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Comparison of Rural Associate Degree Nursing Students' Clinical Judgment after Curriculum Change

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This is to certify that the doctoral dissertation by

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Walden University
2022

Abstract

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MSN, Regis University, 2013

BSN, University of Wyoming, 2010

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

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Abstract

New graduate nurses often lack adequate clinical judgment skills to practice competent nursing care, which may result in increased risk of committing practice errors that threaten patient safety. To mitigate errors in patient safety, industry leaders have called for nursing program improvements in preparation of nursing students' clinical judgement as they transition to professional practice. Guided by Tanner's clinical judgment theory, the rural state nursing programs in this study implemented a concept-based curriculum to promote clinical judgment which includes thinking skills, priority setting, and management of care. The purpose of this three-part, quantitative, nonexperimental study was to compare the development of clinical judgment in associate degree nursing students taught using a traditional systems-based curriculum (n=233) and students taught in a new, concept-based shared curriculum (n=278). A quantitative comparative study using ex post facto student data from the ATI-Comprehensive Predictor exam scores in thinking skills, priority setting, and management of care collected at the completion of each of the associate degree programs was analyzed in SPSS using an independent samples t test. The result of this three-part study did not show a significant difference (p>0.05) in thinking skills and priority setting following curriculum change. However, a significant increase in management of care (p<0.05) was seen. Results of this study may contribute to positive social change as the nursing students develop clinical judgment to perform competent and safe nursing practice improving overall patient care. Future research is needed in the evaluation of curriculum change using other methodologies that support the development of clinical judgment.

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Dedication

To my family, my light and my source of happiness, my loving husband Brad and my beautiful daughter Jocie Rose for your unwavering patience, support, and constant encouragement. To my mom Paula and dad Robert, rest their souls, she my role model in nursing and him my champion, you never let me quit. To my incredible baby sister Katie who always thinks I'm the best, especially when I don't. To our wonderful friends Kristin, Allen, and Kallen Nuss you're always there for us, knowing what we need even when we don't. And, finally, to the underdogs, the imperfect, the doubtful and struggling, just trying to make something of yourselves; let me be an example, you can do it!

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To my committee chair, Dr. Janice Long. Your guidance and patience made this dream not only a possibility but also a reality, my thanks will never be enough. The team at Walden University has been incredibly supportive throughout this journey, I will be forever grateful.

To my colleagues in rural nursing education; we work to grow our own, to develop their clinical judgment, provide them an opportunity to embark on a successful nursing practice, and this work is life changing for us all. What we do requires constant energy, heart, and time. I am proud to work side-by-side with each of you every day. Thank you.

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Part 1: Overview

Introduction

The current healthcare climate is ever-changing and increasingly complex, with challenges that complicate the competent and safe delivery of care (Billings, 2019; Dickison et al., 2019; Institute of Medicine [IOM], 2010). Complications include limited resources, expectations for low-cost-high-efficiency care delivery and increasing patient age and multi-morbidities. Meeting the challenges faced in healthcare in the United States requires clinical staff to be competent and skilled clinicians prepared to practice effectively and efficiently in this complex environment. New graduate nurses are rapidly replacing the aging clinical workforce but with limited experience and inadequate demonstration of clinical competence (American Association of Colleges of Nursing [AACN], 2020; IOM, 2011; National Council of State Boards of Nursing [NCSBN], 2021). The preparation of new graduate nurses has been an area of concentration for the IOM, resulting in a nationwide collaboration using the IOM report "The future of nursing Leading Change, advancing health" as a guide (IOM, 2010). The result of the report included several recommendations regarding the practice and preparation of nurses (Billings, 2019; Dickison et al., 2019; IOM, 2010).

Increased concentration on the healthcare environment's complexity has led to intensive review and reform of registered nurses' academic preparation (Billings, 2019; Dickison et al., 2019). To prepare graduates to practice safely, graduates must possess certain skill sets to perform accurate clinical judgment for competent and safe patient care (Billings, 2019; Dickison et al., 2019; NCSBN, 2021). Defining clinical competence

through clinical judgment includes knowledge, skills, and attitudes developed during students' academic preparations. Further, to develop competence in clinical judgment, students must develop individual constructs which are thinking skills, priority setting, and management of care (Billings, 2019; Benner, 1984, Benner et al., 2009; Dickison et al., 2019, Tanner, 2006, Quality and Safety Education for Nurses [QSEN], n.d.). New graduates who have not yet developed these abilities to competently and safely practice nursing care increase the risk of practice errors that threaten safe patient care.

Nursing practice errors occur more frequently in new graduate practice, resulting in job dissatisfaction and decreased retention, especially within the first year of nursing (Cloete, 2015; Johnson & Benham, 2020; Murray et al., 2019). More common practice errors include medication administration, communication, and failure to recognize acute changes in patient conditions (Benner et al., 2009; Johnson & Benham, 2020; IOM, 2011, Murray et al., 2019; Tanner, 2006). As a result of practice errors, new graduate nurses may be subjected to disciplinary action, policy changes, and deterred progress in cost-effective and efficient care. Additionally, patients affected by these errors may require additional monitoring, increased care interventions, high additional costs, rapid declines in health, long-term damage, and even death (Assessment Technology Institute [ATI], 2016: Cappalletti et al., 2014; IOM, 2016; Johnson & Benham, 2020; Murray et al., 2019; NCSBN, 2021).

To mitigate errors and increase safety in patient care, industry leaders have called for an improvement in the development of nurses' skills to deliver safe and competent care (Billings, 2019; IOM, 2016; NCSBN, 2021). This preparation starts in nursing

programs continuing through transition to professional practice. Educators must develop students' clinical competence through its foundation, clinical judgment (Billings, 2019; NCSBN, 2021). The components of clinical judgment are thinking skills, priority setting, and management of care. Although many are proposed, no one approach to developing clinical judgment in nursing students has proven superior (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). To clarify expectations on a regulatory level, the NCSBN developed the clinical judgment model (Benner, 1984, Benner et al., 2009, Billings, 2019; Dickison et al., 2019; Tanner, 2006). Within the multiple layers of the model, the three significant constructs are thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019). Educational interventions designed to support graduates in developing clinical judgment, including curriculum revision following the IOM's recommendation, may provide necessary guidance for nursing education (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015).

Continued research in the academic preparation of clinically competent nurses may help promote positive social change as knowledge is gained ensuring safe practice for transitioning graduate nurses (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). Additionally, because of this study, the potential exists to isolate important academic preparation qualities and raise the nation's standard of care. Industry leaders may use the information from this study to investigate curriculum designs that foster thinking skills, priority setting, and management of care. Professional development within the industry's clinical nursing staff could result in a more successful transition to

practice from complete and comprehensive academic preparations to promoting clinical judgment development (Dickison et al., 2019; IOM, 2011; Murray et al., 2019; NCSBN, 2021).

Background

Clinical judgment development has been the focus of academics and agencies for several decades and has increased with the release of the IOM recommendations (Billings, 2019; Dickison et al., 2019; IOM, 2011). Despite increased work and focus on developing clinical judgment, graduates are still ill-prepared for entry into competent and safe practice (Billings, 2019; Dickison et al., 2019). Competent and safe practice requires graduates to possess thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019).

The development of clinical judgment begins in the graduate's academic preparation (Benner et al., 2010; Billings, 2019; Close et al., 2015; Dickison et al., 2019; Gorski et al., 2015; Tanner, 2007). Since the IOM recommendations' release, increased concentration on the environment's complexity has led to intensive review and reform of registered nurses' academic preparation across the nation (Benner et al., 2010; Billings, 2019; Dickison et al., 2019; Klenke-Borgmann & Mariani, 2020; Tanner, 2007). Programs have taken several approaches, including adding specific educational interventions to existing programs and overall curriculum revision to assist students in developing clinical judgment (Anderson et al., 2017; Cappalletti et al., 2014; Klenke-Borgmann & Mariani, 2020; Thompson & Stapley, 2011).

Examples of educational interventions in the literature include high-fidelity simulation, amongst others. Generally, with this intervention, students use technology to work through a scenario with a mannequin in a simulation lab using active learning strategies and debriefing, with an instructor following the event (Benner, 2015; Cappalletti et al., 2014; Kim et al., 2016). Another intervention includes pairing clinical experiences alongside didactic experiences throughout the semester, focusing student time and energy in various care settings in which practice clinical judgment under faculty supervision (Benner, 2015; Cappalletti et al., 2014; Landers et al., 2020). Clinical learning and human interaction between student and patient occur in the high-intensity environment of the clinical setting. These learning interventions are examples of strategies used by nursing programs to provide an environment of uncertainty and pressure, requiring the student to apply knowledge and skills attained in real-time without a pause button while maintaining instructor direction (Benner, 2015; Cappalletti et al., 2014; Landers et al., 2020).

Some nursing programs have chosen a more drastic approach to educational reform, re-evaluating, re-imagining, re-designing their nursing programs, determining that overall change is necessary (Close et al., 2015; Giddens, 2015; Gorski et al., 2015). The challenge of curriculum change accepted by nursing programs is a move away from traditional preparation, moving toward various formats that offer the potential to develop competence in clinical judgment for their students (Close et al., 2015; Giddens, 2015; Gorski et al., 2015). Some curriculum formats prevalent in the literature include concept-based curriculum, problem-based-curriculum, shared curriculum, and others that

transcend traditional systems-based platforms. Nursing programs choose educational interventions like these in response to the call for educational reformation and development of clinical judgment (Benner, 2015; Cartwright et a, 2017; Giddens, 2015; Gorski et al., 2015; Repsha et al., 2020; Tanner, 2007).

Curriculum change in nursing programs has occurred across many large and small states. Larger programs, many with academic medical center support, have published their results throughout the literature, demonstrating the use of the many excellent resources and partnerships available to them. Under the AACN partnership guidelines, these nursing programs and clinical agencies can facilitate the progression of a more significant number of participants through their academic preparation with shared clinical staff in partnering clinical facilities. These partnerships can be in the same urban area or across their state. Still, these associations afford a level of expertise between the two that are not the same way in the rural environment (Petges et al., 2020).

In this study, I focused on curriculum change in the rural setting. The reason for this choice is to understand better how an already resource-limited demographic population could achieve such a challenging, resource-demanding goal. Taking on an overall curriculum change requires significant resources and collaboration that include barriers such as increased distance between colleagues, fewer available expert advisors, limited personnel, and inhibited participation due to a lack of population (Anderson et al., 2017; Giddens 2015; Sharp et al., 2019; Tanner, 2007).

The location that I used for this study was a rural state in which consortium member nursing programs chose overall curriculum reform using a shared concept-based

curriculum (Anderson et al., 2017; Giddens, 2015; Repsha et al., 2020; Tanner, 2007). Programs across this state chose to take on the curriculum change collaboratively, not just in one program but in six of seven nursing programs across the state (Anderson et al., 2017). As a rural state with a limited population, working together resulted in necessary resources, expertise, and timelier completion of steps required to succeed with curriculum change (Anderson et al., 2017; Giddens, 2015; Tanner, 2007). This rural state is not the first of its type demographically to take on such a feat. As the rural state began investigating options for the massive project, they discovered other states who could provide lessons learned, guidance for successful revision and implementation, and other vital information they needed to be successful (Anderson et al., 2017; Giddens, 2015; Repsha et al., 2020; Tanner, 2007).

One of the more influential programs that provided guidance and leadership Oregon and the Oregon Consortium for Nursing Education (OCNE; 2007; Tanner, 2007, Gubrud-Howe et al., 2010). Kansas, Hawaii, and New Mexico took on this challenge alongside or before the rural state in this study. These groups provided invaluable information to the rural state of this study and its consortium members. Some contributions include lessons learned, effective strategies for working together, curriculum implementation once programs made pedagogical decisions, collaboration, and mentorship (Anderson et al., 2017; Giddens et al., 2015). In the rural state of this study, the goal of the newly formed consortium was to re-evaluate and re-invent their programs to meet the expectations set forth by the IOM and the NCSBN. Additionally, programs sought to increase the success of their students at the bedside remaining

progressive in their thinking toward the development of clinical judgment in nursing students. The focus is on developing the skill sets needed in clinical judgment helped to prepare competent and safe nurses who could meet the challenges of today's complex healthcare environment (Anderson et al., 2017; Giddens, 2015; Repsha et al., 2020; Tanner, 2007).

Relevance to Discipline

Continued research in the academic preparation of clinically competent nurses improved transitioning graduate nurses' safety and, most importantly, patient safety in receipt of that nurse's care (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). The significance of the lack of adequate preparation of nursing graduates is found in nursing practice errors. As a result of these practice errors, graduate nurses may deter progress in competent and safe care. Patients affected by nursing practice errors could require additional monitoring, increased care interventions and services, higher levels of care, experience a rapid decline in health, and, most severely, death (ATI, 2016: Cappalletti et al., 2014; IOM, 2016; Johnson & Benham, 2020; Murray et al., 2019; NCSBN, 2021).

The development of clinical judgment is a focus of nursing education, yet no single approach for helping students develop clinical judgment proved superior (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). To clarify expectations on a regulatory level, the NCSBN developed the clinical judgment model (Benner, 1984, Benner et al., 2009, Billings, 2019; Dickison et al., 2019; Tanner, 2006). Within the multiple layers of the model are three significant constructs. These constructs

are thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019).

Literature Review

In searching the literature, I used Academic Search Complete, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), the Cochrane Database of Systematic Reviews, Medline, eBook Collection (EBSCOhost), and ERIC. Limits included years of publication ranging from 2015 to 2021. The search terms included *clinical competency*, *competency development*, *clinical judgment*, *thinking*, *thinking skills*, *prioritization*, *priority interventions*, *priority care*, *care management*, *management of care*, *nursing*, *nursing education*, *nursing student*, *curriculum change*, *curriculum reform*, *shared curriculum*, *rural*, and *rural nursing.* Only peer-reviewed articles written in the English language were included. This initial search yielded over five thousand articles, so I began filtering the search to narrow the scope of the review.

I applied further search criteria to limit my literature review to only the most salient studies for the topic. I removed articles that did not focus on specific educational interventions related to curriculum change. Specific interventions included simulation, case-study review, electronic-learning platform integration, clinical site rotations, baccalaureate nursing education, post-graduate education, and continuing professional education. The search yielded approximately seventy-three articles and studies. I ultimately selected 32 articles for the literature review.

Exceptions to the time frame limit between 2015 and 2021 included “Novice to Expert” (1984) and “Expertise in Nursing Practice: Caring, Clinical Judgment, and

Ethics" (2009) (Benner, 1984; Benner et al, 2009). By incorporating eBook Collection (EBSCOhost), these seminal works have been used as a platform for continued academic and practice research over the last decades (Benner, 1984; Benner et al., 2009). Additionally, I included the systematic review of clinical judgment in nursing completed by Dr. Cappalletti and partners (2014), following Tanner's original work in 2006, which were both relevant to this study (Cappalletti et al, 2014: Tanner, 2006). Tanner's 2006 model "Thinking Like a Nurse: A research-based model of clinical judgment in nursing" (2006) is included outside the timeline as a framework for this study which resulted in the definition of clinical judgment (Tanner, 2006). The foundational definition of clinical judgment included comes from Dr. del Bueno (2005). Dr. del Bueno helped to clarify the expectations for priority setting, intervening, managing care, and other identifying qualities of the competent nurse (del Bueno, 2005).

The literature review showed a connection between the constructs of clinical judgment: thinking skills, priority setting, and management of care. I used the theoretical framework of Drs. Benner and Tanner to guide this study in the development of clinical judgment (Benner, 1984; Benner et al., 2009; Tanner, 2006). The findings from this study may be used to inform nursing educators, program directors, and academic researchers on potential tools and processes to develop clinical judgment in nursing students and guide academic practices.

Thinking skills

Thinking skills comprise the first construct of clinical judgment. These and other skills are used when analyzing client issues and problems. To define thinking skills,

actions such as interpretation, analysis, evaluation, inference, and explanation are prevalent throughout the literature (ATI, 2016; Benner et al., 2009; Klenke-Borgmann et al., 2020; Manetti, 2019; Tanner, 2006). Thinking skills are used by the nurse to complete a critical analysis of a client presentation or a problem using this information to take the next appropriate action (ATI, 2016). In alignment with ATI, the consortium members in the rural state defined critical thinking/clinical judgment as an educated conclusion the nurse achieves through use of the nursing process while implementing best practices (WyNursing, n.d.).

There are contradictions to the validity of critical thinking and reasoning in that these skills are highly fallible and subjective to the individual practicing these skills. Croskerry (2018) stated that critical thinking is complex and exceeds initial observations, evidence evaluation, and assessment alone (Croskerry, 2018). Classical evidence collection and critical thinking training do not entirely prepare students to make appropriate clinical judgments. Additional steps must be taken, including reflection, the efficiency of thought, inclusion of patient and family, and mindfulness to successfully put all pieces together to make decisions about care (Croskerry, 2018). Evidence must be present to determine the cause or make diagnoses before including human experience, psychosocial interpretation, and emotional response that does not abide by traditional and epistemological evidence. This school of thought has expanded, developing instead into a partnership of evidential support of clinical findings and judgments (Coney, 2015; Croskerry, 2018).

Maintaining nurses' critical thinking and reasoning remains crucial for competent practice. Determined as a foundational component of competent and safe practice, nurses judge each other's ability to use these skills and determine if the nurse has the skills or doesn't have them upon entry and throughout their careers (Nielsen et al., 2016). The skills must be cultivated throughout the nurse's prelicensure education and continually developed throughout the nurse's career (Benner et al., 2009; del Bueno, 2005; Tanner, 2006; Gorski et al., 2015; Thomas & Stapley, 2011).

Priority Setting

Priority setting and implementation of nursing interventions is the second construct of clinical judgment. In nursing, priority setting has been defined as demonstrating judgment and making decisions about responses, prioritizing these in the correct order. These decisions include a sequence of care, including assessments, subsequent interventions, and multidisciplinary care team coordination (ATI, 2016; del Bueno, 2005; Hendry and Walker, 2004; Suhonen et al., 2018). Additionally, this definition included the nurse's ability to take actions based on rank and importance. To prioritize a sequence of interventions correctly, the nurse must make several considerations to determine the priority nursing interventions (ATI, 2016, Mantovan et al., 2020). Additional descriptions of priority setting include components of significance and evaluation of one's decision. This differentiation is most notably found in Hendry and Walker's early 2000s definition. This definition is "…priority setting involves making decisions about the significance of patient problems and needs, and about the actions that should be made in response" (Hendry and Walker, 2004, p. 430).

Some researchers describe the function of prioritizing care not as an ordering of care but in contradiction, a rationing of care (Hendry and Walker, 2004; Mantovan et al., 2020; Suhonen et al., 2018). Rationing is best described as determining if the patient receives the care prescribed or determined appropriate by the nurse instead of when or how care is provided. However, prioritizing nursing care is centered on putting care in the most appropriate order for the patient, not if care is received but when and how (Mantovan et al., 2020). The perception of rationing care can be due to many issues, including time, staffing, and resource limitations in the healthcare climate (Hendry and Walker, 2004; Mantovan et al., 2020; Suhonen et al., 2018). The description of rationing is different than prioritizing in that rationing would determine whether to give care or not, whereas the definition of prioritizing defines when and how caring interventions are given and in what order (Hendry and Walker, 2004; Mantovan et al., 2020; Suhonen et al., 2018).

Management of Care

Management of care is the third construct of clinical judgment and has been defined by several industry experts. The definition includes the nurse's ability to coordinate, supervise, and collaborate within the healthcare team to achieve optimal patient care (ATI, 2016; del Bueno, 2005; Tanner, 2006). Additionally, the management of care includes being fiscally responsible and not wasteful with resources. As a more complex construct of clinical judgment, management of care ties to thinking skills and priority setting. Additionally, management of care has ethical, legal, and knowledge of technology and healthcare delivery systems (ATI, 2016; del Bueno, 2005; Manetti, 2018;

NCSBN, 2021; Tanner, 2006). The foundational constructs of thinking skills and priority setting are required to effectively manage the patient's care as a professional nurse (ATI, 2016; Benner et al., 2009; del Bueno, 2005; Manetti, 2019; Tanner, 2006).

Management of care is further defined through a rural state-wide consortium. The consortium incorporates leadership and professionalism into the definition (WyNursing, n.d.). This definition includes a heightened awareness to empower others toward attaining a specific objective through nursing excellence. Leadership is exemplified through nurses working with various specialists throughout the medical field, collaborating in management of care for multiple patients in the complex environment (WyNursing, n.d.). According to the Robert Wood Johnson Foundation (RWJF) (2010), management of care is defined as a set of activities intended to improve patient care, reduce need, and enhance coordination. Effective management of care is needed to reduce duplication and frustration and more effectively manage patient conditions (Klenke-Borgmann et al., 2020; RWJF, 2010). The NCSBN defines the management of care as the nurse's ability to identify roles and responsibilities within the healthcare team (NCSBN, 2021).

Managing care in nursing has a different focus from the medical or psychological definition. Medicine defines managing care through oversight, directing other clinicians and providers to ensure the care providers' competence. The care manager communicates expectations for care delivery, serving as the team leader and director more than a direct provider of care and partner (AMA, 2016). The psychological definition of managing care is focused on the clinician individually managing the patient's care, being the primary and only contact through which the patient receives specialized care through a

private and technical provider/patient relationship (Ervin et al., 2018). In nursing, managing care is defined as advocating, collaborating, communicating, and connecting with other healthcare professionals. The goal being to achieve the best possible outcomes for the patient, taking an active role in the provision of care instead of overseeing care or performing the care individually (NCSBN, 2021; WyNursing, 2019).

The fundamental constructs of clinical judgment are thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019). Through the literature review and inclusion of the studies from ATI, Benner et al, Dickison, and others I reviewed, a clear connection emerged between the constructs that comprise the concept of clinical judgment. In completing this review, I sought further understanding of the tools and processes chosen by nursing educators to develop competence in clinical judgment for nursing students preparing for practice (ATI, 2016; Benner et al., 2019; Dickison et al., 2019; IOM, 2011; NCSBN, 2021).

Theoretical Framework

I used Dr. Tanner's clinical judgment model as the framework for this study. The theory was initially introduced in 2006, with further studies by Dr. Tanner and others that examined the phenomenon in years following (Tanner, 2006). Theorists have helped shape the concept of clinical judgment and what it means to be clinically competent in this way. Studying clinical judgment, transition to practice, and successful academic progression to achieve these goals is impossible without Tanner's research on clinical judgment (Benner et al., 2009; Manetti, 2019; Tanner, 2006).

Clinical judgment includes thinking skills and critical thinking and then taking the steps that require accurate decisions about the information, known as judgments. The overall concept of clinical judgment reflects individual thinking and decision-making, meaning continual evaluation of interventions. This reflection results in making changes and performing self-reflection on the situation for personal performance and patient response using this learning for future application (Benner et al., 2009). Clinical judgment includes critical thinking and reasoning, which serve as a cornerstone of development for nursing students to attain competent and safe practice (Benner et al., 2009; Klenke-Borgmann et al., 2020; Manetti, 2019; Tanner, 2006).

Dr. Tanner's work is cited frequently throughout the literature. The foundational work completed by Dr. Benner's skill acquisition in novice to expert and the combined result of Drs Benner, Chesla, and Tanner are the foundations for a framework that guided this study in clinical judgment. Support for the framework was found in Dr. Lasater's Clinical Judgment Rubric and Dr. del Bueno's critical thinking, priority setting, and clinical judgment. The lens provided by these leaders supports the chosen framework of Dr. Tanner's clinical judgment. The framework gave context to this study of curriculum development and revision, evaluation of achievement, and successful development of clinical judgment in nursing students as a result of a new model of preparation (Benner, 1984; Benner et al., 2009; del Bueno, 2005; Dickison et al., 2017; Manetti, 2019; Tanner, 2006).

The Gap

Clinical judgment and its development in pre-licensure or undergraduate nursing students has been studied, defined, and refined in part for decades (Benner, 1984, IOM, 2010; Tanner & Chesla, 2009; Tanner, 2006; QSEN, n.d.). Competent nurses require clinical judgment skills, documented throughout the literature, and provide industry leaders a focus for discussion. Ongoing research clarifies expectations for academics and practice to develop clinical judgment in graduate nurses. However, in nursing education, though the expectation of outcome is clear, there is no clear guidance for clinical judgment development is present, no one approach proven superior to another (Billings, 2019; Cappalletti, Engel, & Prentice, 2014; Dickison et al., 2019; Gorski, Farmer, Sroczynski, Close, & Wortock, 2015) My study may contribute to the literature regarding clinical judgment by exploring curriculum change as an approach to improve the ability of nursing programs to develop clinical judgement in nursing students (Capaletti et al, 2014; Billings, 2019, Murray et al., 2019; Thompson & Stapley, 2011).

Overview of the Manuscripts

A review of the individual constructs of clinical judgment was necessary to understand the overarching concept of clinical judgment. The objective of the three studies was to examine each of the three individual constructs of clinical judgment according to Tanner's model (Benner et al., 2009; del Bueno, 2005; Manetti, 2019; Tanner, 2007 & 2006). The results of the individual studies may help nursing educators to better understand the larger concept of clinical judgment through the review of individual constructs as they were developed in associate degree nursing students in a

rural state (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). Evaluating educational interventions designed to support graduates in the development of clinical judgment through curriculum revision following the IOM report's release may provide necessary guidance for nursing educators' continued effort toward program changes that promote the development of clinical judgment (ATI, 2016: Benner et al, 2009; Cappalletti et al, 2014; Gorski et al, 2015).

Significance

As a result of these individual studies, nursing educators may attain a better understanding of clinical judgment development. Additionally, the potential exists to isolate important academic preparation qualities and raise the nation's standard of care. The information gleaned from this study may allow industry leaders to begin discussions that target the constructs of thinking skills, priority setting, and management of care. Professional development within the industry's clinical staff could provide a more successful transition to practice from complete and comprehensive academic preparation (IOM, 2011; Dickison et al., 2019; Murray et al., 2019; NCSBN, 2021).

As a contribution to positive social change, continued research in the academic preparation of clinically competent nurses helps ensure transitioning graduate nurses' safety and, most importantly, patient safety upon graduation (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). Educational interventions designed to support graduates in developing clinical judgment, including curriculum revision following the IOM's recommendation, may provide necessary guidance for nursing education (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015). As a result of this

study, the potential existed to isolate important academic preparation qualities and raise the nation's standard of care. The information gleaned from this study may allow industry leaders to begin discussions that target the constructs of thinking skills, priority setting, and management of care. Professional development within the industry's clinical staff could provide a more successful transition to practice from complete and comprehensive academic preparation (Dickison et al., 2019; IOM, 2011; Murray et al., 2019; NCSBN, 2021).

Summary

The objective of the three-part study was to evaluate the individual constructs of clinical judgment to effectively understand the overall concept of clinical competence (Benner et al., 2009; del Bueno, 2005; Manetti, 2019; Tanner, 2007 & 2006). These studies included in the literature review covered the individual constructs of clinical judgment, providing a lens through which curriculum revision could be reviewed as part of a nationwide goal to graduate competent and safe nurses. In reviewing the overall concept and academic interventions designed to support the goal, the opportunity existed to evaluate the overall outcome and the student's development of clinical judgment. This study utilized the standardized end-of-program testing administered in the last semester of the previous curriculum and compare that to results following the implementation of the new curriculum within the rural state. Each of the constructs of clinical judgment was represented in the Assessment Technology Institute (ATI-CP). Using the ATI-CP, the evaluation of student performance was possible for each construct of clinical judgment (ATI, 2016).

Manuscript 1

Healthcare in the United States requires clinical competence and skilled clinicians prepared to practice in this complex environment (Billings, 2019; Dickison et al., 2019; IOM, 2010). Competent and safe practice is defined through the concept of clinical judgment. Defining clinical judgment are three primary constructs: thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019). For the first study, I focused on the construct of thinking skills.

The Specific Problem

Although there are many studies published throughout the literature regarding educational interventions for developing thinking skills in nursing students, there is not one proven superior to another (Benner et al., 2009; Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). Continued research is needed to develop thinking skills, which may inform nursing educators in developing clinical judgment in rural associate degree nursing students. Some nursing programs, like the consortium member programs in this study, chose overall curriculum change to develop their students' clinical judgment, specifically thinking skills (Anderson et al., 2017; Close et al., 2015; Giddens, 2015; Gorski et al., 2015; Repsha et al., 2020; Tanner, 2007).

In this study, I focused on curriculum change in a rural state and its potential effect on students' ATI-CP scores in thinking skills. The ATI-CP was administered at the end of the fourth semester in each consortium member's program. The ATI-CP was designed to evaluate the individual construct of thinking skills, nearly equally with the other constructs of clinical judgment (ATI, 2016). In this retrospective quantitative study,

I was tested to determine if there was a difference in students' thinking skills measured by the ATI-CP between students who completed a traditional systems-based curriculum and those taught through a concept-based shared curriculum following a curriculum change in associate degree nursing programs of a rural state.

Research Question

Research Question (RQ): What is the difference in rural fourth-semester associate degree nursing students' exam scores in thinking skills as measured by the ATI – CP before and after curriculum change?

Null Hypothesis (H_0): There is no significant difference in rural fourth-semester associate degree nursing students' scores in thinking skills as measured by the ATI-CP before and after curriculum change.

Alternative Hypothesis (H_a): There is a significant difference in rural fourth-semester associate degree nursing students' scores in thinking skills as measured by the ATI-CP before and after curriculum change.

Nature and Design of the Study

The purpose of this quantitative, nonexperimental research study was to compare ex post facto data collected from the ATI-CP in the category of thinking skills in rural associate degree nursing students. The two groups of students' performance scores were compared between students taught using a traditional systems-based curriculum (n=233) and the new curriculum, a concept-based shared curriculum (n=278). The constructs of clinical judgment were categorically evaluated individually and collectively on the ATI-CP (ATI, 2016). The categories in the ATI-CP account for 176 out of 180 questions on

the exam (ATI, 2016). As the categories comprise a significant majority of the exam, these exam scores could be used to determine a potential effect of curriculum change on students' scores in thinking skills as evaluated by the ATI-CP (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017).

A quantitative, nonexperimental research design follows guidelines put forth by Edmonds and Kennedy (2017) and determined to be appropriate for this study. The data were collected retrospectively following a curriculum change in a rural state. The variables in this study were not manipulated or tested. As data were collected by ATI and consortium member nursing programs regularly, I could objectively measure, make observations, and identify potential differences in students' scores in construct categories following the curriculum change (Edmonds & Kennedy, 2017). As a retrospective data collection, students' scores were collected by ATI and consortium member nursing programs with every cohort in the fourth semester after the ATI-CP. Under instructions from Edmonds and Kennedy (2017), I performed an analysis of the data to determine a potential effect on mean scores in the thinking skills measured on the ATI – CP (Edmonds & Kennedy, 2017). The comparison of scores was made between two groups of students. The first group was taught in the traditional system's based educational format (*n=233)*, and the second group was taught using the new curriculum, a concept-based shared curriculum (*n*=278).

For this analysis, I used an independent samples *t* test. To determine nature and design, I used Edmonds and Kennedy (2017) to employ an a priori calculation of the number of exam scores/sample size required for the study was 128, 64 for each group.

Thompson & Panacek (2007) guided next steps in the approach leading me to use G-power for the sample size calculation using an alpha of 0.05, a medium effect size of .5, and the desired power of 0.80 (Edmonds & Kennedy, 2017; Thompson & Panacek, 2007). Next, I compared students' exam scores using ex post facto data collected during regular academic operations before and after a curriculum change across a consortium of associate degree nursing programs in a rural state. Anderson et al (2017) states the curriculum changed from the traditional systems-based nursing curriculum in 2016 to the concept-based shared nursing curriculum. The change resulted in the graduation of two cohorts per program following the curriculum change in 2018 and 2019, allowing comparison of student results before and after the curriculum change.

Sources of Data

Data were collected by the consortium member nursing programs and ATI regularly at the end of the fourth semester (Anderson et al., 2017). In alignment with study expectations outlined by Thompson & Panacek (2007) ex post facto data could be used as scores were collected regularly (both before and after the curriculum change). Also, these scores were collected by ATI in a cohort style for each program minimizing individual identification of students and the need for individual participation in the study

Manuscript 2

Healthcare in the United States requires clinical competence and skilled clinicians prepared to practice in this complex environment (Billings, 2019; Dickison et al., 2019; IOM, 2010). Competent and safe practice is defined through the concept of clinical judgment. Defining clinical judgment are three primary constructs: thinking skills,

priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019). For the first study, I focused on the construct of thinking skills.

The Specific Problem

Although there are many studies published throughout the literature regarding educational interventions for developing priority setting in nursing students, there is not one proven superior to another (Benner et al., 2009; Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). Continued research is needed to develop priority setting, which may inform nursing educators in developing clinical judgment in rural associate degree nursing students. Some nursing programs, like the consortium member programs in this study, chose overall curriculum change to develop their students' clinical judgment, specifically priority setting (Anderson et al., 2017; Close et al., 2015; Giddens, 2015; Gorski et al., 2015; Repsha et al., 2020; Tanner, 2007).

I focused on curriculum change in a rural state and its potential effect on students' ATI-CP scores in priority setting. The ATI-CP was administered at the end of the fourth semester in each consortium member's program. The ATI-CP was designed to evaluate the individual construct of priority setting, nearly equally with the other constructs of clinical judgment (ATI, 2016). In this retrospective quantitative study, I was able to determine if a difference existed in students' priority setting measured by the ATI-CP. I compared priority setting scores between students who completed a traditional systems-based curriculum and those taught through a concept-based shared curriculum following a curriculum change in associate degree nursing programs of a rural state.

Research Question

Research Question (RQ): What is the difference in rural fourth-semester associate degree nursing students' exam scores in priority setting as measured by the ATI – CP before and after curriculum change?

Null Hypothesis (H_0): There is no significant difference in rural fourth-semester associate degree nursing students' scores in priority setting as measured by the ATI-CP before and after curriculum change.

Alternative Hypothesis (H_a): There is a significant difference in rural fourth-semester associate degree nursing students' scores in priority setting as measured by the ATI-CP before and after curriculum change.

Nature and Design of the Study

The purpose of this quantitative, nonexperimental research study was to compare ex post facto data collected from the ATI-CP in the category of priority setting in rural associate degree nursing students. The two groups of students' performance scores were compared between students taught using a traditional systems-based curriculum (n=233) and the new curriculum, a concept-based shared curriculum (n=278). The constructs of clinical judgment were categorically evaluated individually and collectively on the ATI-CP (ATI, 2016). The categories in the ATI-CP account for 176 out of 180 questions on the exam (ATI, 2016). As the categories comprise a significant majority of the exam, these exam scores could be used to determine a potential effect of curriculum change on students' scores in priority setting as evaluated by the ATI-CP (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017).

A quantitative, nonexperimental research design follows guidelines put forth by Edmonds and Kennedy (2017) and determined to be appropriate for this study. I collected the data retrospectively following a curriculum change in a rural state. The variables in this study were not manipulated or tested. As data were collected by ATI and consortium member nursing programs regularly, I could objectively measure, make observations, and identify potential differences in students' scores in construct categories following the curriculum change (Edmonds & Kennedy, 2017). As a retrospective data collection, students' scores were collected by ATI and consortium member nursing programs with every cohort in the fourth semester after the ATI-CP. Under instructions from Edmonds and Kennedy (2017), I performed an analysis of the data to determine a potential effect on mean scores in the priority setting measured on the ATI – CP (Edmonds & Kennedy, 2017). The comparison of scores was made between two groups of students. The first group was taught in the traditional system's based educational format (*n=233)*, and the second group was taught using the new curriculum, a concept-based shared curriculum (*n*=278).

For this analysis, I used an independent samples *t* test. To determine nature and design, I used Edmonds and Kennedy (2017) to employ an a priori calculation of the number of exam scores/sample size required for the study was 128, 64 for each group. Thompson & Panacek (2007) guided next steps in the approach leading me to use G-power for the sample size calculation using an alpha of 0.05, a medium effect size of .5, and the desired power of 0.80 (Edmonds & Kennedy, 2017; Thompson & Panacek, 2007). Next, I compared students' exam scores using ex post facto data collected during

regular academic operations before and after a curriculum change across a consortium of associate degree nursing programs in a rural state. Anderson et al (2017) stated the curriculum changed from the traditional systems-based nursing curriculum in 2016 to the concept-based shared nursing curriculum. The change resulted in the graduation of two cohorts per program following the curriculum change in 2018 and 2019, allowing comparison of student results before and after (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017; Thompson & Panacek, 2007; WyNursing, n.d).

Sources of Data

Data were collected by the consortium member nursing programs and ATI regularly at the end of the fourth semester (Anderson et al., 2017). In alignment with study expectations outlined by Thompson & Panacek (2007) ex post facto data could be used as scores were collected regularly (both before and after the curriculum change). Also, these scores were collected by ATI in a cohort style for each program minimizing individual identification of students and the need for individual participation in the study.

Manuscript 3

Healthcare in the United States requires clinical competence and skilled clinicians prepared to practice in this complex environment (Billings, 2019; Dickison et al., 2019; IOM, 2010). Competent and safe practice is defined through the concept of clinical judgment. Defining clinical judgment are three primary constructs: thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019). For the first study, I focused on the construct of management of care.

The Specific Problem

Although there are many studies published throughout the literature regarding educational interventions for developing management of care in nursing students, there is not one proven superior to another (Benner et al., 2009; Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). Continued research is needed to develop management of care, which may inform nursing educators in developing clinical judgment in rural associate degree nursing students. Some nursing programs, like the consortium member programs in this study, chose overall curriculum change to develop their students' clinical judgment, specifically management of care (Anderson et al., 2017; Close et al., 2015; Giddens, 2015; Gorski et al., 2015; Repsha et al., 2020; Tanner, 2007).

I focused on curriculum change in a rural state and its potential effect on students' ATI-CP scores in management of care. The ATI-CP was administered at the end of the fourth semester in each consortium member's program. The ATI-CP was designed to evaluate the individual construct of management of care, nearly equally with the other constructs of clinical judgment (ATI, 2016). In this retrospective quantitative study, I was able to determine if a difference existed in students' management of care measured by the ATI-CP. I compared management of care scores between students who completed a traditional systems-based curriculum and those taught through a concept-based shared curriculum following a curriculum change in associate degree nursing programs of a rural state.

Research Question

Research Question (RQ): What is the difference in rural fourth-semester associate degree nursing students' exam scores in management of care as measured by the ATI – CP before and after curriculum change?

Null Hypothesis (H_0): There is no significant difference in rural fourth-semester associate degree nursing students' scores in management of care as measured by the ATI-CP before and after curriculum change.

Alternative Hypothesis (H_a): There is a significant difference in rural fourth-semester associate degree nursing students' scores in management of care as measured by the ATI-CP before and after curriculum change.

Nature and Design of the Study

The purpose of this quantitative, nonexperimental research study was to compare ex post facto data collected from the ATI-CP in the category of management of care in rural associate degree nursing students. The two groups of students' performance scores were compared between students taught using a traditional systems-based curriculum (n=233) and the new curriculum, a concept-based shared curriculum (n=278). The constructs of clinical judgment were categorically evaluated individually and collectively on the ATI-CP (ATI, 2016). The categories in the ATI-CP account for 176 out of 180 questions on the exam (ATI, 2016). As the categories comprise a significant majority of the exam, these exam scores could be used to determine a potential effect of curriculum change on students' scores in management of care as evaluated by the ATI-CP (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017).

A quantitative, nonexperimental research design follows guidelines put forth by Edmonds and Kennedy (2017) and determined to be appropriate for this study. The data were collected retrospectively following a curriculum change in a rural state. The variables in this study were not manipulated or tested. As data were collected by ATI and consortium member nursing programs regularly, I could objectively measure, make observations, and identify potential differences in students' scores in construct categories following the curriculum change (Edmonds & Kennedy, 2017). As a retrospective data collection, students' scores were collected by ATI and consortium member nursing programs with every cohort in the fourth semester after the ATI-CP. Under instructions from Edmonds and Kennedy (2017), I performed an analysis of the data to determine a potential effect on mean scores in the management of care measured on the ATI – CP (Edmonds & Kennedy, 2017). The comparison of scores was made between two groups of students. The first group was taught in the traditional system's based educational format (*n=233)*, and the second group was taught using the new curriculum, a concept-based shared curriculum (*n*=278).

For this analysis, I used an independent samples *t* test. To determine nature and design, I used Edmonds and Kennedy (2017) to employ an a priori calculation of the number of exam scores/sample size required for the study was 128, 64 for each group. Thompson & Panacek (2007) guided next steps in the approach leading me to use G-power for the sample size calculation using an alpha of 0.05, a medium effect size of .5, and the desired power of 0.80 (Edmonds & Kennedy, 2017; Thompson & Panacek, 2007). Next, I compared students' exam scores using ex post facto data collected during

regular academic operations before and after a curriculum change across a consortium of associate degree nursing programs in a rural state. Anderson et al (2017) states the curriculum changed from the traditional systems-based nursing curriculum in 2016 to the concept-based shared nursing curriculum. The change resulted in the graduation of two cohorts per program following the curriculum change in 2018 and 2019, allowing comparison of student results before and after (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017; Thompson & Panacek, 2007; WyNursing, n.d).

Sources of Data

Data were collected by the consortium member nursing programs and ATI regularly at the end of the fourth semester (Anderson et al., 2017). In alignment with study expectations outlined by Thompson & Panacek (2007) ex post facto data could be used as scores were collected regularly (both before and after the curriculum change). Also, these scores were collected by ATI in a cohort style for each program minimizing individual identification of students and the need for individual participation in the study (Anderson et al., 2017; ATI, 2016; Thompson & Panacek, 2007; WyNursing, n.d).

Significance

Findings from this study may help inform nursing educators, program directors, and academic researchers about concept-based shared curriculum and the potential effect on students' development of clinical judgment. I used the ATI-CP as a tool to evaluate the development of clinical judgment evaluates three separate but connected constructs of clinical judgment which are thinking skills, priority setting, and management of care as measured by the ATI-CP (Anderson et al., 2017; ATI, 2016). My results contribute to a

better understanding of the development of clinical judgment in nursing students. Additionally, the potential existed to isolate important academic preparation qualities leading to desired outcomes for students as identified by industry leaders and raise the nation's standard of care. Using the results from this study may allow nurse educators and industry leaders to begin discussions that target the construct of clinical judgment (Anderson et al., 2017; ATI, 2016; Billings, 2019; Dickison et al., 2019; Klenke-Borgmann et al., 2020; Thompson & Stapley, 2011).

My study's findings may contribute to the literature by filling a gap in evidence showing the effectiveness of concept-based shared curriculum change on the development of clinical judgment outlined in the literature (Billings, 2019; Dickison et al., 2019; IOM, 2010; Klenke-Borgmann et al., 2020; NCSBN, 2021). In completing this next step, researchers can continue searching for answers to developing clinical judgment in nursing students. Additionally, the study could inform nursing educators for the continued preparation of competent nursing students heading into professional practice in a complex and ever-changing clinical environment.

Positive Social Change

Positive social change could be seen through several components of this study. This positive social change came from the continual evaluation of nursing education interventions and the effect on student development of clinical judgment. First, by providing this information to nursing educators, especially in rural environments, the results may be used to inform nurse educators further in areas of clinical judgment development (ATI, 2016; IOM, 2010; NCSBN, 2021). Second, through continual

education evaluation, nursing programs can be assured they provide the highest quality education. Students can be assured of quality education as they begin their nursing careers. Third, and most importantly, industry leaders can be assured of improved preparation for future nursing staff through the development of clinical judgment (Billings, 2019; Dickison et al., 2019). The development of clinical judgment meets the expectation of regulatory agencies responsible to ensure the provision of competent and safe care at the bedside for patients and their families (CDC, 2020; IOM, 2010; NCSBN, 2021).

Summary

The purpose of this three-part study was to identify a potential difference between students' performance on the ATI-CP in the three constructs of clinical judgment before and after a curriculum change in a rural state. The constructs of clinical judgment included thinking skills, priority setting, and management of care. The ATI-CP objectively evaluated students' abilities in these categories. Even with all the studies regarding educational interventions designed to support the development of clinical judgment, no one intervention was proven superior (Capaletti et al., 2014; Billings, 2019, Murray et al., 2019; Thompson & Stapley, 2011). The results could also create the possibility of exploring additional educational interventions that could be helpful to the vital work of developing clinical judgment in nursing students.

Part 2: Manuscripts

Manuscript 1

Comparison of Rural Associate Degree Nursing Students' Thinking Skills after Curriculum Change

by

Karen Bowen

MSN, Regis University 2013

BSN, University of Wyoming 2010

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Nursing Education

Walden University

Date (TBD)

Outlet for Manuscript

The outlet I chose for this study aligned with the target journal of *Nursing Education Perspectives*, published by the National League of Nursing (NLN, n.d.). The mission of *Nursing Education Perspectives* is to promote excellence in nursing education which aligned with this study through the continued assessment of educational interventions intended to develop nursing students for practice (NLN, n.d.). This peer-reviewed and regularly released journal provides a home base for nursing educators to find current evidence-based practices for their courses and the development of their students (NLN, n.d.). In addition to curriculum practices, this journal reviews current technology, recruitment and retention of students, and overall support of the development of nursing students to become the next generation of professional nurses (NLN, n.d.).

This journal's formatting can be found at https://journals.lww.com/neponline/pages/default.aspx and follows other professional nursing publications by using consistent formatting throughout the journal. Manuscripts must include three to five keywords published with the abstract using Cumulative Index to Nursing and Allied Health Literature (CINAHL) or MeSH terms. Quantitative studies must address the *p*-value, statistical findings, significance and effect size, and finally, the confidence interval of the results (NLN, n.d.). Authors are to format references according to the Publication Manual of the American Psychological Association, 7th ed. Being current and generally not older than 5 years (NLN, n.d.).

Abstract

Background: The current healthcare climate is ever-changing and increasingly complex, requiring nursing staff who are competent and skilled. Competent practice is defined through clinical judgment, including thinking skills, priority setting, and management of care. The focus of this study is thinking skills. Method: This quantitative, nonexperimental research study compared the development of thinking skills in associate nursing students taught using a traditional systems-based curriculum (*n*=233) and students taught in the new curriculum, a concept-based shared curriculum (*n=278*) in a rural state through the comparison of student exam results on the ATI-CP Results: ATI-CP thinking skills scores in this study were not significantly different before curriculum change (*M*=72.46, *SD*=11.16) than scores achieved after curriculum change (*M*=73.90, *SD*=11.16), *t* (1.4), *p*=.95. Conclusion: The result of this study did not show a significant difference in student's scores in thinking skills after the curriculum change. However, evaluating this educational intervention, curriculum change, and its potential effect on clinical judgment development is an important contribution to the scholarly literature. This study's findings may inform nurse educators regarding educational interventions intended to support the continued development of clinical judgment in nursing students.

Keywords: *Clinical Judgment, Thinking Skills, Associate Degree Nursing Programs, Curriculum Revision*

Introduction

Healthcare in the United States requires clinical competence and skilled clinicians prepared to practice in this complex environment as efficiently as possible (Billings, 2019; Dickison et al., 2019; IOM, 2010). With the complexity of the healthcare climate, competent and safe practicing nurses are critical. Competent and safe practice is defined through the concept of clinical judgment. There are three primary constructs that define clinical judgment which are: thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019). The focus of this study is thinking skills.

Specific Problem

Thinking skills are part of overall clinical judgment. There are many studies published throughout the literature regarding educational interventions for developing thinking skills in nursing students. Though there are many studies published throughout the literature regarding educational interventions that may build thinking skills in nursing students, there is not one proven educational intervention found to be superior (Benner et al., 2009; Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). Continued research is needed to understand the development of thinking skills (Close et al., 2015; Giddens, 2015). The findings of this study may inform nursing educators to develop nursing students in clinical judgment effectively. Some nursing programs, such as the consortium member programs in the rural state studied here, chose overall curriculum change focused on building thinking skills.

Clinical judgment and its constructs have been studied, defined, and refined for decades (Benner, 1984, Benner et al., 2009, IOM, 2010; Tanner, 2006, QSEN, n.d.). Developing competent nurses with clinical judgment skills has provided nursing education and practice industry leaders a challenge to improve pedagogical strategies for working with new graduate nurses and current nurses. Competency in clinical judgment includes knowledge, skills, and attitudes developed during students' academic preparations. As noted, to build competence in clinical judgment, students must develop individual constructs such as thinking skills, priority setting, and management of care (Billings, 2019; Benner, 1984, Benner et al., 2009; Dickison et al., 2019, Tanner, 2006, QSEN, n.d.).

Significance

New graduates who have not yet developed the necessary abilities to practice nursing care effectively suffer an increased risk of committing practice errors that threaten the safety of patients. Nursing practice errors occur more frequently in new graduate practice and may result in job dissatisfaction and decreased retention, especially within the first year of nursing (Cloete, 2015; Johnson & Benham, 2020; Murray et al., 2019). More common practice errors occur in medication administration, communication, and failure to recognize acute changes in patient conditions (Benner et al., 2009; Johnson & Benham, 2020; IOM, 2011, Murray et al., 2019; Tanner, 2006). As a result of practice errors, new graduate nurses may be subjected to decreased job satisfaction, professional insecurity, and disciplinary action. The nurse, patient, and healthcare system suffer deterred progress in the goal of safe, and competent care. Patients affected by these errors

may require additional monitoring, increased care interventions, high additional costs, rapid declines in health, long-term damage, or even death (ATI, 2016: Cappalletti et al., 2014; IOM, 2016; Johnson & Benham, 2020; Murray et al., 2019; NCSBN, 2021). To mitigate errors and increase safety in patient care, industry leaders have called for an improvement in the development of nurses' skills to deliver safe and competent care (Billings, 2019; IOM, 2016; NCSBN, 2021). This preparation starts in nursing programs continuing through transition to professional practice. Educators must develop students' clinical competence through its foundation, clinical judgment (Billings, 2019; NCSBN, 2021). The components of clinical judgment are thinking skills, priority setting, and management of care. The problem is, though many are proposed, no one approach to developing clinical judgment in nursing students has proven superior (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). To clarify expectations on a regulatory level, the NCSBN has developed the clinical judgment model (Benner, 1984, Benner et al., 2009, Billings, 2019; Dickison et al., 2019, Tanner, 2006). Within the multiple layers of the model, the three significant constructs of clinical judgment are found: thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019). Educational interventions designed to support nursing students in developing clinical judgment, including curriculum revision following the IOM's recommendation, may provide necessary guidance for nursing education (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015).

Positive Social Change

As a contribution to positive social change, this study on academic preparation of clinically competent nurses may help ensure transitioning graduate nurses' safety and patient safety in receipt of that nurse's care (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). Evaluating educational interventions designed to support nursing students in this way, specifically curriculum revision following the IOM report's release, may provide necessary guidance for academics' continued effort toward the development of clinical judgment in nursing students (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015). As a result of this study, the potential exists to isolate important academic preparation qualities and raise the nation's standard of care. The information gleaned from this study may allow industry leaders to begin discussions targeting instructional interventions designed to develop thinking skills, priority setting, and management of care. Professional development for the industry's clinical staff may provide a more successful transition to practice due to comprehensive academic preparation (IOM, 2011; Dickison et al., 2019; Murray et al., 2019; NCSBN, 2021).

The purpose of this quantitative, nonexperimental research study was to compare the development of clinical judgment, specifically thinking skills as measured on the ATI-CP in associate degree nursing students taught using a traditional systems-based curriculum (n=233) and students taught in the new curriculum, a concept-based shared curriculum (n=278) a concept-based shared curriculum in a rural state (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017).

Relevant Scholarship

Thinking skills in nursing must be developed as a part of overall clinical judgment. Though there are many studies published throughout the literature regarding educational interventions for developing thinking skills in nursing students, there is not one proven educational intervention found to be superior (Benner et al., 2009; Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). Thinking skills include interpretation, analysis, evaluation, inference, and explanation (Tanner, 2006). Thinking skills are used by the nurse to complete the analysis and determine the appropriate next steps (ATI, 2016). New graduates who have not yet developed the necessary thinking skills are at an increased risk of committing practice errors that threaten the safety of patients (Benner et al., 2009; Johnson & Benham, 2020; IOM, 2011, Murray et al., 2019; Tanner, 2006).

Thinking Skills: Clinical Judgment/Critical Thinking

The definition of clinical judgment is most evident in the application to nursing by Tanner (2006). Tanner said clinical judgment was the "interpretation or conclusion about a patient's needs, concerns, or health problems, and/or the decision to take action (or not), use or modify standard approaches, or improvise new ones as deemed appropriate by the patient's response" (p.204). This definition of clinical judgment includes the construct of thinking skills. Thinking skills contain several components: observation, analysis, interpretation, practical or scientific reasoning, and decision-making resulting from the process. These constructs appear in what Aristotle referred to as phronesis which is the capacity to employ practical reason and make decisions about

findings, utilizing previous experiences and applying additional thought (Coney, 2015; Montgomery, 2006).

Critical thinking and clinical judgment have been used interchangeably throughout the literature. These concepts were difficult to separate, but they were different functions of the thinking process (Benner et al., 2009; del Bueno, 2005; Tanner, 2006). Shared are the concepts of critical thinking and clinical judgment among specialties in the healthcare profession. The idea of thinking dates to the philosopher Aristotle, who began working through what is known today as evidence-based medicine, in 300 BCE. For Aristotle, this concept was the way to objectively evaluate experiences using skills of analysis and classification. Aristotle believed in the tangible, physical, and factual findings that could be described by the senses, classified, and employed to explain the surrounding world. Practical wisdom is referred to in the literature as the requirement of the individual to observe, analyze or interpret what is observed, come to conclusions about the implication of the findings, and then act on those findings should that be necessary (Coney, 2015).

Over time, the analysis of thinking has been seen in many disciplines throughout medicine, psychology, education, and others to arrive at a definition like that adopted in nursing, which guides clinical practice (Shin et al., 2015). The definition of thinking skills includes actions such as interpretation, analysis, evaluation, inference, and explanation. These definitions are consistent amongst industry leaders and prevalent throughout the literature (ATI, 2016; Benner et al., 2009; Klenke-Borgmann et al., 2020; Manetti, 2019; Tanner, 2006). Thinking skills are used by the nurse to complete the

analysis and determine the appropriate next steps (ATI, 2016). In alignment with ATI, the consortium members in the rural state included in the definition of critical thinking/clinical judgment the educated conclusion the nurse achieves through evidence and the nursing process (Anderson et al., 2017).

The concept of thinking has evolved to require focused and specific thinking skills that guided the clinician to understand critical constructs and connect them with thoughts that lead further to decisions, judgments, and actions (Miller et al., 2015). More specifically, thinking includes the "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as an explanation of the evidential and conceptual, methodological, criteriological, or contextual considerations upon which judgment is based" (Facione, 1990 as cited in Shin et al., 2015, p. 538).

Thinking skills, including critical thinking and clinical judgment, are defined by ATI as the skills used when analyzing client issues and problems. In this definition, these thinking skills include interpretation, analysis, evaluation, inference, and explanation. Thinking skills are used by the nurse to complete the analysis and determine the appropriate next steps (ATI, 2016). In alignment with ATI, the consortium members in the rural state defined critical thinking/clinical judgment as an informed or educated conclusion. The nurse arrives at this conclusion using the nursing process and relevant evidence (Anderson et al., 2017).

There are contradictions in the literature regarding the critical thinking, and the decisions clinicians arrive to under its use. Industry researchers have cited this skill set as highly fallible to subjectivity and influence of opinion of the individual practicing these

skills. Croskerry (2018) stated that clinical judgment is a complex process that exceeds initial observations, evidence evaluation, and assessment alone. Classical evidence collection and critical thinking training do not entirely prepare students to make appropriate clinical judgments. Additional steps must be taken, including reflection, the efficiency of thought, inclusion of patient and family, and mindfulness, to successfully put all the pieces together to make decisions about care (Croskerry, 2018). Evidence must be present to determine the cause or make diagnoses before including human experience, psychosocial interpretation, and emotional response that does not abide by traditional and epistemological evidentiary rules. This school of thought has expanded, developing into a partnership of evidential support of clinical findings and judgments (Coney, 2015; Croskerry, 2018). Using both sources of information, clinicians can make a more robust assessment of the situation before them and guide them effectively from there.

The concepts of critical thinking and clinical judgment have constituted a crucial skill set demonstrated by the competent practicing nurse. Determined as a foundational component of safe, competent practice, nurses judge each other's ability to use these skills and have it or not throughout their careers. Cultivating critical thinking and clinical judgment skills are done separately but alongside each other throughout the nurse's prelicensure education. Further development of these skills is required continually throughout the nurse's career (Benner, Chesla, & Tanner, 2009; del Bueno, 2005; Tanner, 2006; Gorski et al., 2015; Thompson & Stapley, 2011), yet the evidence for the effectiveness of nursing education curriculum in the development of clinical judgment is lacking in the literature. My study findings may contribute to the literature filling the

existing gap and demonstrating the effectiveness of concept-based shared curriculum change on clinical judgment development.

Research Question and Design

Research Question (RQ): What is the difference in rural fourth-semester associate degree nursing students' exam scores in thinking skills as measured by the ATI – CP before and after curriculum change?

Null Hypothesis (H_0): There is no significant difference in rural fourth-semester associate degree nursing students' scores in thinking skills as measured by the ATI-CP before and after curriculum change.

Alternative Hypothesis (H_a): There is a significant difference in rural fourth-semester associate degree nursing students' scores in thinking skills as measured by the ATI-CP before and after curriculum change.

I studied thinking skills within the ATI-CP assessment to understand the development of overall clinical judgment in nursing students. The primary constructs of clinical judgment include thinking skills, priority setting, and management of care. The ATI-CP evaluated the three constructs individually and collectively (ATI, 2016). The constructs of clinical judgment were present in 176 out of 180 questions on the exam (ATI, 2016). As the constructs of clinical judgment identified here comprised a significant majority of the exam, I used the exam scores to determine a potential difference between students' scores on the ATI-CP before and after a curriculum change (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017). The purpose of this study was to compare used students' test scores before and after curriculum change to

determine a difference between the two curriculum models on the construct of thinking skills.

To complete the analysis, I conducted an independent samples *t* test. An a priori calculation of the number of exam scores/sample size required for the study was 128, 64 for each group. I used G-power for the sample size calculation using an alpha of 0.05, a medium effect size of .5, and the desired power of 0.80. Guidance for the analysis came from Gray and Grove (2021). Now, in its ninth edition, Gray and Grove's guidelines are known for providing a trusted nursing research resource in graduate-level courses. Gray and Grove provided a competency-aligned, clear set of guidelines by which to conduct primary research. Following these guidelines, the researcher could confidently share the results through the literature, allowing a direct application to current nursing practice. This study's results are important for nursing education as they may inform educators regarding the impact of curriculum change in rural states and student preparation for practice. I compared students' exam scores using ex post facto data collected during regular academic operations before and after a curriculum change across a consortium of nursing programs in a rural state. The study aimed to identify a possible effect on student performance before and after curriculum change in the rural state. The study's results may inform nursing educators about the development of clinical judgment in associate degree nursing students due to curriculum change.

Methods

The purpose of this quantitative, nonexperimental research study was to determine a potential effect of curriculum change on the development of clinical

judgment. In this study, I examined the individual construct of thinking skills measured by the ATI-CP. Thinking skills scores were studied before and after a curriculum change in associate degree nursing students of a rural state to understand a possible effect. Thinking skills is a category measured on the ATI-CP in associate degree nursing students taught using a traditional systems-based curriculum and a new concept-based curriculum. Because ATI collected student results on the same examination platform before and after the curriculum change, I could compare the results to determine a difference. ATI categorically evaluates the constructs of clinical judgment individually and collectively on the ATI-CP (ATI, 2016). The categories of clinical judgment account for 176 out of 180 questions on the exam (ATI, 2016). As the categories comprise a significant majority of the exam, these scores could be used to determine the potential effect of curriculum change on students' scores in thinking skills (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017).

Participants

The population for the study was composed of a sample of associate degree nursing students' ATI CP scores between 2016 and 2019. In 2016 & 2017, the students completed a traditional systems-based curriculum (n=233). In 2018 and 2019, the associate degree nursing students completed the new concept-based shared curriculum in a rural state (n=278) (Anderson et al., 2017; WyNursing, n.d.). The demographic statistics included students who self-identified in race/ethnicity as Caucasian/White (82.8%), Hispanic (8.4%), and African American/Black, Asian, or American Indian (<3%). Further, the population consists mainly of students who self-identified as female

(86.5%) and the remainder as male (13.5%). The mean age of the group was (*m*-28). Approximately half of the group identified as a "traditional student" (44%) compared to a "non-traditional student" (56%). Traditional students are defined as persons enrolled in college directly from high school through age 24. These students seek their first post-secondary degree, attend college full-time, and are absent from major life or work responsibilities such as careers or dependents (ATI, 2021). The curriculum changed from traditional systems-based education in 2016 to the concept-based shared curriculum. The change resulted in the graduation of two cohorts of the new concept-based curriculum per program in 2018 and 2019. Comparison of these cohorts was allowed by using student performance on the ATI-CP before (2016 and 2017) and after (2018 and 2019). By comparing exam results from students across the rural state before and after curriculum change, I could evaluate the intervention of curriculum change for potential effect within this demographic of students.

Sample and Power

For this study, I collected secondary quantitative data from each participating consortium member nursing program across a rural state. Each nursing program in the study used the same ATI-CP in the fourth semester of the ADN nursing program before and after the curriculum change. Because the rural state has few nursing programs and a limited population, combined data were necessary to understand the potential effect of the curriculum change across the consortium. I used the guidance of Gray and Grove (2021), to perform this analysis. An a priori calculation of the number of exam scores/sample size required for the independent *t* test used for the study was 128, 64 for

each group. In addition to an a priori calculation, to correctly perform the study, a G-power is necessary to determine the appropriate sample size. I ran a G-power analysis to calculate the sample size using an alpha of 0.05, a medium effect size of .5, and the desired power of 0.80 for this independent *t* test.

Variables/Sources of Data

I compared scores of the two groups of associate degree nursing students in consortium member nursing programs across a rural state before and after a curriculum change. In 2016 & 2017, the first group of students completed a traditional systems-based curriculum (n=233). In 2018 and 2019, the second group of students completed the new concept-based shared curriculum in a rural state (n=278) (Anderson et al., 2017; WyNursing, n.d.). The independent variable for this study was the fourth-semester associate degree nursing student's test scores in the selected category of thinking skills on the ATI-CP before and after the curriculum change. The dependent variable for this study was the fourth-semester associate degree nursing student's test scores in the thinking skills category on the ATI-CP after the curriculum change. Analyzing the student's test scores before and after the curriculum change, I assessed the difference in students' test scores in thinking skills.

Data were collected by the consortium member programs of nursing and ATI regularly at the end of the fourth semester. As scores were routinely collected (before and after the curriculum change), I accessed the available ex post facto data (appendix C). ATI also collects these data for each program. Due to the outside entity collecting the data, minimization of individual identification of students is possible within the cohorts,

thus reducing the need for individual participation in the study (Anderson et al., 2017; ATI, 2016; Thompson & Panacek, 2007).

Instrumentation

The analysis was possible using an independent samples *t* test (Edmonds & Kennedy, 2017; Gray & Grove, 2021). An independent *t* test is appropriate for this study because test scores used are from different groups of students before and after the curriculum change (Gray & Grove, 2021; Salkind, 2010). The variables in this study were not manipulated or tested. In this study, I examined the assumptions of the *t* test before completing the analysis. The first assumption of the independent *t* test was that each group should contain subjects that only belong to one group. Testing this assumption was done through demographic evaluation of the dataset and avoidance of duplication between the groups. Students in the two groups (before and after the curriculum change) were unique and not duplicated.

The second assumption of the *t* test was that there should be no significant outliers between the groups; the data distribution should be normal. As the population was selected and plotted, distribution evaluation was possible using the histogram. Visual inspection of the histogram showed that the distribution appears normal without significant outliers. The large sample size yielded a reasonably even distribution which more accurately demonstrated the shape of the population (Gray & Grove, 2021).

Finally, the third assumption of the *t* test was that there should be homogeneity of variances. Homogeneity means that the variance of the outcome variable in each group is equal. A Levene's test for homogeneity (equality) of variance in each population was

completed through testing software and did not show significance ($p > .05$). As of this result, equal variances between the groups were not assumed (Gray & Grove, 2021; Salkind, 2010).

Design and Analysis

A quantitative, nonexperimental research design was appropriate for this study as the data were collected retrospectively following a curriculum change (Edmonds & Kennedy, 2017; Gray & Grove, 2021). The variables in this study were not manipulated or tested. Collected data allowed me to objectively measure, make observations, identify any potential differences, and determine the significance of possible effects on students' scores in construct categories due to curriculum change. As a retrospective data collection, students' scores were available following the administration of the ATI-CP in the fourth-semester cohorts of each consortium member nursing program. An analysis helped me determine the potential effect of curriculum change on mean scores in the thinking skills category measured on the ATI – CP.

Results

A comparison of students' exam scores was completed using ex post facto data collected during regular academic operations before and after a curriculum change across a consortium of nursing programs in a rural state. The curriculum change from traditional systems-based education to the concept-based shared curriculum was completed in 2016. The change resulted in the graduation of two cohorts per program in 2018 and 2019, allowing comparison before and after (Anderson et al., 2017; ATI, 2016; WyNursing, n.d). Though the results of this study do not demonstrate a statistically significant

difference in priority-setting scores before and after curriculum change, a contribution to the literature regarding educational interventions to develop these skills is important.

Execution

In conducting this study, I used data collected from participating nursing programs in the consortium in a rural state. The data were obtained in excel format and transferred into SPSS (Statistical Package for the Social Sciences) Version 27 for analysis. My analysis follows Gray and Grove's (2021) guidance, which called for an a priori calculation of the number of exam scores and sample size required for the study, which was 128, 64 for each group. I used G-power to calculate the sample size using an alpha of 0.05, a medium effect size of .5, and the desired power of 0.80. I gathered 155 student then screened and cleaned the data which yielded 128 usable student scores. solidifying validity, though I collected 511 student test results. The correct sample size assisted me in seeing a potential difference between the groups more readily (Gray & Grove, 2021).

Results

The research question for this study was, what is the difference in rural fourth-semester associate degree nursing students' exam scores in thinking skills as measured by the ATI–CP after curriculum change? The null hypothesis for this study: there was no significant difference in rural fourth-semester associate degree nursing students' scores in priority setting as measured by the ATI-CP following a curriculum change. The alternative hypothesis: there was a significant difference in rural fourth-semester associate degree nursing students' scores in thinking skills as measured by the ATI-CP

following a curriculum change. ATI-thinking skills scores in this study were slightly lower before curriculum change (*M*=72.46, *SD*=11.16) than scores achieved after curriculum change (*M*=73.90, *SD*=11.16), *t* (1.4), *p*=.95. The mean difference was not statistically significant between the groups *(SEM*=0.70) showing a small effect size (.13). I used an alpha level of .05 for all statistical tests (see table 1).

Table 1

ATI-Thinking Skills Scores

		N	M	SD	SEM
Thinking Skills Score (raw score)	Pre-Curriculum Change	233	72.46	11.51	.75
	Post Curriculum Change	278	73.90	11.16	.67

In this study, I addressed the *t* test's assumptions before analysis. The first assumption states that each group should contain subjects that only belong to one group. Testing this assumption was done through demographic evaluation of the dataset to avoid duplication between the groups. If duplication in student scores were to be found between groups, the duplicate scores must be removed. In this evaluation, there was no duplication of participants found between the two groups. Each student's score was unique to the curriculum group they completed as well as the ATI-CP examination.

The second major assumption of the *t* test was that there should be no significant outliers between the groups; the data distribution should be normal. As the population was selected and graphed, further distribution evaluation was possible. Visual inspection of the histogram shows that the distribution appears normal without significant outliers. This histogram's slight left, negative skewness (-.28), and kurtosis (-.38) further support

the normal sample size distribution. Additionally, the large sample size yielded an even distribution that more accurately demonstrated the shape of the population (Gray & Grove, 2021).

The third major assumption of the *t* test was that there should be homogeneity of variances, meaning the variance of the outcome variable was equal in each group (Salkind, 2010). A Levene's test for homogeneity (equality) of variance in each population was appropriate and available through testing software (Gray & Grove, 2021; Salkind, 2010) (Table 1b). Levene's test was statistically insignificant in thinking skills, meaning that the variances between groups were equal (Gray & Grove, 2021). The assumption of homogeneity has been met; equal variances are assumed. The results showed no significant difference in thinking skills scores before and after curriculum change among rural fourth-semester associate degree nursing students. The null hypothesis was retained.

Table 2

Mean Performance of Exam Scores in Thinking Skills

		Levene's Test		t-test for Equality of Means						
						Significance		M	SE	95% CI
		F	Sig.	t	df	One-Sided p	Two-Sided p			
Thinking Skills Score	Equal variances assumed	.80	.37	-1.44	509	.076	.15	-1.44	1.01	[-3.42, .53]

(raw score)	Equal variances not assumed	-1.43	487.97	.077	.15	-1.44	1.01	[-3.42, .54]

Discussion

In this study, I looked at the strategy of implementing a shared concept-based curriculum's effect on the development of clinical judgment in associate degree nursing students in a rural state. Specifically, I wanted to study the effect of implementing curriculum change on thinking skills, a construct of clinical judgment. My study is unique, unlike others found in the literature. In the rural state where the curriculum change took place, the mean raw scores from students before the curriculum change and following did increase slightly though not significantly (table 1) with the implementation of the shared concept-based curriculum.

Interpretation

Healthcare in the United States requires clinical competence and skilled clinicians prepared to practice as efficiently as possible in a complex environment (Billings, 2019; Dickison et al., 2019; IOM, 2010). As the focus of this study, developed thinking skills are part of overall clinical judgment. The purpose of this quantitative, nonexperimental research study was to compare the development of clinical judgment—specifically, the construct of thinking skills measured on the ATI-CP. The exam results of the ATI-CP, in the construct of thinking skills, are compared between nursing students' scores before and after curriculum change in a rural state.

The findings of this study were supported throughout the literature (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). One systematic review concluded that what works in developing clinical judgment remains complex and unclear (Thompson & Stapley, 2011). Thompson and Stapley's study was updated in 2021 with similar results indicating the development of clinical judgment remained elusive but warranted continued study by nurse educators and regulators (Jessee, 2021). Other studies focused on the implementation of high-fidelity simulation (HFS) and scenario-based learning, which showed promise, according to the authors but did not present a definitive effect on the development of clinical judgment (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015; Klenke-Borgmann et al., 2020).

My studies' findings may contribute to the ongoing evaluation of educational interventions intended to support the development of clinical judgment in nursing students (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). As nurse educators attempt many strategies to develop clinical judgment in nursing students, continued evaluation of these strategies' potential impact is necessary. While some methods have shown some promise, not one strategy has proven more effective than another in achieving development of clinical judgment in nursing students. Additionally, implementing educational interventions to develop clinical judgment is not without risk. The result of a significant change like this bore the risk of decreased scores or damage to student performance. That was not the case in this study. Though, the results yielded in this study were not statistically significant, and the evaluation of another educational intervention (shared concept-based curriculum) is an important contribution to the

scholarly literature. This study's findings may inform nurse educators regarding potential options to continue working toward this goal (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015; Klenke-Borgmann et al., 2020).

Limitations

In my study, I took results from exams very soon after the consortium implemented the new curriculum. As such, limitations in the results may be related to the newness of the curriculum and faculty still learning it themselves. An additional limitation could include instructors learning to teach in the new methodology while possibly holding on to the previous methods purely out of habit or comfort level. Instructors may have been resistant when asked to take on a new format in an already proven and rigorous program (Anderson et al., 2017).

Another potential limitation exists in the population of the study. On average, students of the programs were non-traditional students (mean age 28) who may have had previous experience in traditional college courses. Completing an already challenging program in an unfamiliar format could have caused students not to perform as well as they may have expected. The non-traditional student often has other life commitments, work, family, etcetera (ATI, 2016). With the additional challenges of the new curriculum, student results could have been affected.

Another consideration for limitations is the management of these already high-performing programs in the consortium. These programs were all nationally accredited and held high success rates as outlined by the accrediting agencies for their students before the curriculum change (ACEN, n.d.). The pressure of maintaining accreditation,

and minimizing risk to student performance, could be a limitation due to the diligence required to maintain accreditation. Changing platforms and methodologies can take time to implement successfully.

Implications

Implications to the discipline of nursing education include maintaining the new curriculum and continuing the solidification of learning strategies agreed upon in the shared concept-based curriculum. Nursing schools throughout the consortium have navigated the curriculum change, maintaining the high success rates they held before the change. They continue to work toward modification and improvement with each cohort. Methodologically, the retrospective quantitative study was an appropriate fit to compare the groups before and after curriculum change test scores. The analysis was possible using an independent samples *t* test (Edmonds & Kennedy, 2017; Gray & Grove, 2021). An independent *t* test was appropriate for this study because the test scores used were from different groups of students before and after the curriculum change (Gray & Grove, 2021; Salkind, 2010).

As a contribution to positive social change, continued research in the academic preparation of clinically competent nurses will help ensure transitioning graduate nurses' and patients' safety (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). Evaluating educational interventions designed to support graduates in this way, specifically curriculum revision following the IOM report's release, may provide necessary guidance for academics' continued effort toward judgment development (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015).

Recommendations

Additional research is needed regarding educational interventions designed to support the development of clinical judgment. Educational interventions intended to support graduates in developing clinical judgment, including curriculum revision following the IOM's recommendation, may provide necessary guidance for nursing education (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015). Further, because of the specificity of this study on just one section of the ATI-CP, an opportunity may exist to study the exam results on a broader level. Additional studies remain to be done in this rural state regarding student performance on the RN-NCLEX examination, both before and after the curriculum change. Comparing my study with other studies on clinical judgment as measured on the ATI-CP may help to determine a potential relationship between the RN-NCLEX and the ATI-CP regarding curriculum change and its possible effect on student performance.

Conclusions

This study evaluated a potential effect of a curriculum change on students' performance on the ATI-CP in the constructs of clinical judgment following a curriculum change in a rural state. The construct of clinical judgment for this study was thinking skills. The ATI-CP provided the tool to objectively evaluate students' mean scores in these categories. Even with all the systematic reviews and other studies regarding educational interventions, no one intervention, theory, or system has proven superior in developing clinical judgment. This gap presented an opportunity to explore the educational intervention of a shared concept-based curriculum implemented to develop

clinical judgment (Capaletti et al., 2014; Billings, 2019, Murray et al., 2019; Thompson & Stapley, 2011).

This study evaluated the strategy of a shared concept-based curriculum not previously completed throughout the literature. In the rural state where the curriculum change took place, the mean raw scores from students before and after did improve slightly, though not statistically significantly, (table 1) with the implementation of the shared concept-based curriculum. The result of a major change like this bore the risk of decreased scores or damage to student performance. That was not the case in this study. The results yielded in this study were not statistically significant. However, the contribution to the conversation remains important, and the need for further research remains (Billings, 2019; Dickison et al., 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015; Klenke-Borgmann et al., 2020).

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Manuscript 2

Comparison of Rural Associate Degree Nursing Students' Priority Setting after Curriculum Change

by

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Outlet for Manuscript

In alignment with a focus on nursing education in undergraduate and graduate programs, *The Journal of Nursing Education* is an appropriate outlet for this manuscript. *The Journal of Nursing Education* focuses on scholarly manuscripts that focus on issues in nursing education, build on previous research, and evaluate current policy. This journal has been in publication for more than fifty years. The journal is indexed in PubMed and Cumulative Index to Nursing and Allied Health Literature (CINAHL) databases. *The Journal for Nursing Education* serves as an outlet for academic research and a resource for nursing educators to continually improve their practice and the quality of education provided to students across the discipline (Healio, n.d.).

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Abstract

Background: The current healthcare climate is increasingly complex, requiring nursing staff who are competent and safe. Competent and safe practice is defined through the concept of clinical judgment, which includes thinking skills, priority setting, and management of care. The focus of this study is priority setting. Method: This quantitative, nonexperimental research study compares the development of priority setting in associate nursing students taught using a traditional systems-based curriculum (n = 233) and students taught in the new curriculum, a concept-based shared curriculum (n = 278) in a rural state through the comparison of student exam results on the ATI-CP. Results: ATI-CP-priority setting scores in this study were not significantly different before curriculum change (M=74.46, SD=12.17) than scores achieved after curriculum change (M=74.39, SD=12.17), t(.07), p = .95. Conclusion: The result of this study did not show a significant difference in student's scores in priority setting after the curriculum change. However, evaluating this educational intervention, curriculum change, and its potential effect on clinical judgment development is an important contribution to the scholarly literature. This study's findings may inform nurse educators regarding possible educational interventions that support the continued development of overall clinical judgment and its constructs in nursing students.

Keywords: *Clinical Judgment, Priority Setting, Associate Degree Nursing Programs, Curriculum Revision*

Introduction

Healthcare in the United States requires clinical competence and skilled clinicians prepared to practice in this complex environment as efficiently as possible (Billings, 2019; Dickison et al., 2019; IOM, 2010). With the complexity of the healthcare climate, competent and safe practicing nurses are critical. Competent and safe practice is defined through the concept of clinical judgment. Defining clinical judgment are three primary constructs: thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019). In this study, I focused on priority setting.

Specific Problem

Priority setting in nursing must be developed as a part of overall clinical judgment. Though there are many studies published throughout the literature regarding educational interventions for developing priority setting in nursing students, there is not one proven educational intervention found to be superior (Benner et al., 2009; Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). Continued research is needed to develop priority setting, which may inform nursing educators to develop nursing students' clinical judgment effectively. Some nursing programs, such as the programs of the rural state in this study, have chosen overall curriculum change to develop clinical judgment, specifically priority setting in their students. In states of similar demographic and higher education availability, the intervention of shared curriculum, concept-based curriculum, was implemented. This change further influenced

the rural state in which this change and subsequent study occurred (Anderson et al., 2017; Close et al., 2015; Giddens, 2015; Gorski et al., 2015).

Priority setting is critical for clinical judgment and effective time management in nursing practice (Hendry & Walker, 2004). Priority setting is a complex skill set that nurses need to develop, yet there is a lack of guidance in the literature for building priority-setting skills in nursing. Nurses often use intuition and gut feeling in their decision making and prioritizing. Unfortunately, this practice does not always result in the nurse deciding on the most appropriate action for the patient (Ball, 2018; del Bueno, 2005; Mantovan et al., 2020; Suhonen et al., 2018). Failure to correctly prioritize nursing interventions increases medication errors, infections, falls, and other adverse patient outcomes (Ball et al., 2018; Hendry & Walker, 2004; Suhonen et al., 2018). In addition to adverse patient outcomes, failure to prioritize interventions and manage time effectively results in a negative professional experience for nurses, including decreased job satisfaction, increased burnout, and turnover (Ball et al., 2018; Harvey et al., 2020; Mandal et al., 2020).

Significance

New graduates who have not yet developed the necessary abilities to practice nursing care effectively have an increased risk of committing practice errors that threaten the safety of patients. Nursing practice errors occur more frequently in new graduate practice and may result in job dissatisfaction and decreased retention, especially within the first year of nursing (Cloete, 2015; Johnson & Benham, 2020; Murray et al., 2019). More common practice errors in the care process include medication administration,

communication, and failure to recognize acute changes in patient conditions (ATI, 2016; Benner et al., 2009; Johnson & Benham, 2020; IOM, 2011, Mantovan et al., 2020; Murray et al., 2019; Tanner, 2006). As a result of practice errors, new graduate nurses may be subjected to decreased job satisfaction, professional insecurity, and disciplinary action. The nurse, patient, and healthcare system suffer deterred progress in the goal of safe, and competent care. Patients affected by these errors may require additional monitoring, increased care interventions, high additional costs, rapid declines in health, long-term damage, or even death (ATI, 2016: Cappalletti et al., 2014; IOM, 2016; Johnson & Benham, 2020; Murray et al., 2019; NCSBN, 2021). To mitigate errors and increase safety in patient care, industry leaders have called for an improvement in the development of nurses' skills to deliver safe and competent care (Billings, 2019; IOM, 2016; NCSBN, 2021). This preparation starts in nursing programs continuing through transition to professional practice. Educators must develop students' clinical competence through its foundation, clinical judgment (Billings, 2019; NCSBN, 2021). The components of clinical judgment are thinking skills, priority setting, and management of care. The problem is, though many are proposed, no one approach to developing clinical judgment in nursing students has proven superior (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). To clarify expectations on a regulatory level, the NCSBN developed the clinical judgment model (Benner, 1984, Benner et al., 2009, Billings, 2019; Dickison et al., 2019; Tanner, 2006). Within the multiple layers of the model, the three significant constructs are thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al.,

2019). Educational interventions designed to support graduates in developing clinical judgment, including curriculum revision following the IOM's recommendation, may provide necessary guidance for nursing education (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015).

Positive Social Change

As a contribution to positive social change, continued research in the academic preparation of clinically competent nurses ensures transitioning graduate nurses' safety and, most importantly, patient safety in receipt of those nurses' care (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). Evaluating educational interventions designed to support the development of clinical judgment and priority setting, specifically curriculum revision following the IOM report's release, may include necessary guidance for academics' continued effort toward judgment development (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015). Because I examined the potential effect of curriculum change on the development of clinical judgment, the potential existed to isolate important academic preparation qualities. The information gleaned from this study may be used by industry leaders to begin discussions about priority setting. Professional development within the industry's clinical staff could result in a more successful transition to practice from complete and comprehensive academic preparation (Anderson et al., 2017; Dickison et al., 2019; IOM, 2011; Murray et al., 2019; NCSBN, 2021). The purpose of this quantitative, nonexperimental research study was to compare the development of clinical judgment, specifically, priority setting, as measured on the ATI-CP in associate degree nursing students who were taught using a traditional systems-

based curriculum and compare those results with nursing students' test scores in the same category taught using the new, concept-based curriculum.

Relevant Scholarship

Priority setting in nursing must be developed as a part of overall clinical judgment. Though there are many studies published throughout the literature regarding educational interventions for developing priority setting in nursing students, there is not one proven educational intervention found to be superior (Benner et al., 2009; Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). Priority setting is critical for clinical judgment and effective time management in nursing practice (Hendry and Walker, 2004). Failure to correctly prioritize nursing interventions increases medication errors, infections, falls, and other adverse patient outcomes. Nursing education needs continued research in priority setting, support for which is found throughout the literature guiding the focus of this study (Ball et al., 2018; Hendry and Walker, 2004; Suhonen et al., 2018).

Priority Setting in Nursing

Priority setting in nursing has been defined as demonstrating judgment, making decisions about responses, and prioritizing these actions correctly. These decisions include a sequence of care, including assessments and subsequent interventions determined in order by the nurse (ATI, 2016; Hendry and Walker, 2004). Several considerations go into the prioritization of a sequence of interventions. The priority setting process has several presentations throughout the literature (ATI, 2016, Mantovan et al., 2020). Hendry and Walker (2004) stated: "…priority setting involves making

decisions about the significance of patient problems and needs, and about the actions that should be made in response" (p. 430).

Clinicians use several models to determine the relevance of actions and interventions. These models include Maslow's hierarchy of needs, the nursing process, the A-B-Cs of patient survival, safety and risk reduction, least restrictive or invasive intervention first, survival potential, acute presentation versus chronic presentation, the urgency of patient need, and finally, stability to determine the order of action for the patient requiring care (ATI, 2016; Hendry and Walker, 2004; Mantovan et al., 2020). Using these guidelines, the clinician can prioritize care for the patient and provide them appropriately, ensuring optimal effect for each assigned patient.

There are contradictions to the use of priority setting in healthcare. The literature review includes priority setting as potential rationing of care. However, prioritizing nursing care is centered on putting care in the most appropriate order for the patient. Specifically, the nurse does not decide if the patient receives care but when and how it will be received (Ball, 2018; del Bueno, 2005; Mantovan et al., 2020; Suhonen et al., 2018). The perception that nurses would ration care instead of prioritizing care can be due to many issues, including time, staffing, and resource limitations in the healthcare climate (Hendry & Walker, 2004; Mantovan et al., 2020). The description of rationing is different than prioritizing in that rationing would be to provide care or not provide care, whereas the definition of prioritizing defines when care is given and in what order (Ball, 2018; del Bueno, 2005; Mantovan et al., 2020; Suhonen et al., 2018).

Research Question and Design

Research Question (RQ): What is the difference in rural fourth-semester associate degree nursing students' exam scores in priority setting as measured by the ATI – CP before and after curriculum change?

Null Hypothesis (H_0): There is no significant difference in rural fourth-semester associate degree nursing students' scores in priority setting as measured by the ATI-CP before and after curriculum change.

Alternative Hypothesis (H_a): There is a significant difference in rural fourth-semester associate degree nursing students' scores in priority setting as measured by the ATI-CP before and after curriculum change.

I studied priority setting within the ATI-CP assessment to understand the development of overall clinical judgment in nursing students. The primary constructs of clinical judgment include thinking skills, priority setting, and management of care. The ATI-CP evaluates the three constructs individually and collectively (ATI, 2016). The constructs of clinical judgment are present in 176 out of 180 questions on the exam (ATI, 2016). As the constructs of clinical judgment identified here comprise a significant majority of the exam, I used the exam scores to determine a potential difference between students' scores on the ATI-CP before and after a curriculum change (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017). The purpose of this study was to compare used students' test scores before and after curriculum change to determine a difference between the two curriculum models on the construct of priority setting.

To complete the analysis, I conducted an independent samples *t* test. An a priori calculation of the number of exam scores/sample size required for the study was 128, 64 for each group. I used G-power to calculate sample size using an alpha of 0.05, a medium effect size of .5, and the desired power of 0.80. Guidance for the analysis comes from Gray and Grove (2021). I compared students' exam scores using ex post facto data collected during regular academic operations before and after a curriculum change across a consortium of nursing programs in a rural state. The study aims to identify a possible effect on student performance before and after curriculum change in the rural state. The study's results may inform nursing educators about the development of clinical judgment in associate degree nursing students due to curriculum change.

Methods

The purpose of this quantitative, nonexperimental research study was to determine a potential effect of curriculum change on the development of clinical judgment. In this study, I examined the individual construct of priority setting measured by the ATI-CP. To understand a possible effect, I studied priority setting scores before and after a curriculum change in associate degree nursing students of a rural state. Priority setting is a category measured on the ATI-CP in associate degree nursing students taught using a traditional systems-based curriculum and a new concept-based curriculum. Because ATI collected student results on the same examination platform before and after the curriculum change, I could compare the results to determine a difference. ATI categorically evaluates the constructs of clinical judgment individually and collectively on the ATI-CP (ATI, 2016). The categories of clinical judgment account

for 176 out of 180 questions on the exam (ATI, 2016). As the categories comprise a significant majority of the exam, these scores could be used to determine the potential effect of curriculum change on students' scores in priority setting (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017).

Participants

The population for the study was composed of a sample of 511 associate degree nursing students' ATI CP scores between 2016 and 2019. In 2016 & 2017, the students completed a traditional systems-based curriculum (*n*=233). In 2018 and 2019, the associate degree nursing students completed the new concept-based shared curriculum in a rural state (*n*=278) (Anderson et al., 2017; WyNursing, n.d.). The demographic statistics include students who self-identified in race/ethnicity as Caucasian/White (82.8%), Hispanic (8.4%), and African American/Black, Asian, or American Indian (<3%). Further, the population consists mainly of students who self-identified as female (86.5%) and the remainder as male (13.5%). The mean age of the group was *m*-28. Approximately half of the group identified as a "traditional student" (44%) compared to a "non-traditional student" (56%). Traditional students are defined as persons enrolling in college directly from high school through age 24. These students seek their first post-secondary degree, attend college full-time, and are absent from major life or work responsibilities such as careers or dependents (ATI, 2021). The curriculum changed from traditional systems-based education in 2016 to the concept-based shared curriculum. The change resulted in the graduation of two cohorts of the new concept-based curriculum per program in 2018 and 2019. Comparison of these cohorts was allowed by using student

performance on the ATI-CP before (2016 and 2017) and after (2018 and 2019). By comparing exam results from students across the rural state before and after curriculum change, I could evaluate the intervention of curriculum change for potential effect within this demographic of students.

Sample and Power

For this study, I collected secondary quantitative data from each participating consortium member nursing program across a rural state. Each nursing program in the study used the same ATI-CP in the fourth semester of the ADN nursing program before and after the curriculum change. Because the rural state has few nursing programs and a limited population, combined data were necessary to understand the potential effect of the curriculum change. In addition to an a priori calculation, to correctly perform the study, a G-power is necessary to determine the appropriate sample size. I ran a G-power analysis to calculate the sample size using an alpha of 0.05, a medium effect size of .5, and the desired power of 0.80 for this independent *t* test which yielded a sample size of 128, 64 for each group.

Variables/Sources of Data

I compared scores of the two groups of associate degree nursing students in consortium member nursing programs across a rural state before and after a curriculum change. In 2016 & 2017, the first group of students completed a traditional systems-based curriculum (n=233). In 2018 and 2019, the second group of students completed the new concept-based shared curriculum in a rural state (n=278) (Anderson et al., 2017; WyNursing, n.d.). The independent variable for this study was the fourth-semester

associate degree nursing student's test scores in the selected category of priority setting on the ATI-CP before and after the curriculum change. The dependent variable for this study was the fourth-semester associate degree nursing student's test scores in the priority setting category on the ATI-CP after the curriculum change. Analyzing the student's test scores before and after the curriculum change, I assessed the difference in students' test scores in priority setting.

Data were collected by the consortium member programs of nursing and ATI regularly at the end of the fourth semester. As scores were routinely collected (before and after the curriculum change), I accessed the available ex post facto data (appendix C). ATI also collects these data for each program. Due to the outside entity collecting the data, minimization of individual identification of students is possible within the cohorts, thus reducing the need for individual participation in the study (Anderson et al., 2017; ATI, 2016; Thompson & Panacek, 2007).

Instrumentation

The analysis was possible using an independent samples *t* test (Edmonds & Kennedy, 2017; Gray & Grove, 2021). An independent *t* test is appropriate for this study because test scores used are from different groups of students before and after the curriculum change (Gray & Grove, 2021; Salkind, 2010). The variables in this study were not manipulated or tested. In this study, I examined the assumptions of the *t* test before completing the analysis. The first assumption of the independent *t* test was that each group should contain subjects that only belong to one group. Testing this assumption was done through demographic evaluation of the dataset and avoidance of

duplication between the groups. Students in the two groups (before and after the curriculum change) were unique and not duplicated.

The second assumption of the *t* test was that there should be no significant outliers between the groups; the data distribution should be normal. As the population was selected and plotted, distribution evaluation was possible using the histogram. Visual inspection of the histogram shows that the distribution appears normal without significant outliers. The large sample size yielded a reasonably even distribution which more accurately demonstrated the shape of the population (Gray & Grove, 2021).

Finally, the third assumption of the *t* test was that there should be homogeneity of variances. Homogeneity means that the variance of the outcome variable in each group is equal. A Levene's test for homogeneity (equality) of variance in each population was completed through testing software and did not show significance ($p > .05$). As of this result, equal variances between the groups were not assumed (Gray & Grove, 2021; Salkind, 2010).

Design and Analysis

A quantitative, nonexperimental research design was appropriate for this study as the data were collected retrospectively following a curriculum change (Edmonds & Kennedy, 2017; Gray & Grove, 2021). The variables in this study were not manipulated or tested. I objectively measured, made observations, identified any potential differences, and determined the significance of possible effects on students' scores in construct categories due to curriculum change. As a retrospective data collection, students’ scores

were available following the administration of the ATI-CP in the fourth-semester cohorts of each consortium member nursing program.

Results

A comparison of students' exam scores was completed using ex post facto data collected during regular academic operations before and after a curriculum change across a consortium of nursing programs in a rural state. The curriculum change from traditional systems-based education to the concept-based shared curriculum was completed in 2016. The change resulted in the graduation of two cohorts per program in 2018 and 2019, allowing comparison before and after (Anderson et al., 2017; ATI, 2016; WyNursing, n.d). Though the results of this study do not demonstrate a statistically significant difference in priority-setting scores before and after curriculum change, a contribution to the literature regarding educational interventions to develop these skills is important.

Execution

In conducting this study, I used data collected from participating nursing programs in the consortium in a rural state. The data were obtained in excel format and transferred into SPSS (Statistical Package for the Social Sciences) Version 27 for analysis. My analysis follows guidance received from Gray and Grove (2021), which called for an a priori calculation of the number of exam scores/ sample size required for the study was 128, 64 for each group. G-power was used for the sample size calculation using an alpha of 0.05, a medium effect size of .5, and the desired power of 0.80. 128 student scores were obtained through data collection, solidifying validity, though I

collected 511 student test results. The increased population size assisted me in seeing a potential difference between the groups more readily (Gray & Grove, 2021).

Results

The research question for this study is, what is the difference in rural fourth-semester associate degree nursing students' exam scores in priority setting as measured by the ATI–CP after curriculum change? The null hypothesis for this study: there was no significant difference in rural fourth-semester associate degree nursing students' scores in priority setting as measured by the ATI-CP following a curriculum change. The alternative hypothesis: there was a significant difference in rural fourth-semester associate degree nursing students' scores in priority setting as measured by the ATI-CP following a curriculum change. ATI-priority setting scores in this study were slightly higher before curriculum change (M=74.46, SD=12.17) than scores achieved after curriculum change (M=74.39, SD=12.17), t (.07), p = .95. The mean difference was not statistically significant between the groups *(*SEM=0.07) showing a small effect size (.006). I used an alpha level of .05 for all statistical tests (see Table 3).

Table 3

ATI-Priority Setting Scores

		N	M	SD	SEM
Priority Setting Score (raw score)	Pre-Curriculum Change	233	74.46	10.37	.68
	Post Curriculum Change	278	74.39	12.17	.73

In this study, I examined the assumptions of the *t* test and addressed them before analysis. The first assumption states that each group should contain subjects that only belong to one group. Testing this assumption was done through demographic evaluation of the dataset to avoid duplication between the groups. If student scores are duplicated between groups, the duplicate scores must be removed. In this evaluation, there was no duplication of participants found between the two groups. Each student's score was unique to the curriculum group they completed as well as the ATI-CP examination.

The second major assumption of the *t* test was that there should be no significant outliers between the groups; the data distribution should be normal. As the population was selected and graphed, further distribution evaluation was possible. Visual inspection of the histogram shows that the distribution appears normal without significant outliers. This histogram's slight left, negative skewness (-3.44), and kurtosis (-.07) further support the normal sample size distribution. Additionally, the large sample size yielded an even distribution that more accurately demonstrated the shape of the population (Gray & Grove, 2021).

The third major assumption of the *t* test was that there should be homogeneity of variances, meaning the variance of the outcome variable was equal in each group

(Salkind, 2010). A Levene's test for homogeneity (equality) of variance in each population was appropriate and available through testing software (Gray & Grove, 2021; Salkind, 2010) (Table 4). Levene's test was statistically significant in priority setting, meaning that the equal variances between groups cannot be assumed (Gray & Grove, 2021). The assumption of homogeneity has not been met; variances are not equal they are potentially different. Even so, the small effect size (.006) renders the significance negligible. This study's results do not demonstrate a significant difference in priority-setting scores before and after curriculum change.

Table 4

Mean Performance of Exam Scores in Priority Setting

		Levene's Test for Equality of Variances		t-test for Equality of Means						
						Significance		M	SE	95% CI
		F	Sig.	t	df	One-Sided *p*	Two-Sided *p*			
Priority Setting Score (raw score)	Equal variances assumed	5.184	.023	.067	509	.473	.947	.06772	1.01	[-1.92, 2.05]
	Equal variances not assumed			.068	508.86	.473	.946	.06772	.99	[-1.89, 2.03]

Discussion

I looked at the strategy of implementing a shared concept-based curriculum's effect on the development of clinical judgment in associate degree nursing students in a rural state. Specifically, I wanted to study the effect of implementing curriculum change on priority-setting, a construct of clinical judgment. My study is unique, unlike others found in the literature. In the rural state where the curriculum change took place, the mean raw scores from students before the curriculum change and following did decrease slightly though not significantly (table 1) with the implementation of the shared concept-based curriculum.

Interpretation

Healthcare in the United States requires clinical competence and skilled clinicians prepared to practice as efficiently as possible in a complex environment (Billings, 2019; Dickison et al., 2019; IOM, 2010). As the focus of this study, developed priority setting are part of overall clinical judgment. The purpose of this quantitative, nonexperimental research study was to compare the development of clinical judgment—specifically, the construct of priority setting as it was measured on the ATI-CP. The exam results of the ATI-CP, in the construct of priority setting, are compared between nursing students' scores before and after curriculum change in a rural state.

The findings of this study were supported throughout the literature (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). One systematic review concluded that what works in developing clinical judgment remains complex and unclear (Thompson & Stapley, 2011). Thompson and Stapley's study was updated in 2021 with

similar results indicating the development of clinical judgment remained elusive but warranted continued study by nurse educators and regulators (Jessee, 2021). Other studies focused on the implementation of high-fidelity simulation (HFS) and scenario-based learning, which showed promise, according to the authors but did not present a definitive effect on the development of clinical judgment (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015; Klenke-Borgmann et al., 2020).

These studies' findings may contribute to the ongoing evaluation of educational interventions intended to support the development of clinical judgment in nursing students (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). As nurse educators attempt many strategies to develop clinical judgment in nursing students, continued evaluation of these strategies' potential impact is necessary. While some methods have shown some promise, not one strategy has proven more effective than another in achieving tangible development of clinical judgment in nursing students. Additionally, implementing educational interventions to develop clinical judgment was not without risk. The result of a significant change like this bore the risk of decreased scores or damage to student performance. That was not the case in this study. Though, the results yielded in this study were not statistically significant, and the evaluation of another educational intervention (shared concept-based curriculum) is an important contribution to the scholarly literature. This study's findings may inform nurse educators regarding potential options to continue working toward this goal (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015; Klenke-Borgmann et al., 2020).

Limitations

In my study, I took results from exams very soon after the consortium implemented the new curriculum. As such, limitations in the results may be related to the newness of the curriculum and faculty still learning it themselves. An additional limitation could include instructors learning to teach in the new methodology while possibly holding on to the previous methods purely out of habit or comfort level. Instructors may have been resistant when asked to take on a new format in an already rigorous program.

Another potential limitation exists in the population of the study. On average, students of the programs were non-traditional students (*m*-28) who may have had previous experience in traditional college courses. Completing an already challenging program in an unfamiliar format could have caused students not to perform as well as they may have expected. The non-traditional student often has other life commitments, work, family, etcetera (ATI, 2016). With the additional challenges of the new curriculum, student results could have been affected.

Another consideration for limitations is the management of these already high-performing programs in the consortium. These programs were all nationally accredited and held high success rates as outlined by the accrediting agencies for their students before the curriculum change (ACEN, n.d.). The pressure of maintaining accreditation, and minimizing risk to student performance, could be a limitation due to the diligence required to maintain accreditation. Changing platforms and methodologies can take time to implement successfully.

Implications

Implications to the discipline of nursing education include maintaining the new curriculum and continuing the solidification of learning strategies agreed upon in the shared concept-based curriculum. Nursing schools throughout the consortium have navigated the curriculum change, maintaining the high success rates they held before the change. They continue to work toward modification and improvement with each cohort. Methodologically, the retrospective quantitative study was an appropriate fit to compare the groups before and after curriculum change test scores. The analysis was possible using an independent samples *t* test (Edmonds & Kennedy, 2017; Gray & Grove, 2021). An independent *t* test was appropriate for this study because the test scores used were from different groups of students before and after the curriculum change (Gray & Grove, 2021; Salkind, 2010).

As a contribution to positive social change, continued research in the academic preparation of clinically competent nurses will help ensure transitioning graduate nurses' and patients' safety (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). Evaluating educational interventions designed to support graduates in this way, specifically curriculum revision following the IOM report's release, may provide necessary guidance for academics' continued effort toward judgment development (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015).

Recommendations

Additional research on educational interventions designed to support the development of clinical judgment is needed. Educational interventions intended to

support graduates in developing clinical judgment, including curriculum revision following the IOM's recommendation, may provide necessary guidance for nursing education (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015). Further, because of the specificity of this study on just one section of the ATI-CP, an opportunity may exist to study the exam results on a broader level. Additional studies remain to be done in this rural state regarding student performance on the RN-NCLEX examination, both before and after the curriculum change. Comparing my study with other studies on clinical judgment as measured on the ATI-CP may help to determine a potential relationship between the RN-NCLEX and the ATI-CP regarding curriculum change and its possible effect on student performance.

Conclusions

This study evaluated a potential effect of a curriculum change on students' performance on the ATI-CP in the constructs of clinical judgment as a result of curriculum change in a rural state. The construct of clinical judgment for this study was priority setting. The ATI-CP provided the tool to objectively evaluate students' mean scores in these categories. Even with all the systematic reviews and other studies regarding educational interventions, no one intervention, theory, or system has proven superior to developing clinical judgment. This gap presented an opportunity to explore the educational intervention of a shared concept-based curriculum implemented to develop clinical judgment (Capaletti et al., 2014; Billings, 2019, Murray et al., 2019; Thompson & Stapley, 2011).

This study evaluated the strategy of a shared concept-based curriculum not previously completed throughout the literature. In the rural state where the curriculum change took place, the mean raw scores from students before and after did improve slightly (table 1) with the implementation of the shared concept-based curriculum. The result of a major change like this bore the risk of decreased scores or damage to student performance. That was not the case in this study. The results yielded in this study were not statistically significant. However, the contribution to the conversation remains important, and the need for further research remains (Billings, 2019; Dickison et al., 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015; Klenke-Borgmann et al., 2020).

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Manuscript 3

Comparison of Rural Associate Degree Nursing Students' Management of Care after Curriculum Change

by

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Outlet for Manuscript

The outlet for this manuscript is *Teaching and Learning in Nursing*. This journal claims to be the official outlet for associate degree nursing programs, focusing on educational development, faculty development, and innovation in the classroom. This journal is a good fit for this study as an outlet focused on associate degree programs. *Teaching and Learning in Nursing* aims to ensure educational innovation through faculty development, especially at the associate degree level (Elsevier, n.d.). This study compares student performance results because of curriculum change that meets the definition of educational innovation.

Formatting expectations for *Teaching and Learning in Nursing* can be found at https://www.elsevier.com/journals/teaching-and-learning-in-nursing/1557-3087/guide-for-authors. The manuscripts must follow the Publication Manual of the American Psychological Association, 7th edition. Article submissions require highlights that include what is known about the subject, what the work will add to the literature, and how the work can be applied to practice. Manuscripts should include an abstract that is 150 words or less and includes key words to increase the ability to find the article in searching databases (Elsevier, n.d.).

Abstract

Background: The current healthcare climate is increasingly complex, requiring nursing staff who are competent and safe. Competent and safe practice is defined through the concept of clinical judgment, which includes thinking skills, priority setting, and management of care. The focus of this study was priority setting. Method: This quantitative, nonexperimental research study compared the development of management of care in associate nursing students taught using a traditional systems-based curriculum (*n*=233) and students taught in the new curriculum, a concept-based shared curriculum (*n*=278) in a rural state through the comparison of student exam results on the ATI ATI-CP. Results: ATI-CP- management of care scores in this study were significantly different before curriculum change (*M*=75.79, *SD*=9.15) than scores achieved after curriculum change (*M*=79.56, *SD*=9.15), *t* (4.3), *p* = .95. Conclusion: The result of this study did show a significant difference in student's scores in management of care after the curriculum change. Evaluating this educational intervention, curriculum change, and its potential effect on clinical judgment development was an important contribution to the scholarly literature. This study's findings may inform nurse educators regarding possible educational interventions that support the continued development of overall clinical judgment and its constructs in nursing students.

Keywords: *Clinical Judgment, Management of Care, Associate Degree Nursing Programs, Curriculum Revision*

Introduction

Healthcare in the United States requires clinical competence and skilled clinicians prepared to practice in this complex environment as efficiently as possible (Billings, 2019; Dickison et al., 2019; IOM, 2010). With the complexity of the healthcare climate, competent and safe practicing nurses are critical. Competent and safe practice is defined through the concept of clinical judgment. Defining clinical judgment are three primary constructs, which are thinking skills thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019). This study will focus on the construct of management of care.

Specific Problem

Management of care in nursing is developed through many components of nursing education, though there is not one proven educational intervention found to be superior (Benner et al., 2009; Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). Continued research was needed to develop skills and competencies in the management of care. Doing so may inform nursing educators to effectively develop nursing students in clinical judgment: management of care. Some nursing programs, like the rural state nursing consortium members studied here, have chosen overall curriculum change focused on building management of care in their students (Anderson et al., 2017; Close et al., 2015; Giddens, 2015; Gorski et al., 2015).

The definition of management of care is seen in several industry expert documents. Several industry experts have defined the third construct of clinical judgment. The definition includes the nurse's ability to coordinate, supervise, and

collaborate within the healthcare team to achieve optimal patient care (ATI, 2016; del Bueno, 2005; Tanner, 2006). Additionally, the management of care includes being fiscally responsible and not wasteful with resources; as a more complex construct of clinical judgment, management of care has a foundation in thinking skills and priority setting. Additionally, the management of care has an ethical responsibility, legal responsibility, and knowledge of technology and healthcare delivery systems (ATI, 2016; del Bueno, 2005; Manetti, 2018; NCSBN, 2021; Tanner, 2006). The foundational constructs of thinking skills and priority setting are required to effectively manage the patient's care as a professional nurse (ATI, 2016; Benner et al., 2009; del Bueno, 2005; Manetti, 2019; Tanner, 2006).

Clinical judgment and the construct of management of care have been studied, defined, and refined for decades (Benner, 1984, Benner et al., 2009, IOM, 2010; Tanner, 2006, QSEN, n.d.). Developing competent nurses with clinical judgment skills, specifically management of care, has provided nursing education and practice industry leaders a challenge to focus on strategies for developing the skills in new graduate nurses and those currently practicing nurses. Defining competency in clinical judgment includes knowledge, skills, and attitudes developed during students' academic preparations. Further, to develop competence in clinical judgment, students must develop individual constructs such as thinking skills, priority setting, and management of care (Billings, 2019; Benner, 1984, Benner et al., 2009; Dickison et al., 2019, Tanner, 2006, QSEN, n.d.).

Lack of clinical judgment predisposes new graduates to errors in their practice. Practice errors include a commitment of medication errors, communication errors, and failure to recognize the change in patient condition, amongst others (Benner et al., 2009; Murray et al., 2019; Tanner, 2006). Practice errors have been shown to result in patients requiring a higher level of care, a rapid decline in health, and even death (ATI, 2016: Cappalletti, Engel, & Prentice, 2014; IOM, 2016; Murray et al., 2019; NCSBN, 2021).

Significance

New graduates who have not yet developed the necessary abilities to practice nursing care effectively have an increased risk of committing practice errors that threaten the safety of patients. Nursing practice errors occur more frequently in new graduate practice and may result in job dissatisfaction and decreased retention, especially within the first year of nursing (Cloete, 2015; Johnson & Benham, 2020; Murray et al., 2019). More common practice errors in the care process include medication administration, communication, and failure to recognize acute changes in patient conditions (ATI, 2016; Benner et al., 2009; Johnson & Benham, 2020; IOM, 2011, Mantovan et al., 2020; Murray et al., 2019; Tanner, 2006). As a result of practice errors, new graduate nurses may be subjected to disciplinary action, policy changes, and deterred progress in cost-effective and efficient care. Additionally, patients affected by these errors may require additional monitoring, increased care interventions, and services. These patients experience excessive cost of care, rapid declines in health, long-term damage, and death (ATI, 2016: Cappalletti et al., 2014; IOM, 2016; Johnson & Benham, 2020; Murray et al., 2019; NCSBN, 2021).

The expectation from industry leaders is that the development of the construct of management of care in overall clinical judgment must be a focus for nursing education, though no one approach has been shown to be superior (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). To clarify expectations on a regulatory level, the NCSBN developed the clinical judgment model (Benner, 1984, Benner et al., 2009, Billings, 2019; Dickison et al., 2019; Tanner, 2006). Within the multiple layers of the model, the three significant constructs are thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019). Educational interventions designed to support graduates in developing clinical judgment, including curriculum revision following the IOM's recommendation, may provide necessary guidance for nursing education (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015).

Positive Social Change

As a contribution to positive social change on a more significant level, continued research in the academic preparation of clinically competent nurses ensures transitioning graduate nurses' safety and, most importantly, patient safety in receipt of those nurses' care (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). Evaluating educational interventions designed to support the development of clinical judgment and management of care, specifically curriculum revision following the IOM report's release, may include necessary guidance for academics' continued effort toward judgment development (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015). As a result of this study, the potential existed to isolate important academic

preparation qualities and raise the United States' standard of care. The information gleaned from this study may be used by industry leaders to begin discussions about the management of care. Professional development within the industry's clinical staff could result in a more successful transition to practice from complete and comprehensive academic preparation (Anderson et al., 2017; Dickison et al., 2019; IOM, 2011; Murray et al., 2019; NCSBN, 2021). The purpose of this quantitative, nonexperimental research study was to compare the development of clinical judgment. Specifically, I looked at the construct of management of care as measured on the ATI-CP in associate degree nursing students. These results were compared between two groups. The first was taught using a traditional systems-based curriculum. Then I compared those results with the next group of nursing students' test scores in the same category who were taught using the new, concept-based curriculum.

Relevant Scholarship

Management of care in nursing must be developed as a part of overall clinical judgment. Though there are many studies published throughout the literature regarding educational interventions for developing management of care in nursing students, there is not one proven educational intervention found to be superior to another (Benner et al., 2009; Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015). Management of care is critical for clinical judgment and effective nursing practice (IOM, 2011; Dickison et al., 2019). Failure in the management of care predisposes new graduate nurses to errors in their practice. As a result of practice errors, new graduate nurses may be subjected to decreased job satisfaction, professional insecurity, and

disciplinary action. The nurse, patient, and healthcare system suffer deterred progress in the goal of safe, cost-effective, and efficient care. Patients affected by these errors may require additional monitoring, increased care interventions, high additional costs, rapid declines in health, long-term damage, or even death (ATI, 2016: Cappalletti et al., 2014; IOM, 2016; Johnson & Benham, 2020; Murray et al., 2019; NCSBN, 2021).

Management of Care

Several industry experts have defined the management of care. These leaders' definition of management of care includes the nurse's ability to coordinate, supervise, and collaborate within the healthcare team to achieve optimal care for their patients (ATI, 2016; del Bueno, 2005; Tanner, 2006). Additionally, the management of care includes being fiscally responsible and not wasteful with resources in the patient's care. As a more complex concept included in clinical judgment, management of care also has ethical responsibility, legal responsibility, knowledge of technology, and healthcare delivery systems (ATI, 2016; NCSBN, 2021). The foundational components of thinking skills, critical thinking, clinical judgment, and priority setting are required to effectively manage the patient's care as a professional nurse (ATI, 2016). Management of care is further defined through a rural state-wide consortium. The consortium incorporates leadership and professionalism into the definition of management of care (Anderson et al., 2017). This definition includes a heightened awareness to empower others toward attaining a specific objective through nursing excellence. Leadership is exemplified through "interprofessional collaboration in the management of care in an adverse and complex

healthcare system" (Anderson et al., 2017). Anderson et al. (2017) defined professionalism as:

> a consistent demonstration of core values evidenced by nurses working with others to achieve optimal health and wellness outcomes in patients, families, and communities by wisely applying principles of altruism, excellence, caring, respect, communication, professional engagement, lifelong learning, and accountability

According to the Robert Woods Johnson Foundation (RWJF) (2010), management of care is defined as a set of activities intended to improve patient care, reduce need, and enhance coordination. Effective management of care is needed to reduce duplication and frustration and more effectively manage patient conditions (Klenke-Borgmann et al., 2020; RWJF, 2010). The NCSBN defines the management of care as the nurse's ability to identify roles and responsibilities within the healthcare team (NCSBN, 2021). Additionally, the nurse must be able to plan strategies and set goals to address client needs. Next, the nurse must act as the liaison and advocate for the patient, managing potential conflict between the client and other healthcare providers. Finally, the nurse must evaluate outcomes for interventions, care, and patient satisfaction (NCSBN, 2021).

Managing care in nursing has a differing focus on medical or psychological definitions. Medicine defines the management of care as directing other clinicians and overseeing providers by ensuring the care providers' competence and communicating expectations for care delivery, serving as the team leader and director more so than

collaborator and partner (AMA, 2016). The psychological definition of managing care focused on the clinician individually managing the patient's care, being the primary and only contact through which the patient receives specialized care through the provider/patient relationship (Ervin et al., 2018). In nursing, management of care is defined as advocating, collaborating, communicating, and connecting with other healthcare professionals to achieve the best possible outcomes for the patient taking an active role in the provision of care instead of overseeing this or performing the care individually (Anderson et al., 2017; NCSBN, 2021).

Research Question and Design

Research Question (RQ): What is the difference in rural fourth-semester associate degree nursing students' exam scores in management of care as measured by the ATI – CP before and after curriculum change?

Null Hypothesis (H_0): There is no significant difference in rural fourth-semester associate degree nursing students' scores in management of care as measured by the ATI-CP before and after curriculum change.

Alternative Hypothesis (H_a): There is a significant difference in rural fourth-semester associate degree nursing students' scores in management of care as measured by the ATI-CP before and after curriculum change.

I studied the management of care within the ATI-CP assessment to understand the development of overall clinical judgment in nursing students. The primary constructs of clinical judgment included thinking skills, priority setting, and management of care. The ATI-CP evaluates the three constructs individually and collectively (ATI, 2016). The

constructs of clinical judgment are present in 176 out of 180 questions on the exam (ATI, 2016). As the constructs of clinical judgment identified here comprise a significant majority of the exam, I used the exam scores to determine a potential difference between students' scores on the ATI-CP before and after a curriculum change (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017). The purpose of this study was to compare used students' test scores before and after curriculum change to determine a difference between the two curriculum models on the construct of management of care.

To complete the analysis, I conducted an independent samples *t* test. An a priori calculation of the number of exam scores/sample size required for the study was 128, 64 for each group. I used G-power for the sample size calculation using an alpha of 0.05, a medium effect size of .5, and the desired power of 0.80. Guidance for the analysis comes from Gray and Grove (2021). This study's results are important for nursing education as they may inform educators regarding the impact of curriculum change in rural states and student preparation for practice. I compared students' exam scores using ex post facto data collected during regular academic operations before and after a curriculum change across a consortium of nursing programs in a rural state. This study aimed to identify a possible effect on student performance before and after curriculum change in the rural state. The study's results may inform nursing educators about the development of clinical judgment in associate degree nursing students due to curriculum change.

Methods

This quantitative, nonexperimental research study aimed to determine a potential effect of curriculum change on the development of clinical judgment. In this study, I

examined the individual construct of management of care as measured by the ATI-CP. To understand a possible effect, I studied the management of care scores before and after a curriculum change in associate degree nursing students of a rural state. Management of care is a category measured on the ATI-CP in associate degree nursing students taught using a traditional systems-based curriculum and a new concept-based curriculum. Because ATI collected student results on the same examination platform before and after the curriculum change, I could compare the results to determine a difference. ATI categorically evaluated the constructs of clinical judgment individually and collectively on the ATI-CP (ATI, 2016). The categories of clinical judgment account for 176 out of 180 questions on the exam (ATI, 2016). As the categories comprise a significant majority of the exam, these scores could be used to determine the potential effect of curriculum change on students' scores in the management of care (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017).

Participants

The population for the study was composed of a sample of 511 associate degree nursing students' ATI CP scores between 2016 and 2019. In 2016 & 2017, the students completed a traditional systems-based curriculum n=233. In 2018 and 2019, the associate degree nursing students completed the new concept-based shared curriculum in a rural state n=278 (Anderson et al., 2017; WyNursing, n.d.). The demographic statistics include students who self-identified in race/ethnicity as Caucasian/White (82.8%), Hispanic (8.4%), and African American/Black, Asian, or American Indian (<3%). Further, the population consists mainly of students who self-identified as female (86.5%)

and the remainder as male (13.5%). The mean age of the group was *m*-28. Approximately half of the group identified as a "traditional student" (44%) compared to a "non-traditional student" (56%). Traditional students are defined as persons enrolling in college directly from high school through age 24. These students seek their first post-secondary degree, attend college full-time, and are absent from major life or work responsibilities such as careers or dependents (ATI, 2021). The curriculum changed from traditional systems-based education in 2016 to the concept-based shared curriculum. The change resulted in the graduation of two cohorts of the new concept-based curriculum per program in 2018 and 2019. Comparison of these cohorts was allowed by using student performance on the ATI-CP before (2016 and 2017) and after (2018 and 2019). By comparing exam results from students across the rural state before and after curriculum change, I could evaluate the intervention of curriculum change for potential effect within this demographic of students

Sample and Power

For this study, I collected secondary quantitative data from each participating consortium member nursing program across a rural state. Each nursing program in the study used the same ATI-CP in the fourth semester of the ADN nursing program before and after the curriculum change. Because the rural state has few nursing programs and a limited population, combined data were necessary to understand the potential effect of the curriculum change. Through the guidance of Gray and Grove (2021), I used their guidelines to perform this analysis. An a priori calculation of the number of exam scores/sample size required for the independent *t* test used for the study was 128, 64 for

each group. In addition to an a priori calculation, to correctly perform the study, a G-power is necessary to determine the appropriate sample size. I ran a G-power analysis to calculate the sample size using an alpha of 0.05, a medium effect size of .5, and the desired power of 0.80 for this independent *t* test.

Variables/Sources of Data

I compared scores of the two groups of associate degree nursing students in consortium member nursing programs across a rural state before and after a curriculum change. In 2016 & 2017, the first group of students completed a traditional systems-based curriculum (n=233). In 2018 and 2019, the second group of students completed the new concept-based shared curriculum in a rural state (n=278) (Anderson et al., 2017; WyNursing, n.d.). The independent variable for this study was the fourth-semester associate degree nursing student's test scores in the selected category of management of care on the ATI-CP before and after the curriculum change. The dependent variable for this study was the fourth-semester associate degree nursing student's test scores in the management of care category on the ATI-CP after the curriculum change. Analyzing the student's test scores before and after the curriculum change, I assessed the difference in students' test scores in the management of care.

Data were collected by the consortium member programs of nursing and ATI regularly at the end of the fourth semester. As scores were routinely collected (before and after the curriculum change), I accessed the available ex post facto data (appendix C). ATI also collected these data for each program. Due to the outside entity collecting the data, minimization of individual identification of students is possible within the cohorts,

thus reducing the need for individual participation in the study (Anderson et al., 2017; ATI, 2016; Thompson & Panacek, 2007).

Instrumentation

The analysis was possible using an independent samples *t* test (Edmonds & Kennedy, 2017; Gray & Grove, 2021). An independent *t* test was appropriate for this study because test scores were from different student groups before and after the curriculum change (Gray & Grove, 2021; Salkind, 2010). The variables in this study were not manipulated or tested. In this study, I examined the assumptions of the *t* test before analysis. The first assumption of the independent *t* test was that each group should contain subjects that only belong to one group. Testing this assumption was done through demographic evaluation of the dataset and avoidance of duplication between the groups. Students in the two groups were unique; no student scores were duplicated before and after the curriculum change. The second assumption is that there should be no significant outliers between the groups; the data distribution should be normal. As the population was selected and plotted out, distribution evaluation was possible. As the population was selected and graphed, further distribution evaluation was possible. Visual inspection of the histogram shows that the distribution appears normal without significant outliers. The large sample size yielded a reasonably even distribution which more accurately demonstrated the shape of the population (Gray & Grove, 2021). Finally, the third assumption was that there should be homogeneity of variances, meaning the variance of the outcome variable was equal in each group. A Levene's test for homogeneity (equality) of variance in each population was appropriate and was

completed through testing software and showed that the Levene's test was significant ($p < .03$) in dictating equal variances could not be assumed (Gray & Grove, 2021; Salkind, 2010).

Design and Analysis

The analysis was possible using an independent samples *t* test (Edmonds & Kennedy, 2017; Gray & Grove, 2021). An independent *t* test is appropriate for this study because test scores used are from different groups of students before and after the curriculum change (Gray & Grove, 2021; Salkind, 2010). The variables in this study were not manipulated or tested. In this study, I examined the assumptions of the *t* test before completing the analysis. The first assumption of the independent *t* test was that each group should contain subjects that only belong to one group. Testing this assumption was done through demographic evaluation of the dataset and avoidance of duplication between the groups. Students in the two groups (before and after the curriculum change) were unique and not duplicated.

The second assumption of the *t* test was that there should be no significant outliers between the groups; the data distribution should be normal. As the population was selected and plotted, distribution evaluation was possible using the histogram. Visual inspection of the histogram shows that the distribution appears normal without significant outliers. The large sample size yielded a reasonably even distribution which more accurately demonstrated the shape of the population (Gray & Grove, 2021).

Finally, the third assumption of the *t* test was that there should be homogeneity of variances. Homogeneity means that the variance of the outcome variable in each group is

equal. A Levene's test for homogeneity (equality) of variance in each population was completed through testing software and did not show significance ($p > .05$). As of this result, equal variances between the groups were not assumed (Gray & Grove, 2021; Salkind, 2010).

Results

A comparison of students' exam scores was completed using ex post facto data collected during regular academic operations before and after a curriculum change across a consortium of nursing programs in a rural state. The curriculum change from traditional systems-based education to the concept-based shared curriculum was completed in 2016. The change resulted in the graduation of two cohorts per program in 2018 and 2019, allowing comparison before and after (Anderson et al., 2017; ATI, 2016; WyNursing, n.d). Though the results of this study do not demonstrate a statistically significant difference in priority-setting scores before and after curriculum change, a contribution to the literature regarding educational interventions to develop these skills is essential.

Execution

In conducting this study, I used data collected from participating nursing programs in the consortium in a rural state. The data were obtained in excel format and transferred into SPSS (Statistical Package for the Social Sciences) Version 27 for analysis. My analysis follows guidance received from Gray and Grove (2021), which called for an a priori calculation of the number of exam scores/ sample size required for the study was 128, 64 for each group. G-power was used for the sample size calculation using an alpha of 0.05, a medium effect size of .5, and the desired power of 0.80. 128

student scores were obtained through data collection, solidifying validity, though I collected 511 student test results. The increased population size assisted me in seeing a potential difference between the groups more readily (Gray & Grove, 2021).

Results

The research question for this study was, what is the difference in rural fourth-semester associate degree nursing students' exam scores in management of care as measured by the ATI–CP after curriculum change? The null hypothesis for this study was there was no significant difference in rural fourth-semester associate degree nursing students' scores in management of care as measured by the ATI-CP following a curriculum change. The alternative hypothesis was that there was a significant difference in rural fourth-semester associate degree nursing students' scores in management of care as measured by the ATI-CP following a curriculum change. ATI- management of care scores in this study were slightly lower before curriculum change (M=75.79, SD=9.15) than scores achieved after curriculum change (M=79.56, SD=9.15), t (.4.3), p = .95. The mean difference was statistically significant between the groups *(SEM*=3.8) showing a small effect size (.39). I used an alpha level of .05 for all statistical tests (see table 5).

Table 5

ATI-Management of Care Scores

		N	M	SD	SEM
Management of Care (raw score)	Pre-Curriculum Change	233	75.78	10.50	.69
	Post Curriculum Change	278	79.56	9.14	.55

This study examined the *t* test's assumptions, and I addressed them before completing the analysis. The first assumption states that each group should contain subjects that only belong to one group. Testing this assumption was done through demographic evaluation of the dataset to avoid duplication between the groups. If duplication in student scores were to be found between groups, the duplicate scores would need to be removed. In this evaluation, there was no duplication of participants found between the two groups. Each student's score was unique to the curriculum style group and the ATI-CP examination.

The second major assumption of the *t* test was that there should be no significant outliers between the group's distribution of the data should be normal. As the population was selected and graphed, further distribution evaluation was possible. Visual inspection of the histogram shows that the distribution appears normal without significant outliers. This histogram's slight left, negative skewness (-.45), and kurtosis (-.95) further support the normal sample size distribution. Additionally, the large sample size yielded an even distribution that more accurately demonstrated the shape of the population (Gray & Grove, 2021).

The third major assumption of the *t* test was that there should be homogeneity of variances, meaning the variance of the outcome variable was equal in each group (Salkind, 2010). A Levene’s test for homogeneity (equality) of variance in each population was appropriate and available through testing software (Gray & Grove, 2021; Salkind, 2010) (Table 6). Levene’s test was statistically significant in management of care, meaning that the variances between groups were not equal (Gray & Grove, 2021).

The assumption of homogeneity has not been met; variances are not equal they are different. The confidence interval does not include zero meaning all the values within the range are plausible. There is a difference between the groups and a correlation in the data, a likely relationship between the variables in the study. The results of this study demonstrate a significant difference in the management of care scores before and after curriculum change.

Table 6

Mean Performance Scores in Management of Care

		Levene's Test		t-test for Equality of Means						
						Significance		M	SE	95% CI
		F	Sig.	t	df	One-Sided p	Two-Sided p			
Management of Care Score (raw score)	Equal variances assumed	4.71	.031	-4.34	509	<.001	<.001	-3.77	.87	[-5.48, -2.07]
	Equal variances not assumed			-4.29	463.77	<.001	<.001	-3.77	.88	[-5.50, -2.05]

Discussion

In this study, I looked at the strategy of implementing a shared concept-based curriculum's effect on the development of clinical judgment in associate degree nursing students in a rural state. Specifically, I wanted to study the effect of implementing curriculum change on the management of care, a construct of clinical judgment. My study is unique, unlike others found in the literature. In the rural state where the

curriculum change took place, the mean raw scores from students before the curriculum change and following did increase significantly (Table 5) with the implementation of the shared concept-based curriculum.

Interpretation

Healthcare in the United States requires clinical competence and skilled clinicians prepared to practice as efficiently as possible in a complex environment (Billings, 2019; Dickison et al., 2019; IOM, 2010). As the focus of this study, developed management of care is part of overall clinical judgment. The purpose of this quantitative, nonexperimental research study was to compare the development of clinical judgment—specifically, the construct of management of care as it is measured on the ATI-CP. The ATI-CP exam results in the management of care were compared between nursing students' scores before and after curriculum change in a rural state.

The findings of this study contribute to the literature in that clinical judgment, when focused upon in the curriculum, can positively affect student outcomes. However, it is not clear in the literature what the specific intervention is (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). One systematic review concluded that what works in developing clinical judgment remains complex and unclear (Thompson & Stapley, 2011). Thompson and Stapley's study was updated in 2021 with similar results indicating the development of clinical judgment remained elusive but warranted continued study by nurse educators and regulators (Jessee, 2021). Other studies focused on the implementation of high-fidelity simulation (HFS) and scenario-based learning, which showed promise, according to the authors but did not present a definitive effect on the

development of clinical judgment (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015; Klenke-Borgmann et al., 2020).

These studies' findings may contribute to the ongoing evaluation of educational interventions intended to support the development of clinical judgment in nursing students (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). As nurse educators attempt many strategies to develop clinical judgment in nursing students, continued evaluation of these strategies' potential impact is necessary. While some methods have shown some promise, not one strategy has proven more effective than another in achieving tangible development of clinical judgment in nursing students. Additionally, implementing educational interventions to develop clinical judgment was not without risk. The result of a significant change like this bore the risk of decreased scores or damage to student performance. That was not the case in this study. The results yielded in this study were statistically significant, student's scores improved following curriculum change, and the evaluation of another educational intervention (shared concept-based curriculum) is an important contribution to the scholarly literature. This study's findings may inform nurse educators regarding potential options to continue working toward this goal (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015; Klenke-Borgmann et al., 2020).

Limitations

In my study, I took results from exams very soon after the consortium implemented the new curriculum. As such, limitations in the results may be related to the newness of the curriculum and faculty still learning it themselves. An additional

limitation could include instructors learning to teach in the new methodology while possibly holding on to the previous methods purely out of habit or comfort level. Instructors may have been resistant when asked to take on a new format in an already rigorous program.

Another potential limitation exists in the population of the study. On average, students of the programs were non-traditional students (mean age 28) who may have had previous experience in traditional college courses. Completing an already challenging program in an unfamiliar format could have caused students not to perform as well as they may have expected. The non-traditional student often has other life commitments, work, family, etcetera (ATI, 2016). With the additional challenges of the new curriculum, student results could have been affected.

Another consideration for limitations is the management of these already high-performing programs in the consortium. These programs were all nationally accredited and held high success rates as outlined by the accrediting agencies for their students before the curriculum change (ACEN, n.d.). The pressure of maintaining accreditation, and minimizing risk to student performance, could be a limitation due to the diligence required to maintain accreditation. Changing platforms and methodologies can take time to implement successfully.

Implications

Implications to the discipline of nursing education include maintaining the new curriculum and continuing the solidification of learning strategies agreed upon in the shared concept-based curriculum. Nursing schools throughout the consortium have

navigated the curriculum change, maintaining the high success rates they held before the change. They continue to work toward modification and improvement with each cohort. Methodologically, the retrospective quantitative study was an appropriate fit to compare the groups before and after curriculum change test scores. The analysis was possible using an independent samples *t* test (Edmonds & Kennedy, 2017; Gray & Grove, 2021). An independent *t* test was appropriate for this study because the test scores used were from different groups of students before and after the curriculum change (Gray & Grove, 2021; Salkind, 2010).

As a contribution to positive social change, continued research in the academic preparation of clinically competent nurses will help ensure transitioning graduate nurses' and patients' safety (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). Evaluating educational interventions designed to support graduates in this way, specifically curriculum revision following the IOM report's release, may provide necessary guidance for academics' continued effort toward judgment development (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015).

Recommendations

Additional research on educational interventions designed to support the development of clinical judgment is needed. Educational interventions intended to support graduates in developing clinical judgment, including curriculum revision following the IOM's recommendation, may provide necessary guidance for nursing education (ATI, 2016: Benner et al., 2009; Cappalletti et al., 2014; Gorski et al., 2015). Further, because of the specificity of this study on just one section of the ATI-CP, an

opportunity may exist to study the exam results on a broader level. Additional studies remain to be done in this rural state regarding student performance on the RN-NCLEX examination, both before and after the curriculum change. Comparing my study with other studies on clinical judgment as measured on the ATI-CP may help to determine a potential relationship between the RN-NCLEX and the ATI-CP regarding curriculum change and its possible effect on student performance.

Conclusions

This study evaluated a potential effect of a curriculum change on students' performance on the ATI-CP in the constructs of clinical judgment because of curriculum change in a rural state. The construct of clinical judgment for this study was priority setting. The ATI-CP provided the tool to objectively evaluate students' mean scores in these categories. Even with all the systematic reviews and other studies regarding educational interventions, no one intervention, theory, or system has proven superior to developing clinical judgment. This gap presented an opportunity to explore the educational intervention of a shared concept-based curriculum implemented to develop clinical judgment (Capaletti et al., 2014; Billings, 2019, Murray et al., 2019; Thompson & Stapley, 2011).

This study evaluated the strategy of a shared concept-based curriculum not previously completed throughout the literature. In the rural state where the curriculum change took place, the mean raw scores from students before and after did improve slightly (table 1) with the implementation of the shared concept-based curriculum. The result of a major change like this bore the risk of decreased scores or damage to student

performance. That was not the case in this study. The results yielded in this study were not statistically significant. However, the contribution to the conversation remains important, and the need for further research remains (Billings, 2019; Dickison et al., 2019; Cappalletti et al., 2014; Dickison et al., 2019; Gorski et al., 2015; Klenke-Borgmann et al., 2020).

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Part 3: Summary

Integration of the Studies

Theoretical Context

The purpose of this three-manuscript dissertation was to identify a potential difference in student performance before and after the curriculum change focusing on the concepts of the clinical judgment model, thinking skills, priority setting, and management of care. These studies work together to compare the effect on the development of clinical judgment following the intervention of curriculum change in a rural state. In this study I was able to compare student performance as measured on the ATI-CP in associate degree nursing students. I obtained the regularly collected test results from consortium member programs as collected before with students taught in a traditional systems-based curriculum (*n*=233) and students taught in the new curriculum, a concept-based shared curriculum (*n*=278; Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017).

The three manuscripts contain the answers to the posed research questions in this study. The three studies were designed to further evaluated interventions intended to support the development of clinical judgment in nursing students. As the healthcare climate in the United States grows increasingly complex, industry leaders required nurse graduates enter practice with developed clinical competence through clinical judgment (Billings, 2019; Dickison et al., 2019; IOM, 2010). Defining clinical judgment includes three primary constructs: thinking skills, priority setting, and management of care (ATI, 2016; Benner et al., 2009; Billings, 2019; Dickison et al., 2019). New graduates who have not yet developed the necessary abilities to practice nursing care effectively suffer

an increased risk of committing practice errors that threaten the safety of patients. Nursing practice errors occur more frequently in new graduate practice, resulting in job dissatisfaction and decreased retention, especially within the first year of nursing (Cloete, 2015; Johnson & Benham, 2020; Murray et al., 2019). Patients affected by these errors may require additional monitoring, increased care interventions and services, excessive cost of care, rapid declines in health, long-term damage, and death (ATI, 2016: Cappalletti et al., 2014; IOM, 2016; Johnson & Benham, 2020; Murray et al., 2019; NCSBN, 2021).The framework I chose to support these studies was Dr. Tanner's clinical judgment model, initially introduced in 2006 (Tanner, 2006). Other researchers completed further studies by Dr. Tanner examining the phenomenon for years following (Billings, 2019; Dickison et al., 2019; Manetti, 2019; Tanner, 2006). Theorists and researchers have continued to add to this body of work, helping to shape the concept of clinical judgment and what it means to be clinically competent. Studying clinical judgment, transition to practice, and successful academic progression to achieve these goals is impossible without Tanner's research on clinical judgment (Benner et al., 2009; Tanner, 2006).

Tanner's work is cited frequently throughout the literature. The foundational work began with Dr. Benner's skill acquisition and novice to expert (Benner, 1984). In the following years, this work was built on through the combined result of Drs Benner, Chesla, and Tanner (Benner et al, 2009). The combination of work is the foundations for a framework that guided these studies in clinical judgment (Tanner, 2006). Additional support for Tanner's framework used in this study can be found in Dr. Lasater's Clinical

Judgment Rubric and Dr. del Bueno's critical thinking, priority setting, and clinical judgment (Benner et al., 2009; Manetti, 2019; Tanner, 2006). These crucial leaders provided the lens through which I could effectively use Tanner's clinical judgment model (Tanner, 2006). The framework gave context to these studies of curriculum development and revision, evaluation of achievement, and successful development of clinical judgment in nursing students because of a new model of preparation (Benner, 1984; Benner et al., 2009; del Bueno, 2005; Dickison et al., 2017; Manetti, 2019; Tanner, 2006).

Implication for Positive Social Change

Continued research in the academic preparation of clinically competent nurses may help promote positive social change as knowledge is gained that ensures safety for transitioning graduate nurses upon graduation and, as a result, promote patient safety (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). Additionally, because of these studies, the potential exists to isolate important academic preparation qualities and raise the nation's standard of care. The information gleaned from these studies may encourage industry leaders to consider curriculum designs that foster thinking skills, priority setting, and management of care. Professional development within the industry's clinical nursing staff could provide a more successful transition to practice from complete and comprehensive academic preparations to promoting clinical judgment development (Dickison et al., 2019; IOM, 2011; Murray et al., 2019; NCSBN, 2021).

Future Research

In this research, I focused on the curriculum change in a rural state: a shared, concept-based nursing curriculum. The findings of this study support curriculum change

and the positive effect on student performance in one construct of clinical judgment. However, future researchers could focus on implementing other educational interventions to support the development of curriculum change in nursing students. As found in the current literature, no specific intervention over another has been identified as superior to another to develop clinical judgment (Billings, 2019; Cappalletti et al., 2014; Dickison et al., 2019). These research studies provide an important contribution to the literature. They could potentially arm nurse educators with the knowledge to continue seeking the best possible options to develop clinical judgment in their students.

Lessons Learned

In completing these research studies, I learned that even though clinical judgment is a known priority in nursing education, no singular educational intervention over another has yet been identified in the literature as superior. I learned that in this gap there was an opportunity to evaluate possible interventions implemented with the intention of positively affecting clinical judgment. Through my studies, I learned that when the focus of educators was on clinical judgment, a positive effect on student performance could be achieved. In the rural state where these studies occur, an intervention of overall curriculum change provided an opportunity to evaluate a potential effect on the development of clinical judgment in a specific population of students.

In the rural state, several nursing programs joined together to form a consortium and develop a shared curriculum with the development of clinical judgment as the focus. I learned through these studies that only a few other states in the United States had accomplished something like this. Though they may have had different priorities, the

accomplishment of the consortium and the shared curriculum was even more of a feat than I had initially thought. The consortium members included in the study also agreed upon a common evaluation system for their students, the ATI-CP. Through the common evaluation system, data could be collected, allowing for comparison of student results both before and after the curriculum change. This type of agreement is not typical amongst consortium-based programs in other states.

The constructs of clinical judgment are categorically evaluated individually and collectively on the ATI-CP (ATI, 2016). The categories of clinical judgment and its constructs account for 176 out of 180 questions of the ATI-CP (ATI, 2016). As the categories comprise a significant majority of the exam, these exam scores could be used to determine the potential effect of curriculum change on students' scores in the management of care scale as evaluated by the ATI-CP (Anderson et al., 2017; ATI, 2016; Edmonds & Kennedy, 2017).

I learned in these studies that the most significant impact was in the management of care, where I thought it would be in thinking skills. The definition of management of care is seen in several industry expert documents. The definition includes the nurse's ability to coordinate, supervise, and collaborate within the healthcare team to achieve optimal patient care (ATI, 2016; del Bueno, 2005; Tanner, 2006). The foundational constructs of thinking skills and priority setting are required to effectively manage the patient's care as a professional nurse (ATI, 2016; Benner et al., 2009; del Bueno, 2005; Manetti, 2019; Tanner, 2006). Perhaps because the construct of management of care

incorporates pieces of all three constructs in clinical judgment, the effect is more profound in the results.

Conclusion

I evaluated a potential effect of a curriculum change on students' performance on the ATI-CP in the constructs of clinical judgment as a result of curriculum change in a rural state. This research afforded me the opportunity to evaluate the strategy of a shared concept-based nursing curriculum and student performance not yet studied throughout the literature. In the rural state where the curriculum change took place, the mean raw scores from students before the curriculum change and following did improve in the category of management of care with the implementation of the shared concept-based curriculum. My study's findings may be used by nursing educators in contribution to the literature regarding clinical judgment by exploring additional educational interventions that may improve the ability of nursing programs to promote clinical judgement development among future nurses (Capaletti et al, 2014; Billings, 2019, Murray et al., 2019; Thompson & Stapley, 2011).

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Appendix A: Programs of Nursing - Letter of Support

Director of Nursing
[redacted] College

Dear Director of Nursing,

My name is Karen Bowen, I am a doctoral student at Walden University working on completing my PhD in Nursing Education. I am focusing my research on developing clinical judgment in associate nursing students of a rural state. Here in Wyoming, we are in many ways progressive in developing the next generation of nurses through our collaborative consortium of programs. We have implemented a revolutionary nursing education system that has clinical judgment as a focus.

I am writing to request your help in my educational journey. I hope that you and your college are willing to support a study. In this study, I hope to analyze student performance on end-of-program testing following the curriculum change we made in 2016 with ReNew. I hope to use end-of-program testing, specifically the Assessment Technology Institute (ATI) Comprehensive Predictor Examination (CP) version 2016. The 2016 ATI-CP is appropriate because some of the nursing programs across our state used this version of the CP before and after the curriculum change. Using the 2016 ATI-CP allows for analysis of potential differences in student scores resulting from the change.

I am requesting ATI-CP 2016 student scores, program demographics, and general curriculum information from before and after the curriculum change to complete the study. The years of data needed are 2016, 2017, 2018, and 2019. The study is entitled "Comparison of Rural Associate Degree Nursing Students' Clinical Judgment after Curriculum Change." I will use the data within the guidelines of Walden University IRB and any protocols your institution may require. The Principal Investigator of this study is me.

With your support of this study, the information gleaned from this study may allow our nursing program leaders, faculty, community colleges, and other stakeholders to target further the constructs of thinking skills, priority setting, and management of care. As our nursing programs have already begun to target these clinical judgment components, this study provides an opportunity to analyze our works' potential effect following ReNew implementation and guide us on our next steps. In completing the study and manuscripts, I will gladly share the study results with you.

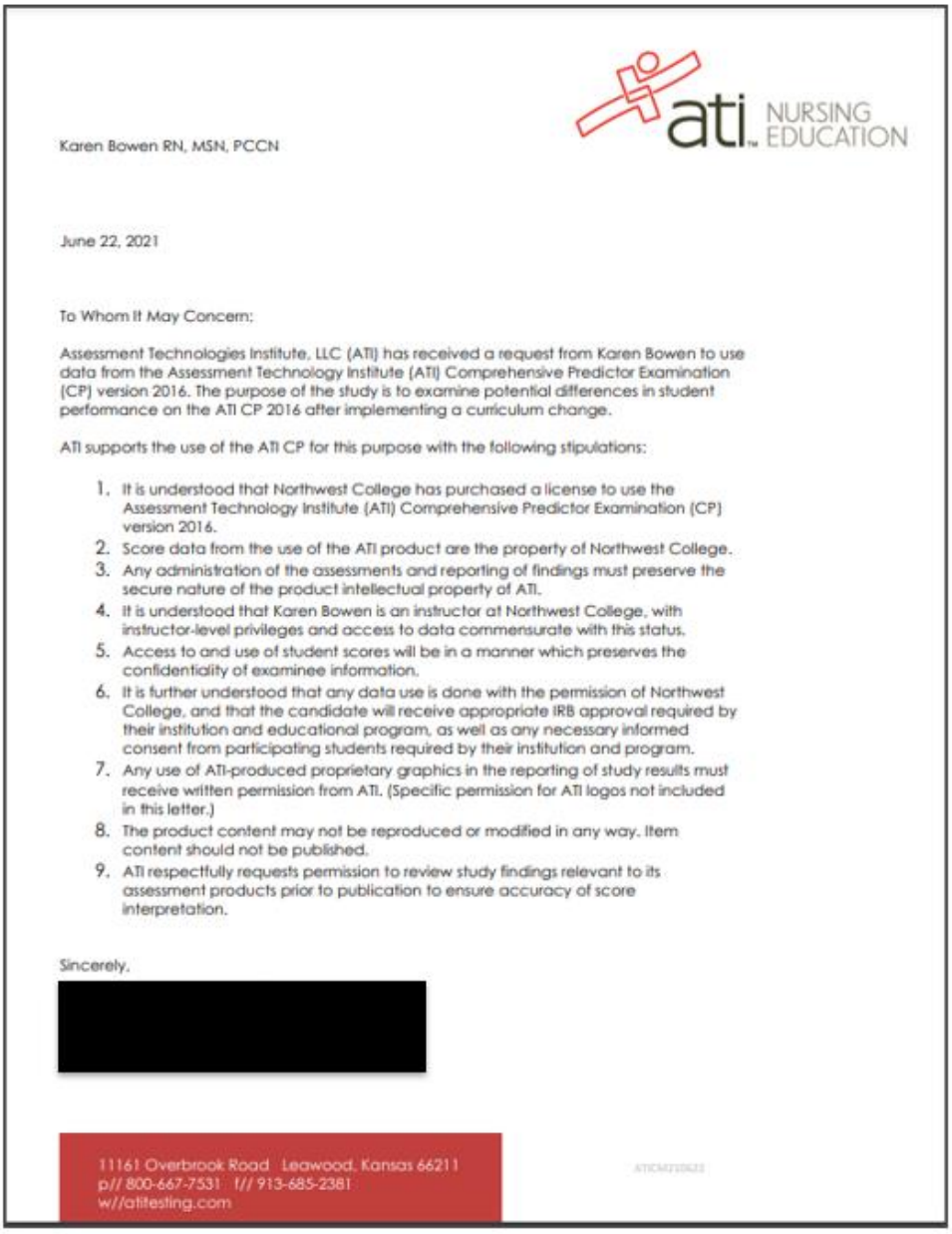
I look forward to answering any questions you may have and look forward to collaborating with you for this study. I'm happy to navigate whatever process/procedures at your programs and colleges should you be willing to support the study.

Thank you for your consideration, I look forward to working with you!

Best Regards,

Karen Bowen MSN, RN

Appendix B: ATI - Letter of Support



Karen Bowen RN, MSN, PCCN

June 22, 2021

To Whom It May Concern:

Assessment Technologies Institute, LLC (ATI) has received a request from Karen Bowen to use data from the Assessment Technology Institute (ATI) Comprehensive Predictor Examination (CP) version 2016. The purpose of the study is to examine potential differences in student performance on the ATI CP 2016 after implementing a curriculum change.

ATI supports the use of the ATI CP for this purpose with the following stipulations:

1. It is understood that Northwest College has purchased a license to use the Assessment Technology Institute (ATI) Comprehensive Predictor Examination (CP) version 2016.
2. Score data from the use of the ATI product are the property of Northwest College.
3. Any administration of the assessments and reporting of findings must preserve the secure nature of the product intellectual property of ATI.
4. It is understood that Karen Bowen is an instructor at Northwest College, with instructor-level privileges and access to data commensurate with this status.
5. Access to and use of student scores will be in a manner which preserves the confidentiality of examinee information.
6. It is further understood that any data use is done with the permission of Northwest College, and that the candidate will receive appropriate IRB approval required by their institution and educational program, as well as any necessary informed consent from participating students required by their institution and program.
7. Any use of ATI-produced proprietary graphics in the reporting of study results must receive written permission from ATI. (Specific permission for ATI logos not included in this letter.)
8. The product content may not be reproduced or modified in any way. Item content should not be published.
9. ATI respectfully requests permission to review study findings relevant to its assessment products prior to publication to ensure accuracy of score interpretation.

Sincerely,

[redacted]

11161 Overbrook Road Leawood, Kansas 66211
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w//atitesting.com

Appendix C: Data Collected

Program Type	Curriculum Used	Curriculum change Implementation at participating schools	Pre-Curriculum change ATI-CP scores utilized from classes	First Graduation Year and ATI-CP test scores used post curriculum change	
Associate Degree Nursing (ADN)	State-wide shared curriculum	2016	2016, 2017	2018, 2019	