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Undergraduate Nurse Educators' Conceptualization and Utilization of Deliberate Practice in Psychomotor Skills Education

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UNDERGRADUATE NURSE EDUCATORS' CONCEPTUALIZATION AND UTILIZATION OF DELIBERATE PRACTICE IN PSYCHOMOTOR SKILLS EDUCATION

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ABSTRACT

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Nurses are responsible for providing safe patient care. When nurses lack skill competence, patient harm can occur. Therefore, providing skill competency education in pre-licensure nursing programs is key to providing safe patient care. Deliberate practice (DP) has been shown to be an effective teaching strategy for psychomotor skills acquisition and retention. Deliberate practice is the repetitive focused practice of skills facilitated by expert feedback with the goal to obtain mastery.

The purpose of this descriptive, cross-sectional, quantitative study was to determine the proportion of undergraduate nurse educators who knew or did not know about DP, what undergraduate nurse educators who taught psychomotor skills knew about DP, how their understanding of DP aligned with the theory of DP, how they used DP in skills education, and their perceived barriers and facilitators to DP. One hundred sixty-one (161) nurse educators in the United States completed an online survey that solicited information about the participants' knowledge about DP, their use of DP, and their perceived barriers and facilitators to using DP.

Results showed that a small proportion of the participants had knowledge about DP and their conceptualization and application of DP did not align with Ericsson's theory of DP (Ericsson et al., 1993). A small portion of participants used DP according to Ericsson's theory, which might have been a result of limited access to resources. Participants identified limited

resources such as enough time and enough faculty as barriers to using DP; they also identified time and faculty as facilitators to DP.

Overall, this study showed that DP was not a well-known concept to nurse educators. Furthermore, nurse educators' knowledge and use of DP were limited and misaligned with Ericsson's theory of DP (Ericsson et al., 1993). These results could be due to the limited research in nursing education literature about DP, the lack of resources in nursing programs to implement DP in skills courses, or limited training or mentorship opportunities to teach nurse educators about DP. Implications for nursing education were discussed.

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INTRODUCTION

In 2016, an estimated 250,000 patients died yearly in the United States due to medical errors, making it the third leading cause of death (Makary & Daniel, 2016). There was much controversary over the accuracy of this extrapolated statistic but there was a general concern for the amount of possible preventable deaths related to medical errors (Ranji, 2016). Patient safety and preventable harm have been in the forefront of healthcare and healthcare education since the Institute of Medicine (1999) revealed in the *To Err Is Human: Building a Safer Health System* report that a substantial number of patients were dying from preventable medical errors. Since then, federal agencies and national organizations have monitored patient safety events, developed standards of care and best practices, and recommended patient safety competencies for healthcare education institutions (Haskins, 2019).

Patient safety competencies are necessary in nursing program curricula because nurses are frontline care providers. A nurse's competence is crucial to maintain patient safety and quality care (DeBourgh, 2011). There is a positive correlation between nursing competence and patient safety (Zaitoun et al., 2023). However, novice nurses reported being less confident with patient safety practices than experienced nurses (Hwang, 2015). A study also found that only 23% of new nursing graduates who participated in the study could demonstrate entry-level competence and readiness (Kavanagh & Szweda, 2017).

When nurses lack skill competence, patient harm can occur. From the most basic skills such as hand washing to more complex skills such as urinary catheter insertion, inadequate

performance of skills could cause harm. For instance, urinary tract infections are the most prevalent type of healthcare-associated infections (HAIs) with 75% of infections caused by urinary catheters (Centers for Disease Control and Prevention, 2015). Nurses are trained to insert urinary catheters using strict sterile procedure. However, if a nurse is incompetent in urinary catheter insertion or sterile procedure, they could cause infection. Nurses primarily learn these skills in their nursing programs. This led to the question, are nursing programs adequately preparing nursing students for safe entry-level practice?

Skills education has not significantly changed in the past 20 years except for the introduction of simulators (Gonzalez & Sole, 2014). Traditionally, nursing students learn psychomotor skills in the first semester of their nursing programs. Instructors provide skill demonstrations and students rely on memorization of skill steps to pass one-time skill assessments (DeBourgh, 2011). Afterwards, students might not have another chance to practice or demonstrate skill competence. Clinical experiences vary and simulations are sporadic in frequency and content. If students do not continuously perform psychomotor skills throughout their nursing program, skill decay is likely to occur. Studies have shown that students exhibit skill decay, associated with poor skill performance, with this traditional method of teaching skills (Gonzalez & Sole, 2014; Kardong-Edgren & Adamson, 2009; Oermann et al., 2011). In fact, skill decay could occur in as little as four to six weeks (Gonzalez & Sole, 2014). Therefore, traditional skill teaching strategies are no longer adequate in developing and maintaining competence for nursing students (Vicdan, 2018).

In addition, nurse educators cannot assume that nursing students will acquire skill competence once they enter practice. A longitudinal study showed that new graduate nurses' level of competence related to evidence-based practices and therapeutic interventions rated high

after graduation and subsequently lower than other competency domains 6 months and 12 months after graduation (Lima et al., 2015). Overall, competency levels plateaued at 12 months after graduation. Therefore, nurse educators should not rely on the assumption that nursing graduates will acquire skill competence during clinical practice.

Deliberate practice (DP) has presented health care with a new direction for skills education that could be a solution to skill competence. Deliberate practice involves repetitive-focused practice of skills facilitated by instructor feedback to improve performance and is a predictor for skill competence (DeBourgh, 2011; Ericsson et al., 1993). Deliberate practice has shown to be an effective teaching technique in psychomotor skill acquisition in healthcare education (Ahmed et al., 2018; Bhatti & Ahmed, 2015; Oermann et al., 2011). Much of the research has been conducted in medical education (Ahmed et al., 2018; Bhatti & Ahmed, 2015; Cordero et al., 2013; Duvivier et al., 2011; Hashimoto et al., 2015; Kessler et al., 2011). There was limited research of DP in nursing practice and nursing education except for cardiopulmonary resuscitation (CPR) skills (Kardong-Edgren & Adamson, 2009; Oermann et al., 2011). In addition, it was unknown if nurse educators had a complete understanding of DP or if they were using it in the skills lab.

To better understand the extent of nurse educators' knowledge and use of DP in nursing education, this study examined the proportion of nurse educators who knew or did not know about DP, what nurse educators knew about DP, if that knowledge was congruent with the theory of DP, how nurse educators were using DP in the skills lab, and the barriers and facilitators to DP in nursing education. Results of this study informed the need for further research into the implementation of DP in nursing education.

Background

Ericsson et al. introduced the concept of DP in 1993, which involved the repetition of activities to improve performance in response to feedback. Originally applied to music, the arts, and sports, the concept emerged in the literature incorporating various psychomotor skills. In 2004, Ericsson explained how the structure of DP "in one domain could be used to guide the improvement of performance in other domains, such as medicine" (p. S78). He proposed that continuous DP and feedback of performances of medical students and physicians could improve their performance and even assist them to achieve higher levels of competence. Specifically, DP as a concept and a process presented the healthcare field with a new direction for psychomotor skill education.

An increase in medical education literature in the past 15 years has focused on the use of DP in psychomotor skills education. Many studies examined the effects of DP on skill competence, performance, or acquisition (Ahmed et al., 2018; Bathish et al., 2018; Cordero et al., 2013; Duvivier et al., 2011; Hashimoto et al., 2015; Kessler et al., 2011; Liou et al., 2013; Oermann et al., 2011). Other studies examined the effects of DP combined with another teaching strategy on skill competence, performance, or acquisition (Bhatti & Ahmed, 2015; Compton et al., 2018; Gunberg Ross et al., 2014; Oermann et al., 2016).

Deliberate Practice and Skill Performance

Three studies used a questionnaire to examine the effects of DP on skill performance and competence and found that DP improved skill performance (Bathish et al., 2018; Duvivier et al., 2011; Liou et al., 2013). Bathish et al. (2018) surveyed registered nurses and found that compared to education and experience, DP was a greater contributing factor in enhancing competence and expertise. Duvivier et al.'s (2011) cross-sectional design study used a

questionnaire and objective structured clinical examination (OSCE) scores to find that DP had a positive relationship with OSCE performance and structured study. The authors suggested that future research focus on whether DP continue to improve performance throughout one's professional career. Liou et al. (2013) examined the effects of DP by surveying 522 registered nurse to Bachelor of Science in Nursing (BSN) students after completion of a DP program. The authors found DP significantly increased skill competence. However, participants who worked in the operating room showed higher self-confidence scores but significantly lower skill competence scores. The authors speculated that these participants might have had confidence in their skill knowledge and therefore only practiced minimally, which resulted in poor skill performance.

Ahmed et al. (2018) compared the effects of DP versus self-guided practice of needling skills among medical students. The authors found that students who had the opportunity for DP spent more time practicing, completed more steps in the skill performance, and made fewer errors than those who participated in self-guided practice. The major limitation of the study was the small sample size (N = 18). Another research study showed that medical students who had DP had lower skill performance time, performed more steps correctly, and lost significantly less performance steps over time compared to the control group (Hermann-Werner et al., 2013).

Three randomized controlled trials showed that DP improved skill performance and quality (Hashimoto et al., 2015; Kessler et al., 2011; Oermann et al., 2011). Hashimoto et al. (2015) found that surgical residents who participated in the DP of virtual laparoscopic cholecystectomies had better performance of the skill compared to the control group. The study did have a significant attrition rate. Kessler et al. (2011) found that DP of lumbar puncture skills using simulation increased the first-time lumbar puncture success rate in pediatric residents.

However, this study had limitations that included self-reported clinical performance, an unvalidated OSCE checklist, and the use of only one DP session. The authors suggested researching the distribution of DP sessions over time. Oermann et al. (2011) conducted a study that examined the effects of DP on CPR skills using voice advisory manikins for nursing students. The results showed that participants who used DP retained and improved their CPR skills over a one-year period. The study had a large sample size (N = 606) that included various schools of nursing and was conducted over one year.

Deliberate Practice Combined with Other Teaching Strategies

Bhatti and Ahmed (2015) conducted a longitudinal study that investigated the effects of DP and a learner-centered approach in the skills lab and operating room for surgical residents in a competency-based model. Participants who used DP had increased performance scores (p= .02), reduced performance time (p = .01), and lower performance error scores (p =.02). The authors found that DP and a learner-centered approach allowed the participants to improve their surgical skills, which improved patient outcomes. The authors identified the main limitation of this study was the small sample size; however, the authors did not state the sample size in the study. Oermann et al. (2016) presented a practice framework that recommended DP and dyad teaching to progress nursing students through the three phases of motor learning, to prevent skill decay, and gain expertise.

Two studies examined the effects of DP and peer teaching or mentorship on skill acquisition and retention (Compton et al., 2018; Gunberg Ross et al., 2014). Despite the small sample size and financial limitations, Compton et al. (2018) found that peer teaching and DP improved surgical skill performance and retention of veterinary students. Gunberg Ross et al.

(2014) presented a literary feature that described the positive feedback from students and mentors after a BSN program implemented a DP model.

A recent study showed that prelicensure nursing students who used peer-to-peer DP before and during high fidelity simulation scenarios had higher skill competence and retention (Johnson et al., 2019). These students had a significant reduction in errors and higher performance scores while performing urinary catheterization. The students also reported less stress during the DP sessions and felt more competent during the simulation scenarios.

Implications for Nursing Education

Overall, the studies found DP was an effective strategy in either skill acquisition, skill performance, or skill retention. The concept could mostly be found in medical education research but could be practical and influential to nursing education. In 2008, Haag-Heitman established the importance of DP in nursing and specific parameters of the concept regarding expert performance in nursing practice. Thus, it is imperative that nurse educators be knowledgeable in the use of DP. However, the lack of current evidence suggested that DP might not be a well-known or a widely used practice in nursing education. This led to the question, what do nurse educators know about DP?

Problem Statement

Patient harm and death due to medical errors continue to be an issue in healthcare. Nurses are frontline healthcare workers whose competence level could influence the safety and quality of care provided to patients. However, new graduate nurses are reporting low levels of confidence and insufficient competency. Poor skill performance leads to poor patient outcomes and skill performance might not improve once new graduates enter professional nursing practice.

Therefore, it is imperative that nurse educators facilitate strong psychomotor skills education so new nursing graduates are better prepared to provide safe patient care.

Studies have shown that DP is a useful technique in psychomotor skill acquisition and retention. However, it was unclear if nurse educators had adequate knowledge of DP and if they were using it in skills education. This study was needed to determine the proportion of nurse educators who knew or did not know about DP, the extent of nurse educators' knowledge, the use of DP in nursing skills education, as well as to identify and overcome barriers preventing DP use. The results of this study informed future research and nursing pedagogy.

Purpose Statement

The purpose of this descriptive, cross-sectional, quantitative study was to determine the proportion of undergraduate nurse educators who knew or did not know about DP, what undergraduate nurse educators who taught psychomotor skills knew about DP, how their understanding of DP aligned with the theory of DP, how they used DP in skills education, and their perceived barriers and facilitators to DP.

Research Questions

To determine nurse educators understanding of DP, the following research questions guided this study:

Q1 What is the proportion of undergraduate nurse educators who know about DP compared to the proportion of undergraduate nurse educators who do not know about DP?

Q2 How do undergraduate nurse educators who teach psychomotor skills conceptualize DP?

Q3 How do undergraduate nurse educators who teach psychomotor skills use DP in skills education?

Q4 What barriers and facilitators to DP do undergraduate nurse educators who teach psychomotor skills identify?

Q5 How does undergraduate nurse educators' conceptualization of DP align with the theory of DP?

Overview of Research Approach and Design

This study used a descriptive, cross-sectional, quantitative research design. A nonprobability sampling method was used including a combination of purposive and network sampling methods. Once Institutional Review Board approval was obtained (see Appendix A), participants were recruited through social networking platforms including LinkedIn™, Facebook™, Instagram™, and Sigma Theta Tau International (STTI) Circle. An invitation to participate in the study was posted in social groups targeting nurse educators and nurse researchers (see Appendix B). After two weeks, more participants were needed; therefore, a recruitment email was sent via the American Association of Colleges of Nursing listserv (see Appendix C).

Participation in the study was voluntary. Participants could also withdraw from the study at any time. Every effort was made to protect the confidentiality of the participants. However**,** due to the nature of an electronic survey, confidentially could not be guaranteed. The risks of participating in the study were no greater than those normally encountered in everyday life. Participants had a choice to enter a drawing to win a gift card after the completion of the survey. There was no cost to the participant to participate in the study.

Individuals who chose to participate were directed to the informed consent in the online survey. After reading the consent, participants then chose to complete the survey or not. The survey was comprised of 47 questions evaluating the participants' knowledge of DP, examining their use of DP, and exploring their perceived barriers and facilitators to DP. The data were analyzed using SPSS and Qualtrics Text iQ®. Descriptive statistics and text analytics were used to analyze and to interpret the data.

Theoretical Framework

Benner's (1982) theory of novice to expert, which is further detailed in Chapter II, was the theoretical framework that guided this research study. The theory describes the levels of nursing competence and how nurses transition to expert performance through experiential learning (Benner, 1982). As nursing students and nurses obtain situational awareness through experiences in nursing practice, they develop increased competence. Benner described five levels of competence: novice, advanced beginner, competent, proficient, and expert. Nursing students start as novice learners with no situational experiences. As they continue to practice through experiential learning opportunities in clinical, simulations, and skills laboratories, they adopt the foundational guidelines of nursing practice. By graduation, it is expected that students would have reached the level of advanced beginner and enter nursing practice (Murray et al., 2019). As the nurse continues their practice, they develop a sense of mastery, efficiency, prioritization, and eventually intuition (Benner, 1982, 2004). Benner's theory complements the concept of DP. Both posited that continued practice could lead to mastery (Benner, 1982; Ericsson et al., 1993). Nurse faculty could use DP as a teaching strategy to help nursing students obtain an appropriate level of competence for entry to practice.

Rationale and Significance of the Study

Since the Coronavirus disease-19 pandemic started in 2020, an estimated 100,000 registered nurses have left the workforce (Smiley et al., 2023). As of 2022, 41% of registered nurses had fewer than 10 years of work experience. The median age of registered nurses was 46, a drop from 52 in 2020. The profession is seeing a large shift in the age distribution as nurses retire and an influx of new graduating nurses enter the field. The profession is experiencing a shortage of experienced nurses that is causing an experience-complexity gap (Virkstis et al.,

2019). In addition, nursing practice has become more complex in recent years. Factors such as high patient acuity, shortened length of stays, staffing shortages, and technology advances have made it increasingly necessary for nurses to be sufficiently competent when entering practice to ensure safe patient care and optimal patient outcomes (Kavanagh & Szweda, 2017). Still, nurse leaders claim that new nurses are taking longer to acquire competence (Virkstis et al., 2019).

Nurse competence affects patient safety and care (Zaitoun et al., 2023). For example, nurses must be able to insert urinary catheters using sterile technique to avoid infection and about 12%-16% of adult patients will have a urinary catheter placed during their hospital stay (National Healthcare Safety Network, 2023). If a nurse breaks sterile technique, patients are at risk for developing catheter associated urinary tract infections. Catheter associated urinary tract infections are one of the most common healthcare-associated infections in the United States with an estimated 24,710 reported cases in 2021 (Centers for Disease Control and Prevention, n.d.; McCleskey et al., 2022). Catheter associated urinary tract infections can lead to extended hospital stays, increased healthcare costs, and patient discomfort. In addition, catheter associated urinary tract infections cause more than 13,000 deaths per year in the United States (National Healthcare Safety Network, 2023).

To close this gap in competence and practice, Virkstis et al. (2019) recommended that nursing programs better prepare nursing students for entry-level practice. Nursing educators have a moral and ethical responsibility to prepare safe and competent nurses to protect the health and well-being of populations. Faculty can no longer rely on on-the-job training to guide new nurses to competence. Healthcare facilities expect new graduate nurses to be fully competent to practice safely without extensive orientation or training (Murray et al., 2019). However, pre-licensure nursing programs train students to be generalist nurses who provide safe care to stable patients.

Orientation and residency programs are needed to build new graduate nurses' confidence and competence; yet only 50.6% of new graduate nurses reported having an orientation program (Murray et al., 2019). Therefore, nurses must acquire clinical competence and clinical judgement prior to practice entry. This could be accomplished through skills education.

It is important that nursing educators continue to develop innovative ways for students to apply knowledge in contrast to rote memorization or knowledge acquisition. At the beginning of nursing programs, faculty have traditionally taught psychomotor skills through lectures in the classroom, skill demonstrations in the lab, brief student practice sessions, and skill performance assessments (Vicdan, 2018). Clinical settings are unpredictable; therefore, faculty cannot guarantee that nursing students will have opportunities to perform all psychomotor skills repeatedly throughout their program. Simulations offer a more controlled environment where nursing students can repeatedly practice skills in life-like scenarios. However, faculty must have training to perform simulation and have the simulation resources to effectively provide this type of instruction.

Studies have shown that DP is an effective teaching strategy for skill acquisition and retention (Ahmed et al., 2018; Bathish et al., 2018; Cordero et al., 2013; Duvivier et al., 2011; Hashimoto et al., 2015; Kessler et al., 2011, Liou et al., 2013; Oermann et al., 2011). However, there was no evidence in the literature that nurse educators were familiar with DP. This study explored what nurse educators knew about DP and how they used DP in skills education. Results of this study further supported the need for DP in nursing skills education, which could lead to a better prepared nursing workforce.

Researcher Perspectives and Assumptions

I am a nurse educator and have taught the didactic and skills portion of a fundamentals of nursing course in a baccalaureate nursing program for years. I have gained extensive knowledge of DP and am currently using it in my skills lab. Prior to starting my doctoral program, I was unfamiliar with the concept of DP. I have also recognized that my nurse educator colleagues have limited to no knowledge of DP.

Prior to starting this study, I had assumptions and biases:

- Much of the literature has shown that DP is effective in medical skills education and therefore I assumed DP would be effective in nursing skills education.
- I conducted a quantitative study with a classmate in a Doctor of Philosophy in Nursing Education course that examined the relationships among DP, education level, and years of experience of professional nurses, and their perceived competence of psychomotor skills. Results were inconsistent with evidence in the literature. Small sample size (N = 17), lack of participant opportunities of DP, and the participants' misinterpretation of DP were limitations of the study. Based on these limitations, I assumed nurses did not have opportunities for DP because it was not used in their nursing programs or nurses in general lacked the understanding of DP and how it differed from regular practice.
- Findings from this study would inform nursing skills education.

Definition of Terms

For this study, the following definitions were used:

Deliberate Practice. Ericsson et al. (1993) defined the concept of DP as the repetition of activities designed to improve the level of performance in response to instructor feedback

and/or performance results while negotiating motivational, resource, and effort constraints. The activities needed to be structured, created to overcome weaknesses, and closely monitored for areas of improvement. Ericsson et al. defined the resource constraint as the requirement of time, energy, and resources needed to complete DP. Time, money, and access to equipment, instruction, and facilities were examples of resources needed for DP. The motivation constraint was the requirement for engagement and interest in the activity to improve performance (Ericsson et al., 1993). The effort constraint was the requirement for sustained attention during the activity. Ericsson et al. suggested that practice sessions not exceed two hours per day to avoid exhaustion and inattention.

The basic assumption of the theory was defined as the "monotonic benefits assumption" (Ericsson et al., 1993, p. 368). The monotonic benefits assumption claimed "that the amount of time an individual is engaged in DP activities is monotonically related to the individual's acquired performance" (Ericsson et al., 1993, p. 368).

Deliberate practice was originally defined as the solitary practice activities designed by a teacher that a student could do in between teacher-supervised practice sessions (Ericsson et al., 1993). Five criteria were established to further define and differentiate DP from other types of practice (Ericsson, 2020; Ericsson & Harwell, 2019).

The first criterion was the teacher must set specific goals for the student and the student could have a mental representation of these goals. The second criterion was the student must be able to perform the practice activities by themselves. The third criterion was the student must receive feedback about their performances and have time to adjust. The fourth criterion was the student was able to practice repeatedly and make

improvements based on teacher feedback to reach the set goals. The fifth criterion was the teacher must design the practice activity to include teacher guidance (Ericsson & Harwell, 2019; Ericsson et al., 1993). Therefore, a key defining factor that distinguished DP from other types of practice was instructor guidance and feedback (Gonzalez & Kardong-Edgren, 2017). It was also important to note that the goal of DP was to obtain mastery of a task (Clapper & Kardong-Edgren, 2012).

Nursing Competence. According to Zaitoun et al. (2023), "Nurse' competence referred to the knowledge, skills, and abilities that nurses possess to provide safe and effective care to patients" (p. 7).

Nurse Educator. "Nurse educators are responsible for creating an environment in classroom, laboratory, and clinical settings that facilitates student learning and the meeting of identified cognitive, affective, and psychomotor outcomes" (National League for Nursing, 2022, p. 1). This study focused on nurse educators who directly taught pre-licensure nursing students psychomotor skills.

Nursing Student. A person enrolled in a pre-licensure nursing program.

Psychomotor Skill. Psychomotor skills were activities that require "neuromuscular coordination" and were "movement-oriented" (Oermann, 1990, p. 202).

Summary

Deliberate practice is a teaching strategy that has presented the healthcare field with a new direction for skills education that could be the solution to the gap in competence and practice. The strategy involves repetitive practice of skills facilitated by instructor feedback to improve performance. Studies have shown that DP is an effective teaching technique in

healthcare skill acquisition (Ahmed et al., 2018; Bhatti & Ahmed, 2015; Oermann et al., 2011). It is a promising strategy that researchers should explore more in nursing skills education.

Chapter II provides an in-depth description of Benner's (1982) novice to expert theory as it pertains to the pedagogical use of DP. A review of the literature regarding nurse educators' knowledge of DP in nursing education is presented. Finally, gaps in the literature are identified regarding DP from the nurse educator's perspective.

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this descriptive, cross-sectional, quantitative study was to determine the proportion of undergraduate nurse educators who knew or did not know about DP, what undergraduate nurse educators who taught psychomotor skills knew about DP, how their understanding of DP aligned with the theory of DP, how they used DP in skills education, and their perceived barriers and facilitators to DP. The previous chapter addressed the importance of DP in nursing education by providing the definition of DP, the background of DP in skills acquisition, and the significance to skills acquisition in nursing. This chapter begins with exploring Benner's (1982) novice to expert theory as it pertains to the pedagogical use of DP. Then a review of the literature regarding nurse educators' knowledge of DP in nursing education is presented. Finally, the chapter concludes with identifying gaps in the literature regarding DP from the nurse educator's perspective.

Theoretical Framework

Nursing skill competence is essential to provide safe patient care (Zaitoun et al., 2023). Level of skill competence varies among nurses. Benner's (1982) novice to expert theory described the levels of nursing competence and how nurses transitioned to expert performance. Benner's novice to expert theory was an adaptation of the Dreyfus (Dreyfus & Dreyfus, 1980) model of skill acquisition. The Dreyfus model presented five stages of skill competency where the learner progressed from reliance on abstract concepts to concrete experiences (Dreyfus & Dreyfus, 1980). Dreyfus and Dreyfus (1980) developed this model from research data on skill

acquisition of pilots, chess players, and those learning a second language. The five stages of skill acquisition included novice, competence, proficiency, expertise, and mastery. Professionals progressed through these stages with experiential learning and practice. Benner's novice to expert theory took into consideration nursing practices, nursing career guidelines, and clinical knowledge development (Benner, 1982). Benner's adaptation included five similar stages: novice, advanced beginner, competent, proficient, and expert. Baccalaureate nursing students are expected to be advanced beginners at the time of graduation and higher levels of competency would develop in practice (Murray et al., 2019).

Novice

Novice nurses are considered beginners (Benner, 1982). Nursing students starting in pre-licensure nursing programs are novice nurses. They have no situational experience in nursing or the skill being taught. Therefore, nurse educators must guide nursing students by providing clear attributes the students could recognize in various clinical skills and situations (Benner, 2004). Attributes are objective features of a skill that could be learned without experience (Benner, 1982). In addition to attributes, novice nurses learn foundational rules to guide practice. For example, novice nurses learn the basics of urinary catheterization by using prescribed skill steps and rules of sterility. Because they lack situational experiences, novice nurses are not able to use discretionary judgement when performing tasks and can only use the attributes and rules. They would not have a sense of priority or the ability to adapt to situations outside of the prescribed set of attributes and rules (Benner, 1982).

Advanced Beginner

Advanced beginners have enough practical experience to recognize aspects of practice (Benner, 1982). Aspects are "meaningful situational components" derived from experiences

(Benner, 1982, p. 403). New graduated nurses are advanced beginners (Benner, 2004). Nurses at this competence level would have marginally acceptable performance of skills (Benner, 1982). They would integrate attributes and aspects of experiences and develop new rules for practice. For example, advanced beginners would recognize that urinary catheter insertion is difficult for persons with enlarged prostates and would use a different insertion technique with a specialized catheter designed to move past the enlarged prostate. Advanced beginner nurses continue to focus on rules, attributes, and just start to recognize aspects; they are not able to discern priority in care. Nurses treat attributes, aspects, and rules equally as they continue to learn aspect recognition (Benner, 1982).

Competent

Competent nurses start to feel a sense of mastery in practice as they become more efficient and organized in their care (Benner, 1982). Typically, competent nurses have one to two years of nursing practice (Benner, 2004). At this point, they have more practice experience and have an acceptable level of prioritization of care that leads to long-term goals or plans (Benner, 1982). For example, the competent nurse could prioritize and organize care based on clinical judgment and keen assessment skills. Competent nurses lack speed and flexibility at this level (Benner, 1982).

Proficient

Proficient nurses recognize situations as a whole and make clinical decisions easily (Benner, 1982). They have a deeper holistic understanding of their practice and clinical situations. They recognize small nuances, or maxims, that guide practice decisions. They could quickly prioritize care using sound clinical reasoning and judgement. They no longer used past rules; they used concreate past experiences to guide practice (Benner, 1982).

Expert

Expert nurses no longer guide practice by attributes, aspects, or maxims (Benner, 1982). They have a much deeper understanding of practice that has led to an intuitive practice. Expert nurses can analyze situations and synthesize multiple solutions based on experience, theories, and practical wisdom (Benner, 2004). Efficiency is maximized as these solutions and actions become self-evident.

Relationship to Deliberate Practice

Benner's theory posited that skills acquisition was experiential (Murray et al., 2019). More experience and practice led to competence. This concept is complementary to the concept of DP. Deliberate practice is the repetition of activities designed to improve the level of performance in response to instructor feedback and/or performance results (Ericsson et al., 1993). The basic assumption is the amount of time a person spends in DP improves their level of performance, leading to mastery. Based on these theoretical assumptions, DP could be an effective strategy in nursing education to develop nursing competence for nursing students.

Review of the Literature

A literature review was conducted to collect and synthesize research that examined nurse educators' perspective of using DP in skills education. The health sciences librarian at University of Northern Colorado was consulted to ensure a thorough search of the literature. Databases used included CINAHL, PubMed, ProQuest, PsychINFO, and Google Scholar. These databases were chosen because they includes journals and grey literature pertaining to health care, nursing, and nursing education. Various limiters and Boolean operators were used to narrow search results. Full text and English language were limiters used in CINAHL, PsychINFO, and PubMed. Peer-reviewed and date limitations were not used due to limited research on this topic. Reverse

citation searches were conducted using the reference lists of studies and Google Scholar. In CINAHL, keywords were used first followed by CINAHL subject headings to help narrow the search. In PubMed, keywords were used first followed by MeSH terms. The following keywords and subject headings were used: ‘deliberate practice,’ ‘faculty,’ ‘nursing faculty,’ ‘nursing,’ ‘perception,’ ‘knowledge,’ ‘faculty knowledge,’ ‘skills laboratory,’ ‘skill acquisition,’ and ‘motor skills.’ In Google Scholar, the following search phrases were used instead of keywords to help narrow the plethora of results: ‘nurse faculty perception of deliberate practice,’ ‘faculty knowledge of deliberate practice,’ and ‘nursing faculty knowledge of deliberate practice.’

Inclusion and exclusion criteria were utilized in the evaluation of articles. Inclusion criteria were (a) literature published in the English language and (b) literature examining nurse educators’ knowledge or perception of DP in psychomotor skills education. Exclusion criteria were (a) nursing student perception of DP, (b) DP used for soft skills, and (c) studies conducted in primary and secondary education. Date of publication was not limited to ensure that landmark studies were included.

The researcher completed the search of the literature and reviewed the titles, abstracts, and full text using inclusion and exclusion criteria. The search of the databases identified 788,691 articles. Searches completed in Google Scholar resulted in hundreds of thousands of articles. A significant portion of these articles did not pertain to nursing, nursing education, or DP of skills. Using various phrases still resulted in over 50,000 articles. Limiting the search to literature conducted in the past 10 and 15 years resulted in over 10,000 articles. The researcher and health sciences librarian determined this search strategy was not effective in searching this topic. Search results from CINHAL, PubMed, ProQuest, and PsychINFO resulted in 674 articles.

After review of the titles and abstracts, 229 articles were identified for review of the full text. After review of the full text, one article was identified that met inclusion criteria.

Bennett's (2022) Doctor of Nursing Practice scholarly project was the only study found that examined nurse educators' knowledge of DP. Although this scholarly project was not disseminated in a peer-reviewed journal, it was included in this review given the scant availability of literature.

Bennett (2022) used the Evidence-Based Nursing Practice Self-Efficacy Scale (Tucker et al., 2009) to determine nurse educators' knowledge of DP. However, Bennett did not clearly describe the rationale for using this tool to measure nurse educators' knowledge of DP. The Evidence-Based Nursing Practice Self-Efficacy Scale does not measure knowledge of a concept; it measures nurses' confidence in performing evidence-based practice (Tucker et al., 2009). The scale is tailored to practicing clinical nurses and not nurse educators. The scale items asked the participant to rate their level of confidence in completing various evidence-based practices that related to caring for patient populations and supporting patient outcomes. Items were not related to DP of skills or nursing pedagogy.

Furthermore, the purpose of the study shifted throughout the document. In the abstract, Bennett (2022) stated the purpose was to provide faculty education on how to use DP in a nursing skills course. Later in chapter one, Bennet stated the purpose was to determine if faculty were using DP and if DP improved competence. Finally, the research question examined the effects of DP on nursing faculty performance, self-efficacy, and motivation in the skills lab. This study did not examine the knowledge nursing faculty had about DP.

Gap in the Literature

Based on the review of the literature, a major gap in research exists pertaining to nurse educators' knowledge or perception of DP in skills education. Valid studies examining nurse educators' knowledge of DP did not exist. As discussed in Chapter I, it was evident in the literature that DP is beneficial to skill acquisition in medical skills education. Therefore, it is vital for nurse educators to have the knowledge to use DP to improve skills acquisition in nursing education. This study filled that gap by exploring nurse educators' knowledge of DP and whether that knowledge aligned with the theory of DP.

Summary

In Chapter II, Benner's (1982) novice to expert theory described stages of nurse competence and provided a framework for this study. A comprehensive literature review of nurse educators' knowledge or perception of knowledge resulted in no current evidence. This was a significant gap in nursing education research. Chapter III provides a description of this study's methodology. Research design, sample characteristics, data collection and analysis strategies, and ethical considerations are presented.

CHAPTER III

METHODOLOGY

Chapter I addressed the significance of DP in nursing education by providing the definition of DP, the background of DP in skills acquisition, and the significance to skills acquisition in nursing. The purpose of this study and the research questions that guided the study were also presented. Chapter II explored Benner's (1982) novice to expert theory as it pertained to the pedagogical use of DP. A review of the literature regarding nurse educators' knowledge of DP in nursing education was presented and a gap in the literature was identified. This chapter provides an overview of the research design and methods used in this study. The research sample, data collection, data analysis, ethical considerations, and limitations and delimitations are described.

Purpose of the Study

The purpose of this descriptive, cross-sectional, quantitative study was to determine the proportion of undergraduate nurse educators who knew or did not know about DP, what undergraduate nurse educators who taught psychomotor skills knew about DP, how their understanding of DP aligned with the theory of DP, how they used DP in skills education, and their perceived barriers and facilitators to DP. There was evidence supporting the use of deliberate practice in skills education; however, there was limited literature on the use of DP in nursing skills education. This study was needed to examine the knowledge and use of DP by nurse educators so further interventions could foster the use of DP in nursing skills education.

Research Questions

To determine nurse educators understanding of DP, the following research questions guided this study:

Q1 What is the proportion of undergraduate nurse educators who know about DP compared to the proportion of undergraduate nurse educators who do not know about DP?

Q2 How do undergraduate nurse educators who teach psychomotor skills conceptualize DP?

Q3 How do undergraduate nurse educators who teach psychomotor skills use DP in skills education?

Q4 What barriers and facilitators to DP do undergraduate nurse educators who teach psychomotor skills identify?

Q5 How does undergraduate nurse educators' conceptualization of DP align with the theory of DP?

Research Design

This study utilized a descriptive, cross-sectional, quantitative research design. Descriptive research is conducted when there is no evidence or limited evidence of the research variables and a description of these variables and their characteristics is necessary (Gray et al., 2017). Since no evidence in the literature described nurse educators' knowledge or use of deliberate practice in skills education, a quantitative descriptive study design was appropriate to answer the research questions. The study was a cross-sectional design because the data were collected at a single point in time (Remler & Van Ryzin, 2015).

Research Participants

Sampling Method

A nonprobability sampling method was used for the study. Specifically, a combination of purposive and network sampling methods was used. Purposeful sampling allowed the researcher

to select participants who could provide data relevant to the central purpose of the study (Gray et al., 2017). Since the purpose of the study was to determine what nurse educators knew about DP, specific sampling criteria had to be met to elicit the appropriate data. Once participants were found who met the sampling inclusion criteria, a networking sampling method was used via social networking and professional networking. Networking allowed sampling of participants nationwide and led to better generalizability of the findings.

Sample

The sample was chosen based on the following inclusion and exclusion criteria. Due to the non-experimental nature of the descriptive, cross-sectional research design, a power analysis to determine adequate sample size was not required (Gray et al., 2017). Inclusion criteria were (a) nurse educators in higher education, (b) had taught in a pre-licensure nursing program in the United States (BSN, Associate Degree in Nursing, or licensed practical nurse), and (c) had taught psychomotor nursing skills to pre-licensure nursing students within the last six years. Exclusion criteria included (a) nurse educators who had not taught in pre-licensure nursing programs in the United States (BSN, Associate Degree in Nursing, or licensed practical nurse), (b) had not taught psychomotor nursing skills, (c) last taught psychomotor skills more than six years ago, (d) had taught psychomotor nursing skills exclusively to graduate students.

Recruitment

Once Institutional Review Board approval (see Appendix A) was granted, participants were recruited. Information about the study was disseminated through social media sites LinkedIn, Facebook, Instagram, and STTI Circle. Specifically, the researcher posted an invitation to participant in the study on her personal LinkedIn (316 followers), Facebook (84 friends), and Instagram (51 followers) pages and in the following groups: Teachers Transforming

Nursing Education group in Facebook (17,022 members), Nurse Educators Group in Facebook (22,705 members), Nurse Educators Community group in STTI Circle (2021 members), and Nursing Research Community group in STTI Circle (875 members) (see Appendix B). Colleagues were encouraged to share the study information with other nurse educators teaching in pre-licensure programs. More participants were needed; therefore, a recruitment email (see Appendix C) was sent via the American Association of Colleges of Nursing listserv. The email included a recruitment flyer (see Appendix D) and the link to the electronic survey.

Data Collection Methods

This study was classified as an exempt study. Institutional Review Board approval was obtained prior to recruiting and collection of data. A link to the study was posted on social media sites starting on March 15, 2024. The link to the study was reposted on social media sites every week until the survey closed on April 9, 2024. Further recruitment was needed so a recruitment email was sent using the American Association of Colleges of Nursing listserv. The study link directed the participants to the letter of informed consent (see Appendix E). Another link led the participants to the electronic survey (see Appendix F). Participants who chose to participate completed the survey inclusion questions. Those who met inclusion criteria could then complete the survey. Those who did not meet the inclusion criteria were not be able to continue.

Ethical Considerations

Participation in the study was voluntary. Participants could decide not to participate in this study and if they had begun the survey they could still decide to stop and withdraw at any time. The participant’s decision to withdraw was respected and did not result in loss of benefits to which they were otherwise entitled.

Confidentiality

The researcher made every effort to protect the confidentiality of the participants. All identifying information was removed from individual responses and participants were assigned a numeric identifier. Data were kept on a password-protected computer located in a locked office. However**,** due to the nature of an electronic survey, confidentially could not be guaranteed.

Risks and Benefits of Participation

The risks of participating in the study were no greater than those normally encountered in everyday life. Participants were given the option to skip any questions on the survey they did not want to answer. Participants had a choice to be entered into a drawing after the completion of the survey by entering their email. The email address was not connected to their survey responses. Participation in the drawing was voluntary. After the survey availability time had ended, a participant was chosen at random and gifted a $100 Amazon© gift card. The gift card was sent electronically via email. There was no cost to the participant to participate in the study. No other compensation was provided.

Survey

The electronic survey was developed by the researcher based upon extant literature on DP and Ericsson's theory of DP (Clapper & Kardong-Edgren, 2012; Ericsson, 2020; Ericsson & Harwell, 2019; Ericsson et al., 1993). It was administered using Qualtrics. Prior to data collection, the survey was sent to a panel of experts for their review and feedback. The expert panel consisted of five nurse educators who had experience using DP or had knowledge of DP. The experts' feedback on clarity, comprehensibility, relevance, and appropriateness of content determined face validity. Revisions were made prior to the launch of the survey.

The survey was comprised of 47 questions consisting of multiple-choice, multiple-response, and open-text questions (Appendix F). The survey took an average of 7.68 minutes to complete. The initial two questions determined inclusion into the study. If the participant met inclusion criteria, they were directed to the next section of questions. If the participant did not meet inclusion criteria, they received a message of appreciation for their consideration in participating in the study and were not allowed to progress. Next, the participants were asked their level of knowledge regarding DP. If the participant did not have knowledge of DP, they received a message of appreciation for their participation and the survey ended. Participants who did have knowledge of DP were directed to questions regarding demographic information. Demographic information collected included degree level, employment status, academic rank, and types of teaching.

Next, four sections of questions were presented. Section I solicited information about the participants' most recent experience teaching psychomotor skills to pre-licensure students. Information included the institution, nursing program, student to faculty ratio, time directed towards skills education, and faculty supervision. This data illustrated the available resources participants had for skills education. Section II evaluated the participants' knowledge of DP. Questions were developed based on the concepts of Ericsson's theory of deliberate practice including instructor guidance and feedback; repetitive practice; structure and goal setting; negotiation of motivation, resource, and effort constraints; and the monotonic assumption that time engaged in DP is monotonically related to one's performance (Clapper & Kardong-Edgren, 2012; Ericsson et al., 1993). Section III explored the participants' use of DP in skills education. Questions solicited data on the practice setting, instructor involvement, and practice behaviors (Ericsson, 2020; Ericsson & Harwell, 2019). Finally, Section IV explored barriers and facilitators

to DP. Questions targeted resource, motivation, and effort constraints (Ericsson et al., 1993). Open-text questions allowed the participants to share other barriers and facilitators that might not have been mentioned in the close-ended questions.

Data Analysis

Data were analyzed using SPSS. Data were cleaned using frequencies to discover invalid or missing data. If data were missing from Section II, then all data from that section were excluded from analysis. Complete data were required to determine knowledge of DP. Sample characteristics were determined using frequency distribution and descriptive statistics. Since items in Section II were dichotomous and tested DP knowledge, Kuder-Richardson Formula 20 (KR-20) was computed to determine internal consistency (McGahee & Ball, 2009). If data were missing from questions 29 to 34, then all data from those questions were excluded from analysis for research question five.

Research Question One

Q1 What is the proportion of undergraduate nurse educators who know about DP compared to the proportion of undergraduate nurse educators who do not know about DP?

To address this question, the nominal data from question three of the survey were analyzed by determining sample proportions. Participants who chose “I can explain deliberate practice in detail” or “I know what deliberate practice is but not in detail” were considered knowledgeable of DP. Participants who chose “I have heard of deliberate practice prior to this study but do not know what it is” or “I have never heard of deliberate practice prior to this study, and I do not know what it is” were considered not knowledgeable of DP. The total number of participants who were knowledgeable of DP was divided by the total number of participants to determine the proportion of nurse educators who knew about DP. The total number of

participants who were not knowledgeable of DP was divided by the total number of participants to determine the proportion of nurse educators who did not know about DP.

Research Question Two

Q2 How do undergraduate nurse educators who teach psychomotor skills conceptualize DP?

To address this question, nominal and ordinal data from Section II, Section III, and questions 36 and 40 of the survey were analyzed. Data from survey questions in Section II were scored as correct or incorrect. Frequency distribution and descriptive statistics were used to analyze the scores, specifically, mean, median, mode, standard deviation, Pearson's skewness coefficient, skewness, and kurtosis. Internal consistency of these items was determined using KR-20. A reliability coefficient of 0.50 or greater is considered acceptable (McGahee & Ball, 2009).

Each question in Section II was analyzed separately using frequency distribution and measures of central tendency. Construct validity of these items was determined by analyzing the difficulty index, item discrimination index (DI), and point biserial. The difficulty index was used to determine the level of difficulty for each item. According to McGahee and Ball (2009), items with a difficulty index of less than 0.5 should be reviewed, revised, or deleted as this value indicates the question is too difficult. Item discrimination index was used to determine if an item was able to discriminate between high-achieving students and low-achieving students. The DI ranges from -1 to +1; a positive DI indicates an acceptable discrimination, a zero DI indicates no discrimination, and a negative DI indicates poor discrimination (Considine et al., 2005). Point biserial was analyzed to determine the degree to which the individual survey items and the test items as a whole were measuring DP (McGahee & Ball, 2009). A point biserial below 0.20

indicates a poor question, 0.20 to 0.30 indicates a fair question, and 0.40 to 0.70 indicates a good question.

Data from Section III were analyzed using frequency distribution, mean, median, mode, and range. Data from questions 36 and 40 were analyzed using frequency distribution, mean, median, and mode.

Research Question Three

Q3 How do undergraduate nurse educators who teach psychomotor skills use DP in skills education?

To address this question, nominal and ordinal data from Section III were analyzed using frequency distribution and descriptive statistics. Specifically, frequency distribution, mean, median, and mode were computed and analyzed.

Research Question Four

Q4 What barriers and facilitators to DP do undergraduate nurse educators who teach psychomotor skills identify?

To address this question, ordinal and open-text data from Section IV were analyzed using frequency distribution, descriptive statistics, and thematic analysis. Specifically, frequency distribution, mean, median, and mode were computed and analyzed for the close-ended questions. Thematic analysis was used to analyze the open-ended questions. Open-text data were reviewed and coded using topic detection in Qualtrics. Frequency distribution of topics was analyzed and main themes were identified.

Research Question Five

Q5 How does undergraduate nurse educators' conceptualization of DP align with the theory of DP?

To address this question, descriptive statistics were conducted on nominal data from Section II of the survey. Each question was scored as correct or incorrect. The scores were

analyzed using frequency distribution, measures of central tendency, and measures of dispersion. Higher scores indicated an alignment to the theory of DP; lower scores indicated an incongruence to the theory of DP.

In addition, data from questions 29 to 34 were analyzed because the results represented how the participant used DP. Responses were scored as correct or incorrect according to the theoretical concepts of DP. The data were then analyzed using frequency distribution and descriptive statistics that included mean, median, mode, standard deviation, Pearson's skewness coefficient, skewness, and kurtosis. Like scores from Section II, higher scores indicated an alignment to the theory of DP; lower scores indicated an incongruence to the theory of DP.

Limitations and Delimitations

Limitations to this study were based on the use of an online survey. One limitation of this study was sampling bias. The online survey was distributed through social networking platforms directed at nursing research and nursing education. This probability sampling technique targeted those individuals who were active in social networking platforms and might have excluded a portion of the representative population.

Nonsampling errors such as response and reporting errors were another limitation to using an online survey. Response error might have occurred if a participant had difficulty comprehending a question or lacked the knowledge necessary to answer a question (Blair et al., 2014). The expert panel review of the survey was an attempt to limit the chance of comprehension errors. Response error might have occurred if a participant did not provide accurate answers to the survey questions (Blair et al., 2014). It was not possible to detect participants who were not accurate in their responses; therefore, some data might have come from participants who did not meet selection criteria or those who provided fraudulent answers.

Nonresponse bias was another limitation to this study. Since the survey was self-administered, some questions could be freely skipped, and some questions were required so there was a chance for participants to choose not to answer questions and to not complete the survey. To reduce the chance of a high nonresponse rate, the survey was brief and the instructions were written to be self-explanatory (Blair et al., 2014).

Another limitation to the study was the survey was developed by the researcher and statistical data on the reliability and validity of the tool was not determined prior to its use. However, the survey was reviewed by an expert panel to determine face validity.

The final limitation to this study was the survey was not intended to be representative of the population of nurse educators. Therefore, generalizability of the results was limited.

Delimitations were established for this study to narrow the focus of research to answer the research questions. The first delimitation was excluding participants who taught exclusively in graduate nursing programs or outside of higher education (e.g., hospitals). The focus of this study was pre-licensure nursing students since they were likely to have limited to no exposure to DP or psychomotor nursing skills education prior to their nursing program.

The second delimitation was the exclusion of soft skills. The focus of this study was the DP of psychomotor skills reflected in the Ericsson's theory of DP (Ericsson et al., 1993). The third delimitation was the inclusion of participants who taught in the United States. The focus of this study was pre-licensure nursing skills education in the United States. It is possible nursing education has different regulations and practices outside of the United States. Also, much of the literature about deliberate practice of skills was conducted in the United States.

The last delimitation was the exclusion of participants who had not taught skills in the past six years. Deliberate-practice is a new concept in nursing education with the first study

appearing in 2008 by Haag-Heitman. The time limit was also determined based on the requirement of remembering detailed information about teaching habits and nursing student composition from the past.

Summary

In this chapter, the methodology of the study was described. This descriptive, cross-sectional, quantitative study was designed to answer the research questions by surveying participants via an online survey. Sampling methods, ethical considerations, data collection, and analysis strategies were presented. The limitations and delimitations of the study were identified.

CHAPTER IV

RESULTS

Chapter I addressed the significance of DP in nursing education and introduced the purpose of this study and the research questions that guided the study. Chapter II examined Benner's (1982) novice to expert theory as it related to the pedagogical use of DP. A literature review of nurse educators' knowledge of DP in nursing education was presented and gaps in the literature were identified. Chapter III provided an overview of the research design and study methods including the research sample, data collection, data analysis, ethical considerations, and limitations and delimitations. This chapter presents the results of the online survey.

Purpose of the Study

The purpose of this descriptive, cross-sectional, quantitative study was to determine the proportion of undergraduate nurse educators who knew or did not know about DP, what undergraduate nurse educators who taught psychomotor skills knew about DP, how their understanding of DP aligned with the theory of DP, how they used DP in skills education, and their perceived barriers and facilitators to DP.

Research Questions

To determine nurse educators' understanding of DP, the following research questions guided this study:

Q1 What is the proportion of undergraduate nurse educators who know about DP compared to the proportion of undergraduate nurse educators who do not know about DP?

Q2 How do undergraduate nurse educators who teach psychomotor skills conceptualize DP?

Q3 How do undergraduate nurse educators who teach psychomotor skills use DP in skills education?

Q4 What barriers and facilitators to DP do undergraduate nurse educators who teach psychomotor skills identify?

Q5 How does undergraduate nurse educators' conceptualization of DP align with the theory of DP?

Data Analysis

Data from the online survey were exported from Qualtrics and analyzed using SPSS version 29. Frequency distribution tables were reviewed for errors and missing data. Open-text responses for "other" options were reviewed. Open-text answers similar to available answer choices were removed and added to the data of the corresponding answer. For example, participants were asked who supervised open lab. If a participant wrote adjunct faculty or instructor, the open text was removed and data were added to the "faculty" answer choice. The six entries from the expert panel review were removed. A total of 199 individuals accessed the study link. Of the 199, 170 (85.4%) consented to participate in the study. Of the 170 participants, 168 completed the selection criteria questions. All participants were nurse educators or nursing faculty in higher education; however, 164 (96.5%) had taught psychomotor skills in a pre-licensure nursing program in the United States since January 1, 2018 and, therefore, met inclusion criteria. Of the 164 participants, 161 started the study questions; therefore, 161 participants' data were analyzed for this study, specifically, frequency distributions, descriptive statistics, and text analytics.

Sample Description

Sample Selection

The sample was recruited by social media platforms and email. A link to the study was posted on social media platforms starting from March 15, 2024, to April 9, 2024. Further

recruitment was needed so a recruitment email was sent using the American Association of Colleges of Nursing listserv. Of the 199 individuals who accessed the study, 161 met inclusion criteria. Of the 161 participants, 61 (37.9%) were familiar with DP and were able to continue, and 53 finished the survey.

Sample Demographics

Demographic information was collected from participants who were familiar with DP (see Table 1). Most participants had a graduate nursing degree, MSN (56.7%), or doctoral degree (40%) and worked as full-time faculty (80%). Although 16.7% of the participants did not currently have an academic rank, the majority did have an academic rank of instructor/lecturer (30%), assistant professor (21.7%), associate professor (16.7%), or professor (15%). Many (80%) of the participants were teaching in a skills laboratory. Other areas of teaching included simulation (78.3%), didactic (75%), and clinical (56.7%).

Information about the participants' most recent experience teaching psychomotor skills to pre-licensure nursing students was also collected (see Table 2). Over half of the participants taught at a university. Data on the location of the teaching institutions resulted in representation of each geographical region in the United States: Midwest (35.6%), South (30.5%), East (20.3%), and West (13.6%). Most participants taught in small institutions with fewer than 5,000 students (58.3%) and in medium-sized nursing programs with 100 to 500 students (65%). All types of pre-licensure nursing programs were represented: BSN (56.7%), ADN/ASN (36.7%), and LPN (6.7%).

Table 1

Demographics of Nurse Educators Familiar with Deliberate Practice

Characteristic	*n*	%
Current Degree		
ADN/ASN	0	0.0
BSN	2	3.3
MSN	34	56.7
Doctoral	24	40.0
Employment Status		
Full-time faculty	48	80.0
Part-time faculty	2	3.3
Adjunct faculty	5	8.3
Retired faculty	0	0.0
No longer in higher education (not retired)	1	1.7
Other role in higher education (not faculty)	5	8.3
Academic Rank		
Instructor/Lecturer	18	30.0
Assistant Professor	13	21.7
Associate Professor	10	16.7
Professor	9	15.0
Emeritus faculty	0	0.0
Do not currently have a rank	10	16.7
Types of Teaching		
Didactic (classroom/online)	45	75.0
Clinical	34	56.7
Simulation	47	78.3
Laboratory skills	51	85.0
Not currently teaching	2	3.3

Note. $N = 60$

Most participants had a 6 to 10 student per faculty ratio (53.3%) in the skills laboratory followed by 11 to 15 student per faculty ratio (26.7%). None of the participants reported having more than 30 students per faculty member. Participants reported 1 to 12 hours of skills lab time per week with the majority reporting three to four hours per week (46.7%). None of the

participants reported more than 12 hours per week. Total lab clock hours per semester varied from less than 15 hours to 105 hours with the majority reporting between less than 15 hours to 60 hours per semester (81.7%). None of the participants reported offering more than 105 lab skills hours per semester. The majority of participants reported offering open lab time to students (91.7%).

Finally, information about supervision and lab hours for open lab was collected from participants who indicated that open lab was offered at their institution (see Table 3). Of the 55 participants, 42 (76.45%) reported that faculty supervised open lab time. Others reported supervision of open lab time by work study students (14.5%), simulation/lab staff (14.5%), student volunteers (7.3%), no supervision (7.3%), or teaching assistants (3.6%). The amount of open lab time offered varied from two hours or less per week to more than 12 hours per week. Many reported either two hours or less per week (27.3%), three to four hours per week (27.3%), or more than 12 hours per week (20%).

Table 2

Recent Teaching Experience Description

Descriptor	*n*	%
Type of Institution		
University	32	53.3
College	17	28.3
Community college	18	30.0
Technical school	5	8.3
Military academy	0	0.0
Private	12	20.0
Public	12	20.0
Nonprofit	13	21.7
For profit	6	10.0
Other	0	0.0
U.S. Region Location		
West	8	13.6
Midwest	21	35.6
South	18	30.5
East	12	20.3
Size of Institution		
Small (fewer than 5,000 students)	35	58.3
Medium (5,000-15,000 students)	17	28.3
Large (more than 15,000 students)	8	13.3
Size of Nursing Program		
Small (fewer than 100 students)	17	28.3
Medium (100-500 students)	39	65.0
Large (more than 500 students)	8	13.3
Type of Nursing Program		
LPN	4	6.7
ADN/ASN	22	36.7
BSN	34	56.7

Table 2 Continued

Descriptor	*n*	%
Student to Faculty Ratio		
1-5 students per faculty member	8	13.3
6-10 students per faculty member	32	53.3
11-15 students per faculty member	16	26.7
16-20 students per faculty member	3	5.0
21-25 students per faculty member	0	0.0
26-30 students per faculty member	1	1.7
More than 30 students per faculty member	0	0.0
Skills Lab Clock Hours for One Session		
1-2 hours per week	17	28.3
3-4 hours per week	28	46.7
5-6 hours per week	9	15.0
7-8 hours per week	3	5.0
9-10 hours per week	1	1.7
11-12 hours per week	2	3.3
More than 12 hours per week	0	0.00
Total lab clock hours for one semester		
Less than 15 hours	12	20.0
15-30 hours	15	25.0
31-45 hours	12	20.0
46-60 hours	10	16.7
61-75 hours	6	10.0
76-90 hours	3	5.0
91-105 hours	2	3.3
More than 105 hours	0	0.0
Open lab times offered		
Yes	55	91.7
No	5	8.3

Table 3

Open Lab Description

Descriptor	*n*	%
Supervisor of open lab time		
No one	4	7.3
Faculty	42	76.4
Work study student	8	14.5
Student volunteer	4	7.3
Other: Simulation/Lab staff	8	14.5
Other: Teaching assistant	2	3.6
Open lab hours per week		
2 hours or less per week	15	27.3
3-4 hours per week	15	27.3
5-6 hours per week	8	14.5
7-8 hours per week	5	9.1
9-10 hours per week	1	1.8
11-12 hours per week	0	0.0
More than 12 hours per week	11	20.0

Note. $N = 55$.

Research Question One

Research question one—What is the proportion of undergraduate nurse educators who know about DP compared to the proportion of undergraduate nurse educators who do not know about DP?—was addressed by analyzing the question related to the participants' level of familiarity with DP. Of the 161 participants, 18 reported the ability to explain DP in detail and 43 reported knowing what DP was but not in detail, resulting in a total of 61 participants reporting knowledge of DP. Of the 161 participants, 35 reported they had heard of DP but did not know what it was and 65 had no knowledge of DP, resulting in a total of 100 participants reporting no knowledge of DP. Overall, 37.9% of participants knew about DP and 62.1% of participants did not know about DP.

Research Questions Two and Three

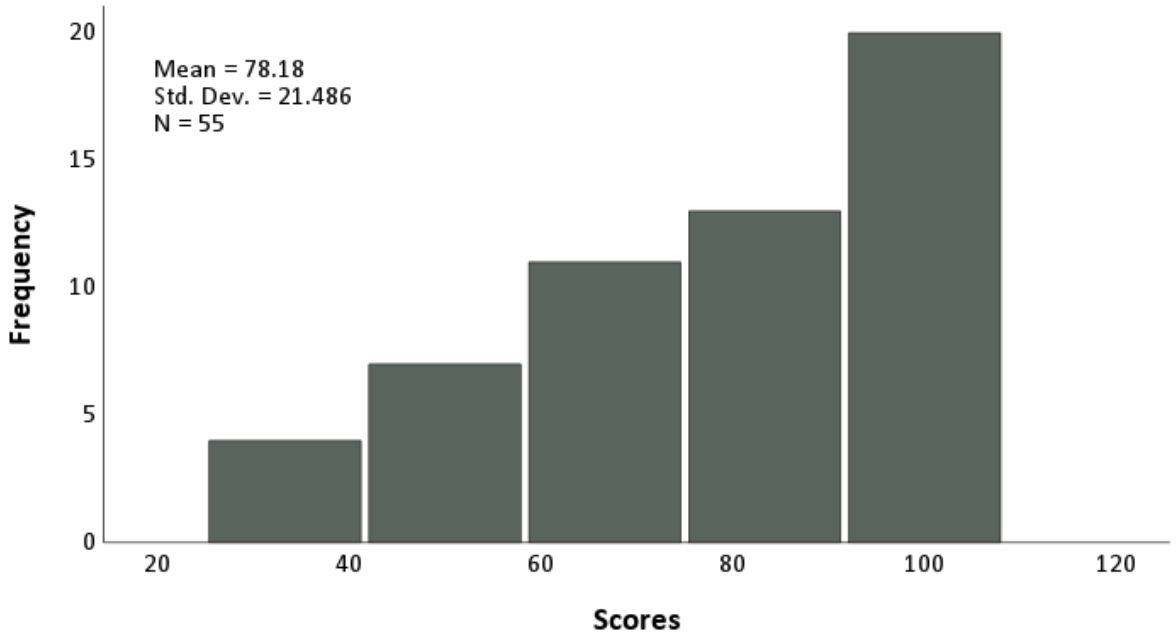
The second research question—How do undergraduate nurse educators who teach psychomotor skills conceptualize DP?—was addressed by analyzing responses to Section II, Section III, and survey items 36 and 40. The third research question—How do undergraduate nurse educators who teach psychomotor skills use DP in skills education?—was addressed by analyzing responses to Section III as well. Both questions are discussed as follows.

Evaluation of Participants' Knowledge of Deliberate Practice

Section II evaluated the participants' knowledge of DP with six test items covering the basic tenets of deliberate practice as presented by Ericsson (2004). Of the 61 participants who were knowledgeable about DP, 55 completed Section II. The mean test score was 78.18% with scores ranging from 33.33% to 100%. The standard deviation was 21.486 and the Pearson's skewness coefficient was -0.24, indicating a severely negatively skewed distribution of scores (see Figure 1). The median was 83.33% and the mode was 100%. The skewness and kurtosis values were -0.629 and -0.714, respectively. Internal consistency of the test items was determined by KR-20. Section II had a KR-20 of 0.456, lower than the recommended 0.50 (McGahee & Ball, 2009). However, a lower reliability coefficient could indicate a test is too short, which was the case in this survey with only six questions.

Figure 1

Distribution of Scores for Section II



Of the 55 participants, 36.4% were knowledgeable of DP, scoring 100% on the six test items. Other participants scored 83.33% (23.6%), 66.67% (20%), 50% (12.7%), or 33.33% (7.3%). An item analysis was conducted to determine validity of each test item (see Table 4). This analysis consisted of difficulty index, item discrimination index, and point biserial. Correct responses were indicated with a one and wrong responses were indicated with a zero. The upper 27% (15) of participants had the highest scorers and the lower 27% (15) of participants had the lowest scorers.

Table 4

Section II Item Analysis

Question/Answers	Answer		Question			
	n	%	*SD*	DIF I	DI	r_{pbis}
Q 19 What is the key defining concept of DP?			0.43	0.76	0.60	0.28
Practice directed by instructor guidance and feedback	42	76.4				
Practice directed by peer guidance and feedback	9	16.4				
Group practice without structured guidance	1	1.8				
Solitary practice without structured guidance	3	5.5				
Q 20 How does a student engage in DP?			0.42	0.78	0.53	0.28
Practice one skill at a time	2	3.6				
Practice all required skills once	1	1.8				
Repeatedly practice a skill a set number of times	9	16.4				
Repeatedly practice a skill using instructor feedback	43	78.2				
Q 21 What is the main goal of DP?			0.44	0.75	0.53	0.28
To deliberately repeat a skill	0	0.0				
To obtain mastery of a skill	41	74.5				
To increase understanding of a skill	13	23.6				
To emphasize the importance of a skill	1	1.8				
Q 22 Which of the following best describes DP?			0.36	0.86	0.47	0.36
Random and sporadic skill practice	1	1.8				
Structured and focused practice with clear goals	47	85.5				
Long practice durations without rest periods	0	0.0				
Student-paced practice	7	12.7				
Q 23 Finish the following sentence: Overall, the more time a student is engaged in DP, the more likely they are to…			0.45	0.73	0.53	0.20
improve their performance.	40	72.7				
weaken their performance.	0	0.0				
make mistakes.	0	0.0				
critically think.	15	27.3				
Q 24 According to the theory of DP, what are the three obstacles that could deter DP?			0.39	0.82	0.33	-0.01
Student's motivation	54	98.2				
Available resources	52	94.5				
Student's innate ability	9	16.4				
Student's effort	48	87.3				
Student's intelligence	2	3.6				
All three correct answers chosen [a]	45	81.8				

Note. Each question in Section II is presented with the possibly answers listed below each. The correct answers are shown in bold. Validity test results of each question is shown first and then frequency distribution of each answer follows. DIF I = Difficulty Index. DI = Discrimination Index.

[a] This question was marked correct only if the participant chose all three correct answers.

Questions 19 to 23 had acceptable difficulty indexes, good discrimination, and fair point biserial coefficients. Question 24 had an acceptable difficulty index. Although still a positive discrimination (0.33), question 24 had the lowest discrimination index. Question 24 also had a poor point biserial coefficient. Question 24 was the only multiple response question and might have contributed to the low discrimination and point biserial coefficient.

How Participants Used Deliberate Practice in the Skills Lab

While Section II tested the participants' knowledge of DP, Section III of the survey solicited information about the participants' use of DP. These data represented the participants' application of the concept of DP. The nominal and ordinal data from Section III were analyzed using frequency distribution and descriptive statistics and addressed both research questions two and three. Of the 55 participants, 45 reported using DP when teaching psychomotor skills to pre-licensure nursing students and completed Section III of the survey (see Table 5).

All participants reported their nursing students practiced psychomotor skills in an in-person environment. For the reported number of skills practiced in a lab skills course, results ranged from one to three skills to 25 or more skills. Most of the participants (n=34) reported that nursing students deliberately practiced one to nine skills (75.6%) during the lab skills course: one to three skills (26.7%), four to six skills (26.7%), and seven to nine skills (22.2%). The mean number of weeks the lab skills courses were reportedly offered was 12 weeks, with a range of 2 to 18 weeks. The median was 12 weeks and the mode was 15 weeks.

Table 5

Reported Use of Deliberate Practice

Question/Answer (Bold indicates correct answers)	Answer *n*	Answer %	Question *M*	Question Median	Question Mode
Q 26 In what kind of environment did the nursing students practice psychomotor skills?			In-person	In-person	In-person
In-person	45	100			
Synchronous virtual	0	0.0			
Asynchronous recorded sessions	0	0.0			
Other: please specify	0	0.0			
Q 27 How many skills did the students deliberately practice over the duration of the lab skills course?			7-9 skills	4-6 skills	Multiple exist
1-3 skills	12	26.7			
4-6 skills	12	26.7			
7-9 skills	10	22.2			
10-12 skills	4	8.9			
13-15 skills	2	4.4			
16-18 skills	0	0.0			
19-21 skills	0	0.0			
22-24 skills	1	2.2			
25 or more skills	4	8.9			
Q 28 Over how many weeks was the lab skills course offered?			11.69	12	15
2	1	2.2			
4	4	8.9			
5	1	2.2			
6	1	2.2			
7	2	4.4			
8	3	6.7			
10	4	8.9			
11	3	6.7			
12	5	11.1			
14	1	2.2			
15	10	22.2			
16	9	20			
18	1	2.2			
Q 29 Did you set specific student goals for deliberate practice of the skill(s)?			Yes	Yes	Yes
Yes	35	77.8			
No	10	22.2			

Table 5 Continued

Question/Answer	Answer *n*	Answer %	Question *M*	Question Median	Question Mode
Q 30 On average, how much time did students engage in deliberate practice during one practice session?			61-90 minutes	61-90 minutes	30-60 minutes
Less than 30 minutes	7	15.6			
30 - 60 minutes	15	33.3			
61-90 minutes	9	20			
91-120 minutes	12	26.7			
121-150 minutes	2	4.4			
151-180 minutes	0	0.0			
More than 150 minutes	0	0.0			
Q 31 How did the students practice?			Paired with a peer mentor	Paired with a peer mentor	Paired with another student
By themselves	1	2.2			
Paired with another student	21	46.7			
Paired with a peer mentor (a more senior student)	1	2.2			
Paired with a faculty member	4	8.9			
In a group of three or more students	13	28.9			
Other: Combination	5	11.1			
Q 32 Which of the following most resembles the instructions you have provided to students during deliberate practice sessions? [a]			Practice a skill until they feel confident	Practice a skill until they meet a certain goal or standard	Practice a skill until they meet a certain goal or standard
Practice a skill a specified amount of times	0	0.0			
Practice a skill for a specified duration of time	9	20.5			
Practice a skill until they feel confident	13	29.5			
Practice a skill until they meet a certain goal or standard	22	50			
Q 33 While the students were practicing, did a faculty member observe each students' skill performance and provide feedback? [a]			Yes, at most skill practice sessions	Yes, at most skill practice sessions	Yes, at most skill practice sessions
Yes, at every skill practice session	13	29.5			
Yes, at most skill practice sessions	21	47.7			
Yes, at some skill practice sessions	9	20.5			
No	1	2.3			
Q 34 Did the students have opportunities to practice the skill after they received instructor feedback? [b]			Yes	Yes	Yes
Yes	42	97.7			
No	1	2.3			

Note. Questions 29 to 34 are presented with the correct answers shown in bold.

[a] *N*=44

[b] *N*= 43

Of the 45 participants, 35 (77.8%) reported setting specific goals for DP of the skills and 10 (22.2%) reported they did not set specific goals. On average, participants reported 30 to 90 minutes of student engagement time in DP during one practice session with a range of less than 30 minutes to 121 to 150 minutes. Many students practiced paired with another student (46.7%) followed by practicing in a group of three or more students (28.9%). Only one participant reported that students practiced by themselves and another reported that the students were paired with a peer mentor. Other participants reported that students practiced paired with a faculty member (8.9%) or a combination of individual practice, group practice, paired with another student, peer mentors, and/or paired with a faculty member (11.1%).

Half of the participants instructed students to practice a skill until they met a certain goal or standard. Other participants either instructed students to practice a skill until they felt confident (29.5%) or practiced a skill for a specified duration of time (20.5%). All but one participant observed each students' skill performance and provided feedback at least at some skill practice sessions. Of the participants who provided feedback, all but one reported that students had opportunities to practice the skill after they had received the instructor feedback.

Lastly, participants were asked their opinions about the ideal duration of DP sessions and the ideal student to faculty ratio. The ideal duration of a DP session ranged from 15 minutes to more than 150 minutes with the average of 31 to 60 minutes. The median and mode was also 31 to 60 minutes. The ideal student to faculty ratio ranged from one to five students per faculty member to 11 to 15 students per faculty member. Most participants believed a one to five student to faculty member ratio was ideal (66%). No one believed a ratio greater than 15 students to one faculty member was ideal.

Research Question Four

The fourth research question—What barriers and facilitators to DP do undergraduate nurse educators who teach psychomotor skills identify?—was addressed by analyzing the data from Section IV of the survey. In Section IV, participants were asked closed-ended questions that solicited information about the three constraints of DP: resource, motivation, and effort (see Table 6). The ordinal data from Section IV were analyzed using frequency distribution and descriptive statistics; open-text data were analyzed using thematic analysis

Fifty-four participants started Section IV and 52 completed it. The first eight questions of this section related to resource constraints. Most participants (92.6%) believed the ideal duration of a DP session was between 15 to 90 minutes: 15 to 30 minutes (20.4%), 31 to 60 minutes (46.3%), and 61 to 90 minutes (25.9%). Most participants (66%) believed the ideal student to faculty ratio was five students to one faculty member. No one believed a ratio greater than 15 students to one faculty member was ideal. Participants were split regarding their opinions on time, funding, and adequate faculty. Close to half either strongly agreed or agreed that they had enough time, funding, and faculty to use DP, while the other half either disagreed or strongly disagreed. The majority of participants either strongly agreed or agreed they had access to the lab equipment and supplies necessary for DP (76%) and the lab facilities were adequate for the use of DP (69.8%).

Table 6

Barriers and Facilitators to Deliberate Practice

	Answer		Question		
Question/Answer	*n*	%	*M*	Median	Mode
Q 35 I have enough scheduled time to effectively use deliberate practice in the skills course.			Agree	Agree	Disagree
Strongly agree	10	18.5			
Agree	18	33.3			
Disagree	22	40.7			
Strongly disagree	4	7.4			
Q 36 In my opinion, a single deliberate practice session should last:			31-60 minutes	31-60 minutes	31-60 minutes
Less than 15 minutes	0	0.0			
15-30 minutes	11	20.4			
31-60 minutes	25	46.3			
61-90 minutes	14	25.9			
91-120 minutes	3	5.6			
121-150 minutes	0	0.0			
151-180 minutes	0	0.0			
More than 150 minutes	1	1.9			
Q 37 I have enough funding to support the use of deliberate practice in the skills course. (e.g., cost of lab materials, faculty salary, etc.)			Disagree	Disagree	Multiple exist
Strongly agree	6	11.1			
Agree	21	38.9			
Disagree	21	38.9			
Strongly disagree	6	11.1			
Q 38 I have access to the lab equipment and supplies I need to use deliberate practice in the skills course.			Agree	Agree	Agree
Strongly agree	11	20.4			
Agree	30	55.6			
Disagree	11	20.4			
Strongly disagree	2	3.7			
Q 39 There is enough faculty to support the use of deliberate practice in the skills course. [a]			Disagree	Disagree	Disagree
Strongly agree	5	9.4			
Agree	20	37.7			
Disagree	23	43.4			
Strongly disagree	5	9.4			

Table 6 Continued

Question/Answer	Answer *n*	Answer %	Question *M*	Median	Mode
Q 40 In my opinion, to be able to effectively use deliberate practice, the ideal student to faculty ratio should be: [a]					
1-5 students per faculty member	35	66			
6-10 students per faculty member	17	32.1			
11-15 students per faculty member	1	1.9			
16-20 students per faculty member	0	0.0			
21-25 students per faculty member	0	0.0			
26-30 students per faculty member	0	0.0			
More than 30 students per faculty member	0	0.0			
Q 41 The lab facilities are adequate for the use of deliberate practice. (e.g., lab space and lab availability). [a]			Agree	Agree	Agree
Strongly agree	12	22.6			
Agree	25	47.2			
Disagree	16	30.2			
Strongly disagree	0	0.0			
Q 42 My nursing students are interested in the skills presented in the skills course. [b]			Agree	Agree	Agree
Strongly agree	17	32.7			
Agree	30	57.7			
Disagree	5	9.6			
Strongly disagree	0	0.0			
Q 43 My nursing students are engaged while practicing the skills presented in the skills course. [a]			Agree	Agree	Agree
Strongly agree	10	18.9			
Agree	34	64.2			
Disagree	9	17			
Strongly disagree	0	0.0			
Q 44 My nursing students are capable of being fully attentive for 2 hours while practicing the skills presented in the skills course. [b]			Agree	Agree	Agree
Strongly agree	5	9.6			
Agree	25	48.1			
Disagree	21	40.4			
Strongly disagree	1	1.9			

[a] *N*=53
[b] *N*=52

Two questions in Section IV related to the motivation constraint. The majority of participants either strongly agreed or agreed that their nursing students were interested in the skills presented (90.4%) and were engaged in skill practice (83.1%). One question related to the

effort constraint. A slight majority of the participants either strongly agreed or agreed that their nursing students were capable of being fully attentive for two hours to deliberately practice a skill (57.7%).

Three open-ended questions solicited data about the biggest barriers to DP, the best facilitators to DP, and any other thoughts about the use of DP in nursing skills education. Thematic analysis was used to analyze the data and to extract primary themes. One theme emerged from question 47, asking for any other thoughts about deliberate practice. Of the 15 comments, six comments (40%) acknowledged the value of DP in nursing skills education. Six main barriers were identified in question 45: lack of time (*n*=20), followed by the lack of faculty (*n*=10), low student motivation (*n*=8), high student to faculty ratios (*n*=8), low student engagement (*n*=5), and lack of supplies (*n*=5). Three main facilitators were identified in question 46: enough time (*n*=7), low student to faculty ratios (*n*=6), and faculty knowledge of DP (*n*=4).

Research Question Five

The fifth research question—How does undergraduate nurse educators' conceptualization of DP align with the theory of DP?—was addressed by analyzing the nominal data from Section II of the survey. Section II evaluated the participants' knowledge of DP with six test items covering the basic tenets of deliberate practice as presented by Ericsson (2004). Higher scores indicated an alignment to the theory of DP; lower scores indicated an incongruence to the theory of DP. In addition, data from questions 29 to 34 were analyzed using descriptive statistics. The data represented how the participant used DP. These data were compared to the theoretical concepts of DP.

As analyzed for research question two, 36.4% of the 55 participants were knowledgeable of DP, scoring 100% on the six test items. This indicated that those participants'

conceptualization aligned with the theory of DP while the 63.6% who scored lower than 100% had a lesser alignment. Questions 29 to 34 evaluated the participants' use of DP based on the basic tenets of deliberate practice as presented by Ericsson (2004). These questions were scored as correct or incorrect based on Ericsson's theory of DP (Ericsson et al., 1993; see Table 7). Participants who did not answer all six questions were not included in the analysis.

Forty-three participants completed the six questions. The mean score was 59.3% with scores ranging from 16.7% to 83.3%, indicating poor application of DP based on Ericsson's theory (Ericsson et al., 1993). The standard deviation was 15.12 and the Pearson's skewness coefficient was -0.49, indicating a severely negatively skewed distribution of scores (see Figure 2). The median was 66.67% and the mode was 66.67%. The skewness and kurtosis values were -0.782 and 0.473, respectively.

Table 7

Reported Use of Deliberate Practice: Graded

	Answer		Question		
Question/Answer	*N*=43	*%*	*M*	Median	Mode
Q 29 Did you set specific student goals for deliberate practice of the skill(s)?			Yes	Yes	Yes
Yes	34	79.1			
No	9	20.9			
Q 30 On average, how much time did students engage in deliberate practice during one practice session?			61-90 minutes	61-90 minutes	30-60 minutes
Less than 30 minutes	6	14			
30 - 60 minutes	15	34.9			
61-90 minutes	9	20.9			
91-120 minutes	11	25.6			
121-150 minutes	2	4.7			
151-180 minutes	0	0.0			
More than 150 minutes	0	0.0			
Q 31 How did the students practice?			Paired with a faculty member	Paired with a peer mentor	Paired with another student
By themselves	1	2.3			
Paired with another student	20	46.5			
Paired with a peer mentor (a more senior student)	1	2.3			
Paired with a faculty member	3	7			
In a group of three or more students	13	30.2			
Other: Combination	5	11.6			
Q 32 Which of the following most resembles the instructions you have provided to students during deliberate practice sessions? [a]			Practice a skill until they feel confident	Practice a skill until they meet a certain goal or standard	Practice a skill until they meet a certain goal or standard
Practice a skill a specified amount of times	0	0.0			
Practice a skill for a specified duration of time	9	20.9			
Practice a skill until they feel confident	12	27.9			
Practice a skill until they meet a certain goal or standard	22	51.2			

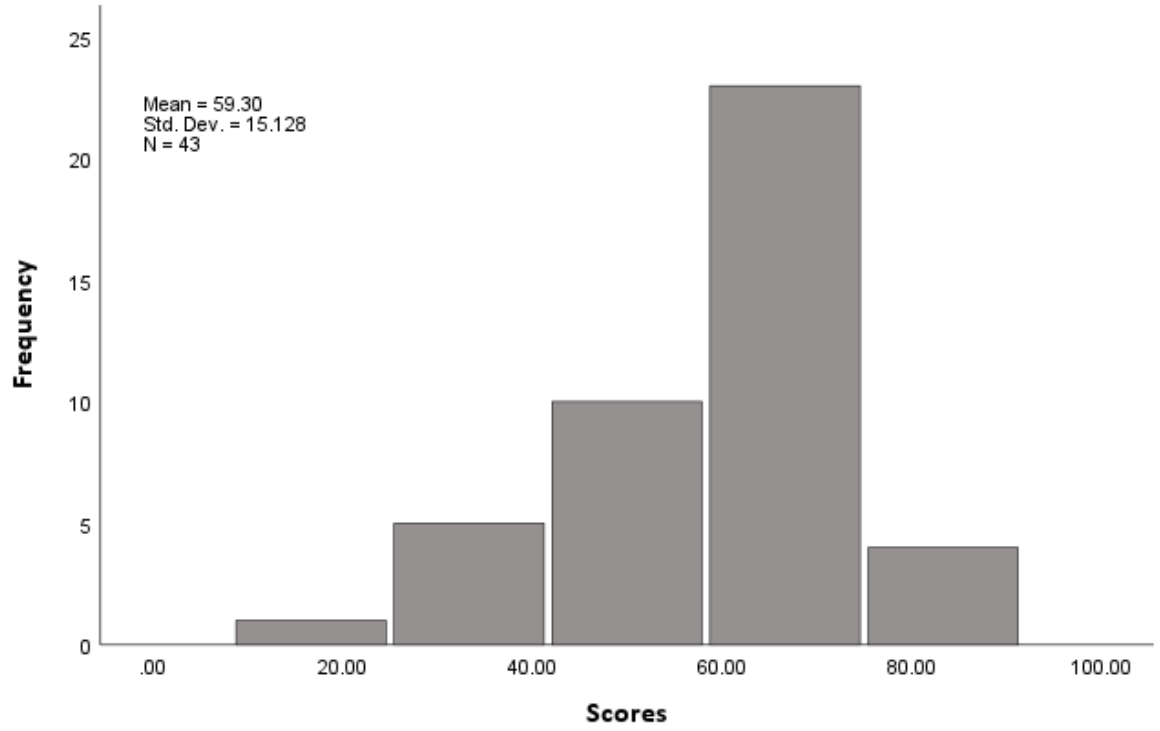
Table 7 continued

	Answer		Question		
Question/Answer	*N*=43	*%*	*M*	Median	Mode
Q 33 While the students were practicing, did a faculty member observe each students' skill performance and provide feedback? [a]			Yes, at most skill practice sessions	Yes, at most skill practice sessions	Yes, at most skill practice sessions
Yes, at every skill practice session	13	30.2			
Yes, at most skill practice sessions	21	48.8			
Yes, at some skill practice sessions	9	20.9			
No	0	0.0			
Q 34 Did the students have opportunities to practice the skill after they received instructor feedback? [b]			Yes	Yes	Yes
Yes	42	97.7			
No	1	2.3			

Note. Questions are presented with the correct answers shown in bold.

Figure 2

Distribution of Scores for Questions 29-34



Summary

In this chapter, the data and analysis for the sample demographics and the five research questions were presented. Frequency distributions, descriptive statistics, and thematic analysis were used to analyze the data. Chapter V elaborates on the results of the survey and discusses the implications for nursing skills education and future research.

CHAPTER V

DISCUSSION

Chapter I introduced the study purpose and the research questions and addressed the significance of deliberate practice (DP) in nursing education. Chapter II explored the relationship between Benner's (1982) novice to expert theory and the pedagogical use of DP. This chapter also presented a review of the literature and identified gaps related to nurse educators' knowledge of DP in nursing education. Chapter III described the research design and study methods including the research sample, data collection, data analysis, ethical considerations, and limitations and delimitations. Chapter IV presented the analysis of the online survey results. This chapter expands on the results of the survey and discusses the implications for nursing skills education, theory, and future research.

Purpose of the Study

The purpose of this quantitative study was to determine the proportion of undergraduate nurse educators that knew or did not know about DP, what undergraduate nurse educators who taught psychomotor skills knew about DP, how their understanding of DP aligned with the theory of DP, how they used DP in skills education, and their perceived barriers and facilitators to DP.

Research Questions

To determine nurse educators' understanding of DP, the following research questions guided this study:

Q1 What is the proportion of undergraduate nurse educators who know about DP compared to the proportion of undergraduate nurse educators who do not know about DP?

Q2 How do undergraduate nurse educators who teach psychomotor skills conceptualize DP?

Q3 How do undergraduate nurse educators who teach psychomotor skills use DP in skills education?

Q4 What barriers and facilitators to DP do undergraduate nurse educators who teach psychomotor skills identify?

Q5 How does undergraduate nurse educators' conceptualization of DP align with the theory of DP?

Methodology

A descriptive, cross-sectional, quantitative research design was used for this study. Participants were recruited through social media platforms and an email using the American Association of Colleges of Nursing (AACN) listserv. Participants were asked to complete a 47-question online survey consisting of multiple-choice, multiple-response, and open-text items. The survey items solicited information about the participants' most recent experience teaching psychomotor skills to pre-licensure nursing students, the participants' knowledge of DP, the participants' use of DP, and the participants' opinions about the barriers and facilitators to using DP in nursing skills education.

Discussion of Results

Research Question One

Q1 What is the proportion of undergraduate nurse educators who know about DP compared to the proportion of undergraduate nurse educators who do not know about DP?

Of the 161 participants, 61 (37.9%) reported some level of knowledge about DP and 65 (62.1%) reported no knowledge about DP. This was a discouraging statistic as DP was

established as an effective strategy in nursing skills acquisition over 15 years ago (Haag-Heitman, 2008). Since then, evidence in nursing and medical education literature showed DP could improve skill acquisition and retention (Ahmed et al., 2018; Bathish et al., 2018; Cordero et al., 2013; Duvivier et al., 2011; Hashimoto et al., 2015; Kessler et al., 2011; Liou et al., 2013; Oermann et al., 2011). So, why has there been such a delay in observing DP as an evidence-based teaching strategy in nursing education?

Integrating evidence-based teaching strategies (EBTS) into nursing curricula require time, support, educator commitment, effort, and funding (Halstead, 2006; Malik et al., 2016). Barriers to implementation of EBTS are educators' limited ability to research EBTS, educators' lack of knowledge of EBTS, educators' increased workload, general lack of time, and lack of resources (Horntvedt et al., 2018; Malik et al., 2016). Events that might have compounded these barriers were the nursing faculty shortage and the COVID-19 pandemic. A report from the AACN (Byrne et al., 2023) showed a national nurse faculty vacancy rate of 7.8%. Many nursing programs must rely on hiring part-time or adjunct faculty to fill vacancies (Jarosinki et al., 2021). Part-time and adjunct faculty typically do not have scholarship or research requirements that would lead to professional development of EBTS. Full-time faculty experience higher workloads as more faculty resign or retire. This perpetuates the lack of time to engage in EBTS. During the pandemic, nursing faculty experienced even higher workloads, low morale, and a poor work-life balance as they faced a quick transition to online education and challenges with engaging nursing students virtually (Farber et al., 2023). Later, it is discussed that DP requires enough time, faculty, and resources to implement. The nurse faculty shortage and the aftermath of the pandemic have left a dwindling faculty workforce with high workloads. This lack of time and

faculty might have contributed to the delay in the use of DP in nursing education despite the evidence of its efficacy in skills education.

Research Questions Two and Three

Q2 How do undergraduate nurse educators who teach psychomotor skills conceptualize DP?

Q3 How do undergraduate nurse educators who teach psychomotor skills use DP in skills education?

To address these questions, results from Section II, Section III, and survey Items 36 to 40 were analyzed. These survey items explored participants' responses related to the basic tenets of DP. Results from Section II determined the participants' level of knowledge about DP. Results from Section III determined how the participants applied that knowledge by examining their use of DP. Finally, the results from Items 36 to 40 showed the participants' opinions about the ideal duration of DP sessions and the ideal student to faculty ratio. In sum, these results demonstrated how the participants conceptualized and used DP in skills education.

Participants' Knowledge of Deliberate Practice

Of the 61 participants who reported some level of knowledge about DP, 29.5% reported the ability to explain DP in detail and 70.5% reported knowledge of DP but not in detail. In Section II of the survey, 55 of these participants completed questions that evaluated their knowledge about DP. A little over a third of participants (36.4%) scored 100%, indicating a high-level of knowledge about DP. Of the 55 participants, 20% scored 50% or less, indicating a very low-level of knowledge of DP. These results indicated that participants with higher levels of knowledge underestimated their competence and those with lower levels of knowledge overestimated their competence, which was a response bias called the Dunning-Kruger Effect (Bradley et al., 2022).

Hypocognition, or a lack of a cognitive representation of a concept, is a key contributor to the Dunning-Kruger Effect (Bradley et al., 2022). In the case of this study, most participants lacked the cognitive representation of DP. They did not know the structure and basic tenets that made up DP, which was evident from the results of Section II. To mitigate this hypocognition, nurse educators involved in nursing skills education must be educated on the tenets of DP and provide expert feedback and mentorship to support acquiring the correct knowledge of DP. Mentorship is often provided by peers in the field. Caution must be used when providing peer mentorship and feedback because peers who are not experts in DP could transfer their own knowledge biases, resulting in errors in teaching and learning (Bradley et al., 2022).

Participants' Use of Deliberate Practice

Data from Section III of the survey illustrated how the participants used DP, therefore indicating their application of the concept. Data from Items 36 and 40 reflected the participants' ideal time and student to faculty ratio to effectively use DP. One criterion of DP was the instructor must set specific goals for practice (Ericsson, 2020; Ericsson & Harwell, 2019). In Section II, 85.5% of participants (n=55) knew DP required structure with clear goals; however, 77.8% of participants (n=45) reported setting specific goals for DP and only 50% of participants (n=44) instructed their students to practice a skill until they met a certain goal or standard. It was evident that the many of the participants knew specific goals should be set but few were doing so in practice.

There could be several reasons why nurse educators were not setting goals or instructing students to practice until a goal was met. One reason could have been lack of time. Again, the faculty shortage brought increased workloads that could have impacted preparation and planning time for activities. Also, lab time might have been limited to allow students adequate time they

needed to practice until they met a goal or standard. Another reason could have been nurse educators' lack of knowledge on how to set goals for competence. In 2021, the AACN released *The Essentials*, which is a competency-based framework for baccalaureate nursing programs. In competency-based education, clear expectations are made to the students, which are met by repeated practice (AACN, n.d.). The AACN (n.d.) has many resources available to help educators transition to competency-based education such as webinars and toolkits. These resources might give nurse educators the skills to set goals or competencies for DP.

Another essential criterion of DP is instructor guidance and feedback. Of the 55 participants, 76.4% knew a key concept of DP was instructor guidance and feedback. However, only 29.5% of participants (n=44) reported that a faculty member observed their students' skill practice and provided feedback at every skill session. Of the 44 participants, 68.2% reported that a faculty member observed their student's skill practice and provided feedback either at most skills practice sessions or at some skills practice sessions.

This finding might be indicative of the effects of resource constraints. It was evident from Section II that many of the participants knew instructor guidance and feedback was a key concept of DP and most participants tried to provide this guidance and feedback. It was possible the participants did not have the resources such as time or enough faculty to provide this level of guidance and feedback at every session. As discussed previously, the nursing faculty shortage created increased workloads for faculty and this shortage might have affected the student to faculty ratio in skills labs (Jarosinki et al., 2021). Higher student to faculty ratios do not allow time for faculty to give feedback and guidance to each student.

A separate finding from this study supported the idea that faculty were strained to provide adequate resources. Of the 53 participants, 52.8% reported not having enough faculty to support

the use of DP. Of the 60 participants, 53.3% reported a student to faculty ratio of 6 to 10 students per one faculty member in their nursing skill courses and 26.7% reported 11 to 15 students per one faculty member. This might seem like standard student to faculty ratios for skills courses; however, 66% of participants (*n*=53) reported the ideal student to faculty ratio to effectively use DP was one to five students per faculty member.

In addition, 48.1% of participants (*n*=54) reported not having enough scheduled time to effectively use DP. This finding might have also contributed to the infrequent faculty observations and feedback. This lack of time was supported from data in Section III. On average, participants reported their ideal duration of a DP session was 31 to 60 minutes. However, participants reported teaching an average of seven to nine skills over an average of 11.69 weeks with practice sessions lasting an average of 61 to 90 minutes. According to Ericsson et al. (1993), a single practice session should not exceed two hours per day. These data supported that the ideal and practical duration of a single practice session was appropriate to effectively use DP but the amount of time for the entire semester might not have been enough to repeatedly practice seven to nine skills every week using DP. This finding was supported by Oermann et al.'s (2011) study that found nursing students who engaged in only six minutes of CPR practice every month performed better and retained their skills longer than those students who practiced for longer but only once. Therefore, the frequency of practice was more beneficial to skill acquisition and retention than length of practice.

Giving students opportunities to practice after instructor feedback is another criterion of DP. The majority of participants in this study knew that students should repeatedly practice a skill using instructor feedback (78.2%). Furthermore, a large majority of participants (97.7%)

reported that their students had opportunities to practice a skill after they received instructor feedback.

Peer Feedback Versus Faculty Feedback. According to Ericsson (2020), students must be able to perform practice activities by themselves guided by expert faculty feedback during DP sessions. Only one of the 45 participants reported that their students practiced by themselves; four reported that students practiced with a faculty member. The majority of participants (77.8%) reported the students practiced with either a peer, a peer mentor, a group of students, or a combination of these options. In practice, most of the participants were not modeling DP in the exact form suggested by Ericsson. Again, this could be a result of resource constraints such as lab space, time, and faculty.

Recent shortages in health profession faculty have left limited time with students, which resulted in less feedback and guidance (Zhang et al., 2022). Many health professions have looked toward peer teaching and mentoring as an economical and efficient strategy for skills education. Studies have shown many advantages to peer teaching and peer feedback such as increased student confidence/self-efficacy (DeBourgh & Prion, 2017; Gunberg Ross et al., 2014), decreased stress/anxiety (Johnson et al., 2019; Park & Kim, 2019; Wong & Shorey, 2022; Yoong et al., 2023), and increased skill performance (Zhang et al., 2022). On the other hand, studies have shown disadvantages to peer teaching and peer feedback such as increased anxiety (Wong & Shorey, 2022; Yoong et al., 2023), biased feedback (Bradley et al., 2022), and poor quality feedback (Blankenship et al., 2023; Park & Kim, 2019), which might lead to poor performance and negative patient outcomes. Results were mixed on the effects of peer teaching/feedback on skill competence or performance: Ahmed et al. (2018) found expert instruction and guidance led to better skill performance in medical students; Coffman et al. (2020) found no significant

difference in skill performance of veterinary students between expert guided and peer guided practice; and Zhang et al.'s (2022) systematic review of 27 randomized controlled trials showed a significant improvement in skill performance for participants who received near-peer teaching compared to expert/faculty teaching.

While peer feedback was shown to be favorable to students, some researchers agreed it should be used as an adjunct and not a replacement to expert faculty feedback (Wong & Shorey, 2022; Yoong et al., 2023) The peer must have expertise in the skills provided and be qualified to give reliable feedback and assessment (Blankenship et al., 2023; Bradley et al., 2022). Without expertise, the peer might rely on knowledge biases that could give the peer a false sense of competence, leading to errors in practice. Expertise is especially important when teaching more complex skills because providing feedback requires the understanding and experience with more complex concepts (Zhang et al., 2022). If the goal to a skills course is to increase skill confidence, peer feedback would be appropriate. However, in DP, the goal is to obtain mastery of a skill. To obtain mastery, expert feedback and guidance is essential (Bradley et al., 2022; Ericsson & Harwell, 2019; Ericsson et al., 1993; Gonzalez & Kardong-Edgren, 2017).

Confidence Versus Competence. It is also important to note the difference between confidence and competence. In this study, 29.5% of participants instructed their nursing students to deliberately practice a skill until they felt confident in the skill. However, confidence does not indicate competence or mastery. In fact, Erat et al. (2022) found that student performance decreased when the degree of student overconfidence increased. Liou et al. (2013) also found that participants who had higher self-confidence scores had significantly lower skill competence scores, which was another example of the Dunning-Kruger Effect where participants with higher levels of knowledge underestimated their competence (Bradley et al., 2022). Authors from both

studies speculated that participants might have had confidence in their skill knowledge and therefore only practiced minimally, which resulted in poor skill performance. Therefore, confidence was not a reliable predictor or indicator of competence or mastery.

Research Question Four

Q4 What barriers and facilitators to DP do undergraduate nurse educators who teach psychomotor skills identify?

To address this question, results from Section IV of the survey were analyzed. These survey items solicited information about the three constraints of DP: resource, motivational, and effort. Results illustrated the main barriers and facilitators to DP.

Barriers to Deliberate Practice

Ericsson et al. (1993) stated that one must negotiate motivational, resource, and effort constraints when engaging in DP. Resource constraints might include time, faculty, and funding needed to complete DP. According to Ericsson et al., there were no inherent rewards to DP except for the reward of improved performance. In the case of the DP of nursing skills, it could be argued that improved patient outcomes and decreased adverse events would be a reward to improved performance of skills but it was unclear if that was inherent to students. This limited intrinsic reward might lead to low engagement or motivation for the student—a motivational constraint.

Finally, DP requires sustained effort and attention for short sessions over an extended period. Students must overcome exhaustion and inattention, which are considered effort constraints. There was limited literature in healthcare education that specifically addressed barriers and facilitators to DP. The following is a discussion of the participants' reports of barriers or constraints to the use of DP.

Resource Constraints. In this study, approximately half of the participants either strongly agreed or agreed they had enough time, funding, and faculty to use DP, while the other half either disagreed or strongly disagreed. Lack of time, funding, and faculty were considered resource constraints. This also corresponded to the data from the open-text question regarding the participants' opinion about the biggest barriers to using DP.

Less than half the comments (43.5%) cited time as a barrier, yet it was the most frequently reported barrier (n=20). Most participants (92.6%) believed the ideal duration of a DP session was between 15 to 90 minutes and on average, participants reported 30 to 90 minutes of student engagement time in DP during one practice session. Ericsson et al. (1993) suggested that practice sessions not exceed two hours per day to avoid exhaustion and inattention. Therefore, most participants were within the two-hour recommendation with their ideal and practical use of DP. Although time was reported as the biggest barrier, it seemed only about half the participants believed and/or experienced a time constraint. Identification of time as a barrier to DP was consistent with the literature (Cordero et al., 2013; Gonzalez & Kardong-Edgren, 2017; Gunberg Ross et al., 2014; Hashimoto et al., 2015; Hastings & Rickard, 2015). During the COVID-19 pandemic, nursing programs could not offer traditional lab experiences. During this time, students had less opportunities to practice skills due to short lab sessions and infrequent open labs (Aldridge & McQuagge, 2021). Students expressed that the limited practice time hindered their skills practice and learning.

There was limited evidence in the literature that lack of faculty was a barrier to DP (Hashimoto et al., 2015). However, it was found that nursing students liked the small student to faculty ratios in the socially-distanced skills labs during the COVID-19 pandemic as they allowed more one-on-one time with faculty (Aldridge & McQuagge, 2021). In this study,

inadequate faculty, specifically not enough faculty (*n*=10) or large student to faculty ratios (*n*=8), was the second most reported barrier to DP (39.1%) but still less than half of the comments mentioned inadequate faculty. There is currently no recommendation on the ideal student to faculty ratio in nursing skills labs. Accrediting bodies like the Accreditation Commission for Education in Nursing (2023) and the Commission on Collegiate Nursing Education (2018) required programs to report their student to faculty ratios in the classroom, simulation, clinical, and skills lab but do not offer a recommendation on what is considered sufficient. The Accreditation Commission for Education in Nursing (2024) defined sufficient faculty as "enough or adequate for the purpose of achieving the end-of-program student learning outcomes and program outcomes" (p. 15) and the Commission on Collegiate Nursing Education recommended that "faculty are sufficient in number to accomplish the mission, goals, and expected program outcomes" (p. 11). Both were vague definitions. The National Council of State Boards of Nursing (2020) also required that pre-licensure nursing programs report their student to faculty ratios for labs but, again, did not provide a specific guideline for minimum standards. Jones et al. (2007) conducted a study to determine the appropriate student to faculty ratio for nursing clinical experiences. Although not pertaining to skills lab and an outdated source, the authors found small student to faculty ratios were significant contributors to cost in nursing programs and proof of cost-effectiveness of this ratio would be needed to support the funding. This would also still be true to support the needed smaller student to faculty ratios to support DP.

Most participants in this study either strongly agreed or agreed they had access to the lab equipment and supplies necessary for DP (76%) and the lab facilities were adequate for the use of DP (69.8%). Access to supplies and lab equipment was not a frequently reported barrier in the open-text survey item (*n*=5). However, nursing students who did not have adequate access to lab

supplies during the pandemic reported a negative impact to their skills practice and learning and access to supplies should be considered when using DP (Aldridge & McQuagge, 2021).

Only two comments from participants in this study identified funding as the biggest barrier to the use of DP and therefore was not recognized as a main barrier in this study. However, adequate faculty and lab equipment are essential to the use of DP. During the COVID-19 pandemic, nursing students experienced limited access to lab equipment such as urinary catheter kits, which inhibited their ability to learn and practice skills (Aldridge & McQuagge, 2021). There was a cost to provide sufficient lab supplies and equipment (Ericsson et al., 1993). Therefore, funding could be a barrier to nursing programs that are not properly funded. A solution for nursing programs would be to charge fees for courses with a lab component (Jones et al., 2007).

Motivational Constraints. In this study, 90.4% of the participants either strongly agreed or agreed that their nursing students were interested in the skills presented and 83.1% of the participants either strongly agreed or agreed their nursing students were engaged in skill practice. Motivation measured in concepts such as interest and engagement are essential for DP. Moulaert et al. (2004) found high achieving undergraduate medical students in skills courses had higher levels of motivation.

Effort Constraints. In this study, 57.7% of the participants either strongly agreed or agreed their nursing students were capable of being fully attentive for two hours to deliberately practice a skill. This slight majority is a concern for future skills education as it has been shown that students' focus and attention could have a positive impact on their performance (Duvivier et al., 2011). It has also been recognized that sustained student engagement might be a challenge to using DP in skills education (Hashimoto et al., 2015). Aldridge and McQuagge (2021) found that

during the COVID-19 pandemic, students struggled with skills practice due to the challenge of focusing their attention on practice while being concerned about safety precautions. Outside of the pandemic, nursing students experienced other stressors that might have negatively impacted their focus and attention in skills practice. Nursing students experienced high levels of stress in clinical settings due to poor interprofessional relationships, new roles and responsibilities, and unfamiliarity of the environment (Labrague et al., 2017). Nursing students also experienced personal stressors such as financial problems and balancing work, school, and homelife (Lavoie-Tremblay et al., 2022). Therefore, it is important for nurse educators to identify students at risk for decreased effort due to life events and stressors.

In addition, evidence showed that nursing students experienced great levels of anxiety and stress during psychomotor skills assessments or check offs (Aldridge & Hummel, 2019; Bengtsson et al., 2016; Monson et al., 2021) These negative emotional reactions could interfere with students' learning processes, affecting memory, concentration, and critical thinking (Hutchinson & Janiszewski Goodin, 2013). Nursing students might lose focus and attention on the DP of skills because of the anxiety and stress of the impending skill check off. In a qualitative study, over half of the nursing students experienced negative emotions during skill checkoffs that resulted in decreased confidence in performing the skill (Monson et al., 2021). It is unrealistic to expect novice nursing students to achieve a proficient level of competency after one semester of practicing a skill. So, why are nurse educators continuing to put nursing students through the stress of skills check offs? It would be more beneficial for nursing students to focus on the DP of skills throughout a nursing program, complete ungraded formative assessments, continue practicing based on expert faculty feedback, and then complete a summative assessment

at the end of the program (Oermann et al., 2011, 2016). This model of DP in nursing education might help to increase student focus and attention on critical skills.

Facilitators to Deliberate Practice

Specific criteria for DP of skills have been established (Ericsson, 2020). Deliberate practice sessions must (a) be guided by specific goals, (b) be performed in solitary, (c) include faculty feedback on student performance, (d) involve repetitive practice to improve performance based on feedback, and (e) be guided by faculty. These criteria could be considered facilitators to the use of DP. The following is a discussion of the participants' reports of facilitators to the use of DP.

Question 46 asked participants what best facilitated using DP in their nursing program. Of the 44 comments, three main facilitators were identified: enough time (*n*=7), low student to faculty ratios (*n*=6), and faculty knowledge of DP (*n*=4). It was interesting that the best facilitators were also the biggest barriers to the use of DP as reported by the participants. The importance of adequate time to engage in DP and smaller student to faculty ratios have been established (Aldridge & McQuagge, 2021; Cordero et al., 2013; Gunberg Ross et al., 2015; Hashimoto et al., 2015; Hastings & Rickard, 2015). It is important to note that the third most frequent facilitator was faculty knowledge of DP, which supported the need for DP education for nurse educators. Deficient faculty knowledge of DP was also a barrier to the use of DP identified by Gonzalez and Kardong-Edgren (2017).

Research Question Five

Q5 How does undergraduate nurse educators' conceptualization of DP align with the theory of DP?

Sections II and III of the survey were designed to solicit information about participants' knowledge and use of DP based on the basic tenets of Ericsson's theory of DP (Ericsson et al.,

1993). These tenets included the monotonic benefits assumption, structured practice with clear goals that lead to mastery, repeated solitary practice guided by faculty feedback, and the three constraints. The following is a discussion of the degree to which the participants' conceptualization of DP aligned with Ericsson's theory of DP.

Monotonic Benefits Assumption

The monotonic benefits assumption claimed "that the amount of time an individual is engaged in deliberate practice activities is monotonically related to the individual's acquired performance," meaning the more time spent engaged in DP improved skill performance (Ericsson et al., 1993, p. 368). Most of the participants knew the monotonic benefits assumption (72.7%) while some participants believed more time engaged in DP resulted in improved critical thinking (27.3%). This misalignment to theory might have come from the emphasis on critical thinking and clinical judgement in nursing education. Critical thinking and clinical judgement are two skills pre-licensure nursing students are expected to acquire and therefore are fundamental concepts in nursing education (Ilaslan et al., 2023). Studies about DP in nursing have emphasized the attainment of critical thinking processes as a benefit to DP (DeBourgh, 2011; DeBourgh & Prion, 2017; Johnston et al., 2024; Welch & Carter, 2018). These findings in the literature might have contributed to some participants believing that time engaged in DP resulted in critical thinking rather than improved performance.

Three Constraints

Ericsson et al. (1993) stated that one must negotiate motivational, resource, and effort constraints while engaging in DP. Of the 55 participants who answered the survey item about these three constraints, 45 answered it correctly. However, this survey item had the lowest discrimination index and a poor point biserial coefficient, indicating the question poorly

evaluated the topic. This survey item was also the only multiple response question and might have contributed to the low discrimination and point biserial coefficient. Despite this, this lower alignment to the theory of DP might have been caused by many studies about DP that omitted the concepts of resource, motivational, and effort constraints (Bathish et al., 2018; Clapper & Kardong-Edgren, 2012; Johnson et al., 2019; Oermann et al., 2011). These omissions might have been due to a dissension from Ericsson's theory of DP (Ericsson et al., 1993). Two of these studies focused on the effects of DP on skill performance and therefore addressing the constraints was not necessary (Johnson et al., 2019; Oermann et al., 2011).

Structure Practice and Setting Goals for Mastery

One tenet of DP is structured practice guided by specific goals with the main goal to obtain mastery (Clapper & Kardong-Edgren, 2012; Ericsson, 2020). In Section II, 85.5% of participants (*n*=55) knew that DP required structure with clear goals and 74.5% of participants (*n*=47) knew the main goal of DP was to obtain mastery of a skill. However, 77.8% of participants (*n*=45) reported setting specific goals for DP and only 50% of participants (*n*=44) instructed their students to practice a skill until they met a certain goal or standard. These results indicated the participants had a moderate level of knowledge of this tenet but had less practical application of the tenet. As discussed previously, lack of time and knowledge could have affected participants' goal setting during DP. Limited lab time or limited preparation time due to increased workload resulting from the nursing faculty shortage could have impacted the participants' ability to set goals or have the students practice until they met a goal. Participants could have also lacked the ability or knowledge to set appropriate goals for DP. The AACN's (2021) *Essentials*, which is a competency-based framework for baccalaureate nursing programs, emphasized setting clear expectations for nursing students that were met by repeated practice.

The AACN (n.d.) offered resources to nurse educators to help develop competency-based education skills like setting goals for competency for DP.

Solitary Practice with Faculty Feedback

Ericsson et al. (1993) defined DP as the solitary practice activities where students received expert faculty feedback about their performances and had time to practice repeatedly and make improvements based on faculty feedback to reach the set expectations (Ericsson et al., 1993). Only one of the participants reported that their students practiced by themselves; four participants reported that their students practiced with a faculty member. Most of the participants knew a key concept of DP was instructor guidance and feedback (76.4%) and that students should repeatedly practice a skill using instructor feedback (78.2%). However, only some of the participants (29.5%) reported that a faculty member observed their student's skill practice and provided feedback at every skill session. Conversely, a large majority of participants (97.7%) indicated their students had opportunities to practice a skill after they received instructor feedback.

The limited use of solitary practice might be due to the prevalence of studies that involved group DP (Gunberg Ross et al., 2014; Johnson et al., 2019; Liou et al., 2013). The limited use of solitary practice and faculty feedback might be indicative of resource constraints such as time or enough faculty, which were barriers to the use of DP identified by the participants of this study. In addition, the physical layout of nursing skills labs might not be conducive to solitary practice. Nursing skill labs are designed to hold several hospital beds with skill trainer manikins to accommodate a group of students for traditional skills sessions. Many times, there were no barriers except for curtains around each workstation so solitary practice might not be feasible in these environments.

Misalignment of Knowledge to Theory

Overall, there was a moderate misalignment of the participants' conceptualization of DP to Ericsson's theory of DP (Ericsson et al., 1993). The misalignment of DP was also evident in the literature as various definitions were presented and skewed to fit research objectives (Bathish et al., 2018; Clapper & Kardong-Edgren, 2012; Johnson et al., 2019). For instance, Bathish et al. (2018) used the Deliberate Practice in Nursing Questionnaire to measure DP. However, the tool collected data on "continuing formal education, continuing professional education, self-regulated learning/self-development, precepting, specialty certification, and professional organization membership" (Bathish et al., 2018, p. 107), which did not measure any of the basic tenets of DP such has repeated practice, instructor feedback, or the three constraints. Johnson et al. (2019) conducted a study that included peer to peer DP that lacked expert feedback. The lack of consistency related to the definition and conceptualization of Ericsson's theory of DP in healthcare education literature might have contributed to the misalignment of knowledge to the theory in this study.

Implications for Theory

Benner's (1982) novice to expert theory described the levels of nursing competence and how nurses transitioned to expert performance. According to Benner's theory, pre-licensure nursing students are considered novices and are expected to become advanced beginners by graduation (Murray et al., 2019). Since this study focused on the DP of skills of pre-licensure students, the novice and advanced beginner stages are discussed.

Faculty feedback, faculty guidance, and setting goals for practice are some of the basic tenets of DP. According to Benner's (2004) theory, nurse educator guidance was also emphasized to support the novice learner in skills acquisition (Benner, 2004). This study showed

that most participants knew faculty guidance and feedback (76.4%) were essential to DP but only some of the participants provided feedback at every DP session (29.5%). This lack of guidance inhibited student skill performance and delayed their progression to advanced beginner.

The tenet of goal setting in DP was like Benner's attributes and rules that nurse educators must provide to novice learners to guide skill practice (Benner, 1982, 2004). Most of the participants in this study knew DP required structure with clear goals (85.5%); however, not all participants (77.8%) set specific goals for DP and only half of them instructed their students to practice a skill until they met a certain goal or standard. Without setting goals or standards for practice, nursing students do not have the fundamental rules to guide their practice. Novice students do not have situational experience in nursing skills and without goals or attributes/rules, students would unlikely progress to advanced beginner (Benner, 1982).

At the time of graduation, pre-licensure nursing students are expected to be advanced beginners. This level of competence is characterized by marginally acceptable performance of skills (Benner, 1982). Advanced beginners are just starting to develop critical thinking and clinical judgment but still relying on the attributes and rules learned in their novice stage. It is important to note that skill mastery is not a characteristic of advanced beginners and would not be obtained until years of experience and when the expert level of competency is reached. The main goal of DP is mastery (Clapper & Kardong-Edgren, 2012). Therefore, it could be assumed that DP should not stop after graduation and should continue through nursing clinical practice. This idea is congruent with Ericsson et al.'s (1993) recommendation that expert performance requires at least 10 years of DP. However, nurse leaders are finding it difficult to continue skill competency education in practice due to the number of skills needed, lack of time to practice skills, and fewer available expert nurses to mentor the advanced beginner nurse due to

complexity of care (Virkstis et al., 2019). Virkstis et al. (2019) recommended that hospitals work with academic partners and offer more clinical opportunities to nursing students so they have more opportunities to practice skills prior to entry into practice. The authors also recommended developing more effective onboarding that involves skill practice and preceptors.

Results of this study showed the lack of faculty knowledge about DP. Without adequate knowledge, nurse educators cannot appropriately use DP in skills courses. This could be detrimental to the progression of nursing student competence.

Recommendations for Nurse Educators

The following recommendations for nurse educators were based on the information from this study:

1. Provide education to nurse educators on the use of DP in nursing skills education. This study showed the need for DP education for nurse educators. Only 37.9% of participants reported some level of knowledge about DP and only approximately a third of those participants scored 100% on the survey items that tested their knowledge of DP. When the participants were asked to share any other thoughts about DP, 40% of the comments acknowledged the value of DP in nursing skills education. The need for DP and the interest in DP is present in nursing education. Education could be provided through workshops, webinars, or classes. Mentorship with an expert in DP is highly recommended. Peers who are not experts in DP could transfer their own knowledge biases, resulting in errors in teaching and learning (Bradley et al., 2022).
2. Determine critical or high-used skills for DP. In this study, participants reported teaching an average of seven to nine skills over an average of 11.69 weeks with

practice sessions lasting an average of 61 to 90 minutes. This did not allow enough time during the semester to repeatedly practice each skill every week using DP. Oermann et al. (2011) recommended that instead of teaching many rarely used skills, nurse educators should determine a few highly used skills for students to learn using DP. Nursing students should engage in focused and repetitive practice, followed by ungraded assessment of performance with expert faculty feedback, followed by continued practice until the competency goal is met.

3. Focus on repeated practice and not skills check offs in fundamental courses. A body of evidence showed that nursing students experienced great levels of anxiety and stress during psychomotor skills assessments or check offs (Aldridge & Hummel, 2019; Bengtsson et al., 2016). Early skills check offs are not beneficial in determining skill competence as nursing students are still at the level of novice and need more time for DP and faculty feedback. In addition, passing a skills check off does not guarantee competent skill performance (Aldridge, 2024; Gonzalez & Sole, 2014; Kardong-Edgren & Mulcock, 2016). Formative ungraded assessments throughout the program followed by a summative assessment at the end of a program would be ideal.
4. Integrate DP in competency-based curriculum framework. The AACN's (2021) *Essentials* transitioned to a competency-based framework that supported the concepts of DP. According to Bradley et al. (2022), competency-based learning occurs when students repeatedly practice skills and knowledge while scaffolding

the application of the skills and knowledge to different healthcare contexts. Deliberate practice could facilitate competency-based learning.

5. Integrate DP throughout the nursing curriculum. If a program is not adopting a competency-based curriculum, it is still essential to integrate DP throughout the curriculum. Skill practice should not be siloed in the first semesters of nursing programs in fundamental skills courses or skill decay is likely to occur. Skill practice could be integrated into simulation and didactic courses throughout the curriculum to foster skill acquisition and retention (Oermann et al., 2011).
6. Use peer mentors as an adjunct to expert faculty guidance and feedback during DP. Involving peers in the DP process has shown to decrease stress and anxiety for nursing students (Johnson et al., 2019; Park & Kim, 2019; Wong & Shorey, 2022; Yoong et al., 2023). Decreased stress and anxiety would help students focus their attention on skill practice. The use of peers might also help with the faculty shortage and higher student to faculty ratios in skills labs. However, expert feedback from faculty is still necessary to provide correct feedback that leads to improved performance and skill mastery (Zhang et al., 2022).
7. Advocate for smaller student to faculty ratios in the skills lab. This recommendation might be difficult for many nurse educators as nursing programs are suffering the effects of a nursing faculty shortage and financial constraints. Providing more faculty, smaller student groups, or more frequent practice sessions might not be possible. The use of trained adjunct faculty or preceptors might be a more cost-efficient strategy to provide expert guidance and feedback in the skills

lab. It would be imperative that these educators receive education and mentorship on the use of DP.

Limitations and Strengths

Some limitations to this study were based on the use of an online survey. One limitation was sampling bias because the online survey was distributed through social networking platforms targeting nurse educators who were active in social networking and might have excluded a portion of the representative population. Non-sampling errors were another limitation to this study. Response error might have occurred if a participant had difficulty understanding a question, lacked the knowledge necessary to answer a question, or did not provide accurate answers (Blair et al., 2014). An expert panel review of the survey was conducted to limit comprehension errors. Also, it was impossible to detect if participants were not accurate in their responses; therefore, some data might have come from participants who did not meet selection criteria or those who provided fraudulent answers. Nonresponse bias was another limitation to this study. Since the survey was self-administered, some participants chose not to answer questions and not complete the survey. Of the 61 participants who were eligible to complete the entire survey, 53 finished the survey. On average, it took the 53 participants approximately 17 minutes to complete the survey. The survey length and average time to complete might have contributed to the nonresponse bias of this study.

Another limitation to the study was the survey was developed by the researcher and statistical data on the reliability and validity of the tool were not determined prior to its use. However, the survey was reviewed by an expert panel to determine face validity.

The final limitation to this study was the survey was not intended to be representative of the population of nurse educators. Therefore, generalizability of the results was limited. There

was good representation of geographical locations of participants but demographic information was only collected from participants who had some knowledge of DP. If this study is repeated, demographic information should be collected on all eligible participants.

One strength of this study was the inclusion of both subjective self-assessment of knowledge about DP and objective evaluation of knowledge about DP. According to Bradley et al. (2022), studies that only have self-assessment tools risk having cognitive bias, which leads to the Dunning-Kruger Effect. Thus, the subjective and objective assessments of this study provided strength and validity to the results about participants' knowledge about DP.

Recommendations for Future Research

This study described nurse educators' conceptualization and use of DP in pre-licensure nursing programs. This preliminary data opened new areas of inquiry and new directions of research for this topic. First, the data from this study could be analyzed further to determine correlations between the participants' reported resources and their beliefs about barriers to using DP in their nursing programs. For example, the resources reported by participants who said they did not have enough resources versus those who did have enough resources could be compared. Or the size of the nursing program and type of institution reported by participants who reported lack of funding could be compared to those participants who had adequate funding to see if there is a correlation.

This study established that nurse educators had limited knowledge of DP; yet, DP has shown to be an effective strategy for skills acquisition and retention in nursing education. Nurse educators should further their education about the use of DP to strengthen skill acquisition in nursing students. Therefore, research is needed to explore the most effective and efficient ways to provide education about DP to nurse educators. Also, research needs to be conducted to

determine the most effective student to faculty ratio to support DP in nursing skills education. These results could support the need for more faculty, smaller faculty to student ratios, or more skills practice time in nursing programs. Research should also focus on determining the most critical psychomotor skills to use with DP. These data could facilitate planning and integration of DP in nursing curricula. Finally, this study focused on DP in pre-licensure nursing programs. Future research could focus on nurse educator conceptualization and use in graduate nursing programs.

Unique Contributions of This Study

Evidence in the literature indicated DP is beneficial to skill acquisition in nursing skills education. Therefore, it would be imperative that nurse educators have the knowledge to use DP to improve skills acquisition in nursing education. Prior to this study, a major gap existed in research pertaining to nurse educators' knowledge of DP in skills education. Valid studies examining nurse educators' knowledge of DP did not exist. This study filled that gap by exploring nurse educators' knowledge of DP and whether that knowledge aligned with Ericsson's theory of DP (Ericsson et al., 1993). This study found that a small proportion of nurse educators had knowledge of DP and its use in pre-licensure nursing skills education. A misalignment of participants' knowledge of DP to Ericsson's theory of DP was also found. This was the first study of its kind and the data could help inform future research on DP of nursing skills.

Conclusion

Patient safety and positive patient outcomes are a priority in health care in the United States; Therefore, it is crucial that healthcare professionals, like nurses, acquire competency in psychomotor skills to maintain patient safety and quality of care. Nurse leaders expect pre-

licensure nursing programs to provide adequate education so nursing graduates are competent when they enter practice. Deliberate practice has shown to be an effective teaching strategy in the acquisition and retention of psychomotor skills. However, there was limited evidence that nurse educators knew about DP or were using it in pre-licensure nursing programs.

The purpose of this study was to determine the proportion of undergraduate nurse educators that knew or did not know about DP, what undergraduate nurse educators who taught psychomotor skills knew about DP, how their understanding of DP aligned with the theory of DP, how they used DP in skills education, and their perceived barriers and facilitators to DP. The results found a small proportion of nurse educators had knowledge about DP and their conceptualization and application of DP did not align with Ericsson's theory of DP (Ericsson et al., 1993). The results also highlighted barriers and facilitators to DP including resources such as time and faculty.

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APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

UNIVERSITY OF
NORTHERN COLORADO

Institutional Review Board

Date:	03/04/2024
Principal Investigator:	Sarah Tappendorf
Committee Action:	**IRB EXEMPT DETERMINATION – New Protocol**
Action Date:	03/04/2024
Protocol Number:	2403058052
Protocol Title:	UNDERGRADUATE NURSE EDUCATORS' CONCEPTUALIZATION AND UTILIZATION OF DELIBERATE PRACTICE IN PSYCHOMOTOR SKILLS EDUCATION
Expiration Date:	

The University of Northern Colorado Institutional Review Board has reviewed your protocol and determined your project to be exempt under 45 CFR 46.104(d)(702) for research involving

Category 2 (2018): EDUCATIONAL TESTS, SURVEYS, INTERVIEWS, OR OBSERVATIONS OF PUBLIC BEHAVIOR. Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: (i) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects; (ii) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation; or (iii) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by 45 CFR 46.111(a)(7).

You may begin conducting your research as outlined in your protocol. Your study does not require further review from the IRB, unless changes need to be made to your approved protocol.

As the Principal Investigator (PI), you are still responsible for contacting the UNC IRB office if and when:

UNIVERSITY OF
NORTHERN COLORADO

Institutional Review Board

- You wish to deviate from the described protocol and would like to formally submit a modification request. Prior IRB approval must be obtained before any changes can be implemented (except to eliminate an immediate hazard to research participants).
- You make changes to the research personnel working on this study (add or drop research staff on this protocol).
- At the end of the study or before you leave The University of Northern Colorado and are no longer a student or employee, to request your protocol be closed. *You cannot continue to reference UNC on any documents (including the informed consent form) or conduct the study under the auspices of UNC if you are no longer a student/employee of this university.
- You have received or have been made aware of any complaints, problems, or adverse events that are related or possibly related to participation in the research.

If you have any questions, please contact the Interim IRB Administrator, Chris Saxton, at 970-702-5427 or via e-mail at chris.saxton@unco.edu. Additional information concerning the requirements for the protection of human subjects may be found at the Office of Human Research Protection website - http://hhs.gov/ohrp/ and https://www.unco.edu/research/research-integrity-and-compliance/institutional-review-board/.

Sincerely,
Michael Aldridge
Interim IRB Administrator

University of Northern Colorado: FWA00000784

APPENDIX B

SOCIAL MEDIA POST

Do you teach skills to pre-licensure nursing students? Then I invite you to participate in my dissertation study! I am a PhD candidate in the Nursing Education program at the University of Northern Colorado and am recruiting participants. **Study purpose:** To determine the proportion of undergraduate nurse educators that know or do not know about DP, what undergraduate nurse educators who teach psychomotor skills know about DP, how their understanding of DP aligns with the theory of DP, how they use DP in skills education, and their perceived barriers and facilitators to DP. **Inclusion criteria:** Nurse educators in higher education who have taught psychomotor nursing skills to pre-licensure nursing students (BSN, ADN, or LPN) in the United States in the past 6 years. **Participation:** Complete an online survey that will take approximately 10 minutes. Study link: https://unco.co1.qualtrics.com/jfe/form/SV_8Dmfka4t4ZQQZoi

APPENDIX C

RECRUITMENT EMAIL

Dear Potential Participants,

I am a PhD candidate in the Nursing Education program at the University of Northern Colorado and am looking to recruit participants for my dissertation study, *Undergraduate Nurse Educators' Conceptualization and Utilization of Deliberate Practice in Psychomotor Skills Education.* The purpose of the study is to determine the proportion of undergraduate nurse educators that know or do not know about deliberate practice, what undergraduate nurse educators who teach psychomotor skills know about deliberate practice, how their understanding of deliberate practice aligns with the theory of deliberate practice, how they use deliberate practice in skills education, and their perceived barriers and facilitators to deliberate practice. Deliberate practice has been shown to be an effective teaching technique in psychomotor skill acquisition in healthcare education. However, there is no literature that examines nursing faculty knowledge or use of deliberate practice.

I am looking for participants that are nurse educators in higher education who have taught psychomotor nursing skills in a pre-licensure nursing program (BSN, ADN, or LPN) in the United States in the past 6 years. Participants will be asked to complete a brief online survey. After completion, participants can enter a drawing to win a $100 Amazon card.

Please email me at bund7530@bears.unco.edu with any questions about the study. Understanding how nurse educators conceptualize and use deliberate practice will help inform future skills education practices. Thank you for your consideration.

https://unco.co1.qualtrics.com/jfe/form/SV_8Dmfka4t4ZQQZoi

Sarah B. Tappendorf MSN, RN

PhD Candidate, University of Northern Colorado

APPENDIX D

RECRUITMENT FLYER

PARTICIPANTS NEEDED

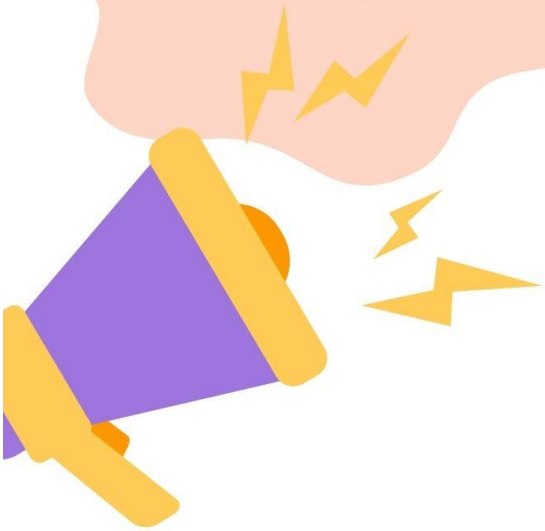
FOR A STUDY ON DELIBERATE PRACTICE OF NURSING SKILLS

WHO CAN PARTICIPATE?

Nurse educators who have taught psychomotor skills to pre-licensure nursing students within the past 6 years

WHAT WILL I DO?

Complete a brief online survey about deliberate practice of skills



QUESTIONS?

Contact Sarah Tappendorf
PhD candidate
University of Northern Colorado
bund7530@bears.unco.edu

APPENDIX E

INFORMED CONSENT

UNIVERSITY OF
NORTHERN COLORADO

INFORMED CONSENT FORM FOR PARTICIPATION IN RESEARCH

Title of Research Study: Undergraduate nurse educators' conceptualization and utilization of deliberate practice in psychomotor skills education.
Researcher: Sarah Tappendorf, University of Northern Colorado, School of Nursing
email: bund7530@bears.unco.edu
Research Advisor: Mike Aldridge, University of Northern Colorado, School of Nursing
Phone Number: (970) 351-1699 email: michael.aldridge@unco.edu

Procedures: I invite you to participate in a research study. The purpose of this quantitative study is to determine the proportion of undergraduate nurse educators that know or do not know about deliberate practice (DP), what undergraduate nurse educators who teach psychomotor skills know about DP, how their understanding of DP aligns with the theory of DP, how they use DP in skills education, and their perceived barriers and facilitators to DP. As a participant in this study, you will be asked to complete a brief online survey. The survey consists of multiple-choice, multiple answer, and fill in the blank questions covering demographic information, knowledge of DP, use of DP, and perceived barriers and facilitators to DP. The survey will take approximately 10 to 15 minutes to complete.

Benefits and Risks: While there is not any direct benefit to you for participating in this study it is possible that what is learned will help nurse educators better understand teaching strategies in nursing skills education. If you choose to participate, you will have an option to be entered into a drawing for a $100 Amazon© gift card after the completion of the survey by entering your email. The email address will not be connected to your survey responses. Participation in the drawing is voluntary. After the survey availability time has ended, a participant will be chosen at random. The gift card will be sent electronically via email. There is no cost to participate in the study. No other compensation will be provided. There are no foreseeable risks to you as a participant in this study. The risks of participating in the study are no greater than those normally encountered in everyday life.

Confidentiality: Data collection will be collected using Qualtrics. I will take every precaution to protect your confidentiality. All identifying information will be removed from your responses and you will be assigned a numeric identifier. Data will be kept on a password-protected computer located in a locked office. However**,** due to the nature of an electronic survey, confidentially cannot be guaranteed. Qualtrics has specific privacy policies. You should be aware that these web services may be able to link your responses to your ID in ways that are not bound by this consent form and the data confidentiality procedures used in this study. If you have concerns, you should consult these services directly.

Voluntary Participation: Please understand that your participation is voluntary. You may decide not to participate in this study and if you begin participation, you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled.

Electronic consent: Please take all the time you need to read this document and decide whether you would like to participate in this research study. If you decide to participate, your completion of the research procedures indicates your consent. You may print this form for your records.

Contact: If you have any questions about this research project, please feel free to contact Sarah Tappendorf at bund7530@bears.unco.edu. If you have any concerns about your selection or treatment as a research participant, please contact Laura Martin, IRB Administrator, at the University of Northern Colorado IRB at Research.Compliance@unco.edu or 970-351-1910.

APPENDIX F

ONLINE SURVEY

Participant Selection Criteria

1. Are you or have you been a nurse educator or nursing faculty member in higher education?
   YES (continue to next question)
   NO (Thank you for your consideration in participating in this study. You do not meet the selection criteria for the study.)
2. Have you taught psychomotor skills in a pre-licensure (BSN, ADN, or LPN) nursing program in the United States since January 1, 2018?
   YES (continue to next question)
   NO (Thank you for your consideration in participating in this study. You do not meet the selection criteria for the study.)

Knowledge of Deliberate Practice

3. Are you familiar with deliberate practice?
   I can explain deliberate practice in detail. (continue to next question)
   I know what deliberate practice is but not in detail. (continue to next question)
   I have heard of deliberate practice prior to this study but do not know what it is. (Thank you for your participation in the study. The survey has ended.)
   I have never heard of deliberate practice prior to this study, and I do not know what it is. (Thank you for your participation in the study. The survey has ended.)

Demographic Information

4. What is the highest nursing degree that you have completed?
   Associate's degree
   Bachelor's degree
   Master's degree
   Doctoral degree
5. What is your current employment status in higher education? Select all that apply.
   Full-time faculty
   Part-time faculty
   Adjunct faculty
   Retired faculty
   No longer in higher education (not retired)
   Other role in higher education (not faculty)
6. What academic rank do you currently hold?
   Instructor/Lecturer
   Assistant Professor
   Associate Professor
   Professor
   Emeritus faculty
   Do not currently have a rank
7. What types of teaching do you currently do in higher education? Select all that apply.
   Didactic (classroom/online)
   Clinical
   Simulation
   Laboratory Skills
   Not currently teaching

Section I

For the following questions, please answer regarding your most recent experience teaching psychomotor skills to pre-licensure the nursing students. If you currently teach psychomotor skills in more than one pre-licensure nursing program, please answer regarding the program you spend the majority of your time.

8. At which type of institution did you most recently teach psychomotor skills? Select all descriptors that apply.
   University
   College
   Community College
   Technical School
   Military academy
   Private
   Public
   Nonprofit
   For profit
   Other (please specify)
9. In which U.S. region is the institution where you most recently taught psychomotor skills?
   West
   Midwest
   South
   East
10. What is the size of the institution where you most recently taught psychomotor skills?
    Small (fewer than 5,000 students)
    Medium (5,000-15,000 students)
    Large (more than 15,000 students)
11. What is the size of the pre-licensure nursing program where you most recently taught psychomotor skills?
    Small (fewer than 100 students)
    Medium (100-500 students)
    Large (more than 500 students)
12. Regarding your most recent psychomotor skills teaching experience, in which nursing program were the nursing students enrolled?
    LPN
    ADN/ASN
    BSN
13. For a single psychomotor skills session/course, what was the average student to faculty ratio?
    1-5 students per faculty member
    6-10 students per faculty member
    11-15 students per faculty member
    16-20 students per faculty member
    21-25 students per faculty member
    26-30 students per faculty member
    More than 30 students per faculty member
14. For a single psychomotor skills course, how many skills lab clock hours per week were the students registered (do not count optional open skills lab time)?
    1-2 hours per week

3-4 hours per week
5-6 hours per week
7-8 hours per week
9-10 hours per week
11-12 hours per week
More than 12 hours per week

15. For a single psychomotor skills course, how many total clock hours were dedicated to skills education during one semester (do not count optional open skills lab time)?
    Less than 15 hours
    15-30 hours
    31-45 hours
    46-60 hours
    61-75 hours
    76-90 hours
    91-105 hours
    More than 105 hours
16. Did the nursing program offer open lab times where students could practice outside of their scheduled lab times?
    YES (continue to question 17)
    NO (continue to question 19)
17. Who supervised student skill performance during open lab times? Select all that apply.
    No one
    Faculty
    Work study student
    Student volunteer
    Other (please specify)
18. On average, how many open lab hours were offered to students per week in one semester?
    2 hours or less per week
    3-4 hours per week
    5-6 hours per week
    7-8 hours per week
    9-10 hours per week
    11-12 hours per week
    More than 12 hours per week

Section II

Deliberate Practice- the following questions will evaluate your knowledge of deliberate practice. If you do not know the answer to a question, please provide your best guess.

19. What is a key defining concept of deliberate practice?
    a. Practice directed by instructor guidance and feedback (correct answer)
    b. Practice directed by peer guidance and feedback
    c. Group practice without structured guidance
    d. Solitary practice without structured guidance
20. How does a student engage in deliberate practice?
    a. Practice one skill once
    b. Practice all required skills once
    c. Repeatedly practice a skill a set number of times

   d. Repeatedly practice a skill using instructor feedback (correct answer)
21. What is the main goal of deliberate practice?
   a. To deliberately repeat a skill
   b. To obtain mastery of a skill (correct answer)
   c. To increase understanding of a skill
   d. To emphasize the importance of a skill
22. Which of following best describes deliberate practice?
   a. Random and sporadic skill practice
   b. Structured and focused practice with clear goals (correct answer)
   c. Long practice durations without rest periods
   d. Student-paced practice
23. Finish the following sentence: Overall, the more time a student is engaged in deliberate practice, the more likely they are to…
   a. improve their performance. (correct answer)
   b. weaken their performance.
   c. make mistakes.
   d. critically think.
24. According to the theory of deliberate practice, what are three obstacles that could deter deliberate practice? Please select three.
   Student's motivation (correct answer)
   Available resources (correct answer)
   Student's innate ability
   Student's effort (correct answer)
   Student's intelligence

Definition of Deliberate Practice

Deliberate practice is the repetition of activities designed to improve the level of performance in response to instructor feedback while negotiating motivational, resource, and effort constraints. Instructors should create structured activities and set specific goals for the students. The goal of deliberate practice is to obtain mastery of a skill.

25. Using the above definition of deliberate practice, have you used deliberate practice when teaching psychomotor skills to pre-licensure nursing students?
   YES (continue to Section III)
   NO (continue to Section IV)

Section III

Deliberate Practice- the following questions will explore your use of deliberate practice in skills education. Answer the following questions regarding your most recent experience using deliberate practice in the skills lab with pre-licensure nursing students.

26. In what kind of environment did the nursing students practice psychomotor skills?
   In-person
   Synchronous virtual
   Asynchronous recorded sessions
   Other: please specify
27. How many skills did the students deliberately practice over the duration of the lab skills course?
   1-3 skills

4-6 skills
7-9 skills
10-12 skills
13-15 skills
16-18 skills
19-21 skills
22-24 skills
25 or more skills

28. Over how many weeks was the lab skills course offered?
    Open text
29. Did you set specific student goals for deliberate practice of the skill(s)?
    YES
    NO
30. On average, how much time did students engage in deliberate practice during one practice session?
    Less than 30 minutes
    30 - 60 minutes
    61-90 minutes
    91-120 minutes
    121-150 minutes
    151-180 minutes
    More than 150 minutes
31. How did the students practice?
    By themselves
    Paired with another student
    Paired with a peer mentor (a more senior student)
    Paired with a faculty member
    In a group of three or more students
    Other (please specify)
32. Which of the following most resembles the instructions you have provided to students during deliberate practice sessions?
    Practice a skill a specified amount of times
    Practice a skill for a specified duration of time
    Practice a skill until they feel confident
    Practice a skill until they meet a certain goal or standard
33. While the students were practicing, did a faculty member observe each students' skill performance and provide feedback?
    Yes, at every skill practice session
    Yes, at most skill practice sessions
    Yes, at some skill practice sessions
    No (skip next question)
34. Did the students have opportunities to practice the skill after they received instructor feedback?
    YES
    NO

Section IV

Deliberate Practice- the following questions will explore barriers and facilitators to deliberate practice. If you have used deliberate practice, please answer regarding your previous experience with using deliberate practice. If you have not used deliberate practice, please reflect on your current practices, and share what you would perceive the barriers and facilitators might be for using deliberate practice.

Questions about three constraints.

Please describe your access to the following in regard to offering deliberate practice in psychomotor skills education in a pre-licensure nursing program.

Resources:

35. I have enough scheduled time to effectively use deliberate practice in the skills course.
    Strongly Agree
    Agree
    Disagree
    Strongly Disagree
36. In my opinion, a single deliberate practice session should last:
    Less than 15 minutes
    15-30 minutes
    31-60 minutes
    61-90 minutes
    91-120 minutes
    121-150 minutes
    151-180 minutes
    More than 150 minutes
37. I have enough funding to support the use of deliberate practice in the skills course. (e.g., cost of lab materials, faculty salary, etc.)
    Strongly Agree
    Agree
    Disagree
    Strongly Disagree
38. I have access to the lab equipment and supplies I need to use deliberate practice in the skills course.
    Strongly Agree
    Agree
    Disagree
    Strongly Disagree
39. There is enough faculty to support the use of deliberate practice in the skills course.
    Strongly Agree
    Agree
    Disagree
    Strongly Disagree
40. In my opinion, to be able to effectively use deliberate practice, the ideal student to faculty ratio should be:
    1-5 students per faculty member
    6-10 students per faculty member
    11-15 students per faculty member
    16-20 students per faculty member

21-25 students per faculty member
26-30 students per faculty member
More than 30 students per faculty member

41. The lab facilities are adequate for the use of deliberate practice. (e.g., lab space and lab availability).
    Strongly Agree
    Agree
    Disagree
    Strongly Disagree

Motivation:

42. My nursing students are interested in the skills presented in the skills course.
    Strongly Agree
    Agree
    Disagree
    Strongly Disagree
43. My nursing students are engaged while practicing the skills presented in the skills course.
    Strongly Agree
    Agree
    Disagree
    Strongly Disagree

Effort:

44. My nursing students are capable of being fully attentive for 2 hours while practicing the skills presented in the skills course.
    Strongly Agree
    Agree
    Disagree
    Strongly Disagree

Open ended questions:

45. In your opinion, what is the biggest barrier to using deliberate practice in your nursing program?
46. In your opinion, what best facilitates using deliberate practice in your nursing program?
47. If you have any other thoughts about the use of deliberate practice in your nursing program, please write them here.

Thank you for your participation in the study. The survey has ended. **If you would like to enter the participation drawing for a $100 Amazon© gift card, please provide your email. If you win the drawing, an electronic gift card will be sent to the email provided. Participation in the drawing is voluntary and does not affect your participation in this study.**