from here are key when she writes higher order thinking questions.

For Maggie, she understands higher order thinking to be the application of content when answering a question. She added that she frequently reminds her students that "it's [test questions] not gonna be asked verbatim, so you're gonna have to understand and apply . . . still they struggle, I don't know."

Beth admitted she does not use higher level NCLEX style test questions with sophomores, "'cause it's just too much." While she does not use Bloom's Taxonomy when developing test questions, she did reference beyond understanding with application and analysis as her understanding and discussion of higher order thinking. Beth commented that the NCLEX needs to focus more on application questions in the future; "because you know, you have people that score so high on the NCLEX that are not really good nurses." She shook her head when discussing how some students are good test takers but cannot apply content.

Emily uses the taxonomy when developing her test questions. "Bloom's Taxonomy lives with me forever." She understands higher order thinking to be the "higher levels of the pyramid of Bloom's Taxonomy." She writes the higher level questions using application and analysis, with the higher level student. She commented that senior students need to be evaluated with application and analysis type questions.

Like Emily, Regina understands that higher order questions should be used with higher level students. The level of question difficulty rises as the student progresses in the nursing program. With the early level students, there is "going to be some just knowledge-based questions because they are just learning." She understands that "they [students] have to be able to synthesize something maybe from someplace else, then apply it." Regina believes higher order thinking questions use both synthesis and application questions with "kind of more of the synthesis questions." When asked about synthesis questions, Regina admitted these questions encourage the student to apply information with something new.

Linda also believes the level of student should determine the level of question. She remarked:

> I understand that, especially, at the sophomore level that they have to have some knowledge questions, but my expectation is that they have to have some thinking questions, as well. However, for my senior level students, it's polar opposite. I think the majority are thinking questions and very few knowledge questions.

She referred to this as "leveling up." Linda uses Bloom's Taxonomy and considers higher order thinking questions to be where the student needs to analyze something.

Judy concurred with Linda that in order to be a higher order test question, the student needs to do some analyzing. She also mentioned "applying information while synthesizing data that you are given in the question" as being part of her higher order thinking understanding. She admitted she tries to follow Bloom's Taxonomy to some extent but was told "we're supposed to be getting away from that to an extent." As a follow up to this comment with the taxonomy, she admitted that she does not know where she heard this information.

**Minor Findings for Research Question One**

During the interview process, a few minor codes were identified which did not lead to major theme formation. The following terms were mentioned by less than half of the participants: priorities, anticipation, and sequencing. During the interviews, a few of the faculty mentioned these terms when discussing the criteria which makes a test question higher order.

The term priorities was referenced when discussing criteria included in higher thinking for testing. Maggie commented that using the word priority in a test question makes the student thinking that all the options might be relevant. She understands using this term makes a test question higher order. Two other faculty mentioned priorities but added it to a discussion along with anticipation and sequencing. Peggy commented, "I hope that I do understand it [higher order thinking] because that's what I'm teaching. I mean I teach a lot of prioritizing, kind of thinking about what comes next, and what the patient needs." Emily discussed having the student "think about a step then be able to think sequentially" in order to get them to the outcome or in this case the correct answer.

## Research Question Two

Research question two: What practices are involved when undergraduate nursing faculty prepare a nursing test?

While investigating research question two (see Table 5), I reviewed the interview questions that focused on the practices nursing faculty consider when preparing a test for undergraduate nursing students. Specifically, I wanted to know what guides them as they prepare or develop a test.

Table 5

*Research Question Two and Interview Questions*

| Research Question Two | Related Interview Questions |
|---|---|
| What practices are involved when undergraduate faculty prepare a nursing test? | a. When you sit down at your desk to develop an exam, explain what guides you.<br>b. What is the process you go through when developing a test for your students?<br>c. What factors do you consider when developing a test? |

Research question one addressed what faculty understand of higher order thinking test questions. Notably, a few of the factors addressed carried over to research question two. For example, faculty are guided by the use of Bloom's Taxonomy categories of application and analysis as well as understanding that students should come to the class with prior knowledge. The following were the themes unique to research question two, without influence from question one.

Three themes were identified in response to research question two:

1. Nursing faculty need to consider a clinical care focus when preparing a nursing examination.
2. Collaboration with fellow colleagues should guide test development.
3. Nursing faculty need continuing education with the practice of test development to ensure consistency.

Table 6

*Research Question Two: What Practices are Involved When Undergraduate Nursing Faculty Prepare a Nursing Test?*

| Themes from Research Question Two | Participants |
|---|---|
| Nursing faculty need to consider a clinical care focus when preparing a nursing examination. | 8 out of 8 |
| Collaboration with fellow colleagues should guide test development | 6 out of 8 |
| Nursing faculty need continuing education with the practice of test development to ensure consistency. | 7 out of 8 |

**Clinical Care**

As previously defined, clinical care refers to nursing care that is preformed within the confines of a healthcare facility. Providing this care is a responsibility of the registered nurse. All participants discussed that tests need to consider nursing care/practice within the test question. Several phrases (codes) included in this discussion of clinical care incorporated: safe for practice, need to know for practice, real-life nursing care, and practice ready.

Dr. Bristol (2015) stresses the importance of ensuring test items have a clinical focus. Students are encouraged to consider clinical care when using higher level thinking to answer test questions (Bristol, 2015). Additionally, the practice analysis studies, as previously discussed, emphasized the clinical care activities necessary for the entry level nurse to begin practice (NCSBN, 2019c). Using such clinical care tasks within test questions better prepares students for their nursing future in which they must use higher order thinking for clinical judgment (NCSBN, 2019c).

Kantar (2014) concurred it is necessary for nursing students to use clinical application with higher order thinking on tests. This study concluded the need for educators to assess students on the ability to use higher order thinking skills while applying knowledge to current practice (Kantar, 2014). Kantar called for an assessment system that encourages students to use higher order transfer skills within a test. "Teaching for transfer influences how students learn" and ultimately, their performance with solving problems on tests (Kantar, 2014, p. 793).

Nicole makes sure to include clinical scenarios in her test questions. She stated she spends a lot of time looking through test questions to really think about how it relates to practice. Nicole commented, "I'm just not sure that higher order thinking is pronounced enough in the NCLEX. These people have people's lives in their hands." She believes there to be a correlation between testing practices and student performance in both the classroom and clinical area.

Clinical is an important consideration for testing; Peggy commented, "I really try to bring a clinical picture to the question." Since Peggy continues to actively work in the clinical arena, she thinks about herself in a clinical situation when developing a test. This is a practice she strives to follow with each test she prepares. She added, "Safely practice—that's my ultimate goal."

For her tests, Maggie stated, "I aim to put a lot of those real-life experience type of questions." She emphasized "real-life" situations in the clinical several times while discussing higher order test questions. While reviewing one of her identified lower order questions, she commented she needs to add more of a clinical situation in order for the questions to be a higher order question.

"Practice-based" is a factor included in Beth's practice of test development. She mentioned having clinical situations that "translate to practice" in her test questions, stating, "I think it's creating good test questions." Beth believes there is a direct correlation between a successful practicing nurse and his or her strength in understanding higher order, NCLEX-style questions. She thinks about the clinical responsibility the nurse would have while caring for this patient when she makes test questions.

Emily considers the things "they're gonna face in practice" when writing test questions. Her perspective comes from what situations they may encounter in clinical practice such as asking, "What are you going to think about at the bedside?" She admitted she thinks about this clinical focus more when creating test questions than whether or not it is an NCLEX-style question.

Writing a test question that assesses the "must know" for practice is a focus for Regina. She uses a clinical case study approach to her test questions. Regina is cautious and admitted it can be a "fine line" when using a real-life scenario with beginning students even though it is necessary.

Judy thinks about "what they need to know" as a practicing nurse and being "safe to practice" in her practice for developing test questions. She commented often faculty do not stick to what a nurse needs to know when developing test questions and this frustrates her. She added, "Make sure that we're including things that they're going to have to use in practice;" this is a key factor to Judy's test development practice.

**Collaboration**

Collaboration with fellow peers was a practice 75% of the participants (six out of eight) commented should guide faculty in their test preparation. A leading agency on quality and safety education (QSEN) for nurses identifies "Teamwork and Collaboration" as one of the competencies necessary in nursing from pre-licensure students to nursing practitioners (QSEN, 2019). Therefore, collaboration with faculty peers for the practice of test development follows QSENS's competencies for nursing.

Educators need to recognize that test writing is a skill that takes practice. "The perfect test has yet to be written," states Bristol (2015, p. 102). Providing opportunities for faculty more seasoned with test development to mentor or collaborate with less skilled faculty is essential for improving test construction practice (Bristol, 2015).

In a study by S. Adams and Mix (2014), faculty collaboration created an environment in which collegiality and transparency fostered improvements in teaching practices. Collaboration efforts between faculty allowed for meaningful sharing of pedagogical knowledge and skills encompassing protocols, projects, and assessment practice. The open communication with collaboration efforts led to positive changes for faculty, which improved student learning and enhanced faculty friendships (S. Adams & Mix, 2014).

A study published in the Journal of Professional Nursing (Kennedy et al., 2019) supported faculty collaboration, whereby faculty interaction was viewed as critical for professional growth. Through coordination of learning environments and practices, positive change was noted for improvements with future healthcare professionals when faculty worked together. Once again, faculty collaboration proves to be key for improved faculty practices, which includes testing.

Nicole admitted she frequently uses a mentor to assist her with test question writing and for question review. She stated:

> I just think faculty need to work more closely together and evaluate each other's exams because some people are not experts in that field. And some of us are absolutely not, so I think that there needs to be a lot of collegiality among nursing

> faculty in such a way that it's consistent across the courses that students are being challenged with those kinds of questions. Being willing to say, "Hey take a look at my exam, what do you think about these questions?" Or even before the fact, work together on question development, a team approach.

Peggy concurred with Nicole in that faculty need to work together more. She commented, "even just critiquing for a little bit more consistency." By doing peer review, Peggy thinks peers looking at other faculty's tests, especially the structure of the questions, would help with the practice of writing test questions.

Peer review would be helpful with the different types of questions, admitted Maggie. Supporting this review, she remarked, "Cause my idea of application might be way different than yours." She is concerned her idea of higher order thinking test questions is vastly different from others and she wonders, "Am I too easy?" She believes the practice of test writing would be improved if faculty came together and discussed test questions. Maggie reiterated her point, "Sometimes I look at my test and go, 'I think this is pretty good.'" Continuing, she commented, "then I think, if I gave it to someone else, they'd go, 'what the heck!'"

> Beth feels we [faculty] need to get on the same page with test development.
>
> I feel like maybe there should be more of test development so that we can—we don't collaborate or talk. Everybody makes their own test questions based on what they feel is important and they design them their own way.

She stated that we need to "work together collaboratively" when creating test questions.

Regina would like to have time in her course group devoted to looking at test questions. She believes this collaboration would benefit faculty members, including herself, since some faculty "may be more up to date with the current thoughts" for test construction. She commented that "item writing is hugely time consuming and looking at questions as a group would be helpful."

The exam provided by Judy was a collaborative effort within her course group. She commented that collaboration can be a good thing when faculty work together sharing positive feedback and dividing the duties fairly. On the other hand, Judy admitted there have been times when collaboration was challenging, and she does not "want to say hurt people's feelings if they write a very poor question and you have to do a lot of revising for that question."

**Continuing Education**

In order to maintain a registered nursing licensure, nurses must follow the guidelines as outlined by the specific state in which the nurse holds the license. Registered nurses are responsible to know the requirements for license renewal. Each state may have different continuing education requirements. Since this study was completed in the state of Ohio, the licensure requirements are discussed from the Ohio Board of Nursing (OBN, 2019). In Ohio, the registered nurse is required to obtain at least 24 hours of continuing education (CE) hours over a two-year period (OBN, 2019). This requirement ensures the nurse is improving or promoting knowledge/skills "to enhance the nurse's contribution to quality health care and pursuit of health care career goals" (OBN, 2019, p. 1)

Currently in Ohio, there is one mandatory hour of legal content for continuing education leaving the remaining required hours to be the nurse's choice. There are numerous CE offerings for the nurse to choose through classes, conferences, or online materials. Many nurses take this as an opportunity to get continuing education in their area of interest or practice specialty. Seven of the nursing faculty participants in my research mentioned continuing education pertaining to test question development.

Naeem, van der Vleuten, and Alfaris (2012) found "faculty development with item writing courses have a profound effect on [test] item quality" (p. 373). Prior to the test writing course, the test items written by faculty were lacking in quality. The faculty developed test items after the course intervention were greatly improved in item quality concluding that continuing education programs enhance faculty understanding of test construction (Naeem et al., 2012).

Continuing education is an important aspect of nursing. "Nurses are lifelong learners," as stated by Kranz, Love, and Roche (2019, p. 12). Billings et al. (2019) commented that test item writing is a skill and needs to be learned and practiced. Experience and continuing education "propel nurses from novice to expert" (Billings et al., 2019, p. 12).

Nicole admitted she does not have a master's in nursing education; therefore, she has taken continuing education courses in the past on test development. She would like her college to do more with continuing education for testing. Maggie, like Nicole, did not receive graduate education in nursing education; therefore, she too went on to take

continuing education courses on her own. She would like to see more continuing education provided for the faculty through her college as well.

Just like Nicole and Maggie, Peggy felt it is important to get her own education on test development. Peggy, being newer to nursing education, admitted she struggles with developing higher order thinking test questions and realized she needs "more pedagogy with test development."

Emily admitted to having test development content in her graduate program stating, "it was very difficult to learn the concepts and understand the difference between the different levels of question writing, and what really made one higher level versus a lower level question." When she began her career in nursing education, she realized she needed more training with test development therefore she attended continuing education on item writing. Emily added:

> Learning the information again even if you know it and you have worked with it, hearing those tidbits and hearing the experiences in those seminars and classes from other educators really helps you expand the way you think about your test questions and your teaching and it helps you improve it. Never stay stagnant. You have to keep challenging yourself to make it better for your students.

While Regina had "some education" with test construction in her graduate program, she admitted:

> I would love if there were workshops or I think, item writing is hugely time consuming so if there were clinics or workshops specifically designated to

banking questions or looking at questions that would be helpful. I think I would be a participant.

In her graduate program, Linda recalled having an entire course of test writing with analysis. She added, "I think we got a very, very valuable detailed and concentrated focus on test writing." As for continuing education with test development, she agreed with Emily that test writing is challenging. Since getting education is important, she added "Well that [continuing education] would be on the faculty's responsibility. You know they have books on too, CEUs on it [writing test questions] workshops." She compared faculty getting continuing education on test writing to students learning; "We ask them to learn how to do something therefore, faculty should do the same thing."

Judy believes some faculty may not have had courses to write test questions, or just may "not have a good understanding of the different levels of questions." She believes if faculty lack understanding of test developments, they should attend some workshops and further their education with test questions.

**Minor Findings for Research Question Two**

Just as with research question one, there were codes that did not develop into themes. With research question two, less than half of the participants mentioned statistical analysis and course objectives guide them when developing a nursing test.

Once a test is completed, Nicole mentioned that often the item analysis on an exam will necessitate deleting the question or altering it. Maggie also looks at the analysis but stated she "might change the options" because she has "good questions" and thinks most of the "students do not read"; at least she stated the test reveals this to her.

Emily concurred that the statistical analysis may be helpful but faculty "really need to critically reflect on how you're writing [test questions]."

The course objectives were mentioned as a *true* starting point for test preparation by only one participant. Peggy considers the course objectives to be the most important factor to consider when developing a test. Two other faculty mentioned the objectives but not as pronounced as Peggy. Emily commented that her lecture notes are from the objectives; therefore, she uses her notes when developing a test. The objectives were "probably" the start to the practice of test development for Regina. From there she considers the course material's "finer points and objectives and then works a question from there."

The lack of consideration for the course objectives is very concerning to me. All nursing programs have objectives and from these overarching program objectives, the course objectives flow. Objectives should guide all courses. Objectives address what faculty want students to learn and describe the tasks to accomplish the goals within a course (Suskie, 2009). Course objectives provide guidance for what will be assessed (Banta & Palomba, 2015). I was very shocked with this finding. Peggy mentioned the objectives as most important to her with test construction. I wonder if this may stem from the fact that Peggy is the most recent nursing education graduate. Would this still be fresh in her mind? Nonetheless, the objectives should guide faculty in every course in both content and testing practices.

## Summary

This chapter presented the analysis of the data collected in the research study of nursing faculty and testing with higher order thinking test questions. Themes emerged from both research questions. The first research question involved the understanding faculty have of higher order thinking test question for their baccalaureate students. The themes included the concepts of critical thinking, foundational knowledge, and application and analysis. The second research question involved the practice faculty employed when developing a nursing test. The themes for question two included the concepts of clinical care, peer collaboration, and continuing education.

Chapter 5 presents a discussion of the findings, implications for nursing education, limitations of the study, and recommendations for future research considering the topic addressed in this study.

# CHAPTER V

## DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

This chapter presents a discussion along with interpretation of the major findings from this research, limitations inherent within this study, implications for nursing education, and recommendations for future research. The purpose of the study was to explore nursing faculty's understanding of higher order thinking test questions and the practices for preparing a test for undergraduate baccalaureate nursing students through interviewing and test reviews. Talking with nursing faculty participants about their understanding of higher order thinking with testing and their practices when preparing tests provided an opportunity to learn more about personal experiences and understanding into higher order thinking test development. These discussions allowed for insight into what faculty may need to further enhance testing knowledge and practice. Two research questions guided this study:

1. What are undergraduate nursing faculty's understanding of higher order thinking test questions for the baccalaureate nursing student?
2. What practices are involved when undergraduate nursing faculty prepare a nursing test?

Not only was a gap identified in nursing theory and practice as discussed in Chapters 1 and 2 of this study, I found a gap in the literature with nursing faculty and testing. Many articles identify that nursing faculty need to write better questions at higher levels. This has led to a plethora of guides and frameworks to help nurse educators create good quality test questions. Researching test question development

within nursing education, I discovered a lack of qualitative research in which nursing faculty voices are heard. I wanted to hear from those faculty who are making tests, administering tests, and assessing nursing students; therefore, I set out to listen to nursing faculty regarding testing.

The participants for this study included eight undergraduate baccalaureate nursing faculty currently teaching in a classroom setting where examinations are administered. The majority of nursing courses employ classroom tests to evaluate the student's progression in the nursing program. Experience with test questions is just as important as nursing knowledge since these go hand in hand for the nursing licensure examination. Nursing faculty need to prepare test questions which will encourage the student to use higher order thinking skills. Higher order thinking is necessary for the application and above questions found on the NCLEX; therefore, nursing students need these types of questions in their nursing program (NCSBN, 2019b).

It has been well documented that nurses require higher levels of thinking when practicing in the clinical setting (Caputi, 2019; Del Bueno, 2005; Kavanagh & Szweda, 2017; Muntean, 2012). In fact, research suggests that new nurses have difficulty making the appropriate clinical decisions necessary for safe, effective client outcomes (Del Bueno, 2005; Kavanagh & Szweda, 2017; Muntean, 2012). Nurse educators need to be cognizant of this research and plan teaching strategies and testing practices to best prepare graduates for the realities of clinical care.

As discussed in Chapter 4, nursing faculty understood higher order test questions in a variety of ways as well as had a mixture of practices for preparing a nursing test.

Themes were evident from both research questions. A discussion and interpretation of these findings are discussed in the following sections, organized by the research questions. Implications for nursing education, limitations fundamental to this study and recommendations for future research follow this discussion.

## Research Question One Discussion

Research question one looked at nursing faculty's understanding of higher order thinking test questions. Three major themes emerged from this question. The first was that higher order test questions require the student to use critical thinking. The second finding was that students need to use foundational knowledge when answering higher order questions. The third and final finding was that higher order test questions use application and analysis type of questions.

### Critical Thinking

The first major theme for research question one involved the use of critical thinking for higher order thinking test questions. All participants commented that critical thinking skills are necessary for nursing students, both when providing clinical care and answering higher order thinking test questions. There was an assortment of remarks within the discussions surrounding critical thinking. These remarks included looking beyond the content, increased complexity, the need to make them think, and that critical thinking leads to clinical reasoning. Nicole and Regina commented that their primary focus or goal with testing is for the student to critically think when answering test questions.

As the literature review in Chapter 3 pointed out, critical thinking is one of the components of higher order thinking. Additionally, Muntean (2015) found that nursing knowledge was not enough when providing safe nursing care. The nurse must use thinking skills to have appropriate, safe clinical judgment skills (Muntean, 2015). Linda commented that nursing tests need to include "a lot of thinking questions because the nurse has to think in clinical practice." Several of the participants discussed the critical thinking that must take place in the clinical setting. Testing is one way in which faculty can assess for this critical thinking ability or skill. McDonald (2018) stated, "If the student can think, they can reason out any question that is proposed to them" (p. 119).

Nursing faculty need to assess for critical thinking skills with higher order thinking test questions throughout nursing programs. The NCSBN is currently working on the Next Generation NCLEX (NGN), which enhances the assessment ability of critical thinking, clinical reasoning and clinical judgment, as these are the skills nurses need in clinical practice (NCSBN, 2019b).

I was not surprised with the finding of critical thinking as a topic of higher order thinking during the interview process. In fact, all participants mentioned critical thinking or higher/deeper thinking with the exam review as well. What's more, all participants used critical thinking and higher order interchangeably during the interviews. Critical thinking has been a popular phrase in nursing education for years. Only recently has the discussion moved on to include terms such as clinical reasoning, clinical judgment, and problem-solving (NCSBN, Winter 2018). These terms, while present in the nursing education literature, have gained popularity with the nurse educator community the last

decade due to the conversations regarding the Next Generation NCLEX. A surprise to me was the lack of awareness by some of the participants for the future plans for the NCLEX. While seven out of the eight participants had heard of the Next Gen NCLEX, they did not have any knowledge of the plans for this project and readily admitted this. In fact, one faculty had not even heard of the Next Generation NCLEX (NGN).

Within the last decade, information regarding research was released looking at whether clinical judgment and decision making in nursing were being analyzed based on the then current practices of registered nurses (Muntean, 2012, 2015). The research findings stimulated conversations within the nursing education community. In 2017, the NCSBN started a special research section for nursing candidates taking the NCLEX-RN. These experiential questions were not evaluated for the NCLEX score, rather were used to consider the testing enhancement for clinical judgment with the future Next Gen NCLEX Project (NCLEX, 2019). With the rigor and format of the NCLEX evolving in the next couple of years, nursing faculty most likely will need to modify their teaching and assessment practices to better prepare students for the future licensure examination.

**Foundational Knowledge**

The second major theme for research question one required the students to use foundational knowledge when answering higher order thinking test questions. Six out of the eight participants made a reference to students needing to use foundational knowledge when answering higher order thinking test questions. Participants included the following into the discussion of foundational knowledge basic anatomy and physiology, fundamental (basic) nursing content (example: vital signs and lab values),

pathophysiology, and medical terminology. Having a foundation in anatomy and physiology was mentioned several times by the participants throughout the discussion of knowledge necessary for higher order thinking test questions. The Essentials document (AACN, 2008) discussed the need for nursing education to include a liberal education from arts and sciences to provide safe, quality nursing care. In fact, those participants teaching at the senior level mentioned the need to be able to build upon the fundamental nursing content, which is taught early in the nursing program. If this early knowledge is not solid, then students will struggle to apply foundational content for the progression of more complex nursing knowledge.

Personally, teaching sophomore nursing students in their first nursing course, I have witnessed the struggle when students do not possess a strong basic science background. Most commonly, a weakness in the rudimentary anatomy and functioning of the body systems causes students headaches early on. This foundation is necessary in order to apply nursing concepts. All the participants gave examples of what background information they believed necessary with particular test items they identified as higher order questions. The majority of background information needed for their questions stemmed from basic physiology. Faculty need to consider what prerequisite knowledge is expected of students as they develop tests (Billings & Halstead, 2019).

Obviously, not all students will have a strong foundation of knowledge and ultimately this can hinder application of content on tests. McDonald (2018) remarked higher order thinking does require students to draw on prior knowledge in order to apply concepts for an appropriate solution to a nursing problem. Putnam, Nestojko, and

Roediger (2016) added that health professionals need to be able to retrieve information from a well-organized knowledge base in order to be successful. Additionally, testing requiring a fundamental knowledge base may be more difficult, but long-term retention and application of this content is necessary as the student progresses in the curriculum (Putnam et al., 2016). This comment is so important in nursing. Nursing knowledge is more difficult to understand and apply if there is no fundamental basis upon which to build. The majority of participants understood this and realized higher order thinking occurs more readily with a strong foundation of basic knowledge.

**Application and Analysis**

The final major theme that emerged with research question one was that higher order thinking test questions need to use application and analysis types of questions. The terms application and analysis come from Bloom's taxonomy, which was referenced in the review of literature and guided the discussion of higher order thinking test questions for this study. According to the NCLEX test plan (NCSBN, 2019b), the majority of items on the licensure examination are written at the application and higher levels of cognitive ability.

As discussed in the background information from Chapter 1, the test plan provides information about content areas tested on the NCLEX examination, outlines general, broad content areas for the licensure examination, and offers examples of NCLEX-style test questions (NCSBN, 2019b). Much to my surprise, only two participants referred to the test plan with their testing practice. Regina acknowledged the importance of this document and admitted she even shares the test plan with her students;

"they need to know this." Emily uses the test plan as a guide with her testing practice. A concerning finding to me was that two faculty participants did not have any knowledge about the test plan. It is interesting to note that these two teachers do not have a master's in nursing education specifically. I wonder if this is a contributing factor to their lack of awareness with the test plan. On the other hand, both have been educators for over 10 years; therefore, I find it hard to think that they have not heard of this important plan. While four of the educators were aware of the test plan, they did not consider it with testing.

All participants understand in order for a test question to be a higher order thinking question it needs to require the student comprehend concepts and be able to apply these concepts to new situations (Bloom, 1956: Suskie, 2009). When higher order questions require analysis, the student would break down content with reasoning skills, identifying patterns in order to answer the question (Anderson & Sosniak, 1994; Bloom, 1956; Brookhart, 2010; Suskie, 2009). Analysis questions require students also apply prior knowledge in order to move through analyzing what the question is asking (Suskie, 2009). According to McDonald (2018), higher order items are created at the cognitive levels of application and analysis, as supported by the participant's understanding of higher order thinking test questions. Dr. Patricia Benner referred to "nursing practice as an *applied* discipline" in which the application of knowledge is necessary for nursing practice (Benner, 1984, p. 1). Emerson summed up what I believe the participants understand about nursing education and application: "Becoming a nurse requires an

education, and nursing practice epitomizes the application of that educated mind" (Emerson, 2007, p. 56).

All participants identified multiple choice questions as application and analysis higher order test questions. Nicole mentioned she understands alternative format questions such as select all that apply can also be application and analysis questions. Maggie often finds alternative questions, other than multiple choice, "muddy the waters" and is not sure these types of questions benefit the student for higher order thinking. Linda agreed with Maggie about alternative test questions and commented, "it's probably a bad thing" over the usual multiple choice questions. Regina mentioned alternative questions are used by the NCLEX for higher order but admited her question development for application, especially analysis type questions, "is not there yet." We [nursing education] need to be careful using alternative questions on the future NCLEX remarked Judy. She added while these are higher order types of questions, application and analysis, it can make the test too hard.

## Research Question Two Discussion

Research question two looked at the practices involved when nursing faculty prepare nursing tests. Three themes emerged with this question. This first was that faculty need to consider a clinical care focus when making an exam. The second finding involved faculty collaboration with test development. The third and final finding was that nursing faculty need continuing education with the practice of test development to ensure consistency.

**Clinical Care**

Providing clinical nursing care to a patient is a major part of the registered nurse's role. Throughout undergraduate nursing education, students deliver nursing care to patients in a variety of clinical settings, most commonly acute care hospitals, long term care facilities, clinics, and rehabilitation facilities. Patient care is the essence of nursing. When a testing candidate passes the licensure exam (NCLEX), they can practice nursing as a registered nurse. Passing this examination implies the nurse can perform nursing care and has met the "competencies needed to perform safely and effectively as a newly, licensed, entry-level RN" (NCSBN, 2019b, p. 3).

The study participants are in congruence with the literature recommendations for nursing education focusing on a clinical care approach with testing. There is plenty of literature to support that nursing education needs to bring clinical practice into the classroom (AACN, 2008; Bristol, 2015; Geist & Catlette, 2014; NCSBN, spring 2018). This clinical care focus in the classroom is necessary for improvement with the transition to clinical practice the new nurse faces. As noted in the literature review, many new graduates are exhibiting poor clinical judgment developments, which can lead to ill decision making. Test questions using clinical situations with higher order thinking will help with the clinical transition, as the participants discussed.

Peggy was very passionate about ensuring students are tested with clinical care scenarios. She commented about presenting real life situations within questions. While she admitted she needs to work on test development, Peggy personally adds her current active bedside practice into test question scenarios for her students, giving them

reality-based questions. Beth commented similarly to Peggy and she is currently working in the clinical area as well. She used the phrase "practice-based" questions repeatedly and makes sure her course content and tests translate to clinical practice. The comments and discussion from these two participants were something I anticipated since they are actively involved in direct patient care at the bedside.

Emily commented she often starts her test questions with the following, "a patient presents with . . . ." She attempts to encourage the students to use higher order thinking at the bedside which in turn guides her when she prepares a test. Linda concurred and has the same requirement of her students, to think like in clinical practice. The literature abounds with guides to help faculty with test preparation. This literature cites using clinical vignettes or scenarios as part of testing practice to produce appropriate nursing tests (Bristol, 2015; Bristol & Brett, 2015; Bristol et al., 2018; Caputi, 2019; Geist & Catlette, 2014; Kranz et al., 2019; Morrison & Free, 2001;Tarrant & Ware, 2012; Wendt & Harmes, 2009).

This finding about the use of clinical scenarios was somewhat surprising to me. I did expect the two faculty with the least years as nurses and educators (Peggy and Beth) to address clinical situations. As for the remaining participants I was not thinking this would be mentioned by all of them. Upon reflection, I do this with my own test questions, but the realization did not hit me until I sorted through the data for this study. As they were reviewing their own test questions, they too realized clinical care guided their test preparation.

**Collaboration**

The finding of faculty collaborating for test development was unexpected. I firmly believe in working together in nursing and beyond, whether it is finding someone to help you or being there to help others. As mentioned previously, one of the competencies identified for nursing is teamwork and collaboration (QSEN, 2019). Often teamwork in nursing is thought of only when delivering direct patient care, helping a fellow nurse turn a patient, or assisting with a complex dressing change. Why does this rarely filter over to nurse teachers? One reason may include the fact that nurse educators commonly teach a course by themselves; therefore, may not seek assistance from others understanding they are busy within their own courses.

In my own experience, I have been in situations where the workplace environment did not encourage one faculty asking another for assistance, especially with test writing. Luckily, these environments are fading and changing in nursing education. Of late, I have noticed and experienced a willingness to share ideas within work environments where mentoring and collegiality are encouraged. This is a welcome occurrence and is a necessity as the future of nursing education evolves.

With the shortage of nursing educators, many come to teach from a clinical background, not an education preparation background; therefore, many have little training with test writing (Bristol & Brett, 2015). Couple this with the looming modification to the NCLEX, faculty need to work together to ensure our students are going to be prepared to take the licensure exam of the future. Collaboration is necessary

with test development. In fact, McDonald (2018) said faculty should never administer a test that has not been reviewed by fellow colleagues.

Since no perfect test question exists, we as educators need to realize that test writing is an evolutionary process. Test creation needs to be an open, shared, collaborative process. Six participants agreed with this need. I was surprised that the two participants who did not mention collaboration were the ones with less than 10 years as nurse educators. I thought this data would have come from participants who have been teaching the longest.

There were two commonalities with Emily and Linda regarding collaboration. Both felt comfortable with their test development ability and mentioned that the student needs to take some responsibility for their learning for tests. Perhaps instead of blaming the faculty with poor test preparation practices maybe we should look at students and their lack of preparedness. While other participants mentioned a lack of student preparation in class and with exams, they also mentioned that faculty should collaborate with test construction and review of questions.

Peggy believes working together needs to be a priority. She commented on how busy everyone is but believes even critiques from peers with a few test questions would be helpful. This "sharing between peers" would be good since everyone has their own style that is worth sharing. Peggy is newer to education (two years as a nursing faculty member) and admitted to feeling "a lot of pressure" with test development from her peers teaching the same course. While she mentioned this with a laugh, I could tell this was nagging at her due to her body language and lack of eye contact during this discussion.

In the next breath she added, “it’s not that bad,” perhaps realizing I too am a faculty member teaching at the same college. The conversation quickly moved forward and I felt this discussion worth mentioning for this topic.

Notable to the discussion of collaboration was the conversation with Judy. Overall, she commented collaboration was a “good thing” but immediately thereafter shared that in some respects it can be bad. She gave an example of “possibly hurting some people’s feelings if they write a very poor question.” It was obvious during the interview that she had experience with revising someone’s test questions and they got their feelings hurt. This experience may have led to a change in their working relationship. To balance the discussion, Judy shared a positive experience of collaboration while discussing a “great mentor.” Judy and this mentor worked together on test development and she “gave me a lot of her knowledge [with writing test questions].”

I appreciated the honesty the participants shared regarding working together for test development. Obviously, this is not being done since the majority of participants commented that collaboration should guide faculty with test development.

**Continuing Education**

As mentioned earlier, registered nurses are required to complete continuing education hours in order to maintain their RN license. What, where, and how this education is obtained is up to the nurse. Most of the participants mentioned that faculty need continuing education for test development.

As previously mentioned, there is an abundance of "self-help" articles in the literature, which offer guidelines, frameworks, or steps for writing test questions. In addition to journal articles, there are online as well as in person continuing education programs that focus on test development. Pressler and Kenner (2012) along with Morrison and Free (2001) placed the onus on the deans/directors of nursing programs to provide faculty development programs including the development of assessments and test items. A study by Naeem et al. (2012) provided evidence that faculty development programs improve the quality of faculty created test items. The participants' discussion regarding continuing education for increasing faculty knowledge of test development is supported by literature findings. This education can in turn lead to improved question development, potentially bettering student assessment outcomes (Clifton & Schriner, 2010; Tarrant & Ware, 2012).

In my experience, I have a master's in nursing education and admittingly had minimal content on test development during my program. When I became an educator, I realized the importance of testing and took it upon myself to get continuing education on test development. While my place of employment provided a few hours of training on test question writing, they do not provide this education on an annual basis. As faculty, it is our responsibility to understand our role expectations as educators which includes appropriate assessment of students. Notably, the National League for Nursing (2012a) has established guidelines for testing within nursing education. These guidelines state that faculty have the obligation to produce tests of "good" quality that are "accurate and

relevant" to current practice (NLN, 2012a, p. 2). Most participants in this study agreed that nurse faculty need continuing education with test development.

One participant, Beth, did not mention continuing education for test construction. She admitted she loves making test questions and is very comfortable doing so. This enjoyment coupled with her recent graduation with her master's in nursing education could be why she did not comment about faculty needing continuing education with test development.

Along with the theme of continuing education, a pattern was noted involving consistency. The majority of participants mentioned consistency as an issue due to the varying levels of experience with test development among nursing faculty. Frustration was noted when Nicole mentioned her experience with inconsistency occurs when students may fail her course but get As in other courses. She cited, "there has to be a disconnect." She questions if other faculty may not create appropriate higher order test questions; therefore, their tests are easier.

Several participants mentioned there are differences in faculty knowledge and experience with writing test questions. Comments such as "getting on the same page" and "keeping levels consistent" were made when discussing consistency with testing practices and continuing education. The levels discussed were those of Bloom's taxonomy, application, and analysis, as previously reported. The participants believe nursing test questions should be application and analysis types of questions.

While the major theme for the practices with test preparation focused on continuing education, I was surprised there was not more mention of critical review of

test questions using a statistical approach. I identified this as minor finding with research question two. I reflected upon this and wonder if these particular faculty may not have understanding of the statistical analysis for exams or perhaps do not consider statistical review to be part of this discussion of testing practices.

The themes identified from this qualitative study were mentioned scattered in some form within the nursing education literature. Taking a qualitative approach to testing with nursing faculty allowed for better understanding of the nursing faculty members' experiences with assessing students. Ultimately, nursing faculty want their students to become the best nurses possible. In order to produce nurses that will be able to safely and skillfully provide clinical care, faculty need to evaluate them with higher order thinking test questions.

## Limitations of This Study

Nurses have a great responsibility to provide safe, effective nursing care. This requires nurses use higher order thinking to make appropriate clinical decisions resulting from critical thinking, clinical judgment, and reasoning skills. Nursing faculty are obligated to evaluate students for such skills as they progress through the nursing program. The use of higher order thinking test questions assist faculty in the determination of a student's ability to make the necessary clinical decisions for positive patient outcomes. The goal of this study was to explore nursing faculty's understanding of higher order thinking test questions and practices for preparing a test for undergraduate baccalaureate nursing students. The study findings presented in Chapter 4 and the

discussion presented in this chapter were influenced by the limitations identified in this section. Some factors, likely inevitable, may have limited the data collection.

The first limitation to consider is the possible timeframe for participation of the study. It can be speculated that asking faculty to participate in research during the summer might have contributed to the number of participants (eight). Although the sample size was consistent with much of the qualitative research in nursing, it would have been interesting to hear from more participants. Gathering data in the fall or spring unlikely would have resulted in different findings from what was obtained during this research data collection. I believe saturation of data occurred with eight participants.

The second limitation involved all the participants being female. This was expected since the majority of nurses are female. It would have been noteworthy to gather a male understanding of higher order thinking and investigate any variances for test preparation. Since there are only four total male faculty in the entire college of nursing studied, I realized from the beginning this was foreseeable limitation.

A possible third limitation may have been my employment as a faculty member at the college of nursing in which the study was conducted. While I did not feel this was a factor during the interviewing process, it may have prevented faculty members from participating in the study. Despite the fact I do not have any input nor influence in faculty evaluations, I still wonder if faculty may have been hesitant to participant in research by a fellow colleague. Although I was familiar with all the participant's names and recognized faces, I have not had contact with all of them in the past. There was only one faculty member with whom I closely worked with the past. Currently, I do not work

directly with any of the participants nor have access to their tests. I believe my professional, warm approach encouraged the participants to be open during the interview process.

Finally, another limitation may have been asking the participants on the spot to identify questions as higher or lower order. This may have been a difficult task for some participants. In fact, many were unable to consider how to revise a lower order question to make it higher order. Another approach to the test review may have been that I provided questions that were established by testing experts as higher order and lower order and then worked with these questions. I could also have asked the participants to come with pre-identified questions of higher order and lower order. This approach would have required the participants to do work ahead of time and I thought this might have limited participation. My initial idea was to see if their questions were reflective of what they understood to be higher order. In some cases, it was evident their understanding of higher order was reflective in the question(s) they identified as higher order. On a few occasions, participants looked at me questionably when identifying their questions as higher or lower order. Some even used terms such as, "I think this is," or "I'm not sure but . . ." when they identified the type of questions. I believe they were looking for affirmation as to the question level. I made sure to focus on the neutrality of my mannerisms and facial expressions as to not influence their initial consideration of the question type.

## Implications for Nursing Education

The results of this study propose important implications for nurse educators and nursing education. While there are many articles offering input as to how faculty can write better test questions, there is a lack of qualitative research in which nursing faculty discuss testing. Hearing directly from nursing faculty provided valuable information as nursing education is progressing forward with higher order thinking questions and the Next Gen NCLEX.

Given the state of nursing education and its imminent transformation with NCLEX, this study offers implications to consider for nurse educators and nursing education. These implications include preparing nursing faculty with continuing educational programs for undergraduate testing practices, recognizing and creating opportunities for faculty collaboration with testing practices, reviewing foundational knowledge expectations of students entering nursing programs, and enriching students' transition to practice using reality, clinical based NCLEX style questioning.

The findings of this study are consistent with literature involving undergraduate testing and test preparation for nursing students. With each implication there are certain components that are addressed in which the participants provided important details. Rounding out this chapter, are possible suggestions for future research that may assist nursing education and faculty.

### Continuing Education

In nursing education, we expect students to be prepared with content necessary for their role as a registered nurse. Therefore, it should be expected that nursing faculty

are prepared with the knowledge necessary to be a nurse educator. Testing is part of the nurse educator's responsibility, yet many nursing exams lack quality and contain item writing flaws (Bristol et al., 2018; Kantar, 2014; Morrison & Free, 2001; Oermann, 2018; Tarrant et al., 2006; Tarrant & Ware, 2008, 2012). Most of the participants admitted nursing faculty need continuing education with testing practices.

As mentioned, nurses can obtain their continuing education requirements with any approved educational program of their choice. The testing guidelines from the National League for Nursing (2012a) stated that educators are obligated to produce high quality test items. Based on the findings from this study, only two participants felt they were pretty comfortable or moderately confident with writing test items. The remaining participants admitted they were average or just fairly comfortable with test question creation. Several commented they still need to work on test development. These results indicate further education is needed.

Even with all the literature available in nursing resources, faculty still need continuing education with testing practices. Traditionally, nurses like face-to-face conferences or workshops for their continuing education programs. Providing this education through the workplace affords faculty the opportunity to get education without travel. In addition, if a college of nursing educates their faculty, consistency mostly likely will improve since faculty all "hear" the same information at the same time. A few of the faculty commented that deans or administration should provide such education, and this was supported in the literature, as well.

Receiving education on testing practices includes test question creation. All participants believe higher order thinking test questions should be at the application or analysis level. Therefore, it is necessary to include education on Bloom's taxonomy and its revision since these types of questions are being used on the NCLEX as identified in the test plan (NCSBN, 2019b). Incorporating application and analysis types of question is necessary within nursing programs to encourage student use of higher order thinking skills.

As the NCLEX is working to enhance the measurement of clinical judgment skills in the entry-level nurse, nursing education must respond. First of all, nursing educators need to be aware of the Next Gen NCLEX and what it means for the future of nursing education. This study reveals that the NGN is not common knowledge with all of these nursing teachers. Through the provision of continuing education, updates as to the progression of the NCLEX can assist faculty to better understand how critical thinking has evolved into higher order expectations with clinical judgment and problem-solving skills.

Additionally, continuing education for educators needs to include the NCLEX test plan. The results of this study found only two faculty participants use the test plan in their testing practice. The test plan provides valuable information for faculty regarding the licensure examination (NCSBN, 2019b). Understanding the content areas highlighted on the licensure examination and reviewing the test question examples will help faculty as they prepare exams for their undergraduate nursing students.

**Collaboration**

Working with others is a necessary part of nursing responsibilities. Whether a nurse is delivering care to a patient or educating future nurses, collaborative efforts will most likely improve outcomes (Bristol & Brett, 2015; Kennedy et al., 2019; McDonald, 2018; QSEN, 2019). Most of the participants echoed the literature for collaborative efforts with testing development. One faculty participant commented that a mentor with expertise in test writing helped her early on in her career as an educator with test construction. Finding a colleague (peer), mentor, or group with testing experience would greatly benefit faculty with testing practices. As Bristol and Brett (2015) commented, test writing is challenging and seeking feedback from colleagues improves the quality of test writing. McDonald (2018) asserted that having a peer critique your exams helps to minimize errors or flaws with test questions. McDonald commented, "you [faculty] should never administer a test that has not been reviewed by at least one of your colleagues" (p. 86).

One study participant, Regina, works within a course group for test development. Her course group has created a question pool or question bank in which each faculty member submits their own created test questions for consideration on a test. Often the questions submitted require tweaking, but Regina does not mind this; in fact, she feels this makes her tests stronger and improves her critiquing ability for higher order thinking questions.

**Foundational Knowledge**

It has been established that nursing programs have prerequisite courses for students entering into the program (Billings & Halstead, 2019; Breckenridge, Wolf, & Roszkowski, 2012). Often these courses include science, anatomy and physiology, and basic mathematics (Breckenridge et al., 2012; Oermann, 2015; Wolkowitz & Kelly, 2010). Having fundamental knowledge in these courses helps the nursing student build upon these concepts and apply nursing content. Most of the participants saw a basis in foundational knowledge as necessary for higher order thinking within tests.

Admission testing is not a standard requirement for the undergraduate nursing program where the study participants are employed. Participants commented that often a lack of fundamental concepts is discovered in the early nursing courses, which hinders nursing program progression. This lack of fundamentals can be a concern when attempting to apply nursing content if the student does not have knowledge of, for example, how the body functions. This study suggests investigation of foundational knowledge and requirements for nursing students to allow for a smoother application of nursing concepts throughout the program.

**Reality, Clinical Based Test Questions**

All study participants reported that nursing faculty need to consider a clinical care focus when creating test questions. Using a clinical scenario in test questions makes the student consider real life experiences of a nurse in which higher order thinking is required to make decisions. Benner (1984) addressed concern with new nurses having difficulty transitioning to practice and being able to use deeper thinking skills to solve problems.

Literature supports the use of clinical based questioning in order to reinforce the transfer of thinking skills into the clinical care (Billings & Halstead, 2016; Bristol, 2015; Geist & Catlette, 2014; Kantar, 2014).

Two of the participants who are actively working at the bedside commented they often use their own clinical experiences in the test questions they write. Using clinical based questions allows for a test item to assess higher levels of thinking since these types of questions require application and analysis of clinical information (Kranz et al., 2019). Aligning class content and testing with clinical care better prepares students to prioritize and make clinical decisions (Bristol, 2015; Geist & Catlette, 2014). The use of higher order thinking questions with a clinical focus is necessary, as Geist and Catlette (2014) commented, "Knowledge is not enough in the real nursing world" (p. 116). "Real world" was a phrase commonly used by the participants of this study. One of the most appropriate comments shared while discussing this topic was by Beth when she said, "test questions should translate to clinical practice." This study and the literature concur that test questions need to reflect clinical care where the student is able to apply content to the real life experiences of a nurse.

## Recommendations for Future Research

The findings of this study provide a foundation for future research ideas surrounding the topic of testing. More research with testing will be necessary as the Next Generation of NCLEX testing is on the horizon and the duties of the nurse are increasing. Nurse educators need to keep up with the many changes occurring to ensure their

students are going to be successful throughout the program, on the “new” licensure exam and as they transition to a practicing registered nurse.

This study identified difficulty with developing higher order test questions as supported by the nursing education literature. Participants found test writing time consuming and challenging. The use of collaboration with fellow peers was a theme that emerged with the participants. Exploring faculty peer relationships may provide insight into approaches for organizing and developing collaborative efforts for test development. One suggestion for schools of nursing might be to organize faculty in small groups of perhaps two to three colleagues to share and review exam questions on a monthly basis. One member should be a seasoned educator with experience writing higher level test questions. The environment of this collaboration should encourage critique and review of test questions without judgment. Once this collaborative critique has taken place over a semester or two, research on faculty member’s understanding of higher order testing and practices should be studied noting possible improvements.

While this study was completed with a mixture of faculty from different graduate level preparations and years of experience, it would be interesting to take a mixed methods approach with more participants. This study could do comparisons between those with degrees in nursing education versus those with a more clinical focused graduate degree. Additionally, looking at the years of experience as a nurse and nurse educator might provide some interesting data as to testing practices. While I am not sure the results would yield differences between male and female educators, securing males

for such a study might be noteworthy, although challenging, in this female dominated profession.

This study suggested continuing education for test development practice would be helpful to nursing teachers. As previously mentioned, the literature brims with guides for effective test item writing. These helpful instructions are readily available so why are faculty still struggling with creating higher other, successful test questions? Exploring what educational methods faculty prefer would be essential prior to offering any education programs for test development. A few studies presented in this research mentioned that deans and administrators are responsible for providing education to their faculty members. I am not sure this is neither appropriate nor cost effective for schools of nursing. At some point faculty need to be responsible for their learning needs.

Nevertheless, further education is needed for nurse educators with testing practices. Writing lower level cognitive questions is less complicated to develop but are not what nursing students need to be successful in nursing programs and on NCLEX. Disseminating information about current trends in nursing education, the test plan, and Next Generation NCLEX need to be included with continuing education efforts for nurse educators. Investigating the learning styles of faculty members would be valuable for planning continuing education programs.

The results of this study addressing the need for more education with testing are consistent with the findings in the nursing education literature. Perhaps future research needs to focus on graduate level nurse educator programs and how test development and testing practices are being taught. Researching what is being taught may expose gaps in

test development that needs to be addressed in the educational programs for future nursing faculty.

## Conclusion

This qualitative study intended to explore nursing faculty's understanding of higher order thinking test questions and the practices of test development for undergraduate baccalaureate nursing students. As the responsibilities of the registered nurse increase and the nursing shortage continues, nursing faculty are challenged to ensure students are using higher order thinking skills to provide safe, appropriate nursing care. Assessing for this deeper thinking must occur throughout a nursing program in both the classroom and clinical areas.

It is well documented that nursing students need to be tested with higher order cognitive stages of application and analysis since nursing requires complex thought processing (NCSBN, 2019b). Many articles are available to assist faculty with the task of writing appropriate level questions whereby the student must apply nursing content to clinical situations (Bristol, 2015; Bristol & Brett, 2015; Bristol, Nelson, Sherrill, & Wangerin, 2018; Caputi, 2019; Geist & Catlette, 2014; Kranz et al., 2019; Morrison & Free, 2001; Tarrant & Ware, 2012; Wendt & Harmes, 2009). Results of the study noted four prominent findings: higher order thinking uses critical thinking with a foundational knowledge requirement, application and analysis principles must be present in higher order test questions, faculty need continuing education and peer collaboration with testing preparation, and the use of a reality, clinical care focus is necessary with higher order testing.

# APPENDICES

# APPENDIX A

# INTERVIEW QUESTIONS

## Appendix A

## Interview Questions

1. How many years have you been teaching in an undergraduate baccalaureate nursing program?
    a. In your current position?
    b. Have you taught in any other RN education program?
2. What level of students do you teach?
3. Can you explain your educational preparation with regard to the development of exams?
    a. Formal
    b. Informal
4. Could you describe your experience with writing test questions?
5. What factors do you consider when developing a test for your students?
6. Tell me about the process you go through when developing a test.
7. When you sit down at your desk to develop an exam, explain what guides you.
8. What would say are challenges (if there are any) for a nurse educator to develop test questions?
9. In your experience, how does undergraduate testing practices influence NCLEX testing and performance?
10. Describe what you consider as the ideal nursing test question.
11. Describe your personal level of comfort with developing test questions for your students?

12. What is your experience with Bloom's Taxonomy?
13. In what instances have you considered or used Bloom's Taxonomy?
14. Bloom's taxonomy is identified in the NCLEX test plan. Are you familiar with the NCLEX test plan?
    a. Does the NCLEX test plan influence your test development?
    b. Does Bloom's Taxonomy influence your test development?
15. Describe your understanding of the phrase Higher Order Thinking?
16. What is your experience with Higher Order test items?
    a. What criteria do you understand a test question needs in order to be Higher Order?
    b. Explain
17. What is your understanding of NCLEX-style questions and Higher Order Thinking for test questions?
18. What role do nursing faculty have with Higher Order Thinking?
19. What role do nursing faculty have with Higher Order Thinking test questions?
20. What role do nursing students have with Higher Order Thinking?
21. What role do nursing students have with Higher Order Thinking test questions?
22. Currently there are discussions about re-working the NCLEX call Next Gen NCLEX. Are you familiar with this?
23. What are your thoughts on the future of the NCLEX with regard to Higher Order Thinking?
24. What does Higher Order Thinking mean to you?

25. Do you consider the NCLEX questions to be of Higher Order?
26. Please explain your answer
27. Currently, there are discussions about re-working the NCLEX called Next Gen NCLEX. Are you familiar with this?
28. What are your thoughts on the future of the NCLEX with regard to Higher Order Thinking?

EXAM REVIEW:

- What process did you use when developing this exam?
- What factors guided you as you put together this exam?
- Show me examples of 3 questions that you understand use Higher Order thinking?
- What makes these 3 Higher Order?
- Now let's look at 2-3 which you believe are not Higher Order?
- What makes these 2-3 Lower Order?
- What do you think might be done to make these questions Higher Order?

# APPENDIX B

# CONSENT FORM

## Appendix B

## Consent Form

### Informed Consent to Participate in a Research Study

**Study Title:** Undergraduate Nursing Faculty and Test Development: An Exploration into their Understanding of Higher Order Thinking Test Questions

**Principal Investigator:** Dr. Todd Hawley
**Co-Investigator:** Cheryl Brady RN, MSN, CNE

You are being invited to participate in a research study. This consent form will provide you with information on the project, what you will need to do, and any associated risks/benefits of this research. Your participation is voluntary. Please read this form carefully. It is important you ask any questions and fully understand the research in order to make an informed decision to participate. You will receive a copy of this document. This study has IRB approval #19-228.

**Purpose:**
This study aims to explore nursing faculty's understanding of higher order thinking test questions and practices for preparing a test for undergraduate baccalaureate nursing students.

**Procedures:**
The requirements for participants include 1-2 interviews lasting no more than 60 minutes each, which includes a discussion of one of your course examinations which you will provide for the interview(s). The data collected includes interview dialogue and a course examination.

**Audio Recording:**
All interviews with participants will be audio recorded to ensure adequacy. The recordings will only be used for the purpose of this study and will be permanently destroyed/deleted when the research is completed. You have the right to refuse to be recorded.

I agree to be audio recorded: YES _____ NO _____

**Benefits:**
The participant will receive no direct benefit from this study. However, the benefit from this research involves the nursing faculty community as a whole. This study is expected

to open the lines of communication and enhance understanding among nursing faculty regarding higher order test questions and test development.

**Risks and Discomforts:**
There are no anticipated risks beyond those encountered in everyday life with participation in this study.

**Privacy and Confidentiality:**
Pseudo names will be used for participants therefore, the collected data will not provide identifying information. Any identifying information will be kept in a secure location. The study information will be kept confidential; only the researchers will have access to the research data. All data collected will be kept on a private, password-secured computer.

**Compensation:**
Participants will not receive any compensation for their participation in this study.

**Voluntary Participation:**
Taking part in this research study is entirely up to you. You may choose not to participate, or you may discontinue your participation at any time without penalty.

**Contact Information:**
If you have any questions or concerns about this research, you may contact Dr. Hawley 330.672.0670, thawley1@kent.edu or Cheryl Brady 330.207.4906, clbrady@kent.edu. This project has been approved by the Kent State University Institutional Review Board (IRB). If you have any questions about your rights as a research participant or complaints about the research, you may call the IRB at 330.672.2704.

**Consent Statement and Signature:**
I have read this consent form and have had the opportunity to have my questions answered to my satisfaction. I voluntarily agree to participate in this study. I understand a copy of this consent form will be provided to me for future reference.

**Participant Signature:** **Date:**

_____ _____

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