THE INFLUENCE OF CLINICAL INSTRUCTORS ON NURSING STUDENT ANXIETY IN BACCALAUREATE PRACTICE EDUCATION

by

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Dedication

To me, myself, and I. The amount of time, energy, fortitude, and tenacity that I poured into this thesis research project is a testament to my unbreakable spirit and ability to succeed in fulfilling my aspirations against all odds.

To Ardeshir and Rocky Pooh Bear for the godsent heroes that they are in bringing sunshine and rainbows to life's storms and dark days without fail, no matter what.

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Abstract

This study explored the relationship between teaching behaviours of clinical instructors (CIs) and nursing student anxiety in baccalaureate practice education. A descriptive, correlational survey design examined the influence of CI teaching behaviours on students' anxiety levels. A total of 202 students participated from an accredited academic institution in British Columbia. Data was collected using an online questionnaire (response rate was 55%). Hierarchical multiple regression statistical analysis found that CI teaching behaviours had a moderate inverse relationship with student anxiety. The predictors of this relationship, in descending order of importance, were CI teaching behaviours that nurtured positive interpersonal relationships with students, the CI fulfilling their role as teacher, and the overall perceived effectiveness of the CI. These findings show that CIs can significantly influence student anxiety by their teaching behaviours. This study contributes valuable knowledge and insights to understanding the student-teacher relationship and the impact of CIs on students' learning experiences.

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List of Abbreviations

CI	Clinical Instructor
DV	Dependent Variable
IV	Independent Variable
MI	Multiple Imputation
HMR	Hierarchical Multiple Regression
MVA	Missing Values Analysis
NCTEI	Nursing Clinical Teacher Effectiveness Inventory
PMM	Predictive Mean Matching
QCLE	Quality of the Clinical Learning Environment
SAI	State Anxiety Inventory
STAI	State-Trait Anxiety Inventory
TAI	Trait Anxiety Inventory

CHAPTER ONE: INTRODUCTION AND BACKGROUND

The fundamental purpose of nursing education is to safeguard the public by ensuring that nurses are sufficiently prepared with adequate knowledge and caring abilities to be competent, safe, and ethical practitioners of healthcare (Canadian Association of Schools of Nursing, 2016). Given that nursing is a practice-based profession, practical hands-on learning experiences in real-life clinical situations and actual care settings are important for nursing students to develop the knowledge, skills, and attitudes required to meet the needs and demands of the nursing workforce after graduation (Canadian Association of Schools of Nursing, 2015; Canadian Association of Schools of Nursing, 2022). Practice education in the clinical setting provides nursing students with the opportunity to apply, develop, and consolidate core nursing capabilities under the guidance and supervision of a clinical instructor (CI), and be objectively evaluated on their nursing performance. The impact of practice education to improve the preparedness of nursing students is such that accreditation of baccalaureate nursing education programs in Canada requires that an adequate number of core curriculum hours be allocated to practice education experiences (Canadian Association of Schools of Nursing, 2015).

The high demands and competitive nature of baccalaureate nursing education, coupled with the concurrent didactic and clinical design of the curriculum, yields a variety of significant stressors for students (Hutchinson & Goodin, 2013). Research suggests that it is predominantly the exposure to the complexities and demands inherent of healthcare environments that cause nursing students to face a disproportionate amount of stressors in their education experience compared to students in other health disciplines (Crary, 2013; Bartlett, Taylor, & Nelson, 2016, as cited in Stubin, 2021). The implications of stress in nursing students have widespread impacts and ramifications, including reduced personal wellness, poorer learning outcomes, lower retention rates, and higher absenteeism (Amattayakong et al., 2020; Simpson & Sawatzky, 2020; Turner & McCarthy, 2017).

Background

To understand the significance of anxiety experienced by nursing students in baccalaureate practice education, it is imperative to understand how stress contributes to

student anxiety and how anxiety impacts students' learning. When stress and/or anxiety overwhelm the human psyche, psychological and physical functioning is significantly impacted. *Stressors* are defined as overwhelming environmental pressures that stimulate stressful thoughts, feelings, and sensations in a person (Simpson & Sawatzky, 2020). How an individual person interprets and manages to cope with stress is ultimately determined by the unique cascade of psychophysiological reactions and behavioural responses that are triggered and manifested. In this way, a stressor can be either helpful or hindering. For example, when a stressor is considered tolerable and can be effectively managed by the person, the effect of the stress may motivate and boost performance (Chettri et al., 2021). However, when a stressor is perceived or imagined as threatening, anxiety results (Simpson & Sawatzky, 2020). When a stressor is recognized as an actual threat causing imminent danger or harm, fear ensues (Simpson & Sawatzky, 2020).

As discussed in Simpson and Sawatzky's (2020) concept analysis of clinical placement anxiety in nursing students, neither fear nor anxiety are helpful for nursing students to experience. Fear evokes the flight, fight, or freeze response by eliciting an overriding activation of the autonomic nervous system (Spielberger, 1972). Although generally less acute and intense than fear, anxiety also activates the autonomic nervous system in ways that can disrupt a students' ability to learn, perform, and enjoy the educational experience (Simpson & Sawatzky, 2020). Symptoms of anxiety experienced by nursing students in the clinical setting have been reported to include shortness of breath, increased heart rate, perspiration, tremors, restlessness, insomnia, stuttering, confusion, inattention or selective attention, recall and memory impairments, avoidance, and intense feelings of dread, worry, uneasiness, apprehension, and more (Simpson & Sawatzky, 2020). Because human experience is predominantly subjective and because there exist fewer objective threats than perceptually subjective ones in the clinical setting, anxiety is much more prevalent than fear amongst nursing students (Simpson & Sawatzky, 2020).

Because anxiety is subjectively perceived, anything perceptually threatening or frightening can provoke anxiety in a person. According to research, common sources of anxiety for nursing students in practice education can stem from a variety of things, mainly

unfamiliar environments or situations, feeling incompetent or unprepared, and difficult interactions with patients and clinical staff (Simpson & Sawatzky, 2020). The student-instructor relationship is also recorded in the literature as being a prominent source of anxiety for nursing students (Hutchinson & Goodin, 2013; Jafarian-Amiri et al., 2020; Panda et al., 2021; Won, 2023). Such behaviours as harsh criticism from the CI commonly produce higher levels of anxiety in students causing them to become overly concerned about making mistakes and receiving a poor evaluation (Panda et al., 2021). Because of the various impediments that anxiety can cause students, CIs who are perceived as causing and/or worsening students' stress and/or anxiety are generally considered to be unsupportive (Hutchinson & Goodin, 2013; Won, 2023). The significance of the effect of anxiety on students' learning is such that Jafarian-Amiri et al. (2020) describe CIs as being "the most important problem" in nursing practice education.

Words such as "empowering/disempowering" (Mahasneh et al., 2020), "best/worst" (Mogan & Knox, 1987), "inviting/uninviting" (Cook, 2005), and "effective/ineffective" (Allen et al., 2012; Gignac-Caille & Oermann, 2001; Li, 1997) have all been used historically to describe behaviours and/or characteristics that define supportive verses unsupportive CIs. "Supportive" and "unsupportive" are terms used loosely in the literature to differentiate CI teaching behaviours into two categories: behaviours that effectively support students' learning and behaviours that hinder it, typically by causing stress and/or anxiety in students (Jafarian-Amiri et al., 2020; Panda et al., 2021).

Supportive CIs are helpful mentors who engage in caring relationships, hand-in-hand as an equal partner, with students through the ups and downs of the entire educational experience of the practice course (Mahasneh et al., 2020). Supportive CIs enjoy teaching and are well organized and confident in their teaching capabilities (Mogan & Knox, 1987). When needed, they are accessible and approachable (George et al., 2020; Mogan & Knox, 1987). They are also knowledgeable and skillful nurse clinicians, who are enthusiastic about empowering students in their clinical capabilities and promoting student independence (Bagcivan et al., 2015; George et al., 2020; Mahasneh et al., 2020; Mogan & Knox, 1987). Moreover, supportive CIs exemplify good role models and take responsibility for their

actions (Mahasneh et al., 2020; Mogan & Knox, 1987). When interacting with students, supportive CIs are willing, patient, and provide a safe space that fosters mutual respect (Mahasneh et al., 2020). When they correct students or provide students with feedback, supportive CIs do so constructively without shaming or belittling students (Bagcivan et al., 2015; George et al., 2020; Mahasneh et al., 2020; Mogan & Knox, 1987).

In contrast, unsupportive CIs are characterized in the literature as being disempowering and poor role models (Knox & Mogan, 1985a; Mahasneh et al., 2020). They are either absent or incompetent teachers and/or nurse clinicians (Knox & Mogan, 1985a; Mahasneh et al., 2020). They abuse their power with grade obsession or threats of punishing or failing students (Mahasneh et al., 2020). Unsupportive CIs are unapproachable, judgemental, closed-minded, and lack empathy and understanding (Knox & Mogan, 1985a; Mahasneh et al., 2020). They do not communicate their expectations clearly and make students feel bad about themselves when mistakes are made (Knox & Mogan, 1985a; Mahasneh et al., 2020). They fail to create an atmosphere of mutual respect and trust, and neglect to take responsibility for their own limitations (Knox & Mogan, 1985a; Mahasneh et al., 2020). In summary, unsupportive behaviours from CIs can be perceived as threatening and cause increased levels of anxiety in nursing students. Whereas supportive behaviours from CIs tend to nurture non-threatening, therapeutic student-teacher relationships, which in turn promotes positive learning experiences and improved learning outcomes for students.

Anxiety experienced by nursing students in practice education is well documented in the literature as being a noteworthy factor that impacts students' ability to learn and perform (Simpson & Sawatzky, 2020). Anxiety has the power to impair students' acquisition and implementation of nursing knowledge, skills, and caring abilities by provoking a cascade of disruptive psychological reactions and physiological responses (Chettri et al., 2021; Simpson & Sawatzky, 2020). While there is no question of the existence and significance of anxiety in nursing students, how exactly and to what extent the CI contributes to student anxiety in practice education has yet to be fully understood. An integrative review exploring nursing student anxiety in the clinical setting (Cornine, 2020) identified just two single research studies that investigated the correlation between specific CI teaching behaviours and student

anxiety (Cook, 2005) and student stress (Roe, 2009, as cited in Cornine, 2020). Despite the relevancy and impactful implications of this topic to teaching and learning in nursing practice education, there remains relatively little research that comprehensively tests the nature and strength of relationship between specific CI teaching behaviours and student anxiety. This gap in research makes it difficult to accurately understand and explain the extent to which behaviours of CIs contribute to the phenomenon of anxiety experienced by nursing students in practice education. It was upon this premise, with the intention of improving learning experiences and outcomes for baccalaureate nursing students, that this research study was created.

Definition of Terms

To ensure accurate comprehension of the concepts used in this research study, this section defines and distinguishes key terms and concepts that were operationalize in this study. The following conceptualized definitions aim to clarify the subjects being studied (i.e., nursing students in practice education), the primary source of influence being investigated (i.e., CIs), and the study's main outcome of interest (i.e., anxiety in nursing students).

Nursing Student

A person who is currently enrolled in a baccalaureate degree program that provides the pre-registration education requirements to become licensed as a Registered Nurse in Canada.

Baccalaureate Degree Program in Nursing (i.e., BSN or BScN)

An undergraduate education program delivered through a college or university that is designed to prepare a generalist nurse for entry-level practice. The program's duration is typically four years in length or three years condensed and consists of a mixture of practical and theoretical courses.

Practice Education

Academic courses that are delivered under the supervision of a CI in any given clinical setting outside the physical environment of formal classrooms and simulated environments (CASN Task Force on Clinical/Practice Education, 2003). Practice education is used interchangeably with clinical experience or clinical practicum. For the purposes of

this study, it does not include preceptorship experiences in which a nursing student is under the direct supervision of a staff nurse.

Clinical Setting

Any given setting in which healthcare services are delivered to patients or clients by regulated care providers. For example, hospitals, nursing homes, outpatient clinics, community group homes, private dwellings, and schools, etc.

Clinical Instructor

A permanent, temporary, or contractual faculty member who is assigned to teach practice education to a group of baccalaureate degree nursing students (typically 6 to 8 students) in a clinical setting. This individual is responsible for negotiating students' patient/client assignments, supervising students' care of patients/clients, and evaluating students' practice performance (CASN Task Force on Clinical/Practice Education, 2003).

Anxiety

A personal feeling of unease caused by intrusive thoughts to the notion of an uncertain or imaginary threat (Yamamori & Robinson, 2023; Xi, 2020). Anxiety can manifest various physical, psychological, and behavioural reactions and responses that are disruptive, and may cause mild to severe impairments to normal functioning through the activation of the autonomic nervous system (Yamamori & Robinson, 2023; Xi, 2020). For the purposes of this study, this definition of anxiety operationalizes "state anxiety" and is separate from a person's tendency or predisposition to experience feelings of anxiousness (i.e., "trait anxiety"; Spielberger, 1972). Furthermore, it does not include the criteria for a clinical diagnosis.

Thesis Purpose and Objectives

The overarching purpose of this study was to examine the influence of CI teaching behaviours on the anxiety experienced by nursing students in baccalaureate practice education. Based on this, the primary research question sought to answer if a relationship existed between CIs and student anxiety, and if so, in what direction and to what extent. The secondary research questions sought to identify and describe specific teaching behaviours of

CIs that contributed to either increasing or decreasing anxiety in nursing students. More explicitly, the objectives and corresponding research questions of this study were:

1. To examine the relationship between CI teaching behaviours and anxiety experienced by nursing students in practice education.
    1.1. What relationship exists between CI teaching behaviours and nursing student anxiety in practice education?
2. To identify what specific CI teaching behaviours are associated with anxiety experienced by nursing students in practice education.
    2.1. What are behaviours of CIs that increase nursing student anxiety in practice education?
    2.2. What are behaviours of CIs that decrease nursing student anxiety in practice education?

It was hypothesized that certain teaching behaviours of CIs would be associated with increasing anxiety in nursing students, while others would be found to either decrease or have no effect on student anxiety.

Relevance and Significance

The topic of this study was relevant and significant because it intended to contribute to lessening the existing gap in research explaining the association between CI teaching behaviours and nursing student anxiety. While sufficient research evidence points to the fact that CIs are key facilitators of student learning in baccalaureate practice education (Jafarian-Amiri et al., 2020), further scientific exploration is needed to accurately identify specific CI teaching behaviours that contribute to student anxiety and to measure the degree to which these CI behaviours influence student anxiety (Cornine, 2020). Conducting this research was important because anxiety in nursing students can create significant barriers and challenges to their ability to learn and perform in the clinical setting and can cause negative impacts to their personal wellbeing. There are many serious consequences associated with heightened anxiety in nursing students that have been identified by existing research literature. Anxiety can make it difficult for nursing students to apply higher-level cognitive nursing capabilities, such as critical thinking (Hutchinson & Goodin, 2012). It can also cause students to engage

in relief behaviours, such as avoidance or escape which contribute to increased absenteeism and attrition rates (Peplau, 1989, & Rachman, 2004, as cited in Simpson & Sawatzky, 2020). Furthermore, intolerable anxiety that is sustained in nursing students is known to be detrimental to students' personal wellbeing (Juan et al., 2023) and increase their risk for the development of anxiety disorders (American Psychological Association, 2013, as cited in Simpson & Sawatzky, 2020). Conducting research to better understand the phenomenon of anxiety in the student-teacher relationship would support the acquisition of knowledge needed to proactively and effectively mitigate student anxiety. The potential benefit of this research evidence to improving learning experiences and outcomes for nursing students cannot be overestimated.

Personal Importance

The topic of anxiety experienced by nursing students in practice education is of particular importance to me because of my own personal experience teaching nursing students at a variety of levels in baccalaureate education programs. From my experience teaching in the role of a CI, I have witnessed anxiety impact the physical functioning and psychological capabilities of nursing students in numerous ways. Sometimes, the experience of anxiety has a positive affect by motivating students to heighten their awareness and increase their due diligence and attentiveness. For example, I have observed anxiety propelling nursing students to take constructive action to better prepare themselves for a clinical shift or become more thorough in the collection process of relevant client data to not miss something important. Most often, however, I have observed anxiety negatively interfering with nursing students' ability to learn and perform in the clinical setting.

Many times, I have seen students became so overwhelmed with anxiety that they miss something that is very important, like neglecting to identify reportable assessment findings of a client. In one instance, a student failed to report and investigate the new onset of bradycardia in a client because of the anxious rush they were in to complete the client's physical assessment and move on to other care activities. I have also witnessed anxiety to inflict sudden states of cognitive freeze or mental block in students, in which they could not process information or respond verbally. Anxiety has also been the cause of students erupting

into tears when given constructive feedback or a poor evaluation, or when confronted with an adverse incident involving a client in their care despite them having done nothing wrong (e.g., accidental fall, sudden hemodynamic instability, or unexpected cardiac arrest). For the few students who were unable to overcome their anxiety and correct their performance with extra support before the end of the course, the consequence of their anxiety was seismic and prevented them from progressing into the next semester of the nursing program.

Of all the students I have taught who have needed additional learning supports or who were failing to meet the learning objectives of the practice course, each one self-reported that their experience of anxiety was a predominant contributing factor, in some way, shape or form, to their unsatisfactory performance. For these students, anxiety presented a serious barrier to their successful performance and progression in the practice course. Anxiety is a very powerful emotion that can have very powerful implications on the autonomic nervous system. When anxiety is experienced by nursing students in the clinical setting it can supress their cognitive functioning, disrupt their emotional stability, and impair their psychomotor capabilities (Simpson & Sawatzky, 2020). While there are an abundance of factors that are known to influence the experience of anxiety in nursing students in the clinical setting, such as a lack of clinical preparation, fear of harming patients or making mistakes, and stressful interactions with physicians, staff nurses, and patients (Hutchinson & Goodin, 2013; Alshahrani et al., 2018, Beck, 1993, Kim, 2003, Melincavage, 2011, Melo et al., 2010, Sharif & Armitage, 2004, & Sun et al., 2016, as cited in Simpson & Sawatzky, 2020), little seems to be known about the influence of CIs on student anxiety.

When I first started teaching, I had a sneaking suspicion based on my own lived experience as a nursing student that I, by default in the role of CI, could potentially be a trigger of anxiety to my students. It did not take long for my suspicion to be confirmed that the CI is most definitely a significant influential factor of student anxiety. Let me take you back to the event that cemented this realization for me. It occurred in 2019 during my first year teaching. One nursing student in the practice course that I was teaching appeared obviously anxious on the first day. Their anxious state persisted relatively consistently every clinical shift thereafter for several weeks before I started to notice some very interesting

patterns of behaviour demonstrated by the student, specifically when I was interacting with them. When I observed the student from afar, they seemed to perform appropriately and as expected for the level of their education in the BSN program. Whenever I approached the student to support or evaluate their clinical practice, the student would often draw blanks or freeze on the spot in response to me, or excessively over check their actions. Realizing that this behaviour seemed to only occur when I was in the student's presence, I decided to change my approach of interacting with them.

Strategies that I adopted in my efforts to ease the student's anxiety included: (a) being mindful as to when and how I gave the student feedback; (b) softening the tone of my voice and demeanour when I was feeling stressed to prevent it from showing outwardly to the student; (c) refraining from interrupting the student when they were performing care activities; (d) making a plan with the student about what support they anticipated needing from me that day at the beginning of the shift; and (e) notifying the student in advance as to what I would be evaluating them on and when this evaluation would occur. As it turned out, these small changes proved to be big wins for the student. Once I started to consistently enact these curtailed teaching behaviours into my interactions with the student, the student's anxious behaviours began to subside and their performance dramatically improved. By the end of the course, the student met all the learning outcomes and passed the course successfully. Since then, I have explored similar tactics to support anxious students with overall great success.

Over the years, my impression that CIs can potentially be stressors for nursing students has been corroborated by the personal experiences of many colleagues that I have worked with and numerous students that I have taught. As a nursing educator who strives for teaching excellence and desires the best of success for all the students entrusted to my care, I felt obligated to find out more about how my teaching behaviours influence anxiety in the students I teach. Focusing my thesis research project on this topic presented me with the opportunity to continue my exploration more scrupulously through scientific means. Conducting research on this topic would not only be valuable to me, but it would also serve to benefit others considering that well over forty thousand nursing students are potentially

being impacted by anxiety stemming from their undertaking of practice courses each year in Canada alone (Canadian Association of Schools of Nursing, 2019).

Chapter Summary and Outline of Thesis

This chapter has identified that anxiety can cause a cascade of psychological, emotional, and physiological reactions that can create learning barriers and performance problems for nursing students in practice education (Simpson & Sawatzky, 2020). Prominent sources of anxiety for nursing students in the clinical setting, as cited by existing research literature, include stressful interactions with patients and clinical staff, and unfamiliar clinical experiences and environments (Hutchinson & Goodin, 2013; Simpson & Sawatzky, 2020). There is also evidence to suggest that the CI, whose role it is to educate and evaluate nursing students in the clinical setting, is also directly associated with student anxiety (Jafarian-Amiri et al., 2020; Panda et al., 2021; Won, 2023). The purpose of this research study aims to identify specific CI teaching behaviours that influence anxiety in baccalaureate nursing students and to determine the strength and direction of the relationship. This study is relevant and significant because there exists a gap in research explaining the phenomenon of CIs influencing anxiety in students. The impact of the findings of this research study have the potential to improve the quality of the learning experience for nursing students and optimize their performance in practice courses.

This thesis is composed of six chapters. The first chapter has described the foundation upon which the research questions were generated. The next chapter will discuss what is currently known about the research topic from a review of published literature. Chapter Two will also explain how this research study contributes to lessening the knowledge gap within the existing research. Chapter Three describes the design and methodology of this research study, including the sampling, data collection, and data analysis procedures. Results of the data analysis will be presented in Chapter Four, followed by a comprehensive discussion of the significance of this study's findings in Chapter Five. Lastly, Chapter Six summarizes the conclusions of this study, and offers recommendations for future research and changes to the pedagogy of practice courses in baccalaureate nursing programs.

CHAPTER TWO: LITERATURE REVIEW

Anxiety contributes to negative learning experiences and poor learning outcomes for nursing students (Simpson & Sawatzky, 2020; Won, 2023). As was mentioned in the previous chapter, anxiety in nursing students enrolled in practice education has been associated with factors that include unfamiliar environments and situations, and stressful interactions with clinical staff, patients, and CIs (Hutchinson & Goodin, 2013; Jafarian-Amiri et al., 2020; Panda et al., 2021; Simpson & Sawatzky, 2020; Won, 2023). Of particular interest to this research study is the association of CI teaching behaviours with student anxiety. This chapter describes the literature review process that was conducted and explains what is currently known about the relationship between CI teaching behaviours and nursing student anxiety in baccalaureate practice education. Based on the review, knowledge gaps and limitations in the literature will be revealed that further substantiate the relevance and significance of this research study.

Search and Retrieval Strategies

A review of the literature for this proposed study was conducted in November 2021. To retrieve the research literature, the following online research databases were searched: the Cumulative Index to Nursing and Allied Health Literature (CINAHL Complete) and Medline with Full Text through the Elton B. Stephens Company (EBSCOhost). These two databases were selected because of their credibility within the global healthcare community as well as inventory size. CINAHL Complete is the largest full-text collection of nursing and allied health research that is available (EBSCO, 2024). Similarly, Medline is widely recognized for its unparalleled full-text collection of sought-after medical journals (EBSCO, 2024). The search strategy for this literature review (see Appendix A) was created based on one primary question and a set of secondary questions that reflect the problem statement for which this research study was undertaken:

1. What behaviours of CIs influence anxiety in nursing students?
    a. In general, what type of anxiety do students encounter in practice courses?
    b. What are students' experiences/perspectives of this anxiety?

c. What do we know about students' interactions with the CI? And how are these associated with student anxiety?
d. What CI teaching behaviours increase or decrease student anxiety in practice education?

From these questions a series of search terms defining each concept of interest was produced and tabulated. Both keyword and subject heading search strategies were devised according to the unique design of the two research databases used (CINAHL Complete and Medline with Full Text). Curtailing the literature review search procedure in this way supported accuracy and relevancy of the records produced. First for the keyword search, the specific search terms (see Appendix A) were carefully selected and pretested to maximize precision and to streamline recall of the results that were produced (Melnyk & Fineout-Overholt, 2015). Since a limited number of research articles used the term "anxiety", the terms "stress", "fear" and "worry" were included to capture relevant historical research related to the topic of interest. These four primary keywords were selected because stress is a precursor to anxiety, fear is induced when anxiety is perceived as causing imminent danger, and worry is sometimes used to describe anxiety (Simpson & Sawatzky, 2020). For the keyword search, asterisk truncation was utilized to provide a more concise search process by reducing the number of separate search terms (Melnyk & Fineout-Overholt, 2015). For the subject heading search, specific CINAHL Subject Headings and Medline Medical Subject Headings (MeSH) were employed to identify and select relevant index terms. For both keyword and subject heading search operations, Boolean operators "AND" and "OR" were used in conjunction with related terms to maximize recall and precision of the search results (Melnyk & Fineout-Overholt, 2015). During the application of this search strategy, it was observed that the concept describing the setting (i.e., "practice education") reduced the recall of the results without necessarily improving the precision when added to the other three concepts (i.e., "baccalaureate nursing students", "anxiety", and "clinical teacher"; see Appendix A). Therefore, it was determined to exclude this concept and screen all the results from all the searches using three concepts only.

Articles that were retrieved from the search strategy were screened following Garrard's (2017) Matrix Method. The inclusion and exclusion criteria (see Appendix B) were carefully formulated to identify relevant articles and filter out irrelevant ones quickly and reliably. Articles that met the inclusion criteria underwent a quality appraisal assessment guided by Polit and Beck (2017). A PRISMA flow diagram was used to illustrate the results of the screening methodology undertaken for this literature review (see Appendix C).

The rest of this chapter discusses the results of the literature review search strategy. The major defining characteristics of the retrieved research articles are first summarized, followed by a synthesis of the research evidence pertaining to the primary and secondary research questions of this study that guided this literature review.

Synthesis of the Research Evidence

A total of four relevant primary single-study research articles investigating the influence of the CI on anxiety experienced by baccalaureate nursing students in practice education were retrieved from the literature review search procedure conducted for this study. These studies used descriptive or exploratory designs that were cross-sectional with non-probability sampling. Twoof the studies were quantitative (Bagcivan et al., 2015; Cook, 2005), one was a mixed method (Oermann, 1998), and the other was qualitative (Kushnir, 1986). Kushnir (1986) explored the reactions of nursing students to stressful encounters with CIs. Oermann (1998) described nursing students' perceptions of prominent stressors, challenges and threats in practice education, and key factors that helped or hindered their learning. Bagcivan et al. (2015) described features of CIs that were most sought after by nursing students and identified specific conditions that were a source of stress for students in the education process. Lastly, Cook (2005) used correlation statistics to describe and differentiate CI teaching behaviours that nursing students perceived as being either anxiety-increasing or anxiety-decreasing. The sample populations of these four studies were exclusively baccalaureate nursing students except for Oermann's (1998) study, which also included nursing students enrolled in associate degree programs. Geographical representation of the research participants included baccalaureate nursing students from a school in Israel (N = 28, Kushnir, 1986), a school in Turkey (N = 260, Bagcivan et al., 2015), and multiple

schools across the United States of America (*N* = 229, Cook, 2005; *N* = 204, Oermann, 1998). Collectively, participants were recruited using convenience sampling methods and ranged from junior (i.e., first year) to senior (i.e., final year) in level of education. All participants had experience in at least one practice course that was facilitated by a CI in a clinical setting. Research data was collected through the administration of questionnaires composed of Likert-style or open-ended questions apart from Kushnir's (1986) study, which instead had participants write a situation reflection about a stressful encounter that they had experienced in the past.

To clearly understand nursing student anxiety in the context of nursing research, it is important to be aware of how anxiety has been historically portrayed and represented in nursing literature. Based on the results of the literature review conducted for this study, "stress" was observed to be used in the literature (Bagcivan et al., 2015; Oermann, 1998) as an umbrella term or synonym for anxiety. By definition, *stress* is "a state of worry or mental tension caused by a difficult situation" (World Health Organization, 2023, n.p.). As such, stress is a precursor to anxiety because anxiety is triggered by stress, in the form of a *stressor* (i.e., source or cause of stress), that is perceived or imagined as threatening (Simpson & Sawatzky, 2020). Because of the disruptive and potentially debilitating effects of anxiety on a person's ability to function and cope normally, anxiety is most often associated with negative outcomes and, therefore, carries with it a negative connotation (Yamamori & Robinson, 2023; Xi, 2020). How anxiety is intertwined with stress was important to distinguish to properly interpret the findings of the literature review underpinning this study.

Anxiety from the Perspective of Nursing Students in Practice Education

Of the four studies resulting from the literature review, Kushnir's (1986) was the only study to comprehensively explore the reactions of nursing students (*n* = 20) to stressful encounters with CIs. About one-third of these students reported experiencing physical reactions resulting from a stressful encounter with a CI. Such symptoms included muscle tension, increased heart rate, blushing, and hand tremors. As for the variety of psychological responses generated from stressful encounters with CIs, these ranged more widely from cognitive processing impairments to feelings of strong negative emotions. Reactions that

students most frequently reported having were memory loss, confusion, crying, impaired performance, fear of failure, emotional stress and tension, helplessness, loss of confidence, anger, shame, and embarrassment. Students attributed these physical and psychological manifestations to adverse impacts on their wellbeing and academic performance. Kushnir's (1986) detailed illustration of students' experiences to stressful encounters with CIs correspond to the findings of Simpson and Sawatzky's (2020) concept analysis defining anxiety in nursing students that was described in the previous chapter. From this comparison, it can be reasonably deduced that the findings of Kushnir (1986) provide an accurate depiction of the anxiety nursing students may experience when interacting with CIs. The findings of Kushnir (1986), reinforced by Simpson and Sawatzky (2020), suggest that anxiety experienced by nursing students in practice education as a result of interactions with CIs is generally unpleasant, unwanted, and unhelpful.

CI as a Source of Anxiety for Nursing Students in Practice Education

Across all four studies generated from the literature review, the CI was identified as being a significant perceived source of stress and/or anxiety for nursing students. The baccalaureate nursing students in Oermann's (1998) study, who reported experiencing a low to moderate amount of stress in practice education (M = 0.8 to 2.49, F = 7.64, $p < 0.001$; 5-point Likert-scale from "none" to "a great deal"), claimed that the CI was a significant source of stress when they acted in ways that students perceived as impairing their ability to learn. They also reported that anxiety in general inhibited their ability to learn. The nursing students in Bagcivan et al.'s (2015) study alleged that the general presence of the CI in the clinical setting was a significant source of stress (M = 6.84, SD = 2.81; 10-point Likert-scale from "causing no stress" to "causing significant stress"). This was similar to the perceptions of some of the students in Kushner's (1986) study who acknowledged that the presence of their CI was a stressor for them. However, for most of the students in Kushnir's study (1986), it was specific behaviours of CIs that caused students to feel stressed and anxious. These findings are further supported by Cook (2005) who discovered moderate negative correlations between inviting teaching behaviours of CIs and self-reported anxiety levels of nursing students. Collectively, the research evidence indicates that the mere presence of a CI,

and more often their behaviours, has the power to influence anxiety in nursing students to some degree.

CI Teaching Behaviours Associated with Nursing Students' Anxiety

Findings from the literature review additionally revealed a range of CI teaching behaviours that were perceived by nursing students as influencing their anxiety levels. Kushnir (1986) isolated four distinct behaviours of CIs that caused the most stress in students. In no order of importance, these behaviours were being highly critical, incisive, interfering, and being inconsiderate of students' level of nursing capabilities or providing feedback in front of patients. Similarly, Bagcivan and colleagues (2015) found that stressors nursing students most complained about in practice education were predominantly related to not being treated fairly (M = 9.49, SD = 1.33) and evaluated objectively by the CI (M = 9.40, SD = 1.25; 10-point Likert-scale from "causing no stress" to "causing significant stress"). Conditions found to cause students the most amount of stress were fear of failure or making mistakes that might jeopardize their academic standing (M = 8.15, SD = 2.15; Bagcivan et al., 2015). Being questioned by the CI (M = 7.37, SD = 2.65) was also reported to provoke heightened stress in students (Bagcivan et al., 2015). Additionally, a lack of supportive supervision from the CI or the complete absence of the CI (M = 6.84, SD = 2.81) was mentioned as being another contributing factor that led to stress in students (Bagcivan et al., 2015).

Furthermore, Cook (2005) found that acting impolitely towards students, being difficult to talk to, or treating students as if they were irresponsible were specific CI teaching behaviours that were found to have moderate *positive* correlations with student anxiety (r = 0.59, $p < 0.01$). In contrast, "showing respect for students, expressing pleasure with a clinical group, selecting appropriate patient assignments, and acting friendly and trustful of students" (Cook, 2005, p. 160), were all behaviours of CIs found to have moderate *negative* correlations with student anxiety (r = -0.64, $p < 0.01$). These teaching behaviours explained 41% of the variance in a stepwise, multiple regression analysis with a high degree of multicollinearity (r = 0.85; Cook, 2005). Similarly, Oermann (1998) found that student stress was decreased when the CI demonstrated behaviours that supported and promoted student

learning in a helpful way. Students in this study described supportive CIs as being "clinical experts who assisted them in applying theory to patient care" (Oermann, 1998, p. 200). Supportive CIs exemplified the ability to demonstrate procedures, explain concepts clearly, and supervise students without hindering their independence (Oermann, 1998). Displaying caring behaviours and empathy, providing immediate feedback, demonstrating enthusiasm, and being available to students and answer their questions were additional behaviours of CIs reported to be particularly effective at reducing anxiety provoking stressors and facilitating students' learning in the clinical setting (Oermann, 1998). Overall, CI teaching behaviours that students perceive as inhibiting their learning were associated with increased stress and anxiety, which in turn impaired students' ability to learn and perform in the clinical setting (Oermann, 1998).

Major Conclusions

This literature review revealed that anxiety for nursing students in practice education stems from CI teaching behaviours that are perceived to be "stressful" (Bagcivan et al., 2015; Kushner, 1986), "inhibit learning" (Oermann, 1998), or are "uninviting" (Cook, 2005). As for what specific CI teaching behaviours are stressors for students and cause student anxiety, the descriptions varied widely across all four single studies perhaps because of the different measurement tools used. Terms such as "being unhelpful", "demeaning", "overly critical", "unavailable", "inconsiderate", "unfair", "unfriendly", and "unapproachable" summarize words that research participants used to describe CIs who were perceived as causing stress and/or provoking anxiety in students. In comparison, CIs who were not perceived as causing stress and/or provoking anxiety in students were described in more positive terms such as "kind", "caring", "effective communicators", "helpful", "knowledgeable", and "present". These negative and positive descriptions of CI teaching behaviours corresponded to the negative and positive perceptions students had about them. Overall, the research literature interpreted CI teaching behaviours that were perceived to impair or threaten a student's state of wellbeing or satisfactory performance as causing stress and/or anxiety that was unhelpful to students and unwanted. Despite the differences between the four studies reviewed, the

evidence from the literature review collectively identified the CI as being a predominant source of stress and/or anxiety for nursing students in practice education.

Gaps and Limitations

While the literature review provided valuable insights into the existence of stress and/or anxiety in nursing students influenced by teaching behaviours of CIs, it is important to consider the gaps and limitations of this evidence. The main limitations pertain to the generalizability of the evidence. Of most significance is the strength of evidence, which has been assessed as being a Level II on a three-point hierarchy scale for descriptive and meaning-type research inquiry (Polit & Beck, 2017). None of the studies met the highest levels of evidence: a systematic review or experimental research study (Polit & Beck, 2017). The strength of the evidence is further weakened by convenience sampling methods executed in all four studies; granted, it is very common for these types of research designs to use it for reasons of feasibility. Convenience sampling is a type of non-probability sampling method that is prone to self-selection bias because the participants of the studies volunteer themselves compared to being randomly selected (Polit & Beck, 2017). Another limitation is that power analysis and effect size, which are statistical tests used to measure the generalizability of the findings within the sample (Polit & Beck, 2017), were not evaluated in any of the quantitative studies (Bagcivan et al., 2015; Cook, 2005; Oermann, 1998). However, the concerns of generalizability are offset by the similarities found within the findings of the studies collectively.

Various other biases may have also altered the purity of the collected data and the subsequent results of the studies. Inherent limitations of self-administered questionnaires for data collection (Bagcivan et al., 2015; Cook, 2005; Oermann, 1998) include a risk that participants may provide dishonest answers or interpret questions differently than intended (Polit & Beck, 2017). Granted, most of the researchers of these studies made reasonable efforts to reduce response bias by using measurement tools with established face and content validity. It is also possible that Kushnir (1986) may have introduced experimenter bias by interpreting the written situation reflection responses alone and not having other expert involvement. Additionally, recall bias could have caused the participants of Kushnir's (1986)

study to provide somewhat inaccurate or incomplete written reports of their experiences because they relied on their memory recall to explain the event and had only a short amount of time to do so.

Another limitation worthy of highlighting is the fact that most participants across all four studies were female, which further reduces the generalizability of the studies' findings to all genders. This is a limitation that is difficult to control for given that females continue to dominate the nursing profession around the globe to the present day. Despite the samples of these studies not being gender diverse, they are similar to the representation of nurses in Canada (Canadian Institute of Health Information, 2023).

The strength of the research evidence gathered from the literature review was overall limited by the scant number of studies that met the selection criteria, in addition to the collective variance of non-probability research designs, methodologies, and data collection methods used. This limits the generalizability of the findings and begs for additional, more rigorous research to be conducted so that more accurate and complete conclusions about the research evidence can be determined.

Theoretical Framework

To date, there does not exist a comprehensive theoretical framework that explains the influence of CI teaching behaviours on anxiety in nursing students. Additionally, few attempts have been made by researchers to explain this research problem using existing theories. Of the four studies extracted from the literature review, Cook (2005) was the only researcher to synthesize a theoretical framework as a foundation upon which to build their research study. Based on Novak and Purkey's invitation education theory and Spielberger's state-trait anxiety theory, Cook (2005) proposed that "when both faculty and students perceive faculty behaviours to be inviting or positive, it will lead to lower state anxiety levels and increased learning and performance capabilities among students" (p. 157). This research study intends to build upon Cook's theoretical foundations with the knowledge that teaching faculty are not always aware of the effects their behaviours have on nursing students. Because anxiety is subjective, as is the experience of pain or shortness of breath, understanding the lived experience of students and how they are affected by teaching

behaviours of CIs has great importance. For these reasons, the theoretical framework situating this research study is a synthesis of Spielberger's state-trait anxiety theory and Watson's human caring theory as described below.

Spielberger's Anxiety Theory

According to late expert psychologist Dr. Charles D. Spielberger (1972), anxiety is an emotional state deriving from two distinct concepts: state anxiety and trait anxiety. Spielberger (1972) describes state anxiety as being characterized by feelings of tension and apprehension, accompanied by heightened autonomic nervous system activity, that is stimulated when specific situations are perceived as being personally threatening. The intensity and longevity of the complex psychological and physical reactions stimulated by state anxiety are hinged to the amount of threat that is perceived coupled with the persistence of the person's interpretation of the situation as being dangerous. Trait anxiety is a person's predisposition or proneness to perceive situations as threatening or dangerous. Spielberger's theory denotes that a positive relationship manifests between state and trait anxiety. That is, the greater a person's trait anxiety, the more likely they are to experience state anxiety.

Spielberger's state-trait anxiety theory (Spielberger, 1972) is significant to the research problem of this study because it explains the biological processes and manifestations of anxiety as a response to the activation of the autonomic nervous system when a person perceives a threat to their wellbeing. It also differentiates trait and state anxiety which is important for understanding the two types of anxiety that were measured in this study. Spielberger's (1972) theory suggests that if a student perceives a behaviour of the CI to be threatening or otherwise unsupportive, this will either cause or contribute to state anxiety in the student. The severity of the student's anxious state depends on the student's perception of the threat, their personality trait proneness to experience anxiety (i.e., level of trait anxiety), and the effectiveness of their learned coping mechanisms to combat the threat. CIs who lack the awareness and knowledge to detect anxiety in students and understand how certain teaching behaviours may be threatening to students' sense of wellbeing may not realize their impact on student anxiety. For CIs to be able to curtail their behaviours to avoid causing anxiety in students, they need to know what teaching behaviours are generally

perceived as threatening to students and what behaviours generally help reduce anxiety in students. Therefore, identifying specific CI teaching behaviours that are associated with influencing student anxiety is critical to improving anxiety for nursing students in practice education.

Watson's Human Caring Theory

Nurse theorist Dr. Jean Watson's Caring Science embodies a multi-dimensional model of transformational nursing care that promotes health, healing, wellbeing, and wholeness that extends well beyond the confinements of the dominating conventional biomedical model in healthcare with a focus on caring (Watson, 2008). The theory emphasises that caring is the vessel in which health, healing, and wellbeing prosper. The theory describes the act of caring as a sacred transactional, holistic, and humanistic process that honours all dimensions of the human person: body, mind, and spirit. The theory contends that *what* care is provided is equally as important as *how* the care is provided (Watson, 2008). By fostering human interactions that are meaningful, authentic, intentional, and that honour the person and share in human experiences through loving-kindness and equanimity, a harmonious setting is created between the caregiver and the recipient (Wagner, 2010). This caring approach serves to facilitate and deepen the therapeutic relationship between the two parties and enhance therapeutic outcomes for the person being cared for.

The application of this theory to this study proposed that the essence of providing supportive learning experiences for nursing students is an *act of caring*. As such, caring behaviours are supportive behaviours, and supportive behaviours are those that lead to improved learning experiences and outcomes for students. Since anxiety in nursing students is known to create barriers and challenges to students' ability to learn and perform, teaching behaviours that cause adverse anxious states in students are unsupportive and are therefore uncaring. If a CI enacts principles of human caring in their teaching pedagogy, there is greater likelihood that their teaching methods will be perceived as being supportive by students. When CI teaching behaviours are perceived as being supportive, students will likely experience less anxiety. Mitigating anxiety will improve students' learning experiences and outcomes in practice education. If a CI does not recognize the importance of creating a caring

learning atmosphere for students in practice education, they may act in ways that are perceived by students as being unsupportive, just as a nurse who provides care without caring can be perceived as not caring.

Integration of Watson's and Spielberger's Theories

In the context of nursing education, Watson's theory of human caring (Watson, 2008) and Spielberger's theory of anxiety (Spielberger, 1972) can be integrated and similarly applied. For optimal practice education, students should be placed at the centre of focus to meet their learning needs by facilitating effective learning experiences that support them to develop adequate nursing capabilities and competencies. Because teaching faculty are the cornerstone to the implementation and evaluation of this learning process, their impact and influence cannot be overstated. From an educational standpoint, teaching faculty are the 'caregivers' and the students are the 'recipients' of their instruction. In this context, student anxiety caused by unsupportive CI teaching behaviours (e.g., being unavailable, uncaring, or overly critical of students, etc.) may cause disharmony in the student-teacher relationship that interferes with students' ability to learn and perform in practice education. If the CI is perceived by a student to be a source of anxiety, the complex psychological and physiological reactions that anxiety elicits risks jeopardizing the student's learning and performance. Conversely, if the student-teacher dynamic is based on a harmonious relationship, a student will be less likely to perceive the CI as threatening or a source of anxiety, and this will create an atmosphere that optimizes the student's learning and performance. For students who have moderate to high levels of personality traits that predispose them to experiencing anxiety (i.e., trait anxiety), having a CI that provides them with emotional and psychological safety may be even more impactful to help reduce their anxious tendencies and improve their learning and performance (Spielberger, 1972; Watson, 2008).

Promoting a values-based teaching approach that facilitates caring relationships between the CI and students is instrumental to reducing barriers caused by anxiety and improving positive learning experiences and outcomes for nursing students. The purpose of practice courses in baccalaureate nursing education is for students to learn how to care for

patients safely and appropriately. By demonstrating teaching behaviours that mitigate anxiety and promote a caring learning atmosphere, CIs can support the success of nursing students and optimize their chances of becoming the capable, compassionate nurses that are expected of them and so greatly needed by society (Spielberger, 1972; Watson, 2008).

Chapter Summary

This chapter explained the foundation upon which this research study was constructed. A review of the literature revealed that there exists a very limited amount of scientific knowledge explaining the relationship between CI teaching behaviours and student anxiety in practice education. Despite the limitations of the existing research evidence, there exists an obvious association between CI teaching behaviours and student stress and/or anxiety in baccalaureate practice education (Bagcivan et al., 2015; Cook, 2005; Kushner, 1986; Oermann, 1998). Specifically, some CI teaching behaviours, such as being overly critical, interfering, impolite, threatening, or difficult to talk to, are perceived by students in the research literature as provoking stress and/or anxiety (Bagcivan et al., 2015; Cook, 2005; Kushner, 1986; Oermann, 1998). The theoretical framework upon which this research study was undertaken was rooted in Watson's caring perspective (Watson, 2008) with the understanding that anxiety does not benefit nursing students' wellbeing or learning, and that a caring teaching approach can serve to effectively reduce student anxiety. The theoretical framework of this study was also rooted in Spielberger's anxiety theory (Spielberger, 1972), which provides a sound scientific understanding of anxiety and a person's proneness to experience anxiety as a personality trait. The next chapter will explain how the design of this study was constructed upon the existing body of scientific evidence and synthesized theoretical framework.

CHAPTER THREE: RESEARCH METHODS

This quantitative study examined the relationship between CI teaching behaviours and anxiety experienced by nursing students in baccalaureate practice education with the aim of identifying specific CI teaching behaviours that are associated with student anxiety. This chapter describes the design of the data collection tool and process, the sampling and recruitment procedure, and the data analysis methods.

Design

A quantitative descriptive, correlational survey design was selected as being the most appropriate research design for this study. This specific type of research design could produce measurable data that would describe students' level of anxiety and examine the relationships between behaviours of CIs and the anxiety experienced by nursing students in practice education. Furthermore, this cross-sectional non-probability research methodology enabled the study to be manageable and feasible to conduct, compared to other approaches such as longitudinal, given the limited resources and time constraints.

Data Collection

The data collection tool was a single self-administered questionnaire (see Appendix D) that was delivered electronically through Survey Monkey®, a reputable online survey administration platform. This was the preferred method of delivery for three main reasons: accessibility, environmental stewardship, and privacy. An electronic survey meant that it would be accessible to participants 24/7 on any electronic device that had the compatibility of connecting to the internet. A digital format would also spare costly amounts of paper, ink, and waste, limiting any negative impacts to the environment. Survey Monkey® stored the data in a cloud server that met the requirements of British Columbia's Freedom of Information and Protection of Privacy Act (FIPPA).

The electronic questionnaire consisted of five sections and took an average of 19 minutes to complete. The first section asked participants about their current practice course and how they perceived their performance in practice education. This section also contained one question that asked about the participant's perception of the CI's overall teaching effectiveness. In the second section, participants were asked to rate the quality of the clinical

learning environment where their practice course was situated. This was followed by the next section which asked participants to assess the frequency that the CI demonstrated effective teaching behaviours during their interactions with them. The next section asked participants to rate the degree of anxious feelings that they felt during both their interactions with the CI and in general irrespective of the CI. The final section was composed of typical demographic questions and an optional textbox for participants to provide any additional comments about their experiences and feelings. The questionnaire concluded with a thank-you statement to participants that included contact information for the study.

Measurement

Table 1

The 123 items in the questionnaire comprised four categories of quantitative measurements: (a) demographic indicators; (b) dependent variables; (c) independent variables; and (d) covariates. The independent variables (IVs) had a presumed influence on the dependent variable (DV) or outcome, which was student anxiety. Covariates were variables presumed to have a confounding effect on the DV. As described in Chapter Two, anxiety in baccalaureate nursing students was reported in the literature as being influenced by the CI. Therefore, all variables that would help to explain specific behaviours and/or the effectiveness of CIs in fulfilling their role of a 'good' or 'supportive' CI were selected to be IVs in this study. Similarly, covariates were selected from those variables isolated in the literature as possibly being associated with student anxiety in baccalaureate practice education. provides a categorized list of all the variables included in this study and Table 4 summarizes the measurement properties. In the text of this document, variables are denoted by their given name or code and capitalized. Appendix K illustrates the relationships between the DV, IVs, and covariates as hypothesized.

Table 1

Variables and Their Description

Variable Name	Question	Code	Type
	Sample demographics		
Age	What is your age in number of years?	Age	Categorical
Gender	What is your gender?	Gender	Categorical

Variable Name	Question	Code	Type
Ethnicity	What are your ethnic or cultural origins?	Eth	Categorical
Self-evaluation of practice performance	How would you rate your overall performance in the practice course that you are currently completing?	PC4	Categorical
Type of care facility	What type of care facility is the current placement site?	PC2	Categorical
Practice course care focus	What is the care focus of the current practice setting? (i.e., the type of patients for which care is being provided.)	PC3	Categorical
	DV		
State Anxiety (SAI, 20 items)	Asks participants to rate their feelings of state anxiety when interacting with the CI.	S_Ax_#	Continuous
	IVs		
Overall CI Effectiveness	Overall, how do you rate the effectiveness of your clinical instructor in the current practice course that you are completing right now?	CIe	Continuous
Role of CI (QCLE, 6 items)	Asks participants to rate the CI's ability to fulfill their teaching role.	RCT#	Continuous
CI Teaching Ability (NCTEI, 17 items)	Asks participants to rate their CI's demonstration of specific teaching ability behaviours.	NCTEI_TA#	Continuous
CI Nursing Competence (NCTEI, 9 items)	Asks participants to rate their CI's demonstration of specific nursing competence behaviours.	NCTEI_NC#	Continuous
CI Evaluation (NCTEI, 8 items)	Asks participants to rate their CI's demonstration of specific evaluative behaviours.	NCTEI_E#	Continuous
CI Interpersonal Relations (NCTEI, 6 items)	Asks participants to rate their CI's demonstration of specific interpersonal relation behaviours.	NCTEI_IR#	Continuous
CI Personality (NCTEI, 7 items)	Asks participants to rate their CI's demonstration of specific personality behaviours.	NCTEI_P#	Continuous
	Covariates		

Variable Name	Question	Code	Type
Trait Anxiety (TAI, 20 items)	Asks participates to rate their feelings of trait anxiety in general.	T_Ax_#	Continuous
Role of Staff (QCLE, 14 items)	Asks participants to rate the nursing staff's ability to support student learning.	PA#	Continuous
Manager's Contribution (QCLE, 4 items)	Asks participants to rate the unit manager's ability to support student learning.	MC#	Continuous
Staff Readiness (QCLE, 3 items)	Asks participants to rate the preparedness of unit staff to support student learning.	READ#	Continuous
Level in the BSN program	What practice course are you completing right now?	PC1	Categorical
Work experience in healthcare	What type of healthcare registration or licensing have you held in the past or hold at present? (Select all that apply.)	Type_ Nurse	Categorical

Note. Table 4 provides a summary of the subscales, total mean score range, and Cronbach's alpha of the measurement tools (i.e., SAI, QCLE, NCTEI, and TAI) used in this study. See Appendix D for each item of the SAI, QCLE, NCTEI, and TAI.

Demographic Variables

Demographic indicators were all single items measured at the nominal level in the form of polychotomous categories (see Table 1 and Appendix D, sections 1 and 6). These variables focused on obtaining relevant information about participants (see Table 2) and the practice courses that they were enrolled in (see Table 3). Questions were purposefully selected based on findings from the literature review and information necessary to adequately describe important sample population characteristics. Included were general sociodemographic questions like gender, age, ethnicity, and type of nursing-related work experience. Level in the baccalaureate nursing program was also included to provide an indication of student experience with CIs in practice education. Other questions described the care focus of the practice course that participants were enrolled in, and their performance standing in the course.

Table 2

Distribution of Demographic Characteristics of BSN Students from the Original Data

Variable	Response Options	*n*[a]	Valid %	Missing %
Age	19 to 24	128	65.3	2.0
	25 to 30	54	27.4	
	31 to 60	16	8.2	
Gender	Male	31	15.5	1.5
	Female	164	82.0	
	Non-binary	4	2.0	
Ethnicity	Caucasian	34	17.3	3.0
	Chinese	36	18.4	
	Filipino	55	28.1	
	Indian (non-indigenous)	22	11.2	
	Other	49	25.0	
Self-evaluation of practice performance	Not at risk	185	92.5	1.0
	At risk	15	7.5	

[a] $N = 202$.

Table 3

Characteristics of the Practice Courses Participants were Enrolled In from the Original Data

Variable	Response Options	*n*[a]	Valid %	Missing %
Type of care facility	Hospital	162	80.2	0.0
	Clinic	1	0.5	
	Residential/long-term/assisted care	39	19.3	
Practice course care focus	Medical for adults	45	22.3	0.0
	Surgical for adults	29	14.4	
	Older adults	57	28.2	
	Mental health for adults	20	9.9	
	Mental health for children/youth	0	0.0	
	Maternity and newborn care	12	5.9	
	Pediatrics	23	11.4	
	Specialized care for adults (e.g., nephrology, cardiology, oncology, neurology, etc.)	16	7.9	

[a] $N = 202$.

Dependent Variable and Covariate Variable: State Anxiety and Trait Anxiety

The State-Trait Anxiety Inventory (STAI or SAI and TAI) for Adults (Spielberger, 1983) was used to measure anxiety (see Appendix D). The STAI is one of the most popular world-renowned psychometric tools used among various disciplines to evaluate the presence and proneness of self-reported anxiety (American Psychological Association, 2011). It is a non-diagnostic tool used to measure state anxiety and trait anxiety. State anxiety refers to the actual experience of anxiety. On the other hand, trait anxiety is a person's predisposition or proneness to experience anxiety and relates to a person's underlying personality traits. It is important to measure both state and trait anxiety because one can impact the other. "Persons who are high in Anxiety-Trait tend to perceive a larger number of situations as dangerous or threatening than persons who are low in Anxiety-Trait, and to respond to threatening situations with Anxiety-State elevations of greater intensity" (Spielberger, 1972, p. 39). Therefore, the DV of this study was state anxiety and trait anxiety was measured as a covariate. The STAI is composed of a total of 40 items measuring physical, psychological, and emotional presentations of anxiety that are split into two forms:

1. Form Y-1 (i.e., SAI) consists of 20 question items that cumulatively measure the level of anxiety experienced by a person in a given situation at a particular time.
2. Form Y-2 (i.e., TAI) has 20 question items that identify underlying personality traits that lead to an increase in a person's proneness to experience anxiety in any given situation.

All items of the STI and TAI were measured at a continuous level on a 4-point Likert scale (see Table 2). Different wording was used for the items on each form to conform to the specific type of anxiety being examined (e.g., state or trait anxiety). STI items were scored as "not at all", "somewhat", "moderately so", or "very much so". Whereas, the Trait Anxiety items were scored as "almost never", "sometimes", "often", or "almost always". Higher scores denote higher levels of anxious feelings with total scores for each anxiety type ranging from a minimum of 20 to a maximum of 80 points. To promote personal wellbeing, it may be advantageous for students who score as having moderate to high levels of anxiety to explore

the causes and effects of the anxiety and develop strategies to reduce and/or therapeutically manage it (Chettri et al., 2021; Simpson & Sawatzky, 2020).

In terms of the psychometric properties of this tool, both reliability and validity has been reported by researchers historically. Initial reliability testing of the tool produced strong median Cronbach alpha coefficients of .92 for the SAI and .90 for the TAI (Spielberger, 1983). More recently in a nursing study, Cook (2005) found that the STI produced a high degree of internal consistency with a calculated reliability coefficient of .96. Furthermore, numerous recent and historic published and peer-reviewed research studies have used the STAI, which further supports the validity of the measurement tool (American Psychological Association, 2011). Table 4 shows the range of the total mean subscale scores for the SAI and the TAI.

Table 4

Summary of Measurement Tools and Their Properties

Tool and Variable Type	Variable Name of Subscale	Number of Items	Range of Total Mean Score	Published Cronbach's Alpha
STAI				
DV	State Anxiety	20	1 to 4	.92, .96
Covariate	Trait Anxiety	20	1 to 4	.90
NCTEI		47		.90 to .99[a]
IV	CI Teaching Ability	17	1 to 7	.89
IV	CI Nursing Competence	9	1 to 7	.84
IV	CI Evaluation	8	1 to 7	.86
IV	CI Interpersonal Relations	6	1 to 7	.86
IV	CI Personality	7	1 to 7	.83
QCLE		27		.95[a]
IV	Role of CI	6	1 to 5	.91
Covariate	Role of Staff	14	1 to 5	.95
Covariate	Manager's Contribution	4	1 to 5	.91
Covariate	Staff Readiness	3	1 to 5	.91
CI Effectiveness				
IV	Overall CI Effectiveness	1	1 to 5	n/a

[a] Based on the combined total score of the measurement tool.

Independent Variables: CI Teaching Behaviours (NCTEI)

Knox and Mogan (1985a) designed the Nursing Clinical Teacher Effectiveness Inventory (NCTEI) for baccalaureate nursing students, graduates, and faculty to measure the effectiveness of CI teaching behaviours. They determined effective clinical teaching to be "those actions, activities, and verbalizations of the clinical instructor which facilitate student learning in the clinical setting" (O'Shea & Parsons, 1979, p. 411). The NCTEI (see Appendix D) has a total of 47 items that describe effective teaching behaviours of CIs and are categorized into five domains: (a) Teaching Ability (17 items), (b) Nursing Competence (9 items), (c) Evaluation (8 items), (d) Interpersonal Relations (6 items), and (e) Personality (7 items). A 7-point Likert scale from "not at all descriptive" to "very descriptive" measures each item. The higher the score on each item, the more effectively a CI demonstrates a specific teaching behaviour. Likewise, the higher the domain score (i.e., subscale score), the more effectively a CI demonstrates the cluster of associated teaching behaviours within that domain. For the whole tool, the lowest total score is 47 and the highest is 329. See Table 4 for the total mean subscale score ranges of each domain.

In terms of the psychometrics for the NCTEI, when tested by the authors (Knox & Mogan, 1985b), the tool had a strong combined total Cronbach alpha score of .95 and produced acceptable (≥ .8) reliability coefficients for each of the five domains: Teaching Ability (α = .89); Nursing Competence (α = .84); Evaluation (α = .86); Interpersonal Relations (α = .86); and Personality (α = .83). Other studies using the tool have produced combined total scores of similar strengths: .99 (Kotzabassaki et al., 1997), .90 (Gignac-Caille & Oermann, 2001), .98 (Kube, 2010), .98 (Allison-Jones, 2002), .91 (Lovrić et al., 2014), and .99 (Rowbotham & Owen, 2015). Content validity of this tool was assured by the authors using confirmatory evidence derived from expert literature and the study participants (Knox & Mogan, 1985b). Positive comments from participants also supported the face validity of the tool (Knox & Mogan, 1985b). Validity has since been consistently supported by expert utilization of the tool in numerous published, peer-reviewed studies (Allison-Jones, 2002; Gignac-Caille & Oermann, 2001; Hababeh & Lalithabai, 2020; Kotzabassaki et al., 1997; Lovrić et al., 2014; Nehring, 1990; Rowbotham & Owen, 2015; Shafig et al., 2022).

Independent Variable: Overall CI Effectiveness

A single item in the questionnaire asked students to rate their overall satisfaction with the effectiveness of the CI (see Table 4 and Appendix D). This item was, "Overall, how do you rate the effectiveness of your clinical instructor in the current practice course that you are completing right now?" The response options were: "unacceptable", "below average", "average", "above average", and "excellent". This item was treated as a continuous variable and had a total score range of 1 to 5. The purpose of this single item was to obtain students' overall perception of the teaching effectiveness of the CI, more in a general sense compared to the specific teaching behaviours listed in the NCTEI. The development and inclusion of this item was based on the expertise of the thesis supervisor.

Independent and Covariate Variables: Quality of the Learning Environment

The Quality of the Clinical Learning Environment (QCLE) scale was designed by the Wolff and Currie (2022) to evaluate the quality of the clinical setting for practice education. The measurement tool was based on the original work by Saarokoski and Leino-Kipli (2002), who created the Clinical Learning Environment and Supervision (CLES) scale in Finland (Saarokoski et al., 2008). Wolff and Currie (2022) revised the tool to the clinical context and completed factor analysis and psychometric analysis. Part of the revision process included testing the tool to assess the quality of the learning environment from the perspective of students, CIs, and staff (Wolff & Currie, 2022). Assessing the quality of the clinical learning environment for interactions with student anxiety is important in this study because it has been reported in the research literature as being a major stressor for nursing students. This was the case for 11% of the baccalaureate nursing student participants (N = 204) in Oermann's (1998) study. Additionally, Bagcivan and colleagues (2015) found that negative behaviours from nurses, doctors, or patients caused the most stress for nursing students in practice education. This was similar to the more recent findings of Amattayakong and colleagues (2020) that attributed high levels of stress in nursing students to the clinical practice environment, particularly student interactions with staff nurses.

The QCLE instrument (see Table 4 and Appendix D) has 27-items and four domains or subscales: Readiness of Staff in Student Learning (e.g., "Staff are positive role models for

nursing", 14 items); Role of the Clinical Teacher in Student Learning (e.g., "Clinical teachers help students bridge the theory-practice gap", 6 items); Manager's Contribution to Student Learning (e.g., "The manager is a team member", 4 items); Staff Readiness for Student Practice Education (e.g., "Staff have the opportunity in the practice settings to attend preceptor/mentor training", 3 items). Because the Role of the Clinical Teacher in Student Learning involved assessing CI teaching behaviours, the subscale score of this domain was included as an IV. The other three domain subscale scores were treated as covariates to measure environmental factors of the clinical setting that may contribute to nursing students' anxiety levels in practice education. Each item of the QCLE is rated on a 5-point Likert scale from "strongly disagree" to "strongly agree". The lowest total score is 27 and the highest is 135. The higher the rating, the higher the agreement that the item was representative of the clinical setting in which the nursing student was completing their practice education. In other words, higher scores represent a higher quality clinical learning environment for nursing students (Wolff & Currie, 2022). For each of the total mean subscale scores, see Table 4.

In terms of psychometric properties, the QCLE was validated by Wolff and Currie (2022) using exploratory and confirmatory factor analysis with significant chi-square values ($\chi^2[318, n = 740] = 1222.486, p < 0.001$). The Cronbach alpha statistic proved to have good internal consistency and reliability within all four domains with a combined total score of .95 (Currie et al., 2015): Role of Staff in Student Learning ($\alpha = .95$); Role of the Clinical Teacher in Student Learning ($\alpha = .91$); Manager's Contribution to Student Learning ($\alpha = .91$); and Staff Readiness for Student Practice Education ($\alpha = .91$).

Covariate Variable: Level in the BSN Program and Work Experience in Healthcare

Two additional variables were selected to be included in this study based on factors that were identified in the literature review (Cook, 2005; Oermann, 1998; Simpson & Sawatzky, 2022). These single-item variables were students' level in the baccalaureate program (i.e., Level in the BSN Program) and previous work experience in healthcare (i.e., Work Experience in Healthcare), and were measured at the nominal level in the form of polychotomous categories (see Table 3 and Appendix D). Although Cook (2005) found there to be no significant differences between junior and senior students' anxiety ($t = -1.25$, $df =$

187.9, $p < 0.215$), junior students perceived the teaching behaviours of CIs more positively than did senior students (M = 92.85 to 92.77 and 85.01 to 88.63, respectively). While none of the research articles from the literature conducted for this study explicitly tested the relationship between previous work experience in healthcare and anxiety in nursing students, this variable was included based on the findings of Simpson and Sawatzky's (2020) concept analysis. Simpson and Sawatzky's (2020) assert that unfamiliar environments or situations and feelings of incompetence or unpreparedness may cause students to experience increased anxiety in the clinical setting. In theory, work experience in healthcare may help to reduce student anxiety by increasing students' familiarity and preparedness in the clinical setting.

Participants

The general population of interest for this research study were baccalaureate nursing students enrolled in practice education. However, for geographical considerations, the target population was refined to baccalaureate nursing students enrolled in practice education in Canada. Due to feasibility constraints, the sample population was confined to baccalaureate nursing students at a single academic institution located in the Lower Mainland of British Columbia, Canada. All nursing students who were enrolled in a baccalaureate practice course at this academic institution were invited to participate in this study. A non-probability population sampling method that was well-suited for the research design was utilized to recruit participants (Polit & Beck, 2017).

Inclusion/Exclusion Criteria

To be eligible to participate in this study, baccalaureate nursing students were required to have active enrollment status in a practice course that was taught by a CI. This included Licensed Practical Nurses (LPNs) who had bridged into the baccalaureate program and baccalaureate nursing students who were retaking a practice course for the second time. The sample excluded baccalaureate nursing students who were not actively enrolled in a practice course (for reasons of ineligibility or withdrawal) at the time that this study took place, and nursing students who were enrolled in a baccalaureate practice course not taught by a CI (e.g., preceptorship courses). Participation in the study was voluntary and no

compensation or incentive was offered. At the time that the data was collected, participants had completed at least half of the practice course that they were enrolled in.

Sample Size, Power, and Precision

Because there was little known about normally distributed parameters in the sample population, Solvin's formula was used to calculate the minimum sample size that would be required to make statistical inferences about the sample population as a whole (Glen, 2024). During the data collection period of this study, five baccalaureate practice courses were being offered by the academic institution. Each practice course had a maximum intake capacity of 80 students and an average attrition rate of less than 10%. From these numbers, the total accessible population was calculated to be a minimum of 72 to a maximum of 80 students per course. This resulted in an anticipated total number of baccalaureate nursing students qualifying for recruitment to this study as anywhere between 360 to 400. As is standard for this type of research study, a 5% error of tolerance was considered acceptable (Polit & Beck, 2017). The input of these numbers into Solvin's Formula, $n = 360/[1 + (360 \times 0.05^2)]$, concluded that the minimum sufficient response rate was 190. This number coincides well with the quantitative studies that were generated from the literature review (Bagcivan et al., 2015; Cook, 2005; Oermann, 1998), which had sample sizes ranging from 204 (N = n.d.) to 260 (N = 299). This number also correlates with an expected response rate of about 50%, which is considered good for self-administered questionnaires (Dillman et al., 2014; Polit & Beck, 2017). Based on this preliminary power analysis procedure, achieving a minimum sample size of 190 participants would secure a small to moderate effect size (i.e., magnitude of change in the sample), which is typically the norm for nursing research in general (Polit & Beck, 2017).

Recruitment and Data Collection

Using a modified version of the Dillman method (Dillman et al., 2014), eligible nursing students were invited to participate in the study through a sequential series of various communication modalities. The recruitment was implemented over an eight-week period during the last half of the semester to maximize student participation in the study. Repetition of contact using diverse methods over time has been shown in survey research to increase

response rates (Dillman et al., 2014). A minimum of five points of contact were made to eligible participants during the recruitment period for this study.

The eight-week recruitment process was launched with a written announcement endorsed by the Dean of the nursing program that was posted to the online nursing student web board by administrative staff. This was followed by an invitational email from me a week after (see Appendix E). Starting in Week 3, I conducted brief 5-to-10-minute face-to-face information sessions in the classrooms of other courses that participants were concurrently taking that semester. Permission to do so had been previously obtained from the teaching faculty of these courses through targeted solicitation. Staff and teaching faculty of the school's nursing department had previously been made aware of this study's purpose, objectives, and design two weeks prior to the start of the recruitment process (see Appendix F and G). At this time, they were also encouraged to support the research project in whatever way that they could and were willing to do. The in-class face-to-face information sessions were repeated one to two weeks after the initial visit as a reminder and to capture students who were perhaps not in attendance during the first visit. Through a student work-on-campus initiative, two baccalaureate nursing student ambassadors were recruited by word-of-mouth to provide peer support in the recruitment process (see Appendix H and I). They offered information sessions like those that I conducted and additionally advertised the study through social media. After the in-person recruitment phase was completed in Week 5, the Student Coordinator of the baccalaureate nursing program posted a reminder announcement to the online student web board inviting students to participate in the study. At the beginning of the week that the questionnaire was scheduled to close (Week 8), I disseminated a final email reminder promoting the study to students enrolled in the baccalaureate nursing program. This invitation was a shortened and simplified version of Appendix E.

Quantitative Data Analysis Procedure

Following the data collection phase, the data was retrieved from the Survey Monkey® online cloud database and downloaded for quantitative analysis using the IBM® Statistical Package for Social Sciences (SPSS®) Faculty Pack for iOS version 28.01.1. First, the data was screened and cleaned in preparation for statistical analysis. This began with visually

scanning the entire set of raw data for obvious anomalies listwise and casewise (Polit & Beck, 2017). Then variables were cleaned. This included that several STAI question items be reverse coded as instructed by the measurement tool's manual (Spielberger, 1983), and open-text entries from variables with "other" categories be collapsed into numerical values. "Prefer not to answer" selections and question items that were left unanswered by participants were coded as "missing". Mean subscale scores were then created for all items in each of the subscales of the QCLE, NCTEI, and STAI. This was followed by conducting an analysis of the missing data and treating the missingness before conducting the statistical analysis.

Missing Values Analysis

This application of missing values analysis (MVA) consisted of two phases. First, each case and variable in the original dataset were scrutinized for missing values. Both casewise and pairwise approaches were used to identify patterns and types of missingness in the dataset. This step was necessary to determine the magnitude of the missing data. Missingness was then strategically dealt with by removing unusable cases to create a dependable dataset that was representative of the sample to use for sound statistical analysis (Tabachnick & Fidell, 2007).

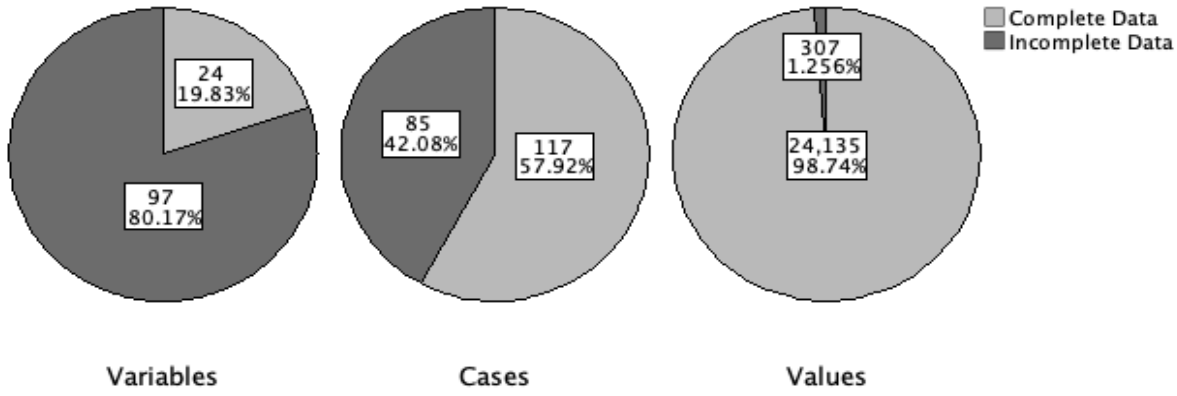
Cases

A total of 248 cases of submitted questionnaires were retrieved from the Survey Monkey® online database. Forty-five cases had a 100% incompletion rate and were immediately deleted. One additional case was deleted because it had a completion score of 32.5% with 100% of values missing in the DV and most values missing across the IVs. The remaining cases were scanned for duplicates with none found. Figures 1, 2, and 3 provide an illustration of the missing values and patterns resulting from a statistical case analysis conducted on the 202 cases that remained. The pattern of missingness displayed within and between these cases appeared to be random. One-hundred-and-seventeen (58%) cases had zero missing values, and 73 (36.1%) cases had less than 5% missing values. Missingness in cases that is less than 5% were determined to be acceptable because the effect of this amount is generally considered to be negligible by research statisticians (Dong & Peng, 2013; Schafer, 1999). The remaining 12 cases (5.9%) had missing values in the range of 5% to

20.3%. Six of these cases had missing values ranging from 5% to 10%, which were mostly concentrated in the IVs and the QCLE covariates. Another 3 of these cases contained 11.4% to 13.0% missingness with less than 10% missing in the DV. Two more cases had 12.2% and 18.7% of values missing with 25% and 50% missing in the DV, respectively. The last case with the most amount missing (20.3%) was unique in that it was missing 100% of the values for the covariate, Trait Anxiety. To further assess the nature of missingness in the data, specific variables were examined.

Figure 1

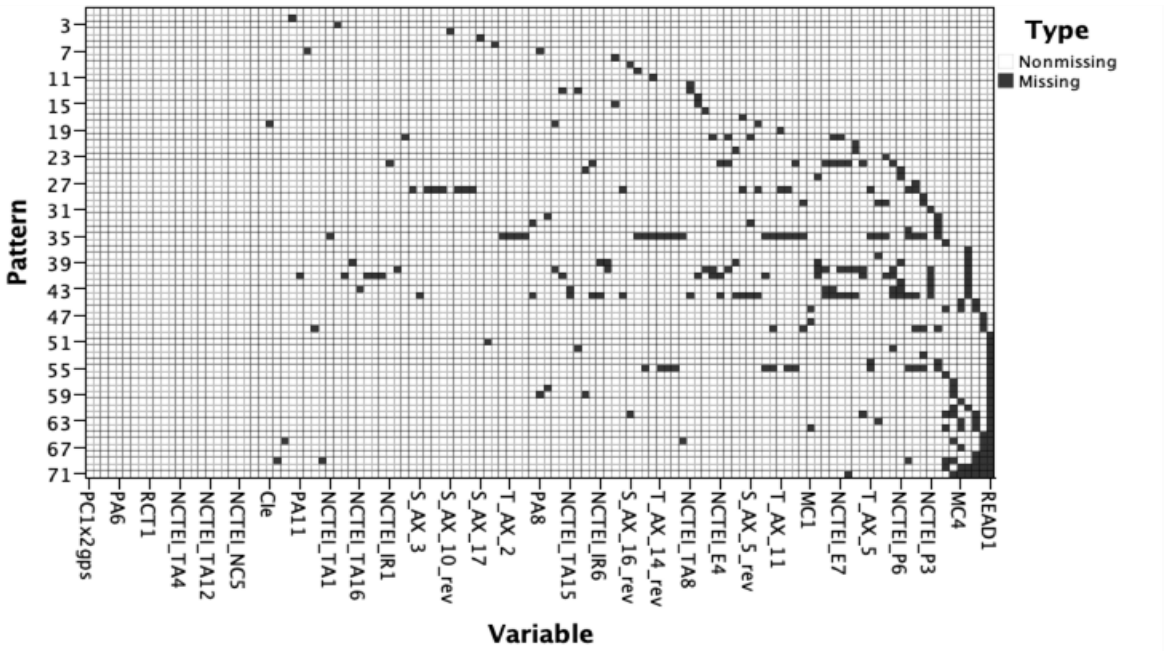
Summary of Missing Values



Note. $N = 202$.

Figure 2

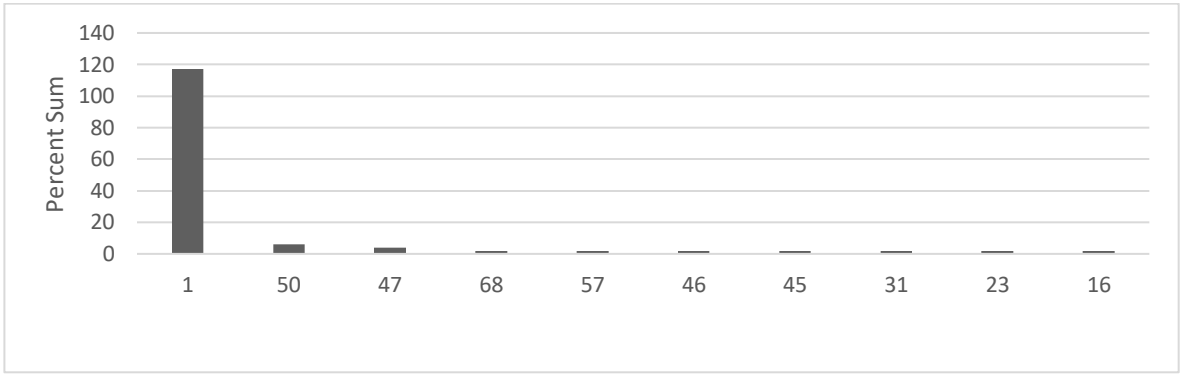
Missing Values Patterns



Note. $N = 202$. Variable codes are listed in Table 1.

Figure 3

Missing Values Patterns Frequency Graph



Note. The 10 most frequently occurring patterns are shown in the chart.

Variable Items

Of the 123 question items composing the research questionnaire, 31 (25.2%) had at least one missing value. Of these items, only five had more than 5% missing and underwent

further examination (see Table 5). One of these items (NCTEI_P4) was from the NCTEI and belonged to the IV, CI Personality. It asked participants to rate if the CI was self-critical. A possible explanation for the amount of missingness in this single variable item may be that nursing students do not know the CI well enough to know if they are self-critical. Or perhaps they found this question confusing. The other four items that had more than 5% of values missing belonged to the three domains of the QCLE that were designated as covariates. These items asked participants to rate their agreement on the following: that the unit staff attend mentor training (READ1); that the unit staff are supportive of preceptors (PA7); that the unit manager provides feedback that contributes to learning (MC3); and that the unit manager appreciates the efforts of individual staff members (MC4). The elevated number of missing values in these four items may be explained by the fact that nursing students sometimes do not have sufficient interactions with or knowledge about the unit manager and certain staff members to be able to provide answers these questions. As a result, participants may have opted to skip these items.

Table 5

Summary of Variables with More Than 5% Missing Values

Variable Code	Missing		Valid		
	n	%	*n*	*M*	*SD*
READ1	29	14.4	173	3.10	0.89
PA7	14	6.9	188	3.85	0.87
MC3	12	5.9	190	3.35	0.91
NCTEI_P4	11	5.4	191	5.50	1.73
MC4	10	5.0	192	3.47	0.93

Note. Refer to Table 1 for the list of variable codes and their corresponding variable names.

In total, the percent of missingness across the DV, IVs, and covariates ranged from 0 to 14.4. To discard the variable items with missing values, or to remove the cases with missing values in these variable items, would result in loss of statistical power and produce a dataset that is a less reliable representation of the sample (Howell, 2018). This is because "missing data mechanisms and the missing data patterns have greater impact on research results than does the proportion of missing data" (Tabachnick & Fidell, 2012, as cited in Dong & Peng, 2013, p. 2). Instead, a treatment option that levels the interaction effect of the

missingness that might occur during statistical analysis should be implemented (Dong & Peng, 2013). The same also pertains to the missingness found in the analysis of cases described above (Dong & Peng, 2013).

Results

The results of the individual and collective MVA procedure indicated a somewhat arbitrary nonresponse pattern with reasonable evidence to assume that the probability of missingness was related to other observed variables in the dataset and not to the missing values themselves (Lang & Little, 2018). To confirm the type of randomness within and between the cases and variable items in the dataset, Little's Missing Completely at Random (MCAR) statistical test was performed using expectation maximization to estimate the means. The null hypothesis of this test is that the missingness in the data is completely at random with a significance level of 0.05 (IBM, 2021a). With all 123 variable items included in the procedure, the result of Little's MCAR test was insignificant ($\chi^2 = 7183$, $df = 7117$, $p = 0.29$). When the test was rerun with only the DV, IVs, and covariates, the results were similar, $\chi^2 = 7182$, $df = 7117$, $p = 0.29$. However, when the DV (total of 20 items) and the five IVs from the NCTEI (total of 47 items) were tested separately, the test results were equally significant and had dramatic differences in degrees of freedom ($\chi^2 = 282$, $df = 196$, $p = 0.0$ and $\chi^2 = 1246$, $df = 984$, $p = 0.0$, respectively). Large degrees of freedom indicate more variance of missingness between the variables, less efficient estimation, and weaker test power (Li, 2013). These results suggest that the probability of missingness in the dataset should be treated as missing at random (MAR) rather than MCAR. With the assumption of randomness met and the missingness in the variable items and cases exceeding 5%, treatment rather than removal of the missingness in the cleaned dataset ($N = 202$) was necessitated (McCleary, 2002).

Analytical Approach to Treat Missing Data

Because the validity of statistical inferences is directly related to the proportion of missing values (Dong & Peng, 2013), a best-practice approach that could account for all the missing data in the cleaned dataset was multiple imputation (MI) (Garham, 2009). MI is a state-of-the-art technique of dealing with missing data that meets the assumption of

randomness (Schafer & Graham, 2002). MI uses two or more generated values based on probability to replace missing values (Rubin, 1987). Unlike other techniques of handling missing data, such as averaging the means of available items or deleting selected cases or variables, MI preserves the integrity of the dataset by preventing loss of reliability and protecting against inflated variance within and between variables (Schafer & Graham, 2002). Conditions confirming the appropriateness to treat missing values in the dataset with MI included missingness above 5%, missingness involving variables other than the DV, and a plausible MAR mechanism of missingness (Graham, 2009; Jakobsen et al., 2017). Three steps constitute the MI procedure (Enders, 2010): (1) the imputation phase, whereby multiple copies of the dataset are created each with different probability estimations; (2) the analysis phase, which produces parameter estimates and standard errors; and (3) the pooling phase to combine the analysis results into a single dataset.

Multiple Imputation Procedure

To amplify unbiased parameter estimates, a total of 117 variable items were included in the MI procedure (Garham, 2009). These included 20 items describing the DV, 54 items describing the IVs, and 43 items describing the covariates. The remaining six items were excluded because they were demographic variables intended for descriptive purposes only or covariates that had less than 5% of their values missing. Contrary to some beliefs within the research community, including the DV is imperative, despite the percentage of missingness within it, to prevent the suppression of correlations among the variables within the model (Garham, 2009).

Because the pattern of missingness in the dataset was not monotone, MI was conducted using the Markov Chain Monte Carlo (MCMC) fully conditional specification method (Jakobsen et al., 2017). Predictive mean matching (PMM) was chosen as the imputation model for the scale variables, over the option of linear regression, to control for plausibility in the imputed values (IBM, 2021a). PMM provides "a degree of robustness when…the normality assumption is in question, residuals are heteroscedastic, or associations are nonlinear" (Morris et al., 2014, p. 4). To maximize probable coverage, the *k*-statistic was set to randomly select a case from the 10 closest predictions to improve coverage and

efficiency (Morris et al., 2014). Categorical variables (see Table 1) were imputed by logistic regression using indicator (i.e., dummy) coding to handle categorical predictors and possible two-way interactions (IBM, 2021a). Forty-two imputed datasets were created in accordance with the principle that "the number of imputations should be at least equal to the percentage of incomplete cases" (Nguyen et al., 2017, p. 4). The total amount of missing values in the dataset was 42% (n = 85). For the purposes of this study, imputed data was used for statistical analysis only.

Statistical Techniques

A mixture of univariate, bivariate, and multivariate analysis procedures were used to analyse the cleaned datasets (N = 202). This rigorous, multilayered approach to analysing the data aligned cohesively with the research purpose and design of the study. It also served to ensure that a robust and thorough statistical investigation of the research data was completed.

Descriptive Univariate and Bivariate Analysis

Univariate descriptive statistics were used to measure and summarize single-variable statistics and describe the sample. Calculations included central tendency (i.e., mean, mode, median, and skewness), dispersion (i.e., range, variance, maximum, minimum, quartiles, and standard deviation), and frequencies. The fundamental assumption of univariate analysis is normality of the sample's distribution (Laerd Statistics, 2020).

Bivariate statistics were used to answer the first research question (Question 1.1) to determine if a meaningful relationship exists between CI teaching behaviours (IVs) and student anxiety (DV). This was determined by performing separate comparisons tests between the DV and each of the IVs. Scatter plots were used to visualize how the data points might be related, while correlation coefficients were used to more precisely measure the direction and strength of the relationship. Bivariate testing was also conducted between the DV and other variables to determine what covariates to include in the multivariate analysis. The independent samples t-test was used to determine if relationships existed between nominal categorical variables and the DV. These specific statistical tests will be discussed in more detail in the next section.

As it is for univariate analysis, normality is also a fundamental assumption required for sound bivariate and regression analysis. Unlike univariate statistical analysis, though, the assumption of normality involving more than one variable refers to the error or residuals distribution rather than to the actual sample distribution (Laerd Statistics, 2020). How non-normality of the data was treated in this study will be explained below and addressed in subsequent chapters.

Multivariate Statistical Analysis

Multivariate statistics were used to answer the second research question (Questions 2.1 and 2.2) which asks what specific IVs (i.e., effective teaching behaviours of CIs) exerted a statistically significant effect on the DV (i.e., student anxiety) and evaluate the strength of this effect, while controlling for the confounding effects of covariates. Testing for the existence of alternate explanations as to why students might be experiencing anxiety controlled for Type I errors being committed by reducing the chances that the null hypothesis would be accepted when in fact it was false (Polit & Beck, 2017). Hierarchical multiple regression (HMR) was chosen to facilitate the multivariate analysis procedure because the levels of measurement of the data matched the requirements, and it was well suited to answer research questions 2.1 and 2.2. To determine which variables were important to include with the DV in the HMR analysis, three types of statistical tests were conducted.

Pearson's and Kendall's Tau-b Correlation Statistics. Correlational testing using the Pearson's and Kendall's tau-b correlation statistics were conducted to determine which variables demonstrated having a direct relationship with the DV (bivariate analysis), and which IVs and continuous covariates shared simultaneous relationship with the DV (multivariate analysis). The Kendall's tau-b correlation statistic is particularly useful when the data is not normally distributed, unlike the Pearson's correlation statistic which requires that the data is normally distributed to achieve accurate results. Careful scrutiny of the correlation coefficients and *p*-values of all the variable items supported initial assumptions of which variables were important with a couple of exemptions, as will be discussed in Chapter Four. Variables with very weak or no correlation significance with the DV were excluded from the statistical regression model to preserve goodness of fit (Tabachnick & Fidell, 2007).

Independent-Samples T-test and Shapiro-Wilk's Statistic. Since correlation coefficients are not well-suited for testing categorical variables, the independent samples *t*-test provided a secondary measure to rule out the existence of there being any direct relationship between these types of variables and the DV. By comparing the means of each independent group, this parametric test confirmed whether a portion of the variability in the DV could reliably be attributed to the variable being tested (Polit & Beck, 2017). A two-tailed level of significance in the form of an independent-samples *t*-test was used to evaluate the relationship between the DV and each of the categorical covariates that were presumed to influence the DV based on the evidence stemming from the literature review conducted for this study (Cook, 2005; Oermann, 1998; Simpson & Sawatzky, 2022). These were Level in the BSN Program and Work Experience in Healthcare. Because the intent of this research study was exploratory in nature, any sort of directional change in the parameters of variables other than the predetermined IVs was considered noteworthy (Polit & Beck, 2017). To better represent the data and meet the requirements of the *t*-test, each categorical variable was reduced from a polytomous to a dichotomous categorical level (Laerd Statistics, 2020). To test that the assumption of normality was met, the Shapiro-Wilk's test ($p > .05$) was used (Laerd Statistics, 2020).

Hierarchical Multiple Regression: Assumptions and Transformation of the Original Data. HMR is particularly useful to understand the true effect that a set of IVs has on a DV by accounting for the effects of confounding and extraneous variables (Tabachnick & Fidell, 2007). In this type of regression modelling, variables are entered individually or in blocks into the model based on the anticipated theorized effect that the variable will add to the equation at its point of entry (Tabachnick & Fidell, 2007). Regression modeling in this study was applied in reverse sequential order of the presumed effect to establish the best model fit for the HMR analysis. This meant that the variable considered to have the least effect on the DV, as determined by the correlation coefficient, was entered into the equation model first followed by variables that were presumed to have a greater relationship with the DV (Laerd Statistics, 2020). In this situation, the confounding variables, or covariates, were entered first in the regression equation followed by the IVs. This "backward elimination"

approach of adding variables into the regression equation made it possible to evaluate the "major" set of variables over the "lesser" ones (IBM, 2021b; Laerd Statistics, 2020). This type of reverse sequential structuring of the regression model is particularly useful when covariance is a problem because it assists to hold "nuisance" variables constant (Allen, 2017; Tabachnick & Fidell, 2007). Furthermore, by using multiple blocks to isolate variables in the HMR equation, variability created by the addition of each subsequent block could be determined (Allen, 2017). Using this logic, a HMR model blueprint was constructed. Appendix L and M show the initial and final model of the HMR procedure.

To meet the criteria for HMR statistical analysis, a total of eight assumptions had to be met (Laerd Statistics, 2020). Of these, the original data conclusively met only five as described in Appendix J. This required that the original data be transformed to satisfy the assumptions of linearity, multicollinearity, and normal distribution (Assumptions 5, 6, and 8). After testing more than a hundred transformation variations, the best fit was finally decided. The DV was transformed by "logarithmic" equation, which is particularly well suited for strongly positively skewed data. The IVs and covariates were transformed using the "reflect and inverse" equation, which is useful for normalizing extremely negatively skewed data (Laerd Statistics, 2020).

Continuous DV. By design, the first assumption of HMR was met. The only DV, State Anxiety, was measured at the ordinal level on a 4-point Likert scale. However, since the mean total scores were used for the analysis, the measurement level converted to continuous because the scores could then be measured along a continuum with an infinite number of values between two points (Polit & Beck, 2017).

Two or More IVs. The second assumption was also met by design of the research study. All the IVs and most of the covariates were all measured at an ordinal level using 4 to seven-point Likert scales. As was with the DV, the measures of these variables were transitioned to a continuous level because the mean total score or subscale score of these variables were used for the analysis. Two other predetermined covariates were measured at the nominal level: Level in the BSN Program and Work Experience in Healthcare. These variables were initially polytomous but were recategorized into dichotomous variables out of

necessity to speed up the MI process when treating the missing data (IBM, 2021a) and to perform independent-samples *t*-tests on with the DV.

Independence of Observations. This third assumption tested for first-order autocorrelation to check for relatedness between the observations because HMR requires that observation errors be unrelated or independent of one another. The Durban-Watson statistic was used where a value of approximately 2 indicates no correlation between residuals and values closer to 0 or 4 indicate high autocorrelation (Laerd Statistics, 2020). The results of the statistical test rendered a range of values between 1.7 and 2.0 for the DV and all the predictor variables, which satisfied the requirement for independence of residuals.

Linearity Between the DV and Each IV. Testing for linearity between the DV and each of the IVs was achieved by populating scatterplots of the studentized residuals against the unstandardized predicted values. To determine linearity between the DV and each of the continuous IVs, partial regression plots were plotted. Results showed that not all variables were linearly related to the DV. To satisfy this forth assumption both collectively and individually, the data had to undergo transformation as aforementioned.

Homoscedasticity of Residuals. This fifth assumption checked for equal residual values of the DV. This is important to ensure that the variance along the line of best fit remains similar (Laerd Statistics, 2020). The same partial regression plots used to check the fourth assumption were again used to visualize the data. Again, this assumption was only satisfactorily met in the transformed data and not in the original data.

Multicollinearity. Multicollinearity is problematic in HMR because it makes it difficult to determine which IV contributes to the variance explained in the DV (Laerd Statistics, 2020). To determine if this sixth assumption was met, Pearson's correlation coefficients and Tolerance/VIF collinearity statistics were inspected. The results of this procedure demonstrated a moderate amount of multicollinearity (r = .4 to .8) between all the IVs and most of the covariates. However, this was balanced out by the Tolerance statistic not being less than 0.1 and the VIF statistic not being greater than 10 (Laerd Statistics, 2020). Similar results were shown in the transformed data. Therefore, it was decided to accept and

proceed through this seventh assumption keeping in mind the threat of multicollinearity when interpreting the findings of the analysis (Laerd Statistics, 2020).

Outliers. There should be no significant outliers because high leverage points can reduce predictive accuracy and statistical significance of the results of a HMR equation (Laerd Statistics, 2020). To check that this assumption was met, casewise residuals, which represents the "degree of error" in prediction, were checked for unusual points greater than ±3 standard deviations. This is a common cut-off criterion used to define whether a particular residual might be representative of an outlier or not (Laerd Statistics, 2020). The original data showed a standard deviation range of -1.5 to 2.0 compared to -0.3 to 0.4 in the transformed data.

Residual Errors. To run inferential statistics to determine statistical significance, the errors in prediction (i.e., residuals) need to be approximately normally distributed. To best detect residual errors in the data, histograms with superimposed normal curves and P-P plots were produced for each variable. Results from this procedure proved more satisfactory in the transformed data. Overall, the residual errors ranged from -0.36 to 0.41.

Pratt's Index. Upon completion of the HMR analysis, the Pratt Index was used to complete the HMR testing. The Pratt Index provides a reliable approach to assessing the relative importance of predictor variables to the DV within a regression equation (Thomas et al., 1998). It is also particularly useful to identify suppressor variables, which present themselves in the form of negative valued Pratt measurements. The larger the magnitude of negativity, the larger the presence of multicollinearity within the explanatory variables (Thomas et al., 1998).

Ethics

This study was initially approved by the TWU Human Research Ethics Board (HREB) on June 8, 2022. It was secondly approved by the Research Ethics Board (REB) of the academic institution from which the participants were recruited on June 14, 2022. This study collected information about participants' demographics, the practice course that they were enrolled in, a self-evaluation of their overall practice performance, their perceptions of the CI's teaching behaviours, and their experience of anxiety. Participation in the study was

voluntary and no incentive was offered. Informed Consent (see Appendix D) was required for participants to agree to before they could proceed to the questions. Anonymity was maximized by limiting the collection of personal identifying information and not collecting the IP addresses of electronic devices that accessed the questionnaire online. No names were included on the questionnaire. Strict maintenance of confidentiality and privacy was upheld by securely storing the raw data for a limited amount of time in a Canadian online cloud database protected by British Columbia's Freedom of Information and Protection of Privacy Act and safely destroying it afterwards. Additionally, raw data was not shared with anyone, including the academic institution. A $2100 grant was received to help cover operational costs of this research study. I declare no conflict of interest.

Because the data was collected through a self-administered questionnaire, participants were not at risk of physical harm. However, about a third of the questions asked participants about their experiences with anxious feelings and asked them to recall interactions with the CIs that may have caused them stress. Due to the sensitivity of these questions, there was a small risk of provoking uncomfortable emotions and/or psychological distress in participants. To mitigate this potential harm, participants were provided with information about free-of-charge psychological supports available to them 24/7 both prior to and upon completion of the questionnaire.

Chapter Summary

This chapter provided a detailed description of the study's design and methodology. This study received approval from the appropriate human research ethics boards of the involved academic institutions. Risks to participants were proactively mitigated through the implementation of sound ethical research practices. Using three valid and reliable measurement tools (i.e., STAI, NCTEI, and QCLE) a single self-administered electronic questionnaire was developed to gather relevant and applicable data to answer the research questions. Participants were nursing students actively enrolled in a BSN practice course at a single academic institution southwestern BC. From a population sampling procedure conducted during a single semester in the year of 2022, 202 questionnaires completed by participants were admitted into the study for statistical analysis. After the dataset was

cleaned, MI was used to treat the missing data before a variety of descriptive and inferential statistical tests were employed to analyze the data. The Kendall's tau-b and Pearson's correlation coefficients, in addition to an independent-samples *t*-test, were used to determine the relationships between the DV and other variables. HMR and the Pratt Index were used to draw conclusions about the predictive power of the IVs on the DV, while controlling for the influence of covariates. The results of the statistical analysis procedure are explained in the next chapter.

CHAPTER FOUR: FINDINGS

The purpose of this study was to examine the influence of CI teaching behaviours on nursing student anxiety in baccalaureate practice education. In accordance with the design and methodology of this study, a rigorous statistical analysis procedure was performed to measure the data collected from a final sample of 202 participants. This chapter details the findings of this study to answer the research questions:

1.1. What relationship exists between CI teaching behaviours and nursing student anxiety in practice education?

2.1. What are behaviours of CIs that increase nursing student anxiety in practice education?

2.2. What are behaviours of CIs that decrease nursing student anxiety in practice education?

The results of the statistical analysis are presented sequentially in this chapter. First, univariate descriptive statistics are reported to explain the characteristics of the sample population and each variable. Next, bivariate statistics are reported to explain the correlations between the DV (i.e., state anxiety), IVs (i.e., CI teaching behaviours and effectiveness), and covariates (i.e., trait anxiety and environmental factors of the clinical setting). Lastly, the results of the inferential HMR analysis are reported to explain which specific IVs influence the DV, while controlling for the effects of the covariates. The bivariate statistics answer the first research question (Question 1.1), while the multivariate statistics answer the second research question (Questions 2.1 and 2.2).

Descriptive Statistics

This section explains the sample, as well as the variables included in this study. The statistical results explaining the demographics and characteristics of the study participants are presented first, followed by the DV and each IV and covariate.

Sample Demographics and Characteristics

The final sample of this study consisted of 202 baccalaureate nursing students enrolled in an accredited BSN program at an academic institution in the Lower Mainland of British Columbia, Canada. Data was collected during one semester in the year of 2022.

During the data collection period, the total enrollment in practice courses within the BSN program at the academic institution was 365 students. This rendered a response rate of 55%, which is common for questionnaire-type studies (Dillman et al., 2014). This response rate also surpassed the minimum requirement of 190 respondents, that was predetermined by the power analysis calculated in Chapter Two, to achieve an acceptable small to moderate effect size (Polit & Beck, 2017).

All demographic data is presented in Table 2. Most participants were female (82%, *n* = 164). Ages ranged from 19 to 60 years. Most participants (65%, *n* = 128) were between 19 to 24 years of age and about a third of participants were between 25 and 30 years of age (32%, *n* = 54). More than half of participants (*n* = 113) were Asian (28% Filipino, 18% Chinese, and 11% South Asian Indian) and 18% (*n* = 34) were Caucasian. The remaining self-reported ethnic backgrounds (25%, *n* = 49) represented an additional 26 singular and mixed origins. Sixty-nine percent of participants (*n* = 136) had no relevant experience in direct patient care in the capacity of a licensed practical nurse (LPN), employed student nurse (ESN), and/or healthcare assistant (HCA). Ninety-nine participants were in the first half of the BSN program, while the remaining 51% were in the process of completing the second half of the BSN program. Only 7.5% of participants (*n* = 15) disclosed that they were in jeopardy of being unsuccessful in the practice course that they were enrolled in.

Table 3 describes the characteristics of the practice courses in which the participants were enrolled in. Practice courses for most participants (80%, *n* = 163) were situated in hospitals and 19% (*n* = 39) in long-term care facilities. Most participants were enrolled in practice courses with a care focus on adult populations, which included hospital units designated for care of older adults (28%, *n* = 57), medical care for adults (22%, *n* = 47), surgical care for adults (14%, *n* = 29), and specialized care for adults (7.9%, *n* = 16).

The next sections explains the characteristics of the DV, IVs, and covariates. When applicable, statistics from the original and transformed imputed datasets are presented for comparison. Table 6 lists the variables of this study and their frequencies.

Table 6

Non-Demographic Variables and Their Frequencies

Variable	Response Options	*n*[a]	Valid %	Missing %	Range of Mean Score[b]
	DV				
State Anxiety	Not at all (none)	67	35.5	6.9	1.0 to 1.4
mean score	Somewhat (low)	82	43.5		1.5 to 2.4
	Moderately so (moderate)	30	15.9		2.5 to 3.4
	Very much so (high)	9	4.8		3.4 to 4.0
	IVs				
Overall CI	Unacceptable	8	4.0	0.5	
Effectiveness	Below average	20	9.9		
	Average	27	13.4		
	Above average	37	18.3		
	Excellent	109	54.9		
Role of CI	Strongly disagree	5	2.6	2.5	1.0 to 1.4
mean subscore	Disagree	10	5.1		1.4 to 2.4
	Neutral	17	8.7		2.5 to 3.4
	Agree	76	38.8		3.5 to 4.4
	Strongly agree	89	45.4		4.5 to 5.0
CI Teaching	Not at all descriptive	1	0.5	4.0	1.0 to 1.4
Ability	Not descriptive	5	2.6		1.4 to 2.4
mean subscore	Mostly not descriptive	8	4.2		2.5 to 3.4
	Somewhat descriptive	16	8.3		3.5 to 4.4
	Mostly descriptive	16	8.3		4.5 to 5.4
	Descriptive	53	27.6		5.5 to 6.4
	Very descriptive	95	49.4		6.5 to 7.0
CI Nursing	Not at all descriptive	2	1.1	6.4	1.0 to 1.4
Competence	Not descriptive	10	5.3		1.4 to 2.4
mean subscore	Mostly not descriptive	4	2.1		2.5 to 3.4
	Somewhat descriptive	11	5.8		3.5 to 4.4
	Mostly descriptive	22	11.7		4.5 to 5.4
	Descriptive	59	31.3		5.5 to 6.4
	Very descriptive	81	42.9		6.5 to 7.0
CI Evaluation	Not at all descriptive	4	2.1	4.0	1.0 to 1.4
mean subscore	Not descriptive	5	2.6		1.4 to 2.4
	Mostly not descriptive	6	3.1		2.5 to 3.4
	Somewhat descriptive	17	8.8		3.5 to 4.4
	Mostly descriptive	22	11.4		4.5 to 5.4
	Descriptive	47	24.4		5.5 to 6.4
	Very descriptive	93	48.4		6.5 to 7.0

Variable	Response Options	*n*[a]	Valid %	Missing %	Range of Mean Score[b]
CI	Not at all descriptive	6	3.1	2.5	1.0 to 1.4
Interpersonal	Not descriptive	4	2.0		1.4 to 2.4
Relations	Mostly not descriptive	8	4.1		2.5 to 3.4
mean subscore	Somewhat descriptive	11	5.6		3.5 to 4.4
	Mostly descriptive	20	10.2		4.5 to 5.4
	Descriptive	39	19.9		5.5 to 6.4
	Very descriptive	109	55.6		6.5 to 7.0
CI Personality	Not at all descriptive	0	0.0	9.4	1.0 to 1.4
mean subscore	Not descriptive	7	3.9		1.4 to 2.4
	Mostly not descriptive	7	3.9		2.5 to 3.4
	Somewhat descriptive	10	55		3.5 to 4.4
	Mostly descriptive	15	8.25		4.5 to 5.4
	Descriptive	56	30.8		5.5 to 6.4
	Very descriptive	88	48.4		6.5 to 7.0
	Covariates				
Trait Anxiety	Almost never (scant)	11	5.9	8.4	1.0 to 1.4
mean score	Sometimes (low)	111	59.9		1.5 to 2.4
	Often (moderate)	56	30.2		2.5 to 3.4
	Almost always (high)	7	3.8		3.4 to 4.0
Role of Staff	Strongly disagree	1	5.5	9.9	1.0 to 1.4
mean subscore	Disagree	11	6.1		1.4 to 2.4
	Neutral	47	24.9		2.5 to 3.4
	Agree	100	55.0		3.5 to 4.4
	Strongly agree	23	12.7		4.5 to 5.0
Manager's	Strongly disagree	2	1.1	8.4[b]	1.0 to 1.4
Contribution	Disagree	10	5.4		1.4 to 2.4
mean subscore	Neutral	65	34.6		2.5 to 3.4
	Agree	83	44.8		3.5 to 4.4
	Strongly agree	25	13.5		4.5 to 5.0
Staff Readiness	Strongly disagree	3	1.7	14.4	1.0 to 1.4
mean subscore	Disagree	23	13.3		1.4 to 2.4
	Neutral	79	45.8		2.5 to 3.4
	Agree	57	33.1		3.5 to 4.4
	Strongly agree	11	6.4		4.5 to 5.0
Level in the	1st half of the BSN program	99	49	0.0	
BSN program	2nd half of the BSN program	103	51		

Variable	Response Options	*n*[a]	Valid %	Missing %	Range of Mean Score[b]
Work experience in healthcare	No experience Has experience (LPN and/or HCA and/or ESN)	136 61	69.4 31.1	2.5	

Note. LPN (Licensed Practical Nurse); HCA (Health Care Assistant); ESN (Employed Student Nurse).
[a] $N = 202$.
[b] Blank cells denote that the data is not applicable.

Dependent Variable: State Anxiety

Based on the total mean score of the scale, State Anxiety was of overall mild magnitude amongst study participants when they interacted with the CI ($M = 1.9$, $SD = 0.8$, $Mdn = 1.75$; see Table 7). Based on the original data (see Table 6), 43.5% ($n = 82$) of participants experienced low amounts of anxiety when they interacted with CIs, 15.9% ($n = 30$) moderate amounts, and 4.8% ($n = 9$) high amounts. The remaining 35.5% ($n = 67$) of participants reported experiencing no anxiety in their interactions with CIs. Figures 4 and 5 illustrate the distribution between the original data and the transformed imputed data demonstrating inconsequential differences. The skewness of the data was moderately positive (0.85). Internal consistency of the 20 items constituting the total score, as measured by the Cronbach's alpha reliability coefficient from the original data, was strong at .96.

Table 7

Distribution of the Mean Total Score of State Anxiety (DV) from the Original and Transformed Data

State Anxiety[a]	Statistics								
	Mean (S.E.)	Median	Variance	SD	Min.	Max.	Skewness (SE)	Kurtosis (SE)	Missing
Original Data	1.90 (0.05)	1.73	0.57	0.84	1	4	0.69 (0.18)	-0.09 (0.35)	14
Trans-formed Data	1.90 (0.01)	1.75	0.57	0.75	1	4	0.85 (0.17)	-0.15 (0.34)	0

Note. N = 202.

[a] Response scale: 1 = “not at all”, 2 = “somewhat”, 3 = “moderately so”, 4 = “very much so”. Items included in the mean total score = 20.

Figure 4

Distribution of State Anxiety (DV) from the Original Data

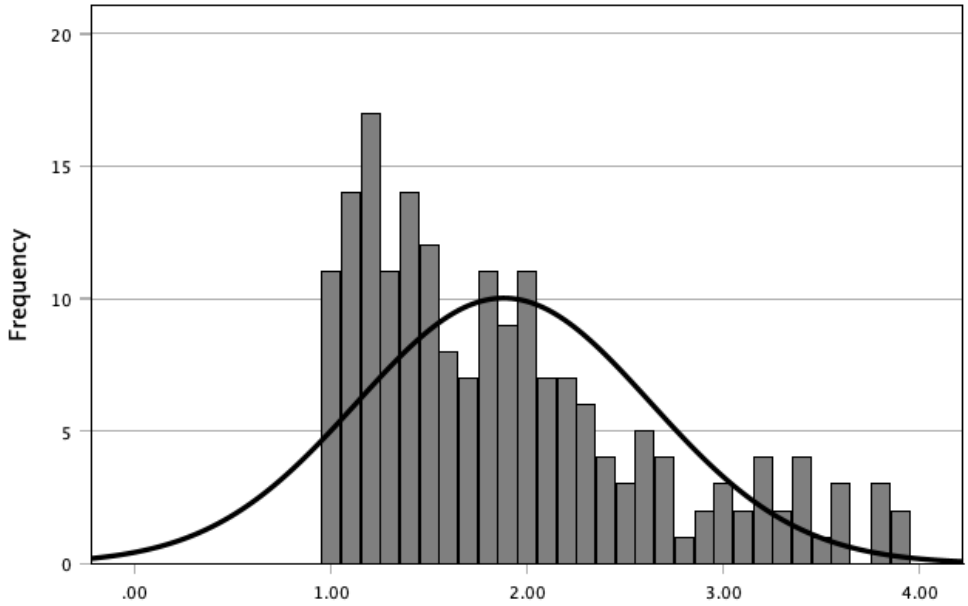
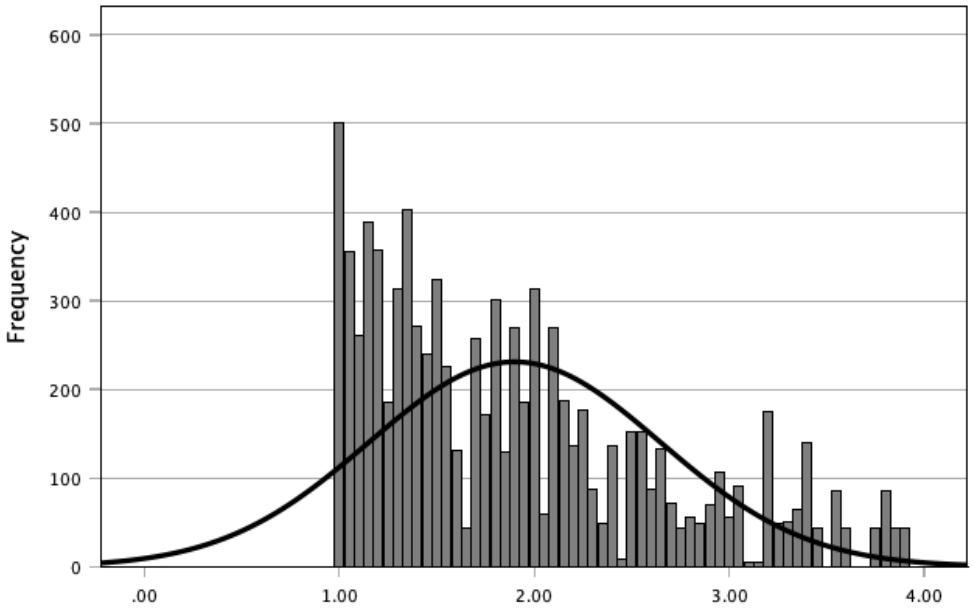


Figure 5

Distribution of State Anxiety (DV) from the Transformed Data (42 Imputations)



Covariates

There were four covariates included in in the final data analysis of this study: Trait Anxiety (TAI), and the Role of Staff, Manager's Contribution, and Staff Readiness (QCLE).

Trait Anxiety

A low amount of trait anxiety was characteristic of the average participant in this study (*M* = 2.3, *SD* = 0.6, *Mdn* = 2.20; see Table 8). The original data showed 59.9% (*n* = 111) of students exhibited low amounts of trait anxiety, 30.2% (*n* = 56) moderate amounts, and 3.8% (*n* = 7) high amounts (see Table 6). The remainder of participants, 5.9% (*n* = 11), reported to have no trait anxiety. The data was mildly positively skewed (0.38). Cronbach's alpha reliability coefficient of the 20 items making up the total score from the original data was strong at .93.

Table 8

Distribution of the Covariates from the Original and Transformed Data

Variable	Statistics							
	Mean (S.E.)	Median	Variance	SD	Min.	Max.	Skewness (SE)	Kurtosis (SE)
				TAI				
Trait Anxiety mean total score[a]	2.27 (0.04)	2.25	0.34	0.58	1.15	3.75	0.34 (0.18)	-0.38 (0.36)
	2.25 (0.01)	2.20	0.33	0.57	1	4	0.38 (0.03)	-0.37 (0.05)
				QCLE[b]				
Role of Staff mean subscore[c]	3.67 (0.05)	3.71	0.47	0.78	1	5	-0.32 (0.18)	0.24 (0.36)
	3.67 (0.01)	3.71	0.46	0.68	1	5	-0.69 (0.03)	1.32 (0.05)
Manager's Contribution mean subscore[d]	3.64 (0.60)	4.0	0.68	0.82	1	5	-0.32 (0.18)	0.24 (0.36)
	3.53 (0.01)	3.50	0.61	0.78	1	5	-0.34 (0.03)	0.12 (0.05)
Staff Readiness mean subscore[e]	3.29 (0.06)	3.0	0.71	0.84	1	5	-0.12 (0.19)	0.02 (0.37)
	3.26 (0.01)	3.33	0.60	0.78	1	5	-0.17 (0.03)	0.20 (0.05)

Note. *N* = 202. Statistics from the original data are reported on the first row and transformed data on the second row for each variable.

[a] Response scale: 1 = “not at all”, 2 = “somewhat”, 3 = “moderately so”, 4 = “very much so”. Mean subscore range = 1 to 4. Number with missing values in the original data = 17.
[b] Response scale: 1 = “strongly disagree”, 2 = “disagree”, 3 = “neutral”, 4 = “agree”, 5 = “strongly agree”.
[c] Mean subscore range = 1 to 5. Number with missing values in the original data = 20.
[d] Mean subscore range = 1 to 5. Number with missing values in the original data = 17.
[e] Mean subscore range = 1 to 5. Number with missing values in the original data = 29.

Role of Staff, Manager’s Contribution, and Staff Readiness (QCLE)

Participants expressed mixed feelings about the quality of the clinical learning environment (see Table 8). Three of the four domains of the QCLE were treated as covariates in this study. These were Role of Staff, Manager’s Contribution, and Staff Readiness. The other domain of the QCLE, Role of CI, is reported below as an IV. On average, students agreed that the unit staff were supportive of their learning (M = 3.67, SD = 0.68, Mdn = 3.71) and that the unit manager outwardly contributed to the clinical environment in a positive way for staff and students alike (M = 3.53, SD = 0.78, Mdn = 3.50). Participants nether agreed nor disagreed that unit staff had been prepared to support their learning (M = 3.26; SD = 0.78, Mdn = 3.33). Cronbach’s alpha coefficients were strong (.92 and .86, respectively) for Role of Staff (14 items) and Manager’s Contribution (4 items). Staff Readiness, which contained 3 items, demonstrated moderate internal consistency of .67.

Independent Variables: CI Teaching Behaviours

There were seven IVs included in this study to assess the teaching behaviours of CIs. These were the five domains of the NCTEI, the Role of CI from the QCLE, and the single item that asked participants to rate the overall teaching effectiveness of the CI (i.e., Overall CI Effectiveness).

Nursing Clinical Teacher Effectiveness Inventory

The main variables assessing the CI teaching behaviours were the five domains of the NCTEI. Overall, most participants perceived CIs favourably (see Table 9). They believed that the CI was, for the most part, consistently demonstrating behaviours that were characteristic of effective clinical teachers in the areas of teaching ability, nursing capability, evaluation, interpersonal relations, and personality. The transformed data showed a median of 6.33 to 6.67, a mean of 5.82 to 5.91, and a standard deviation of 1.33 to 1.53. Interpersonal

Relations behaviours were perceived by students to be demonstrated by CIs the most frequently (*M* = 5.91, *SD* = 1.53, *Mdn* = 6.67) and Evaluation behaviours the least frequently (*M* = 5.821, *SD* = 1.42, *Mdn* = 6.38). Overall, the range between the lowest and highest median and mean scores across the five NCTEI variables was small (6 indicating "descriptive" and 7 indicating "very descriptive" on the measurement scale). The data was strongly negatively skewed across all five of the domains (-1.46 to -1.69) indicating that some students reported that the CI demonstrated effective teaching behaviours less frequently. Internal consistency was strong with Cronbach's alpha coefficients ranging from .94 to .98 in each domain and .98 for all 47 items constituting the NCTEI.

Table 9

Distribution of the IVs from the Original and Transformed Data

Variable	Statistics							
	Mean (S.E.)	Median	Variance	SD	Min.	Max.	Skewness (SE)	Kurtosis (SE)
				NCTEI[a]				
CI Teaching Ability mean subscore[b]	5.90 (0.10)	6.41	1.79	1.33	1.18	7	-1.59 (0.18)	1.95 (0.35)
	5.84 (0.02)	6.41	1.97	1.40	1	7	-1.56 (0.03)	1.71 (0.05)
CI Nursing Capability mean subscore[c]	5.86 (0.10)	6.33	1.95	1.40	1.33	7	-1.74 (0.18)	2.48 (0.35)
	5.85 (0.02)	6.33	1.90	1.38	1	7	-1.69 (0.03)	2.31 (0.05)
CI Evaluation mean subscore[d]	5.84 (0.10)	6.38	2.02	1.44	1.13	7	-1.50 (0.18)	1.72 (0.35)
	5.82 (0.02)	6.38	2.01	1.42	1	7	-1.46 (0.03)	1.55 (0.05)
CI Interpersonal Relations mean subscore[e]	5.94 (0.11)	6.67	2.34	1.53	1	7	-1.70 (0.17)	2.24 (0.35)
	5.91 (0.02)	6.67	2.35	1.53	1	7	-1.63 (0.26)	1.96 (0.05)
CI Personality mean subscore[f]	5.96 (0.98)	6.43	1.73	1.32	1.57	7	-1.68 (0.18)	2.28 (0.36)
	5.91 (0.02)	6.43	1.85	1.36	1	7	-1.57 (0.03)	1.72 (0.05)

Variable	Statistics							
	Mean (S.E.)	Median	Variance	SD	Min.	Max.	Skewness (SE)	Kurtosis (SE)
				QCLE[g]				
Role of CI mean subscore[h]	4.19 (0.07)	4.00	0.94	0.97	1	5	-1.41 (0.17)	1.83 (0.35)
	4.13 (0.01)	4.33	0.82	0.91	1	5	-1.63 (0.03)	2.49 (0.05)
				CI Effectiveness (single-item)				
Overall CI Effective-ness[i]	4.09 (0.08)	5.00	1.43	1.20	1	5	-1.09 (0.17)	0.03 (0.34)
	4.09 (0.02)	5.00	1.42	1.19	1	5	-1.08 (0.03)	-0.01 (0.05)

Note. N = 202. Statistics from the original data are reported on the first row and transformed data on the second row for each variable.

[a] Response scale: 1 = "not at all descriptive", 2 = "not descriptive", 3 = "mostly not descriptive", 4 = "somewhat descriptive", 5 = "mostly descriptive", 6 = "descriptive", 7 = "very descriptive".

[b] Mean subscore range = 1 to 7. Number with missing values in the original data = 8.

[c] Mean subscore range = 1 to 7. Number with missing values in the original data = 13.

[d] Mean subscore range = 1 to 7. Number with missing values in the original data = 8.

[e] Mean subscore range = 1 to 7. Number with missing values in the original data = 5.

[f] Mean subscore range = 1 to 7. Number with missing values in the original data = 19.

[g] Response scale: 1 = "strongly disagree", 2 = "disagree", 3 = "neutral", 4 = "agree", 5 = "strongly agree".

[h] Mean subscore range = 1 to 5. Number with missing values in the original data = 5.

[i] Single item. Response scale: 1 = "unacceptable", 2 = "below average", 3 = "average", 4 = "above average", 5 = "excellent". Number with missing values in the original data = 1.

Role of CI (QCLE)

Eighty-four percent of participants agreed (38.8%, n = 76) or strongly agreed (45.4%, n = 89) that the CI was fulfilling their role in the clinical learning environment (original data; see Table 6). Despite the data being strongly negatively skewed (-1.63), on average, participants agreed that the CI was fulfilling their role as a quality teacher (M = 4.13, SD = 0.91, Mdn = 4.33; see Table 9). Internal consistency for the six items in this domain of the QCLE was strong as demonstrated by a Cronbach's alpha coefficient of .94.

Overall CI Effectiveness

Most participants rated the overall teaching effectiveness of the CI to be either "above average" (18.3%, n = 37) or "excellent" (54.9%, n = 109) (original data; see Table 6). For 13.9% of the participants, the effectiveness of the CI was either "below average" (n = 20,

9.9%) or "unacceptable" (n = 8, 4.0%). This produced a strong negative skew in the data that leveled the average mean of participants' ratings to 4.09 (SD = 1.42, Mdn = 5.0; see Table 9).

Bivariate Associations

Before examining what CI teaching behaviours influence student anxiety (Questions 2.1 and 2.2), it is important to first determine if a relationship exists between CI teaching behaviours (IVs) and student anxiety (DV). Accordingly, this section answers the first research question:

1.1. What relationship exists between CI teaching behaviours and nursing student anxiety in practice education?

State Anxiety (DV) and CI Teaching Behaviours (IVs)

To determine what CI teaching behaviours had a direct relationship with student anxiety, the Kendall's tau-b correlation statistic (range = -1 to +1) was used because of the abnormal distribution of the original data (Laerd Statistics, 2020). For comparison purposes, the Pearson's correlation statistic was used to confirm the appropriate selection of the variables included in the HMR analysis, which were from the transformed data and met the assumption of normal distribution (Laerd Statistics, 2020). Unlike the Kendall's tau-b correlation statistic, which individually compares variable items to the DV (see Table 10), the Pearson's correlation statistic produces a coefficient matrix table that measures the correlations between all the variables in addition to the DV (see Table 11 and 12). Both correlation tests produced similar results and corroborated that effective CI teaching behaviours have a moderate inverse relationship with student anxiety (τ_b = -.400 to -.488, p = < .001; r -.547 to -.642, p = .000).

Table 10

Bivariate Associations of State Anxiety (DV) and Other Variables from the Original Data

Variable Name	Kendall's *tau-b*	*p*-value* (2-tailed)	*N*
Sample Demographics			
Gender	-.035	.547	199
Age	.003	.950	198

Variable Name	Kendall's *tau-b*	*p*-value* (2-tailed)	*N*
Ethnicity	.098	.061	196
Work experience in healthcare	.103	.082	197
Level in the BSN program (1st half/2nd half)	.099	.088	202
Type of care facility	-.046	.429	202
Practice course care focus	-.017	.738	202
Self-evaluation of practice performance	***.242***	< .001	200
IVs			
Overall CI Effectiveness	**-.441**	< .001	201
Role of CI (QCLE)	**-.437**	< .001	202
CI Teaching Ability (NCTEI)	**-.432**	< .001	202
CI Nursing Capability (NCTEI)	**-.400**	< .001	202
CI Evaluation (NCTEI)	**-.455**	< .001	202
CI Interpersonal Relations (NCTEI)	**-.488**	< .001	202
CI Personality (NCTEI)	**-.415**	< .001	202
Covariates			
Trait Anxiety (TAI)	***.203***	< .001	201
Role of Staff (QCLE)	***-.185***	< .001	202
Staff Readiness (QCLE)	***-.188***	< .001	202
Manager's Contribution (QCLE)	***-.195***	< .001	199

Note: Significant *p*-value = < .05. Coefficients for variables with statistically significant correlations that are moderate to strong in strength are bolded. Italics refer to variables with statically significant weak correlations.

Table 11

Pooled Pearson's Correlations for Variables Used in the HMR Analysis from the Transformed Data

Variable Name	1	2	3	4	5	6	7	8	9	10	11	12
1. State Anxiety	1.00	**.244**	**-.227**	**-.283**	**-.264**	***-.579***	***-.547***	***-.642***	***-.603***	***-.553***	***-.605***	***-.562***
2. Trait Anxiety	**.224**	1.00	**-.203**	-.072	**-.163**	**-.167**	-.074	-.087	**-.068**	**-.074**	**-.056**	**-.071**
3. Role of Staff	**-.277**	**-.203**	1.00	***.569***	***.614***	***.608***	**.273**	**.343**	***.414***	***.433***	**.392**	**.384**
4. Manager's Contribution	**-.283**	-.072	***.569***	1.00	***.531***	***.455***	**.196**	**.307**	**.357**	**.359**	***.408***	**.356**
5. Staff Readiness	**-.264**	**-.163**	***.613***	***.531***	1.00	***.471***	**.235**	**.302**	**.384**	**.375**	**.374**	**.346**
6. Role of CI	***-.579***	**-.167**	***.608***	***.455***	***.471***	1.00	***.645***	***.707***	***.750***	***.739***	***.733***	***.670***
7. Overall CI Effectiveness	***-.547***	-.074	**.273**	**.196**	**.235**	***.645***	1.00	***.679***	***.752***	***.672***	***.699***	***.667***
8. CI Interpersonal Relations	***-.642***	-.087	**.343**	**.307**	**.302**	***.707***	***.679***	1.00	***.835***	***.810***	***.857***	***.840***

Variable Name	1	2	3	4	5	6	7	8	9	10	11	12
9. CI Teaching Ability	**-.603**	-.068	***.414***	**.357**	**.384**	***.750***	***.752***	***.835***	1.00	***.897***	***.892***	***.835***
10. CI Nursing Competence	**-.553**	-.074	***.433***	**.359**	**.375**	***.739***	***.672***	***.810***	***.897***	1.00	***.830***	***.850***
11. CI Evaluation	***-.605***	-.056	**.392**	***.408***	**.374**	***.733***	***.699***	***.857***	***.892***	***.830***	1.00	***.824***
12. CI Personality	***-.562***	-.071	**.384**	**.356**	**.346**	***.670***	***.677***	***.840***	***.835***	***.850***	***.824***	1.00

Note. $N = 202$. Bold denotes statistical significance ($p < 0.05$) as per Table 12. Italics indicates statistically significant correlations that are moderate to strong in strength.

Table 12

Pooled Significance (1-tailed) of Pearson's Correlations for Variables Used in the HMR Analysis from the Transformed Data*

Variable Name	1	2	3	4	5	6	7	8	9	10	11	12
1. State Anxiety		< .001	< .001	< .001	< .001	.000	.000	.000	.000	< .001	.000	.000
2. Trait Anxiety	.000		.002	.158	.011	.009	.148	.109	.000	.000	.000	.000
3. Role of Staff	.000	.002		.000	.000	.000	.000	.000	.000	.000	.000	.000
4. Manager's Contribution	.000	.158	.000		.000	.000	.003	.000	.000	.000	.000	.000
5. Staff Readiness	.000	.011	.000	.000		.000	.000	.000	.000	.000	.000	.000
6. Role of CI	.000	.009	.000	.000	.000		.000	.000	.000	.000	.000	.000
7. Overall CI Effectiveness	.000	.148	.000	.003	.000	.000		.000	.000	.000	.000	.000
8. CI Interpersonal Relations	.000	.109	.000	.000	.000	.000	.000		.000	.000	.000	.000
9. CI Teaching Ability	.000	.338	.000	.000	.000	.000	.000	.000		.000	.000	.000
10. CI Nursing Competence	.000	.294	.000	.000	.000	.000	.000	.000	.000		.000	.000
11. CI Evaluation	.000	.427	.000	.000	.000	.000	.000	.000	.000	.000		.000
12. CI Personality	.000	.318	.000	.000	.000	.000	.000	.000	.000	.000	.000	

Note. $N = 202$.
*$p < .05$

State Anxiety (DV) and Other Variables

Of the other variables tested with the Kendall's tau-b and Pearson's correlation statistics, some demonstrated to be associated with State Anxiety (DV), while others did not. As Table 10 illustrates, only one of the sample demographics and characteristics items showed a direct correlation with State Anxiety. This item was Self-evaluation of Practice Performance and exhibited a weak positive relationship with State Anxiety ($\tau_b = 0.242$, $p = <$

.001). However, since this was a categorical variable, this relationship required further testing using a bivariate statistic that is suitable for categorical variables, such as the *t*-test. The results of this test's results are explained in the next section. Of the selected covariates, all four of these variables demonstrated to be weakly correlational with State Anxiety (see Table 10). As predicted by Spielberger's (1972) anxiety theory, Trait Anxiety showed a weak positive relationship with State Anxiety (τ_b = .203, p = < .001). Whereas Role of Staff, Staff Readiness, and Manager's Contributions demonstrated very weak inverse relationships with State Anxiety (τ_b = -.185 to -.195, respectively, p = < .001). Covariates are important to identify so that they can be controlled for to prevent them from having a confounding effect on the DV's relationship with the IVs. Understanding the correlational relationships between the DV, IVs, and covariates contribute to answering the second research question, as is explained in the next section.

Hierarchical Multiple Regression Analysis

In the final phase of this study's statistical analysis procedure, multiple regression with sequential hierarchical scaffolding was performed to determine which specific CI teaching behaviours directly influence student anxiety. The results of this sophisticated multivariate statistical test answered the second research question:

2.1. What are behaviours of CIs that increase nursing student anxiety in practice education?

2.2. What are behaviours of CIs that decrease nursing student anxiety in practice education?

To begin with, a rigorous variable selection process was undertaken to determine which variables were suitable to include in the final regression equation model. This was followed by a careful reduction process of the HMR model to ensure that the variables were organized appropriately into the equation. Combined, these two processes ensured that the HMR analysis results provided the best answer to Questions 2.1 and 2.2, stated above.

Variable Selection

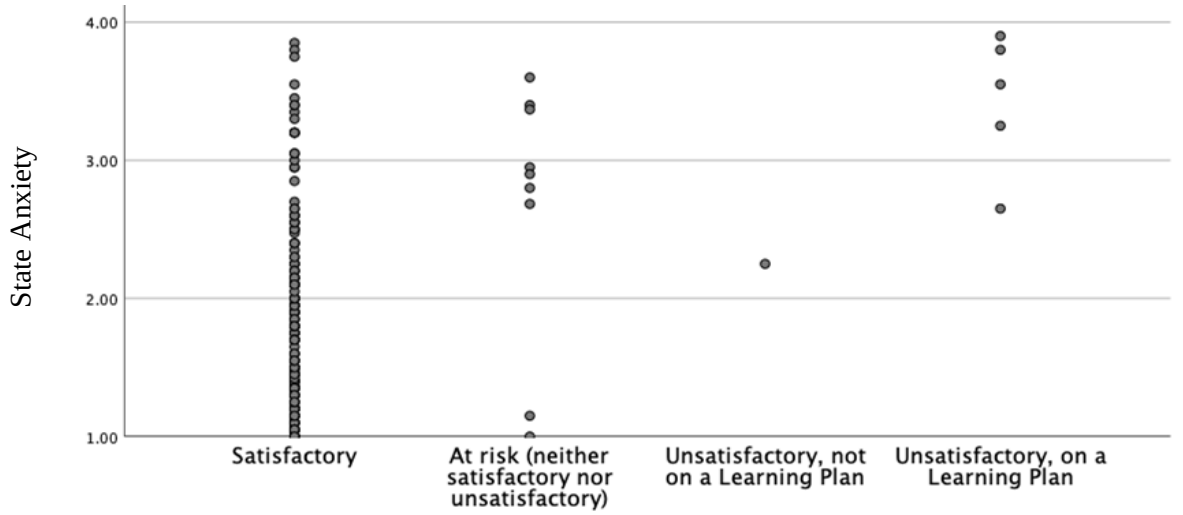
Variables tested in the HMR model were purposefully selected based on the findings of the literature review (as discussed in Chapter Two and Three), in addition to the findings

of the bivariate analysis discussed previously in this chapter (Tabachnick & Fidell, 2007). Variable selection sought to determine which variables were important to include and which ones were important to exclude to produce a model for the HMR equation that was most representative of the data. The first step in this process was to scrutinize each variable with the goal of capturing all the IVs and covariates that had statistically meaningful relationships with the DV. This meant that any variable that did not demonstrate a statistically significant relationship with the DV was excluded.

Based on the bivariate analysis results, all but one of the sample demographic variables were automatically excluded. Self-Evaluation of Practice Performance was the only one to demonstrate a statistically significant weak positive relationship with the DV (τ_b = 0.242, p = < .001; see Table 10). However, a closer examination of the distribution of the data within this variable revealed that the difference in variance was explained by less than 10% of the sample participants, which may be grounds for exclusion despite it having a correlational relationship with the DV (Tabachnick & Fidell, 2007). Figure 6 illustrates the distribution of this variable's data in relationship to the DV. It is logical that a student may experience more anxiety when their performance in a practice course is unsatisfactory, or when their satisfactory standing in the course is at risk because they are not fully meeting the learning outcomes. To concretely determine whether the relationship of this variable with the DV was strong enough to include in the HMR analysis, an independent-samples *t*-test was performed. Two other categorical variables that were presumed to be correlated with the DV based on the findings from the literature review were Work Experience in Healthcare and Level in the BSN Program. However, the bivariate analysis showed that these variables had no statistically significant relationship with the DV (see Table 10). Since correlation statistics are not well suited for categorical variables, an independent-samples *t*-test was also performed on these two variables separately.

Figure 6

Scatter Plot Distribution of Self-evaluation of Practice Performance and State Anxiety (DV) from the Original Data



The results of the independent-samples *t*-test (see Table 13) showed no significant differences between State Anxiety and students' level of education in the BSN program (t = -1.39, df = 191.86, p = 0.17) or previous work experience in healthcare (t = -1.63, df = 134.75, p = 0.11). There was, however, a significant difference between State Anxiety and students' self-evaluation of their practice performance (t = -5.43, df = 186, p = < 0.001). Further examination and testing was undertaken to thoroughly understand these three categorical variables in relation to State Anxiety. The results of this analysis are explained below.

Table 13

Results Comparing the Relationship Between State Anxiety (DV) and Categorical Covariates

Variable	*t*	*df*	Sig.* (2-tailed)	Mean Difference	95% CI for Mean Difference Lower, Upper
Level in the BSN program	-1.39	191.86	0.17	-0.03	-0.08, 0.01
Work experience in healthcare	-1.63	134.75	0.11	-0.04	-0.09, 0.01

Variable	*t*	*df*	Sig.* (2-tailed)	Mean Difference	95% CI for Mean Difference Lower, Upper
Self-evaluation of practice performance	-5.43	186	< 0.001	-0.22	-0.30, -0.14

*p = < 0.05

State Anxiety and Level in the BSN Program

There were no outliers in the data comparing the DV with Level in the BSN Program, as assessed by inspection of the boxplots. The Shapiro-Wilk's test (p > .05) showed that the distribution of mean state anxiety scores of participants that were enrolled in the first half of the BSN program (i.e., juniors) and those that were enrolled the second half of the BSN program (i.e., seniors) at the time of this study was not normal (p = < 0.001 and p = 0.49, respectively). The assumption of homogeneity between the two groups was also violated (p < 0.03) as assessed by Levene's test for equality of variances (p > 0.05). Junior students had mean anxiety scores -0.03 (CI 95% [-0.08, 0.01]), less than their senior counterparts. Additionally, there was not a statistically significant difference in mean anxiety scores between junior and senior nursing students, $t(191.86) = -1.39$, $p = .17$. Therefore, the null hypothesis cannot be rejected, and it must be concluded that there is no statistically significant difference in mean state anxiety scores between junior and senior nursing students.

State Anxiety and Work Experience in Healthcare

The second categorical predictor variable, Work Experience in Healthcare, also displayed no outliers in the data when compared with the DV as assessed by inspection of the boxplots. The Shapiro-Wilk's test (p > .05) showed that the distribution of mean state anxiety scores of participants that did not have any work experience in healthcare was not normal (p = .001). In contrast, the mean state anxiety scores of participants that did have work experience in healthcare were normal (p = 0.304). The assumption of homogeneity between the two groups was also violated (p < 0.03) as assessed by Levene's test for equality of variances (p > 0.05). Students without work experience had mean anxiety scores -0.04 (CI 95% [-.09, .01]) less than students with work experience. Additionally, there was not a statistically significant difference in mean anxiety scores between those with work

experience compared to those with work experience, $t(134.75) = -1.63$, $p = 0.11$. Therefore, the null hypothesis cannot be rejected, and it can only be concluded that there is no statistically significant difference in mean state anxiety scores between students without work experience and those with work experience.

State Anxiety and Self-evaluation of Practice Performance

In data comparing the DV and the third predictor categorical variable in question, Self-Evaluation of Practice Performance, one significant outlier greater than minus three box-lengths was present upon inspection of the boxplots. It was determined acceptable to proceed with the analysis without controlling for the outlier because it was contained within the group of students who were at risk for unsatisfactory performance in the practice course, which makes for a clinically significant finding. The mean state anxiety scores of participants in both the satisfactory and unsatisfactory performance groups were not normally distributed ($p < .001$ and $p = .002$, respectively), as assessed by the Shapiro-Wilk's test ($p > .05$). However, Levene's test ($p > 0.05$) showed homogeneity between the two groups ($p < .12$). Students with satisfactory performance had mean anxiety scores -.22 (CI 95% [-.30, -.14]) less than students who were at risk for unsatisfactory performance in the practice course. This difference in mean anxiety scores between the two groups was statistically significant, $t(186) = -5.43$, $p = < .001$. This suggests that the null hypothesis can be rejected and that there is a statistically significant difference in mean state anxiety scores between students with satisfactory performance compared to student with unsatisfactory performance.

Because of the violation of normality between the two groups, a Mann-Whitney U test was run to confirm the results of the independent-samples. Distributions of mean state anxiety scores for students with satisfactory performance compared to those without were not similar, as assessed by visual inspection of the population pyramid. There was a statistically significant difference in mean state anxiety scores between students that had satisfactory standing in the practice course, compared to those who were at risk using an exact sampling distribution for U ($U = 2118$, $z = 4.60$, $p = < .001$). However, comparisons between groups were complicated by the fact that only a small number of participants self-reported that they were at risk of being unsuccessful in the practice course that they were enrolled in *(*$n = 15$,

7.4%) compared to those participants who did not report being at risk *(n* = 185, 91.6%). The large *U* score illustrates this and suggests that the likelihood of the test's conclusions is at a high risk to have occurred by chance.

Conclusion of Variable Selection

For reasons presented above, Level in the BSN Program, Work Experience in Healthcare, and Self-Evaluation of Practice Performance were excluded from the HMR analysis along with all the variables explaining the sample demographics. This rendered a total of 11 eligible variables to be include with the DV in the second step of the HMR analysis procedure, which tests the fit of the equation model. Seven of these variables were IVs (i.e., Overall CI Effectiveness, Role of CI, CI Teaching Ability, CI Nursing Capability, CI Evaluation, CI Interpersonal Relations, and CI Personality). The other four variables were covariates (i.e., Trait Anxiety, Role of Staff, Manager's Contribution, and Staff Readiness).

Model Reduction

The fit testing procedure of the HMR analysis followed a process of reverse sequential order of hierarchy input as described in Chapter Three. As instructed by this method, the covariate variables were added to the model first. Trait Anxiety was put into the first block because of its close relationship with the DV as a trait factor of anxiety, making it possibly the biggest correlational threat to the DV as described by Spielberger's (1972) state-trait anxiety theory. Three additional covariates, explaining the quality of the clinical learning environment from the QCLE, were added to the second block. These were Role of Staff, Manager's Contribution, and Staff Readiness. Isolating these three variables together in one block helped to control for the multicollinearity that existed between them (Allen, 2017; Laerd Statistics, 2020; Tabachnick & Fidell, 2007), as is demonstrated by the moderate sized Pearson's correlation coefficients that resulted from the bivariate analysis (see Table 11). The third block that was added to the HMR equation model contained the first IV, that is the Role of CI (QCLE). This IV was selected to be inputted into the equation model next because it was seen to be largely correlated with the three covariates that were clustered in the second block (see Table 11). The multicollinearity seen between these four variables, as demonstrated by the moderate Pearson's correlation coefficients in Table 11, makes sense

because they constitute the four subscales of the QCLE. The next IV, Overall CI Effectiveness (single item), was added to the fourth block of the equation model because it is independent of the IVs from both the QCLE and NCTEI. The fifth and final block of the equation model contained the remaining five IVs, which represented the five domain subscores of the NCTEI: CI Teaching Ability, CI Nursing Capability, CI Evaluation, CI Interpersonal Relations, and CI Personality. These final five IVs were theorized to be the most "major" predictors of the DV because they clearly describe specific teaching behaviours of effective CIs.

The logic that was used to order the input of the variables into the HMR equation model proved satisfactory as demonstrated by the results of the output. The variation in the DV, as represented by a statistically significant R^2, sequentially increased from the first to the final block of the equation model. This characteristic is indicative of a good model fit for how well the predictor variables in each block model explain the DV (Laerd Statistics, 2020). The initial HMR modeling results (see Table 14) indicate that Trait Anxiety (Block 1) was responsible for a change of less than 6% in the DV, State Anxiety (R^2 of .059, $F(1, 200) = 12.548$, $p < .001$). The three QCLE covariates (Block 2), which represented the quality of the clinical learning environment, influenced a combined change of only 8.7% in State Anxiety (R^2 of .146, $F(1, 197) = 6.700$, $p < .001$). The IV from the QCLE, Role of CI (Block 3), improved the change in State Anxiety by 23.1% (R^2 of .377, $F(1, 196) = 72.487$, $p < .001$). Whereas, the single-item IV, Overall CI Effectiveness (Block 4), added only a 5% change in State Anxiety (R^2 of .427, $F(1, 195) = 17.161$, $p < .001$). Lastly, the five NCTEI IVs (Model 5) explained an additional 6.7% of the variance in the DV (R^2 of .494, $F(1, 190) = 5.005$, $p < .001$). In comparison to the four covariates, 34.8% of the variance in the DV was explained by the seven IVs collectively.

Table 14

Initial HMR Model Results on State Anxiety (DV) from the Transformed Data

Blocks	Variable(s)	R^2	$F(df1, df2)$	p-value*
1	Trait Anxiety	0.059	12.548(1, 200)	< .001

Blocks	Variable(s)	R^2	$F(df1, df2)$	p-value*
2	Role of Staff (QCLE) Manager's Contribution (QCLE) Staff Readiness (QCLE)	0.146	6.700(3, 197)	< .001
3	Role of CI (QCLE)	.377	72.487(1, 196)	< .001
4	Overall CI Effectiveness	.427	17.161(1, 195)	< .001
5	CI Teaching Ability (NCTEI) CI Nursing Capability (NCTEI) CI Evaluation (NCTEI) CI Interpersonal Relations (NCTEI) CI Personality (NCTEI)	.494	5.005(5, 190)	< .001

*p = < 0.05

To understand how each of the five IVs from the NCTEI was exerting the most influence on the DV, State Anxiety, additional regression equation models were created to isolate the effect of each variable on State Anxiety. This was accomplished by adding a sixth block to the original HMR equation model and inputting each one of the IVs from the NCTEI individually. It was necessary to proceed this way because it was impossible to isolate all these IVs into separate blocks in one equation model due to the statistical software having a capacity restriction of a maximum of six blocks. The HMR analysis procedure was repeated five times to isolate each IV separately (Allen, 2017). The results of this procedure, as shown in Table 15, indicate that only one of the IVs representing effective CI teaching behaviours from the NCTEI had statistically significant predictive power on State Anxiety. CI Interpersonal Relations caused a 6.3% increase in State Anxiety (R^2 = .490 $F(1, 194)$ = 23.954, p < .001). Accordingly, the final HMR equation was revised to exclude the other four IVs (NCTEI) from the model, which were statistically *in*significant to causing any change in State Anxiety. These were CI Teaching Ability, CI Nursing Capability, CI Evaluation, and CI Personality.

Table 15

HMR Modeling Results from the Transformed Data: NCTEI IVs on State Anxiety (DV)

Model	Block	NCTEI Variable(s)	R^2	$F(df1, df2)$	p-value*
2	5	CI Nursing Capability CI Evaluation CI Interpersonal Relations	.492	6.123(4, 191)	< .001

Model	Block	NCTEI Variable(s)	R^2	$F(df1, df2)$	p-value*
		CI Personality			
	6	CI Teaching Ability	.494	.586(1, 190)	.455
3	5	CI Teaching Ability	.491	6.035 (4, 191)	< .001
		CI Evaluation			
		CI Interpersonal Relations			
		CI Personality			
	6	CI Nursing Capability	.494	.896(1, 190)	.345
4	5	CI Teaching Ability	.494	6.269(4, 191)	< .001
		CI Nursing Capability			
		CI Interpersonal Relations			
		CI Personality			
	6	CI Evaluation	.494	.069(1, 190)	.793
5	5	CI Teaching Ability	.465	3.346 (4, 191)	.011
		CI Nursing Capability			
		CI Evaluation			
		CI Personality			
	6	CI Interpersonal Relations	.494	10.942(1,190)	.001
6	5	CI Teaching Ability	.494	6.248(4, 191)	< .001
		CI Nursing Capability			
		CI Evaluation			
		CI Interpersonal Relations			
	6	CI Personality	.494	.017(1, 190)	.897

*p = < 0.05

A similar process to that described above was repeated for the QCLE covariates to determine which ones, if any, were not responsible for explaining the change collectively exerted by these variables on the DV, State Anxiety. As illustrated in Table 16, only the combined interactions of these three variables produced statistically significant results, granted Manager's Contribution had the most influence with the DV by exerting a 1.8% increase in change over the others, R^2 of .146, $F(1, 197) = 4.069$, $p < .001$. Therefore, it was decided to keep all three of these covariates clustered together within a single block in the final HMR equation model, as was done originally (see Table 14).

Table 16

HMR Modeling Results Using Transformed Data: QCLE Covariates on State Anxiety (DV)

Model	Block	Variable(s)	R^2	F(df1, df2)	p-value*
7	1	Trait Anxiety	.059	12.548(1, 200)	< .001
	2	Manager's Contribution	.142	9.554(2, 198)	< .001

Model	Block	Variable(s)	R^2	F(df1, df2)	p-value*
		Staff Readiness			
	3	Role of Staff	.146	.993(1, 197)	.320
8	1	Trait Anxiety	.059	12.548(1, 200)	< .001
	2	Role of Staff	.129	7.893(2, 198)	< .001
		Staff Readiness			
	3	Manager's Contribution	.146	4.069(1, 197)	.045
9	1	Trait Anxiety	.059	12.548(1, 200)	< .001
	2	Role of Staff	.141	9.488(2, 198)	< .001
		Manager's Contribution			
	3	Staff Readiness	.146	1.113(1, 197)	.293

*p = < 0.05

Results of the HMR Analysis

The rigorous development of the HMR model by way of careful selection of the variables and a meticulous model reduction process secured a final equation model that demonstrated good fitness and parsimony to achieve accurate results (Tabachnick & Fidell, 2007). From 11 variables, the final HMR equation model was reduced to include only 7 variables that met statistical significance to influencing a change in the DV, State Anxiety. Table 17 shows the results of the final model equation that was used for the HMR analysis using the transformed imputed data. The four variables in the first two blocks of the equation model were covariates: Trait Anxiety and three QCLE scales (Role of Staff, Manager's Contribution, and the Readiness of Staff). The three remaining variables in the last three blocks of the model equation were all IVs: Role of CI (QCLE), Overall CI Effectiveness (single item), and CI Interpersonal Relations (NCTEI). The final HMR equation model answered the second research question which sought to determine what specific CI teaching behaviours increased anxiety in nursing students (Question 2.1) and what specific CI teaching behaviours decreased anxiety in nursing students (Question 2.2).

Table 17

Final HMR Model Results on State Anxiety (DV) from the Transformed Data

Block	Variable(s)	R^2	F(df1, df2)	p-value*
1	Trait Anxiety (TAI)	.059	12.548(1, 200)	< .001
2	Role of Staff (QCLE)	.146	6.700(3, 197)	< .001
	Manager's Contribution (QCLE)			

Block	Variable(s)	R^2	$F(df1, df2)$	p-value*
	Staff Readiness (QCLE)			
3	Role of CI (QCLE)	.377	72.487(1, 196)	< .001
4	Overall CI Effectiveness	.427	17.161(1, 195)	< .001
5	CI Interpersonal Relations (NCTEI)	.490	23.954(1, 194)	< .001

*p = < 0.05

The results of the HMR analysis showed that while controlling for Trait Anxiety and the quality of the learning environment (i.e., Role of Staff, Manager's Contributions, and Staff Readiness), the IVs that predicted State Anxiety were CI Interpersonal Relations, Role of CI, and Overall CI Effectiveness (see Table 17). Overall, the final HMR model equation produced strong statistically significant results predicting the variance in the DV, State Anxiety: R^2 = .490, $F(1, 194)$ = 23.954, p < .001, adjusted R^2 = .472. Stated another way, taking into consideration students' Trait Anxiety and the effects of the quality of the learning environment, teaching behaviours of CIs influenced anxiety in nursing students the most. To understand the predictive power of these IVs on State Anxiety and the impact of the covariates, the strength and direction of the change in the DV in relation to each predictor variable, and the relative importance of that change, must be scrutinized.

Parameter estimate coefficients (i.e., standardized beta-weights) indicate the degree and direction of change in the DV that is caused by a one-unit change in the predictor variable, while all other variables in the equation model are held constant (Laerd Statistics, 2020). Table 18 provides a summary of the parameter estimates detailing the power of change caused in State Anxiety by each of the predictor variables included in the HMR analysis.

Table 18

State Anxiety (DV) Standardized Parameter Estimates from the Transformed Data

Pooled Parameters	*B*	*SE*	p-value*	95% CI Lower	95% CI Upper
Constant	.343	.064	< .001	.218	.468
Trait Anxiety	.622	.182	< .001	.265	.979
Role of Staff	.119	.084	.155	-.045	.283
Manager's Contribution	-.085	.064	.181	-.210	.040
Staff Readiness	-.009	.076	.903	-.158	.139

Pooled Parameters	*B*	*SE*	*p*-value*	95% CI Lower	95% CI Upper
Role of CI	-.137	.065	.036	-.265	-.009
Overall CI Effectiveness	-.077	.038	.044	-.152	-.002
Interpersonal Relations	-.202	.041	< .001	-.283	-.121

*$p < 0.05$

In comparison to parameter estimates, the Pratt Index assigns relative importance to each predictor variable in proportion to the product of its standardized regression coefficient and its correlation to the DV (Thomas et al., 1998). Because it partitions the DV relative to each predictor variable despite the correlation among them, the Pratt Index is an arguably more robust method to determine the order of relative importance of predictor variables to the DV (Ochieng & Zumbo, 2001). Table 19 provides the results of the Pratt index analysis using the data from the final regression model equation.

Table 19

Pratt Index of Relative Importance of the IVs and Covariates to the Variance in the DV

	Model Summary				
Variable	*B*	*SE*	*ß*	Corr	*Pratt*
		DV			
State Anxiety	0.34	0.06			
		Covariates			
Trait Anxiety	0.63	0.18	0.18	0.24	9%
Role of Staff	0.12	0.08	0.11	-0.27	-6%
Manager's Contribution	-0.08	0.06	-0.09	-0.28	5%
Staff Readiness	-0.01	0.07	-0.01	-0.25	1%
		IVs			
Role of CI	-0.13	0.07	-0.19	-0.58	23%
Overall CI Effectiveness	-0.08	0.04	-0.16	-0.52	17%
CI Interpersonal Relations	-0.2	0.04	-0.39	-0.64	35%
Model R^2	49%				84%

Note. Predicted score = 0.34

Greatest Predictor of State Anxiety: CI Interpersonal Relations

The variable of greatest importance to predicting State Anxiety was CI Interpersonal Relations (*Pratt* = 35%, *ß* = -.39, *r* = -.64). It was also the strongest predictor of State Anxiety ($R^2 = 0.49$, $F = 23.95$, $p < 0.001$) causing the greatest amount of change ($B = -.202$, $p < .001$, 95% CI [-.283, -.121]). For every 1.0 unit increase in CI Interpersonal Relations,

State Anxiety decreased by 0.2 unit. This means that a CI, who frequently demonstrates interpersonal relationship teaching behaviours (7-point Likert scale from "not at all descriptive" to "very descriptive"), can potentially decrease anxiety in nursing students up to seven-fold. A seven-fold decrease in anxiety is equivalent to 1.4 units, which could be all the difference needed for anxiety in a nursing student to be eliminated (4-point Likert scale from "not at all" to "very much so").

Second Greatest Predictor of State Anxiety: Role of CI

Role of CI was the second most important predictor of State Anxiety (*Pratt* = 23%, *ß* = -.19, *r* = -.58) and the second strongest predictor of State Anxiety (R^2 = .37, *F* = 72.49, *p* < .001). For every 1.0 unit increase in Role of CI, State Anxiety increased by 0.14 unit (*B* = -.137, *p* = .036, 95% CI [.265, -.009]). This means that a CI, who does not fulfill their teaching role (5-point Likert scale from "strongly agree" to "strongly disagree"), can cause an increase of anxiety in nursing students by up to 0.7 unit. This is about half of the power of CI Interpersonal Relations.

To interpret the full magnitude of this finding, it is important to remember that Role of CI was statistically *in*significant ($p \geq .05$) in relation to State Anxiety without the inclusion of the three QCLE covariates in the HMR analysis (see Table 20). Alone, the unit manager's contribution to student learning (i.e., Manager's Contribution) did not have a significant inverse relationship on student anxiety, as indicated by the confidence interval crossing over "0" (*B* = -.105, *p* = .056, 95% CI [-.213, .003]; see Table 16). To meet statistical significance, Manager's Contribution required being combined with the unit's conduciveness to support student learning (i.e., Staff Readiness) and the readiness of nursing staff to support students (i.e., Role of Staff) for a small inverse relationship with State Anxiety to be produced (*B* = -.137, *p* = .036, 95% CI [-.265, -.009]). This variance is believed to be explained by a strong degree of positive multicollinearity existing between these four variables (*r* = .455 to .614, *n* = 202, *p* = .000), which are all subscales of the QCLE.

Table 20

Interplay of the Quality of the Clinical Learning Environment on Role of CI

Model	Model Summary			Coefficients		
	R^2	*F*	*p*-value	*B*	*p*-value	95% CI
Role of CI *with* Role of Staff, Manager's Contribution, and Staff Readiness	.37	72.49	< .001	-.137	.036	-.265, -.009
Role of CI *without* Role of Staff, Manager's Contribution, and Readiness	.34	81 .7	< .001	-.105	.056	-.213, .003

Third Greatest Predictor of State Anxiety: Overall CI Effectiveness

The third most important and powerful predictor of State Anxiety was Overall CI Effectiveness (*Pratt* = 17%, *ß* = -.16, *r* = -.52; R^2 = .43, *F* = 17.76, *p* < .001). For every one unit increase in CI Overall Effectiveness (5-point Likert scale from "unacceptable" to "excellent"), State Anxiety decreased by 0.08 unit (*B* = -.077, *p* = .044, 95% CI [-.152, -.002]), for a maximum change of 0.4 unit. Of all the IVs, this one was the most subjective because it asked students to rate their perception of the overall teaching effectiveness of the CI, rather than evaluate specific teaching behaviours of the CI.

Impact of Covariates on State Anxiety

Trait Anxiety was the most important covariate (*Pratt* = 9, *ß* = 0.18, *r* = 0.24; R^2 = .141, *F* = 6.38, *p* < .001). For every one unit increase in Trait Anxiety, State Anxiety increased by 0.62 unit (*B* = .622, *p* < .001, 95% CI [.265, .979]). This means that a student who has trait anxiety (4-point Likert Scale from "almost never" to "almost always") may experience higher levels of anxiety, despite the effectiveness of the CI's teaching behaviours.

Covariates describing the quality of the clinical learning environment that were found to help predict State Anxiety scores of students were Role of Staff (*Pratt* = -6%, *ß* = -.19, *r* = .24), Manager's Contribution (*Pratt* = 5%, *ß* = -.09, *r* = 0.28), and Staff Readiness (*Pratt* = 1%, *ß* = -.01, *r* = -.25). Alone, however, these three variables did not directly contribute to students' State Anxiety scores (*p* = ≥ 0.05). Yet when combined into one block in the HMR analysis, these covariates evoked a significant impact on whether the CI was able to fulfill their teaching role (i.e., Role of CI) and subsequently influence a decrease in student anxiety. A high degree of multicollinearity among these variables was further evidenced by Role of Staff having a relative importance Pratt value of -6%. Negative Pratt values are likely to

indicate multicollinearity in the explanatory variables (Thomas et al., 1998). As previously mentioned, the high degree of multicollinearity these variables is not surprising given that these variables constitute the four subscales of the QCLE.

Chapter Summary

The sample population of this study consisted of 202 baccalaureate nursing students that were primarily female (82.4 %) between the ages of 21 to 28 (79.1%). Participants represented various ethnic backgrounds and 69% had no previous experience in healthcare. There was student representation from all the practice courses offered at the academic institution with 49% of participants registered in the first half of the BSN program. In terms of the practice education, 80% of participants were situated in hospital care facilities, and the predominant focus of care was adult patients in medical, surgical, and older adult units. In terms of experiencing anxiety when interacting with the CI, 37.7% of students (n = 76) reported no State Anxiety, 39.9% (n = 81) had mild amounts, 18.4% (n = 37) had moderate amounts, and 4% (n = 8) had severe amounts. To answer the first research question, the bivariate analysis showed a moderate inverse relationship between variables measuring effective CI teaching behaviours and student anxiety (τ_b = -.30 to -.49; r = -.547 to -.642; p < .001). Hierarchical multiple regression analysis showed that CI Interpersonal Relations, Role of CI, and Overall CI Effectiveness (in order of predictive power and importance) were significant predictors of State Anxiety. The meaning and significance of the major findings of this study will be discussed in the next chapter.

CHAPTER FIVE: DISCUSSION

This study aimed to determine what teaching behaviours of CIs influence anxiety in baccalaureate nursing students *(N* = 202). The findings show that a significant relationship exists between CI teaching behaviours and student anxiety in practice education. However, not all types of CI teaching behaviours contribute equally to student anxiety. Of the seven variables describing effective CI teaching behaviours measured in this study, only three predicted student anxiety. These are CI Interpersonal Relationships (i.e., behaviours that foster interpersonal relationships with students), Role of CI (i.e., behaviours that fulfill the role of teacher), and Overall CI Effectiveness (i.e., students' perception of the CI's overall teaching effectiveness). The study results also show that the CI is not the only influential factor of student anxiety in practice education. Other external factors, such as the quality of the clinical learning environment (i.e., Role of Staff, Manager's Contribution, Readiness of Staff) and underlying anxiety traits of students (i.e., Trait Anxiety) also contribute to student anxiety. In this chapter, the meaning of this study's findings will be discussed with a focus on answering the objectives of this study.

Research Question One

Objective 1 of this study was to *examine the relationship between CI teaching behaviours and anxiety experienced by nursing students in their practice education.* The corresponding research question asked, *What relationship exists between CI teaching behaviours and nursing student anxiety in practice education?* All seven of the IVs describing CI teaching behaviours that were measured in this study demonstrated statistically meaningful ($p < .05$) relationships with the DV, Student Anxiety. These variables were all five subscales of the NCTEI, Role of CI from the QCLE, and Overall CI Effectiveness (single item). The correlation of these relationships was inverse and moderate in strength anxiety (τ_b = -.400 to -.488, p = < .001; r -.547 to -.642, p = .000). This finding means that the more frequently a CI demonstrates effective teaching behaviours, the more likely students experience less anxiety. This finding parallels with earlier research by Cook (2005), who discovered that "inviting" teaching behaviours were negatively correlated with state anxiety.

Research Question Two

Objective 2 of this study was to *identify what specific CI teaching behaviours are associated with anxiety experienced by nursing students in practice education*. The corresponding research question was twofold: *What are behaviours of CIs that increase nursing student anxiety in practice education,* and *what are behaviours of CIs that decrease nursing student anxiety in practice education?* Of the seven IVs describing CI teaching behaviours tested in this study, only three met the criteria of statistical significance ($p < .05$) for inclusion in the final multiple regression equation. In order of relative importance and predictive power on the change in the DV, State Anxiety, these three significant predictors were: CI Interpersonal Relations from the NCTEI, Role of CI from the QCLE, and Overall CI Effectiveness (single item).

CI Interpersonal Relations

The strongest predictor associated with decreasing anxiety in students was CI teaching behaviours that nurtured positive interpersonal relationships with students. These teaching behaviours were found to explain 35% ($ß = -.39$, $r = -.64$) of the variance in students' anxiety. The NCTEI lists a total of six specific teaching behaviours that describe a CI who demonstrates good interpersonal relations with students (Knox & Mogan, 1985b). These items are: (a) "Provides support and encouragement to students", (b) "Is approachable", (c) "Encourages a climate of mutual respect", (d) "Listens attentively", (e) "Shows a personal interest in students", and (f) "Demonstrates empathy". Similarly, Cook (2005) found that "personally inviting" teaching behaviours ($r = -.64$, $p < .01$) explained 41% of the variance in student anxiety compared to "professionally inviting" ones ($r = .59$, $p < .01$), which were found to contribute to student anxiety but did not explain any variance.

"Personally inviting" teaching behaviours are those that foster interpersonal connections with students, such as expressing positivity with students, knowing students by their names, promoting trust, sharing clinical expertise, and involving students in decision-making processes (Cook, 2005). Conversely, "professionally inviting" teaching behaviours pertain to mastery of the subject matter being taught. Examples of these include providing students with clear and objective assignments and assessments, using a variety of teaching

methods to help students learn, and demonstrating clinical expertise (Cook, 2005). It is interesting that Cook's (2005) "personally inviting" teaching behaviours reflect Knox and Mogan's (1985a, 1985b) interpersonal teaching behaviours that were measured by the variable, CI Interpersonal Relations, in this study. The major finding of this study that interpersonal teaching behaviours are the most important predictors of student anxiety, having a moderate, inverse relationship with student anxiety, is also substantiated by Cook (2005). The more frequently a CI demonstrates interpersonal teaching behaviours, the less likely students will experience anxiety in their interactions them. This finding also coincides with an integrative review of 29 single studies conducted by Labrague and colleagues (2020), which found that nursing students perceive interpersonal skills as being the most important domain of teaching behaviours that determines a CI's effectiveness, second to professional/clinical competence. The reason for this may be that interpersonal skills offer CIs the ability to interact and communicate with students effectively (Labrague et al., 2020). If a CI cannot relate and communicate effectively with students, confusion, conflict, disillusionment, and distrust can ensue, souring the teacher-student relationship, which can threaten students' learning and clinical performance (Del Prato et al., 2011). Considering that a critical role of the CI is to prepare nursing students for future professional practice, the impact of a quality student-teacher relationship should not be undervalued.

Role of CI

The second strongest predictor of students' anxiety was the CI fulfilling their role as teacher (*Pratt* = 23%, *ß* = -.19, *r* = -.58). Currie and colleagues (2015) attribute six distinct behaviours to CIs who fulfill their instructional duties in the clinical practice setting. CIs integrate theoretical knowledge into their nursing practice (Currie et al., 2015). They support students to meet their learning goals and help students bridge the theory-practice gap (Currie et al., 2015). They have collegial relationships with students and support their learning (Currie et al., 2015). Additionally, CIs contribute their expertise to the clinical team (Currie et al., 2015). According to the literature, CIs acknowledge that their role as teacher carries with it several unique responsibilities to be effective. A structured literature review by Dahlke and colleagues (2012) found that CIs believe that to fulfill their teaching role

effectively, they need to be able to communicate clearly, possess clinical expertise, and be a role model and source of support for students. They additionally found that a person-centered teaching approach was an important factor that contributed to CIs fulfilling their teaching role (Dahlke et al., 2012).

Overall CI Effectiveness

The third strongest predictor of student anxiety was the overall teaching effectiveness of the CI (*Pratt* = 17%, *ß* = -.16, *r* = -0.52). The higher a student perceived the teaching effectiveness of the CI to be, the less anxiety the student overall experienced. When interpreting these results, it is important to keep in mind that this variable did not describe a specific teaching behaviour, but rather quantified the student's overall perception of the effectiveness of the CI's teaching behaviours. Furthermore, because this variable was derived from a single Likert-style question asking students to subjectively rate the overall effectiveness of the CI teaching them in the practice course, it is not clear as to what factors were involved in students deciding their rating selection. However, considering the supporting evidence linking CI teaching behaviours and role fulfillment to teaching effectiveness (Dahlke et al., 2012; Labrague et al., 2020), it seems reasonable to assert that the perceived overall teaching effectiveness of a CI is representative of the CI's effectiveness at fostering interpersonal relations with students and fulfilling their teaching role. It also means that there may be other equally as important factors influencing students' perceptions that were not revealed by this study.

Importance of the Three Predictor Variables

Cumulatively, the three predictors of effective CI teaching behaviours were CI Interpersonal Relations, Role of CI, and Overall CI Effectiveness, accounting for 49% of the variance in student anxiety. Of the total variance, the importance of explaining student anxiety was predominantly by three variables. First and foremost, 35% of the importance was attributed to CI Interpersonal relations followed by the role of CI (23%) and overall CI effectiveness (17%). The HMR analysis results suggest that if the CI's teaching behaviours are very descriptive of CI Interpersonal Relations, and if they fulfill the Role of CI, then the CI has the power to influence student anxiety levels by up to 2.1 units. Add on a student's

strong agreement that the CI is an effective teacher, and the student's anxiety could decrease even further by 0.4 unit for a maximum total combined score of 2.5 units. For the 202 participants of this study, whose mean anxiety score was 1.9 (4-point Likert scale from "not at all" to "very much so"), a CI who fosters strong interpersonal relationships with students and strongly fulfills their teaching role has the potential to dramatically decrease the incidence and severity of anxiety in nursing students. For students whose source of anxiety is only the CI, having a CI who demonstrates effective teaching behaviours could be the difference between students experiencing anxiety and them not experiencing any anxiety in practice education.

The major findings of this study confirm that the CI is a very important predictor of nursing student anxiety in baccalaureate practice education (Bagcivan et al., 2015; Cook, 2005; Kushnir, 1986; Oermann, 1998). This evidence aligns with a recent umbrella review of published literature that identified the CI as being the third most common stressor for nursing students (Labrague, 2024), given that stress is often a precursor to anxiety experienced by nursing students in practice education (Simpson & Sawatzky, 2020). Namely, this study found that CIs can contribute to decreasing anxiety in nursing students in three significant ways (in order of influential power and importance): (1) by frequently demonstrating interpersonal teaching behaviours with students; (2) by fulfilling their teaching role; and (3) by teaching effectively overall.

Additional Findings

In addition to determining specific CI teaching behaviours that predict student anxiety, this study incidentally found that student anxiety in baccalaureate practice education is linked to two other factors independent of the CI. Underlying anxious traits of students contribute to increasing student anxiety, whereas a quality clinical learning environment contributes to decreasing student anxiety. Compared to effective CI teaching behaviours, however, the importance of these two factors on influencing student anxiety is overall relatively small (combined *Pratt* = 15%) and did not explain the remaining variance in student anxiety.

Trait Anxiety

The findings of this study show that having anxious personality traits increases a student's risk of experience anxiety (i.e., Trait Anxiety), despite the effectiveness of the CI's teaching behaviours or the quality of the clinical learning environment. This aligns with Spielberger's theory (1972) that claims trait anxiety predisposes a person to experience anxiety more readily and/or severely. This positive correlation occurs because having underlying anxiety traits increases a person's proneness to experience anxiety in general (Spielberger, 1972). In other words, an already anxious person is, by default, more likely to experience anxiety than a person who does not have anxious traits. This is because anxious individuals are more likely to selectively perceive threat and show bias towards appraising certain situations as threatening than a non-anxious person, even when no clear threat is present (Elwood et al., 2012). Generally, anxious persons have an adaptive desire to avoid or escape threat (Elwood et al., 2012). Take for example a student who is perfectionistic in nature and generally fearful of making mistakes. This student is more likely to perceive constructive feedback from the CI as threatening than a student who accepts that receiving correction for mistakes is a normal aspect of the learning process and welcomes opportunities to be corrected. An anxious student may also try to mitigate their heightened experience of anxiety by inadvertently avoiding interactions with the CI.

Quality of the Clinical Learning Environment

A surprising finding of this study was seeing how factors influencing the quality of the clinical learning environment (i.e., Role of Staff, Manager's Contribution, and Staff Readiness) influence student anxiety. Alone, however, these three variables did not directly contribute to students' State Anxiety scores ($p = \geq .05$). Yet when combined, these environmental factors determine if a CI can fulfill their teaching role (i.e., Role of CI), and subsequently decrease student anxiety. These findings indicate that controlling for environmental factors in the clinical setting is important because they impact the CI's ability to fulfill their teaching role, and subsequently have an inadvertent influence on students' anxiety.

Unexplained Predictors of State Anxiety

Only 49% of the variance in State Anxiety could be explained by the five variables included in the HMR equation: CI Interpersonal Relations, Role of CI, Overall CI Effectiveness, Trait Anxiety, and Role of Staff, Staff Readiness, and Manager's Contribution. This left 51% percent of the change in State Anxiety unaccounted for. This finding alone indicates that there are more variables, other than the ones tested in this study, that contribute to anxiety experienced by nursing students in practice education. This unaccounted variance may be explained by the research findings of Labrague (2024). This umbrella review found that both academic demands and challenges caring for patients are more predominant stressors for nursing students than are interactions with CIs and nursing staff (Labrague, 2024). An integrative review by Bhurtun and colleagues (2019) specifically identified a lack of knowledge and skill, fear of making mistakes, and heavy workload as being major stressors for nursing students in practice education. Future research is needed to measure the extent that these stressors are determinants of student anxiety in practice education.

Insignificant Findings

Equally as important as significant findings are insignificant ones. This study found several factors that were *not* statistically associated with student anxiety. These were a student's level in the baccalaureate program and their past work experience in healthcare. Unlike the research of Cook (2005) and Oermann (1998), this study did not find that being a junior or senior student contributed to anxiety. Nor did it find that previous work experience in healthcare made a difference in student anxiety levels. While it may sound reasonable to assume that students who are at risk of failing a practice course experience more anxiety, this was not a finding of this study. Instead, a student's academic standing in a practice course (i.e., Self-evaluation of Practice Performance) was found to have no association with anxiety levels, contrary to Simpson & Sawatzky's (2022) expert prediction. However, considering the grossly skewed distribution of this variable's data, future testing of this potential factor in relation to student anxiety is warranted. Perhaps the most surprising finding of this study is the discovery that not all CI teaching behaviours are associated with decreasing student

anxiety. The other four domains of effective teaching behaviours included in the NCTEI (i.e., Teaching Ability, Teaching Competence, Evaluation, and Personality) proved to not be predictors of student anxiety ($p = \geq .05$). This is an important finding because it differentiates between teaching behaviours that actually contribute to student anxiety and those that do not.

Chapter Summary

The findings of this study provide statistically significant evidence to substantiate the notion that CI teaching behaviours influence anxiety in baccalaureate students. The findings of this study also shed light on identifying specific CI teaching behaviours and other external factors that influence anxiety in students and those that do not. CI teaching behaviours that strongly fostered interpersonal relationships with students demonstrated a moderate inverse relationship with student anxiety. This relationship is strengthened further when coupled with the CI fulfilling their role as teacher and the overall teaching effectiveness of the CI (in order of ranking). This study also discovered that factors determining the quality of the clinical learning environment, specifically the readiness and role of nursing staff and the contributions of the unit manager to support a quality learning environment for students, also contribute inversely to student anxiety, but to a lesser extent. Another discovery was that the CI's ability to fulfill their teaching role was dependent in some way on the quality of the clinical learning environment. Other teaching behaviours pertaining to a CI's teaching ability, nursing capability, personality, and evaluation of students did not demonstrate a statistically meaningful relationship with student anxiety. Additionally, students' level in the baccalaureate program, work experience in healthcare, and academic standing in the course did not show any meaningful direct relationship with student anxiety. Still, the collective findings of this study left 49% of the variance in student anxiety unexplained. In summary, the major predictors of student anxiety were CI teaching behaviours that fostered interpersonal relationships with students, fulfillment of the CI's teaching role, and overall teaching effectiveness of the CI.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

This study contributes to research evidence in several ways. First, it substantiates historical research evidence identifying CI teaching behaviours as influencing anxiety in nursing students. Additionally, it confirms that not all types of CI teaching behaviours contribute to student anxiety. Interpersonal teaching behaviours, CIs fulfilling their teaching role, and the overall teaching effectiveness of the CI were found to be moderately negatively correlated with student anxiety and significant predictors of student anxiety.

Strengths and Limitations

Various strengths of this study include its sampling method and multivariate statistics. Relatively limited research exists evaluating the relationship between nursing students' anxiety and CI teaching behaviours in practice education. Even fewer studies apply a research methodology that employes robust statistical methods, like multiple regression, to provide confirmatory evidence of the existence and strength of relationships between student anxiety and CIs. The population sampling method used in this study, in comparison to convenience sampling, also contributed to the overall strength of this study. Population sampling garners deeper insight into the phenomenon of interest and reduces the risk of missing potential insights from members of the population that are not included (Laerd Dissertation, 2012). The sample of this study were baccalaureate students enrolled in a single academic institution located in British Columbia's most populated region. The school had the same accreditation as most nursing schools throughout the province and across the country. The sample size of 202 participants met a small to moderate effect size, which is considered the norm for general nursing research (Polit & Beck, 2017). It also achieved a 55% response rate, which is common for questionnaire-type studies (Dillman et al., 2014). The many strengths of this study bolster its contributions to providing new information and insights to this area of study in a way that has not before been realized. Cumulatively, the strengths of this study permit relatively strong analytical generalisations about the population of interest being studied.

No study is without limitations. The survey data collection method allowed for a few biases. Inherent of self-administered questionnaires is the risk that participants may provide

dishonest answers or interpret questions differently than intended (Polit & Beck, 2017). To mitigate this, a variety of strategies were employed in the creation of the questionnaire used in this study. These included use of proper terminology, neutral language, careful placement and randomization of questions, and mindful formatting of the content of the questionnaire to improve user-friendliness. The use of measurement tools (i.e., STAI, NCTEI, and QCLE) with high face and content validity also reduced the threat of response bias.

Another consideration worthy of mentioning pertains to gender differences. Most participants in this study were cisgender female. Only 15.5% (n = 31) of participants reported being cisgender male and 2% (n = 4) identified as non-binary. Due to the size discrepancy among the three gender groups, it was impossible to statistically analyze if differences exist between gender and anxiety levels or gender and perceptions of CIs. Exploring differences in the experience of anxiety between different genders of nursing students is relevant and prudent given that there are long-standing social notions that anxiety may be, to some extent, gender driven. While this is an important question, answering it within the confinements of this study is beyond the scope of this research project. Despite the sample of this study not being equally gender diverse, it is representative of the gender diversity of nurses in Canada (Canadian Institute of Health Information, 2023).

Recommendations

This study verified that a meaningful relationship does indeed exist between student anxiety and the quality of a CI's interpersonal relations with students, fulfillment of their teaching role, and overall teaching effectiveness. The strength and relevance of the evidence produced in this study supports immediate application and implementation of its findings into practice in nursing education. Additionally, the evidence produced by this research study serves to promote and guide future research to further explore and explain causes and impacts of anxiety in nursing students.

Education and Practice

This study found that CI interpersonal teaching behaviours, coupled with the CI fulfilling their teaching role and the CI's overall teaching effectiveness, have an inverse relationship of moderate magnitude with student anxiety. As such, it would benefit nursing

education programs to support CIs to utilize the evidence of this study for the benefit of their students' wellbeing and academic success. Nursing education administrators can start by offering tailored professional development education that describes and promotes the utilization of evidence-based teaching behaviours that optimize teaching effectiveness and decrease student anxiety in practice education. Peer support and personal mentoring are shown to be the most effective and sought-after professional development strategies for CIs, particularly for those that are new (Del Prato et al., 2011; Tiscornia, 2017). Many Nursing programs across Canada support new teaching faculty with peer mentoring programs and performance evaluation opportunities. Orientation sessions and professional learning workshops are additional feasible channels that can be utilized to disseminate valuable teaching supports and resources to sessional instructors and permanent teaching faculty. Department administrators can also take these teaching qualities into consideration when hiring CIs and when conducting formal or informal clinical teaching performance evaluations (Labrague et al., 2020). CIs who teach effectively have many presumed benefits, the most important of which is improving learning experiences and outcomes for students, which in turn has a positive impact on the school's reputation and performance ratings.

Regardless of institutional supports, CIs can be proactive and take action to enhance their teaching effectiveness and reduce student anxiety by demonstrating teaching behaviours that foster quality interpersonal relations with students. Mogan and Knox (1987) define an interpersonal relationship as "a state of reciprocal interest or communication between two or more people excluding specific therapeutic communication between nursing and patient" (p. 332). Fostering quality interpersonal relations with students is an act of caring that is composed of five distinct behaviours (Knox & Mogan, 1985b): (a) providing support and encouragement to students; (b) encouraging a climate of trust and mutual respect; (c) being approachable and listening attentively; (d) showing a personal interest in students; and (e) demonstrating empathy. Approachability is consistently supported in the nursing literature as being the most important component to effective clinical teaching (Collier, 2017). This may be explained by the concept that approachability affords opportunities for action, and so being approachable is the gateway to engaging in human interactions (Gibson, 1979).

Additionally, CIs can personally assist themselves to enhance their teaching effectiveness by ensuring that they are fulfilling their teaching role in ways that maximize students' abilities to meet course learning outcomes and promote a quality learning environment for students. CIs fulfill their teaching role in practice education by (Wolff & Currie, 2022): (a) integrating theoretical knowledge into their everyday nursing practice; (b) supporting students to meet their learning needs and goals; (c) helping students to bridge the theory-practice gap; and (d) providing their expertise to the unit staff. The multifocal dimensionality of effective teaching behaviours highlights the complex nature of clinical teaching. Facilitation of quality learning experiences in the clinical setting that mitigates student anxiety involves the intersectionality of the CI's knowledge base and clinical expertise, their supportiveness and helpfulness to students' learning, and their usefulness to the staff in the clinical setting. The central responsibility of the CI in fulfilling their teaching role is to facilitate student learning in a complex clinical context with student supervision being the major focus of the role (Page-Cutrara & Bradley, 2020).

To become even more effective teachers, CIs would benefit from formal education opportunities through a variety of different avenues. Many graduate nursing programs offer electives in nursing education. There are also a variety of relevant professional development education opportunities that exist from professional nursing organizations. One such offering is the Clinical Instructor Certificate Course delivered by the Canadian Association of Schools of Nursing through the Canadian Nurse Educators Institute. Likewise, formal nursing education would benefit from incorporating research-based evidence, such as the findings of this study, into their teaching curriculum. As evidenced by this study, ineffective CI teaching behaviours can impose significant psychological stressors on students which can impact students' learning for the worse. By learning about behavioural approaches to teaching that foster psychological safety for students, CIs can optimize their teaching effectiveness and improve student outcomes.

Theory and Research

To the best of my knowledge, there is no single theory that can fully explain the influence that the CI has on student anxiety in practice education. The theoretical framework

establishing the foundation of this study was a combination of Spielberger's State-Trait Anxiety Theory (Spielberger, 1972) and an extrapolation of Watson's Human Caring Theory (Watson, 2008). This was somewhat different from the theoretical approach of Cook (2005), who used Novak and Purkey's Invitational Theory and Spielberger's theory of state anxiety. Clearly, more research is needed to provide further evidence to support theory development and explore the application of other established theories that may have relevance to explaining the cause-and-effect relationship between the CIs and student anxiety. This study serves to illuminate the need for future research to fill the gap in scientific knowledge that is currently quite limited on this topic. Considering the nature and dynamics of the interplay of the CI on student anxiety in practice education, it would be beneficial for such research to extend across other disciplines of health and social sciences.

Future nursing research should focus on deepening our understanding of the relationship between CI behaviours and student anxiety in practice education by building on the findings of this study. While this study explained three major predictors of lowering anxiety levels in students (i.e., in order of importance, the CI's interpersonal teaching behaviours, the CI's ability to fulfill their teaching role, and the CI's overall teaching effectiveness), more than half of the variance in students' anxiety was left unexplained. As such, future research examining the relationship between CIs and student anxiety should carefully control for known covariates and seek to discover other predictors still unknown. This study found a positive and direct relationship between trait and state anxiety such that state anxiety levels were predicted by trait anxiety, which holds true for Spielberger's Anxiety Theory. Although the effect of this relationship was relatively small, it would be prudent to control for students' trait anxiety when testing for predictors of their state anxiety. Additionally, this study found that factors influencing the quality of the clinical learning environment significantly impacted the CI's ability to fulfill their teaching role and that the CI's ability to fulfill their teaching role had an inverse relationship with student anxiety. Therefore, it would be equally as important for researchers to control for environmental factors such as these. Furthermore, since there is now a known connection between the quality of the learning environment and the CI's teaching ability, future research should also

aim to more deeply understand how individual factors influencing the quality of the clinical learning environment impact the student-teacher dynamic.

Since this study found that students' level of education in the baccalaureate program and work experience in healthcare does not impact student anxiety levels, there should be no reason to continue to test for these relationships in future research. A person's experience of anxiety is very personal and unique, despite age or type of work experience (Xi, 2020). To improve generalization of research findings, more varied and diverse baccalaureate nursing student populations should be studied. This will provide more insights into possible influential factors pertaining to specific student demographics and core teaching and curriculum components that are inherent of community colleges compared to universities (e.g., practical and academic preparation, student-to-teacher ratios, CI qualifications and education, etc.). Where large sample populations are accessible and when feasible across multiple sites, randomized sampling methods should be considered to better control for biases and identify confounding factors and other sources of influence. Consistency in the use of reliable and valid tools to measure constructs, such as those in this study, will further contribute to the strength of the collective research evidence.

Conclusion

This study provides confirmatory scientific evidence that anxiety experienced by baccalaureate nursing students in practice education is influenced by CIs' teaching behaviours. It also identifies specific CI teaching behaviours that influence a reduction in students' anxiety, as well as other factors. CIs who effectively demonstrated interpersonal relationships with their students and fulfilled their teaching role predicted lower anxiety scores in students. Furthermore, the mere perception by a student that their CI is overall teaching effectively can influence a reduction in student anxiety. Considering that the negative impacts of anxiety in general are well known and widespread, it would benefit CIs and academic institutions to adopt the findings of this study into their teaching methods and education practices to improve student learning experiences and outcomes.

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Appendix A

Literature Review Search Strategy

Concepts Defining the Research Problem						
Concept 1 (population)	AND	Concept 2 (outcome)	AND	Concept 3 (comparison)	AND	Concept 4 (setting)
"Baccalaureate nurs* student*"		Anxiety		"Clinical teacher"		"Practice education"

CINAHL Complete through EBSCOhost Keyword Search and Corresponding Numbers of Articles Found							
Concept 1		Concept 2 (outcome)		Concept 3 (comparison)		Concept 4 (setting)	
"Student nurse*"	26,098	"Anxi*"	116,356	"Clinical teach*"	1,869	"Clinical"	1,320,215
		"Worr*"	14,992			"Clinical experience*"	12,024
"Student* of nursing"	1,618	"Fear*"	46,628	"Clinical instruct*"	1,045		
						"Clinical setting*"	21,893
"Nurs* student*"	24,525			"Clinical supervis*"	5,658		
						"Clinical education"	10,153
"Baccalaureate nurs* student*"	1,610			"Clinical facult*"	528		
						"Practice education"	5,663
"Baccalaureate student* of nursing"	10			"Nursing facult*"	3,150		
						"Fieldwork"	5,173
"Baccalaureate student nurs*"	56			"Teach* behavio*"	444	"Nursing education"	67,187
						"Undergraduate nursing education"	467
"Undergraduate nurs* student*"	2,869						
						"Baccalaureate nursing education"	8,168
"Undergraduate student* of nursing"	78						
"Undergraduate student nurs*"	144						
Total results for Concept 1 = 40,437		Total results for Concept 2 = 164,887		Total results for Concept 3 = 12,053		Total results for Concept 4 =1,382,564	

Total number of results from first three concepts combined = 112.
Total number of results from all four concepts combined = 95.
Total number of results from the first three concepts combined with Limiters applied (English only and Scholarly, Peer-reviewed Journals) = 82.

Total number of articles exported to Endnote = 82.

CINAHL Complete through EBSCOhost
Subject Headings Search and Corresponding Numbers of Articles Found

Concept 1		Concept 2		Concept 3		Concept 4	
(MM "Students, Nursing, Baccalaureate") Definition: students enrolled in accredited four-year nursing education programs.	4,015	(MM "Anxiety") Definition: persistent feeling of dread, apprehension and impending disaster.	22,202	(MM "Faculty, Nursing") Definition: individuals of high academic achievement employed as teaching staff and members of the administrative staff in a nursing school. Includes nurse instructors in clinical or academic settings. Staff Development Instructors also available.	9,572	(MH "Education, Clinical") Definition: education relating to or involving the treatment or observation of living patients.	7,976
		OR		OR		OR	
		(MM "Student Experiences") Definition: life events concerning learning and academic development as experienced by students.	3,216	(MH "Student Supervision") Definition: supervision of students, usually in the clinical setting.	517	(MH "Fieldwork") Definition: supervised educational activities occurring outside the classroom or campus that are designed to promote practical or clinical experience in a specific discipline.	908
		OR		OR		OR	
		(MH "Fear") Definition: affective response to an external threat or danger.	6,153	(MM "Teaching Methods, Clinical+")	6,815	(MM "Learning Environment, Clinical")	1,413
		OR					
		(MM "Stress, Psychological") Definition: for prevention and control, consider also Stress Management.	30,664				
Total results for Concept 1 = 4,015		Total results for Concept 2 = 59,758		Total results for Concept 3 = 16,698		Total results for Concept 4 = 9,982	

Total number of results from first three concepts combined = 16.
Total number of results from all four concepts combined = 8.
Total number of results from the first three concepts combined with Limiters applied (English only and Scholarly, Peer-reviewed Journals) = 10.
Total number of articles exported to Endnote = 10.

MEDLINE with Full Text through EBSCOhost
Keyword Search and Corresponding Numbers of Articles Found

Concept 1		Concept 2		Concept 3		Concept 4	
"Student nurse*"	22,953	"Anxi*"	285,196	"Clinical teach*"	3,641	"Clinical"	4,947,605
		"Worr*"	31,075			"Clinical experience*"	49,850
"Student* of nursing"	1,245	"Fear*"	109,596	"Clinical instruct*"	1,920		
"Nurs* student*"	18,532			"Clinical supervis*"	2,231	"Clinical setting*"	68,568
"Baccalaureate nurs* student*"	1,071			"Clinical facult*"	1,339	"Clinical education"	4,856
"Baccalaureate student* of nursing"	6			"Nursing facult*"	11,773	"Practice education"	1,604
"Baccalaureate student nurs*"	31			"Teaching behavior*"	351	"Fieldwork"	3,963
"Undergraduate nurs* student*"	2,406					"Nursing education"	55,362
"Undergraduate student* of nursing"	63					"Undergraduate nursing education"	414
"Undergraduate student nurs*"	132					"Baccalaureate nursing education"	14,839
Total results for Concept 1 = 31,520		Total results for Concept 2 = 392,196		Total results for Concept 3 = 20,658		Total results for Concept 4 = 4,998,587	

Total number of results from first three concepts combined = 132.
Total number of results from all four concepts combined = 94.
Total number of results from the first three concepts combined with Limiters applied (English only and Scholarly, Peer-reviewed Journals) = 129.
Total number of articles exported to Endnote = 129.

MEDLINE with Full Text through EBSCOhost
Subject Headings Search (MeSH Terms) and Corresponding Numbers of Articles Found

Concept 1 (population)	Concept 2 (Outcome)	Concept 3 (comparison)	Concept 4 (setting)

(MM "Students, Nursing") = Individuals enrolled in a school of nursing or a formal educational program leading to a degree in nursing.	21,063	(MM "Anxiety") = Feelings or emotions of dread, apprehension, and impending disaster but not disabling as with anxiety disorders. OR (MM "Performance Anxiety") = Anxiety related to the execution of a task. OR (MH "Fear+") = Excusing or pardoning for an offense or release of anger or resentment. --> includes (MM "Panic") = A state of extreme acute, intense anxiety and unreasoning fear accompanied by disorganization of personality function. OR (MM "Stress, Psychological")	46,589 123 36,297 79,877	(MM "Faculty, Nursing") = The teaching staff and members of the administrative staff having academic rank in a nursing school. OR (MM "Teaching") = A formal and organized process of transmitting knowledge to a person or group.	6,547 29,497	(MM "Education, Nursing, Baccalaureate") = A four-year program in nursing education in a college or university leading to a B.S.N. (Bachelor of Science in Nursing). Graduates are eligible for state examination for licensure as RN (Registered Nurse).	14,786

	= Stress wherein emotional factors predominate.		
Total results for Concept 1 = 21,063	Total results for Concept 2 = 154,605	Total results for Concept 3 = 35,437	Total results for Concept 4 = 14,786

Total number of results from first three concepts combined = 29.
Total number of results from all four concepts combined = 7.
Total number of results from the first three concepts combined with Limiters applied (English only and Scholarly, Peer-reviewed Journals) = 28.
Total number of articles exported to Endnote = 28.

Appendix B

Literature Review Eligibility Criteria

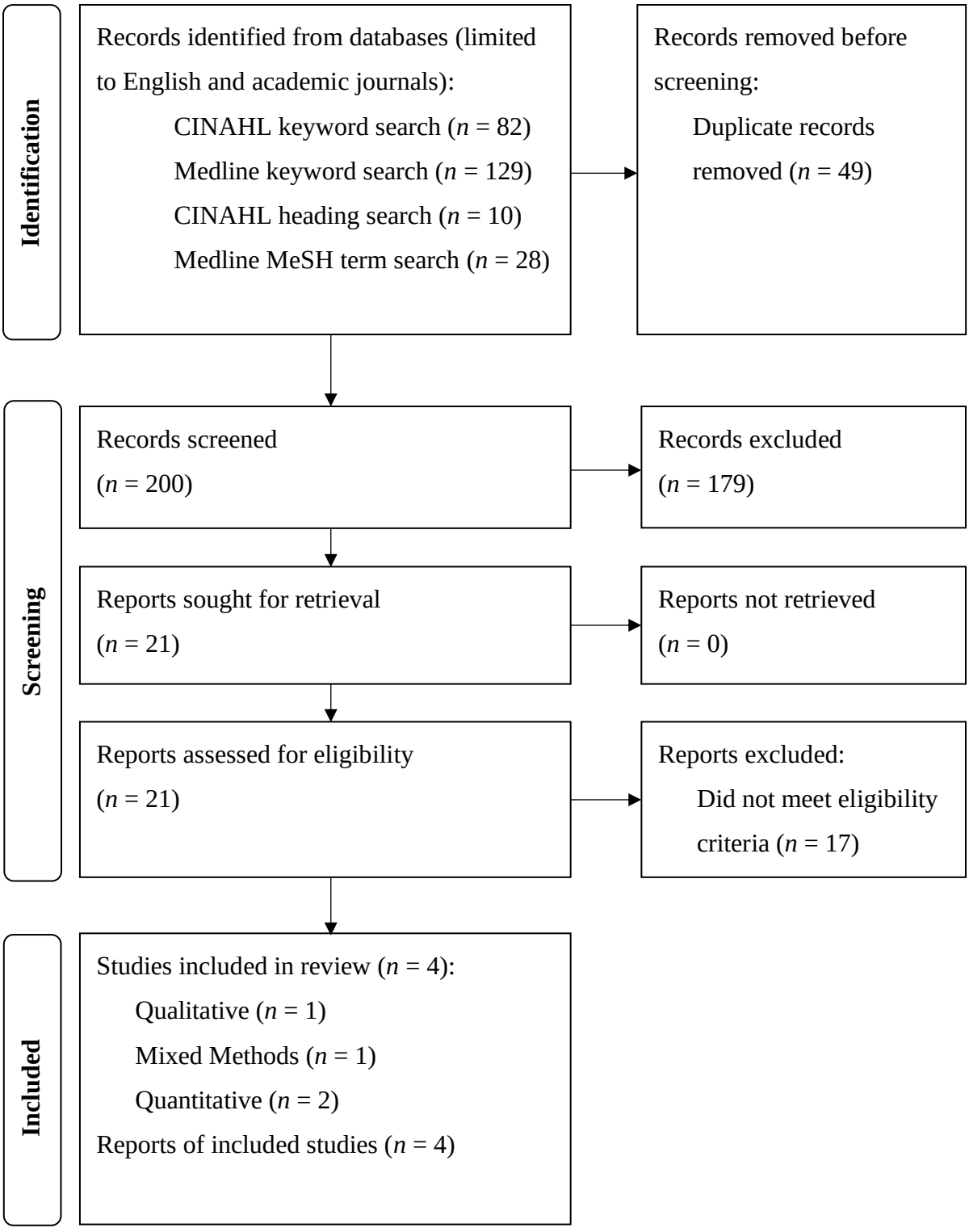
PICOT element	Relevant (inclusion criteria)	Not relevant (exclusion criteria)
Population	Participants in the study must include nursing students actively enrolled in a baccalaureate degree program providing the pre-registration education requirements to become licensed as a Registered Nurse. Participants must also be concurrently enrolled in a practice education course that provides them with direct client care experiences in the clinical setting under the direct supervision of a CI. Participants may be bridge-in students with previous nursing licensure or employed nursing experience. E.g., Licensed Practical Nurses (LPNs) and Associate Degree in Nursing students (ADNs). For systematic and integrative reviews, the sample is articles.	Nursing students who are not actively enrolled in in a baccalaureate degree program providing the pre-registration education requirements to become licensed as a Registered Nurse. E.g., practical nursing diploma, post-degree diploma, specialty training, and graduate education programs. Nursing students enrolled in practice or preceptorship courses who are not under the direct supervision of a CI. E.g., nursing students under the direct supervision of staff nurses or a nurse preceptor. Nursing students enrolled in practice courses that have the majority of their training facilitated in a clinical simulation or lab setting. CIs or teaching faculty.
Phenomenon of Interest	The study must examine the relationship between CI teaching behaviours and/or characteristics on the anxiety experienced by nursing students in baccalaureate practice education and identifies predictors of nursing students' anxiety based on the CI's teaching behaviours and/or characteristics.	Studies reporting primarily on: o Trait anxiety of nursing students o Anxiety, fear, worry, stress, or stressors experienced by nursing students in the clinical setting that are not associated with being influenced by the CI's teaching behaviours and/or characteristics (e.g., influenced by doctors, nurses, healthcare staff, clients/patients,

PICOT element	Relevant (inclusion criteria)	Not relevant (exclusion criteria)
	If there is limited research on the topic, studies with the following foci will be included: ○ Fear and/or worry experienced by nursing students that is perceived to be influenced by CIs' behaviours and/or characteristics ○ Stress or stressors influenced by CIs' behaviour and characteristic that is perceived by nursing students as being unhelpful, unwanted, or negative. The study must scientifically measure anxiety, fear, worry, stress, or stressors experienced by nursing students that is perceived to be directly influenced by CIs' behaviours and/or characteristics. Both qualitative and quantitative methodologies and all study designs are permitted.	visitors/family members, and other environmental factors in or outside of the clinical practice setting). If the study does not measure anxiety, fear, worry, stress, or stressors experienced by nursing students that is perceived to be directly influenced by CIs' behaviours and/or characteristics. E.g. anecdotal reports.
Comparison	Not applicable.	Not applicable.
Outcome	CIs' teaching behaviours and/or characteristics as perceived by nursing students to increase or decrease their anxiety, fear, worry, stress, or stressors in the clinical setting.	Anxiety, fear, worry, stress, or stressors experienced by nursing students in the clinical setting that is not directly influenced by CIs.
Time	Participants must have current or recent experience directly interacting with a CI in the clinical setting while enrolled in a practice course.	Participants have no or only distantly past experience directly interacting with a CI in the clinical setting.

PICOT element	Relevant (inclusion criteria)	Not relevant (exclusion criteria)
		Participants have current or recent experience directly interacting with a CI but not in a clinical setting, such as in a simulation or lab environment.
Other elements	English language (limiter) and human subjects. Published literature that is scholarly and peer reviewed. Publication date unlimited (ending with the year 2021).	Non-English language, non-human subjects. Published literature that includes but is not limited to: o editorials o opinion papers o commentaries o non-research-based discussions o study protocols o conference proceedings and conference abstracts

Appendix C

PRISMA Flow Diagram



Appendix D

Informed Consent and Research Questionnaire

TRINITY WESTERN UNIVERSITY | SCHOOL OF NURSING

[redacted]

Research Questionnaire: The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education

1.

Consent Form: Page 1 of 2

Dear Langara BSN student,

Thank you for your interest in participating in this grassroots research initiative! Please continue to read on to learn more about the research project, participant eligibility requirements, and to provide your consent to participate if you choose to do so.

About This Research Study

This study aims to explore how the learning environment may influence students during their practice education. Existing nursing research literature reveals that nursing students face many challenges when completing practice courses. By acquiring more knowledge on the topic, the goal of this study is to improve the clinical learning experiences and outcomes for nursing students.

Participant Requirements & Eligibility Criteria

To participate, you will need to be currently completing a practice course (excluding [redacted] preceptorship) in the BSN program at [redacted]. With your consent, you will be asked to complete an electronic questionnaire. The questionnaire consists of six sections asking you about your current learning experiences. It will take about 15-25 minutes to complete. It is highly recommended that you complete the questionnaire in one sitting. However, if you are interrupted you may return to the URL link from the same IP address on the same device (cookies must be enabled) to complete the questionnaire until its closing on August 25, 2022, at 10 pm.

Potential Risks & Discomforts

Because a section of the questionnaire will ask you about stressful feelings that you may have experienced during practice courses, you may feel some uncomfortable emotions from recalling these encounters. While the risk is considered minimal, if you should experience any emotional or psychological distress during or after you complete the questionnaire, please do not hesitate to get support by

contacting Here2Talk, BC's free and confidential counselling service, toll-free at 1-877-857-3397 or by visiting here2talk.ca. Counselling Services at [redacted] are also available to you at your discretion.

Potential Benefits

While this study will not benefit you directly, by participating in it you will be contributing valuable information that will be used to inform the teaching instruction provided in practice courses by [redacted] Nursing faculty. In this way, participating in this study offers you a unique opportunity to potentially enhance future learning experiences for yourself and your peers in the Baccalaureate Nursing Program at [redacted].

TRINITY WESTERN UNIVERSITY | SCHOOL OF NURSING [redacted]

Research Questionnaire: The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education

2.

Consent Form: Page 2 of 2

Privacy

Your privacy is of utmost importance to the investigators of this study. Therefore, a number of safeguards have been integrated into the study to protect your confidentiality and anonymity if you choose to participate. Completed questionnaires will be stored in their original format for a period of no more than 180 days after the data collection period on Survey Monkey's servers located in Canada. Your personal information is subject to protections under the BC Freedom of Information and Protection of Privacy Act (FIPPA). The information from completed questionnaires will then be transferred to a secure password protected computer for safe storage. Data obtained from the questionnaires will be recoded and combined with other participant responses as an additional measure to ensure the privacy of all participants. Your name and other personal identification information, such as your birthdate, student number, email address, and computer IP address will not be collected. The information you provide on the questionnaire will be stored for a maximum period of 5 years and may be used for educational and/or future research use after completion of this study. After this period, all data will be safely destroyed.

Voluntary Participation & Authorization

Participation in this study is entirely voluntary, and you can withdraw your consent to participate, without penalty, at any time before submitting the questionnaire by closing the URL window. Since there is no way of tracing the questionnaire back to you due to the privacy measures described above, you will not be able to withdraw your data once you submit the questionnaire. Only questionnaires that are completed and electronically submitted will be used in this study. If you decide not to participate, it will not affect you in any way. There is no compensation or incentive for participating in this study.

If you have any questions or desire further information with respect to this study, you may contact Anna Douglas (Principal Investigator) at [redacted] or Angela Wolff (Research Supervisor) at [redacted]

If you have any concerns about your treatment or rights as a research participant, you may contact the [redacted] ([redacted]) chair at [redacted] and the Ethics Compliance Officer of Research, Trinity Western University at [redacted] or [redacted].

This research study was approved by the [redacted] on June 14 and the Human Research Ethics Board at Trinity Western University on June 8 of this year.

To complete the research questionnaire now, click "Next" to proceed to Informed Consent. Otherwise, please close the browser window. You can return to the questionnaire at another time that is convenient for you by using the URL link until it closes on August 25, 2022, at 10 pm.

Thank you in advance for contributing to the success of this important study.

***Anna Douglas*, BSN, RN**
[redacted]

TRINITY WESTERN UNIVERSITY | SCHOOL OF NURSING [redacted]

Research Questionnaire: The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education

3.

* 1. **Informed Consent**

By consenting below, you are indicating that:

a) You have read and understood the information provided to you in the Consent Form (previous two pages).
b) You have had your questions about the study answered.
c) You voluntarily consent to participate in this research study.

By selecting "I consent", you are indicating that you consent to participate in this study and that your responses may be put in anonymous form and kept for further use after the completion for this study. Please print a copy of this consent form for your own records.

- ◯ I consent (click "Next" to proceed to the first page of the questionnaire)
- ◯ I do not consent (click "Next" to close the questionnaire)

TRINITY WESTERN UNIVERSITY | SCHOOL OF NURSING [redacted]

Research Questionnaire: The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education

4.

Section One: Your Current Practice Course

Instructions

This section asks some general questions about the practice course that you are currently enrolled in.

* 2. What **practice course** are you completing right now?

- ◯ [redacted]

* 3. What **type** of care facility is the current placement site?

- ◯ Hospital (in-patient)
- ◯ Clinic (out-patient)
- ◯ Residential / long-term / assisted care
- ◯ Group home

Other (please specify)

* 4. What is the **care focus** of the current practice setting?
(I.e., the type of patients for which care is being provided.)

- ◯ Medical for adults
- ◯ Surgical for adults
- ◯ Older adults
- ◯ Mental health for adults
- ◯ Mental health for children/youth
- ◯ Maternity and newborn care
- ◯ Pediatrics
- ◯ Specialized care for adults (e.g. nephrology, cardiology, oncology, neurology, etc.)

Other (please specify)

* 5. How would you rate your **overall performance** in the practice course that you are currently completing?

- ◯ Satisfactory
- ◯ At risk (neither satisfactory nor unsatisfactory)
- ◯ Unsatisfactory, not on a Learning Plan
- ◯ Unsatisfactory, on a Learning Plan
- ◯ Prefer not to answer

* 6. Overall, how do you rate the **effectiveness** of your clinical instructor in the current practice course that you are completing right now?

Note: **Clinical instructor** refers to a registered nurse, employed with the [redacted] at [redacted], who teaches undergraduate nursing students in the practice setting.

Unacceptable	Below average	Average	Above average	Excellent	Prefer not to answer
◯	◯	◯	◯	◯	◯

TRINITY WESTERN UNIVERSITY | SCHOOL OF NURSING

[redacted]

Research Questionnaire: The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education

5.

Section Two: The Learning Environment

Instructions

Below is a list of statements, in no particular order of relevance, to assess the clinical learning environment from the perspective of nursing students.

For each of the following statements, select the answer that most closely reflects your level of agreement about the clinical setting of the practice course that you are currently completing.

* 7. **Overall, in this practice setting/unit...**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Prefer not to answer
Staff are easy to approach	○	○	○	○	○	○
There is a spirit of solidarity among the nursing staff	○	○	○	○	○	○
Students are encouraged to take part in the discussion during shift report/patient care rounds	○	○	○	○	○	○
Staff are supportive of those in the role of preceptor	○	○	○	○	○	○
Students are made to feel comfortable when they start each shift	○	○	○	○	○	○
Clinical instructors are capable of supporting students to meet their learning goals	○	○	○	○	○	○
The manager regards the staff as a key resource	○	○	○	○	○	○
There is mutual interaction in the	○	○	○	○	○	○

learning relationship between staff and students	○	○	○	○	○	○
The manager is a team member	○	○	○	○	○	○
Clinical instructors help students bridge the theory-practice gap	○	○	○	○	○	○
Staff are positive role models for nursing	○	○	○	○	○	○
Feedback from the manager contributes to learning	○	○	○	○	○	○
The efforts of individual staff are appreciated by the manager	○	○	○	○	○	○
The nursing philosophy is clearly defined	○	○	○	○	○	○
Clinical instructors integrate theoretical knowledge in their everyday practice of nursing	○	○	○	○	○	○
Staff are generally interested in working with students	○	○	○	○	○	○
Clinical instructors support student learning	○	○	○	○	○	○
Staff make an effort to get to know the students	○	○	○	○	○	○
Staff encourage more independence as students' skills increase	○	○	○	○	○	○
There is a good learning environment	○	○	○	○	○	○
Students are satisfied with the supervision they receive	○	○	○	○	○	○
Clinical instructors are able to provide their expertise to the clinical team	○	○	○	○	○	○
Staff are aware of students' learning objectives before	○	○	○	○	○	○

students arrive						
There is a spirit of solidarity among the clinical team	○	○	○	○	○	○
In common meetings, students experience collegial relationships with clinical instructors	○	○	○	○	○	○
Staff inform students of possible learning experiences	○	○	○	○	○	○
Staff have the opportunity to attend preceptor/mentor training	○	○	○	○	○	○
There is a well-defined communication process between the clinical unit and the Education Program	○	○	○	○	○	○
Staff are notified of students learning objectives in advance of the placement start date	○	○	○	○	○	○

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[redacted]

Research Questionnaire: The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education

6.

Section Three: The Clinical Instructor

Instructions

Below is a list of statements, in no particular order of relevance, to assess specific behaviours demonstrated by clinical instructors from the perspective of nursing students.

Think of the interactions that you have had with your current clinical instructor during the practice course that you are completing right now. Recall specifically what this clinical instructor does during their interactions with you. For each statement below, select the number which indicates how descriptive the behaviour is of this clinical

instructor when they interact with you.

* 8. **Overall, my current clinical instructor...**

	1 = Not At All Descriptive	2 = Not Descriptive	3 = Mostly Not Descriptive	4 = Somewhat Descriptive	5 = Mostly Descriptive	6 = Descriptive	7 = Very Descriptive	Prefer not to answer
Explains clearly	○	○	○	○	○	○	○	○
Emphasizes what is important	○	○	○	○	○	○	○	○
Stimulates student interest	○	○	○	○	○	○	○	○
Remains accessible to students	○	○	○	○	○	○	○	○
Demonstrates clinical procedures and techniques	○	○	○	○	○	○	○	○
Guides students' development of clinical skills	○	○	○	○	○	○	○	○
Provides specific practice opportunity	○	○	○	○	○	○	○	○
Offers special help when difficulties arise	○	○	○	○	○	○	○	○
Is well prepared for teaching	○	○	○	○	○	○	○	○
Enjoys teaching	○	○	○	○	○	○	○	○
Encourages active participation in discussion	○	○	○	○	○	○	○	○
Gears instruction to students level of readiness	○	○	○	○	○	○	○	○
Quickly grasps what students are asking or telling	○	○	○	○	○	○	○	○
Answers carefully and precisely questions raised by students	○	○	○	○	○	○	○	○
Questions students to elicit underlying reasoning	○	○	○	○	○	○	○	○
Helps students organize their thoughts about patient problems	○	○	○	○	○	○	○	○

Promotes student independence	○	○	○	○	○	○	○	○
Demonstrates clinical skill and judgment	○	○	○	○	○	○	○	○
Demonstrates communication skills	○	○	○	○	○	○	○	○
Reveals broad reading in his/her/their area of interest	○	○	○	○	○	○	○	○
Discusses current development in his/her/their field	○	○	○	○	○	○	○	○
Directs students to useful literature in nursing	○	○	○	○	○	○	○	○
Demonstrates a breadth of knowledge in nursing	○	○	○	○	○	○	○	○
Recognizes own limitations	○	○	○	○	○	○	○	○
Takes responsibility of own actions	○	○	○	○	○	○	○	○
Is a good role model	○	○	○	○	○	○	○	○
Makes specific suggestions for improvement	○	○	○	○	○	○	○	○
Provides frequent feedback on students' performance	○	○	○	○	○	○	○	○
Identifies students' strengths and limitations objectively	○	○	○	○	○	○	○	○
Observes students' performance frequently	○	○	○	○	○	○	○	○
Communicates expectations of students	○	○	○	○	○	○	○	○
Gives students positive reinforcement for good contributions,	○	○	○	○	○	○	○	○

observations or performance								
Corrects students' mistakes without belittling them	○	○	○	○	○	○	○	○
Does not criticize students in front of others	○	○	○	○	○	○	○	○
Provides support and encouragement to students	○	○	○	○	○	○	○	○
Is approachable	○	○	○	○	○	○	○	○
Encourages a climate of mutual respect	○	○	○	○	○	○	○	○
Listens attentively	○	○	○	○	○	○	○	○
Shows a personal interest in students	○	○	○	○	○	○	○	○
Demonstrates empathy	○	○	○	○	○	○	○	○
Demonstrates enthusiasm	○	○	○	○	○	○	○	○
Is a dynamic and energetic person	○	○	○	○	○	○	○	○
Is self-confident	○	○	○	○	○	○	○	○
Is self-critical	○	○	○	○	○	○	○	○
Is open-minded and non-judgmental	○	○	○	○	○	○	○	○
Has a good sense of humour	○	○	○	○	○	○	○	○
Appears organized	○	○	○	○	○	○	○	○

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[redacted]

Research Questionnaire: The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education

7.

Section Four: Your Feelings Part 1

Instructions

A number of statements which people have used to describe themselves are given below. Read each statement and then select a response to indicate how you feel right now when you interact with your clinical instructor during the practice course that you are currently completing.

There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

* 9. **Overall, when I interact with the assigned clinical instructor. . .**

	Not At All	Somewhat	Moderately So	Very Much So	Prefer not to answer
Copywrite	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
I feel at ease	○	○	○	○	○
I feel upset	○	○	○	○	○
Copywrite	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○
	○	○	○	○	○

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[redacted]

Research Questionnaire: The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education

8.

Section Five: Your Feelings Part 2

Instructions

A number of statements which people have used to describe themselves are given below. Read each statement and then select the appropriate response to indicate how you generally feel in life.

There are no right or wrong answers. Do not spend too much time on any one statement but give the answer that seems to describe how you generally feel in life.

* 10. **In general. . .**

	Almost Never	Sometimes	Often	Almost Always	Prefer not to answer
Copywrite					
I lack self-confidence					
Copywrite					
I am a steady person					
Copywrite					

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[redacted]

Research Questionnaire: The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education

9.

Section Six: General Information

Instructions

This final section asks you to share some general information about yourself. Because these are questions about you, your answers remain anonymous and cannot be traced back to you.

11. What type of health care **registration or licensing** have you held in the past or hold at present?

For example, if you have completed a practical nurse diploma program and are currently enrolled in the baccalaureate nursing programme, you would select LPN as your answer.

Select all that apply.

- ☐ Licensed Practical Nurse (LPN)
- ☐ Registered Psychiatric Nurse (RPN)
- ☐ Employed Student Nurse registrant (ESN)
- ☐ None of the above
- ☐ Health Care Assistant (HCA)

Other (please specify)

12. What are your **ethnic or cultural origins**?

(Select all that apply.)

- ☐ Brazilian
- ☐ Caucasian (White)
- ☐ Chinese
- ☐ Filipino
- ☐ Indigenous (e.g. First Nations, Metis, Inuit)
- ☐ Indian (India)
- ☐ Iranian
- ☐ Japanese
- ☐ Mexican
- ☐ South Korean
- ☐ Vietnamese

Other (please specify)

13. What is your **gender**?

- ○ Male
- ○ Female

Other (please specify)

14. What is your **age** in number of years?

Note: Insert your age as a whole number (e.g., 20). Do not state partial years (e.g., 20.5).

15. Please provide any additional comments you have about the influence of the current clinical instructor or any other aspects of the learning environment on your learning. Do not include any names or personal identifiers.

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[redacted]

Research Questionnaire: The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education

10.

This concludes the questionnaire.

Thank you very much for completing it!

To submit it, click “Done” and wait until you see the confirmation letter before closing out the browser window.

Appendix E
Study Recruitment Invitation

Announcement Title: Invitation to Participate in Nursing Research—*The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education*

~*~*~*~

Dear [redacted] BSN Nursing Students in [redacted]:

Please consider participating in an important research study being conducted by one of our teaching faculty, Anna Douglas, as part of her graduate degree in Nursing at Trinity Western University. Here are the details…

Research Title: *The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education*

What is this research about?

The aim of this study is to explore how the learning environment influences baccalaureate nursing students during their practice education (a.k.a. clinical practice experiences).

Why is this study important?

The goal of this study is to improve the clinical learning experiences and outcomes for nursing students like you.

Who can participate?

Any BSN student at [redacted] who is currently completing a practice course (excluding [redacted] preceptorship) can participate in this study.

What does the study involve?

With your consent, you will complete a single electronic questionnaire, which will take about 15-25 minutes. You can access the questionnaire at any time from [redacted] to [redacted], 2022, at 10 pm. It is recommended that you complete the questionnaire in one sitting at a time that is convenient for you to avoid technical issues that may cause loss of your data.

Do I have a choice to participate?

Yes, your participation is voluntary and there is no obligation or incentive for you to participate in this study.

Will my privacy be protected?

Yes, absolutely. Your responses on the questionnaire will be kept anonymous and confidential, and will not be shared with anyone at [redacted].

Who do I contact for more information?

If you have any questions or would like more information about the study, please don't hesitate to contact the principal investigator, Anna Douglas, at [redacted]

Thank you in advance for your interest in participating in this valuable grassroots research initiative. Your participation would be greatly appreciated!

To participate in this research study, click on this link or access the QR code below to proceed to the consent form and questionnaire:

https://www.surveymonkey.ca/[redacted]

Appendix F

Study Announcement Presentation to Nursing Faculty

Slide 1: Coming to [redacted]'s BSN Program next month!

Principal Investigator: Anna Douglas, BScN, RN
Secondary Investigator (Supervisor): Dr. Angela Wolff, PhD, RN

~*~*~*~

The Influence of the Learning Environment on Baccalaureate Nursing Students in Practice Education

~*~*~*~

Endorsed by: [redacted] Dean, [redacted]
Funded by: [redacted]
Approved by: [redacted] & Trinity Western University's Human Research Ethics Board

Slide 2: Why is this study being conducted?

Me - professional development
We - our students and us
All - the greater Nursing Education community

Slide 3: Why is this study important?

Purpose = To explore how the learning environment may influence nursing students during their practice education experiences (i.e. clinical courses)
Goal = To improve the learning experiences and outcomes for nursing students in baccalaureate practice education
Pillars of the learning environment = Clinical Environment, Staff, Client Interactions, Teaching Faculty (i.e. clinical instructor), & Student's Emotional/Psychological State
Methodology = Quantitative: descriptive, correlational

Slide 4: Who can participate?

All [redacted] students, who are actively enrolled in a practice course in the BSN program this [redacted].

Sample size target = minimum of 190 students ; goal 100%!
Participation is voluntary ; there is no incentive to participate.

Slide 5: What is required of participants?

✅ Complete a single electronic questionnaire via Survey Monkey
20-30 mins.

⇒ 4 data collection tools spread into six sections:

- ◊ demographic questions
- ◊ State-Trait Anxiety Inventory (Spielberger et al., 1989)
- ◊ Nursing Clinical Teacher Effectiveness Inventory (Knox & Mogan, 1985)

- ◊ Clinical Learning Environment, Supervision and Nurse Teacher Inventory (Currie et al., 2015)

⇒ Preview link: https://www.surveymonkey.com[redacted]

Slide 6: References

Knox, J. E., & Mogan, J. (1985). Important clinical teacher behaviours as perceived by university nursing faculty, students, and graduates. *Journal of Advanced Nursing*, *10*(1), 25–30. https://doi.org/10.1111/j.1365-2648.1985.tb00488.x

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory*. Consulting Psychologists Press.

Wolff, A. C., & Currie, L. (2022). *Measuring the quality of the clinical learning environment: Validation of the revised CLES+T from multiple perspectives* [Unpublished manuscript]. Trinity Western University.

Slide 7: How will privacy and confidentiality be maintained?

- ◊ The questionnaire is anonymous.
- ◊ Personal identification information *will not* be collected.
- ◊ Names, birthdates, student numbers, email addresses, computer IP addresses, etc.
- ◊ Collected data will be securely stored for a maximum period of 5 years, then safely destroyed.
- ◊ Data will *not* be shared with anyone at the college.
- ◊ Questionnaire responses cannot be traced back to any specific instructor.

Slide 8: When will the results of the study become available?

[redacted]*

Slide 9: What can I expect to happen?

a) [redacted]: Electronic announcement to all BSN students promoting the study and inviting them to participate; electronic questionnaire availability opens.
b) [redacted]: On-campus promotion of the research by the PI.
c) [redacted]: On-campus promotion of the research by employed student peers.
d) [redacted]: Electronic updates to all BSN students thanking those that have participated and inviting others to participate.
e) [redacted] at 10pm: Questionnaire availability closes.

Slide 10: How can I contribute to the study?

- ◊ Host a live promotional event in class! (~10 min., SNACKS will be provided)
- ◊ Recommend a student to become a peer recruiter! (commitment = 5 hours PAID; need one student per section)
- ◊ Share electronic announcements/updates that you receive with your students via email, social media, or your Brightspace course
- ◊ Talk it up with your colleagues, family, and friends!

Check your inbox on Monday for more details and to sign-up.

Slide 11: In closing…

Thank you in advance for your support! The success of this study involves YOU!

For more information, contact the PI, Anna Douglas, at [redacted]

Appendix G

Study Announcement Email to Nursing Faculty

Subject: Research study coming to the BSN program in July! Response required before July 6.

Dear Faculty of the BSN program at [redacted],

As some of you already heard at the Faculty Meeting last week, in July I will be conducting a quantitative research study titled, *The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education*. This study has been approved by [redacted] Research Ethics Board in partnership with Trinity Western University and has received endorsement from [redacted]. I am writing to invite you to contribute to the success of this research by promoting it in your classroom! Here are the exciting details…

About This Research Study

The aim of this research is to explore how the learning environment may baccalaureate influence nursing students in their practice education. The goal is to improve the clinical learning experiences and outcomes for nursing students.

Subjects & Data Collection Procedure

Participation in this study is open to all [redacted] BSN nursing students who are actively enrolled in a practice course (i.e., clinical course, excludes preceptorship) during the [redacted] 2022 semester. An anonymous self-administered electronic questionnaire will be used to collect data and will be made available in the second week of [redacted] until [redacted] at 10pm. The questionnaire will take students approximately 15-25 minutes to complete.

Privacy & Confidentiality

Privacy and confidentiality are of upmost importance to the researchers of this study. To protect the anonymity of participants, personal identifying information, such as names, birthdays, student numbers, email addresses, and IP addresses, will not be collected. Collected data will not be shared with anyone at the college and will be securely stored for a maximum period of 5 years, then safely destroyed. All data reported will be aggregated without identifying teachers or students.

Duration & Phases of the Data Collection Process

- ◊ [redacted]: An electronic announcement will be sent out to all BSN students promoting the study and inviting them to participate. At the time that the announcement is posted, the electronic questionnaire will become available for participants to complete.
- ◊ [redacted]: On-campus promotion of the research by employed student peers.

- ◊ [redacted]: Electronic updates will be sent to all BSN students thanking those that have participated and reminding others to participate.
- ◊ [redacted] at 10pm: Questionnaire availability closes. Data collection period ends.

How You Can Contribute--It's simple!

1. Host a live promotional event in your classroom!
   - All you need to do is donate a 10-minute timeslot at the beginning or end of class once between [redacted] and again between [redacted]. Snacks will be provided! Sign-up here through Survey Monkey before July 6: https://www.surveymonkey.ca/r/[redacted]
2. Recommend a student to become a peer recruiter!
   - This study has been provided a small grant from the [redacted]. Part of this funding has been allocated to employ one nursing student from each section of [redacted] to assist in the promotion and recruitment process of the study. If you know of a student who may be interested in being hired into this position, please complete this form through Survey Monkey before [redacted]:
     https://www.surveymonkey.ca/r/[redacted]
3. Spread the word!
   Share electronic announcements/updates that you receive about the study with your students via email, social media, and your Brightspace course.

You can review a prototype of the questionnaire here:
https://www.surveymonkey.ca/[redacted]

If you have any questions or desire further information with respect to this study, please don't hesitate to contact me.

Thank you so much in advance for your support of this grassroots research initiative!

Warm regards,
Anna Douglas, BSN, RN
[redacted]

~*~ *~*~

Principal Investigator
Anna Douglas, BSN, RN
[redacted]

Research Supervisor
Angela Wolff, PhD, RN
Faculty, School of Nursing
Trinity Western University
[redacted]

Institutional Contact:
[redacted]

Appendix H

Study Participant Recruiter Recruitment Email Template

Hello [nursing student's name],

Thank you for your interest in helping to contribute to the success of this research study by promoting it to your peers! This is a paid position through Langara's Work on Campus Program. The time commitment is 5 to 10 hours dispersed over 3 weeks (July 18 to Aug. 5).

Here is an overview of this contractual employment position...

Position Title: Research Participant Recruiter
Employee Group: [redacted]
Employment Period: Week of [redacted]
Time Commitment: a minimum of 5 to 10 hours (5 hours per section of each term)
Location: On-campus at [redacted]
Pre-requisites: Be actively enrolled and in good academic standing in [redacted] of the BSN program at [redacted]
Role: To promote the research study, *The Influence of the Learning Environment on Nursing Students in Baccalaureate Practice Education*, to [redacted] BSN students and recruit participants from [redacted]. An orientation to the position will be provided during the week prior to the 2-week promotional period.
Responsibilities--it's as simple as 1, 2, 3!:

1. Sign and abide by the Confidentiality Agreement (see attachment).
2. Attend an orientation session via. Zoom during the week of [redacted]. (2 hours paid time.)
   - Date and time to be determined based on the availability of hired peer recruiters.
3. Promote the study on-campus by doing the following (up to 3 hours paid time per section of each term from [redacted]):
   - Obtain permission from a course instructor to facilitate a 10-minute in-class promotional event. Promotional materials will be provided by the Principal Investigator/Researcher.
   - Create, plan, and facilitate additional events and/or activities to recruit participants outside of the classroom.

Benefits of the Work Experience:

Have the rare and unique opportunity of being involved in the recruitment process of an extraordinary grassroots nursing research study happening right here in the BSN program at [redacted].

- Actively learn about the process of conducting data collection for quantitative nursing research and get paid for it.
- Be a champion for nursing research that aims to improve the learning experiences and outcomes of nursing students just like you.
- Stand apart from your peers and gain valuable work experience for your resume.
- Support and encourage other nursing students to meet their BCCNM competencies in the role of "Scholar" by participating in important nursing research.

Let me know if you have any questions or would like to sign up for the position. Feel free to share this with other nursing students who you think might also be interested. There are enough positions for one student from each section of [redacted].

Anna Douglas, BSN, RN
[redacted]

Appendix I

Research Participant Recruiters Confidentiality Agreement

Position Title: Research Participant Recruiter

As a Research Participant Recruiter, you have the unique role of inviting and supporting fellow [redacted] nursing students to participate in this research study that examines some situations that may influence nursing students in their practice education. The purpose of this agreement is to protect the privacy and confidentiality of the research integrity and study participants in accordance with the Tri-Council Policy Statement: Ethical Conduct for Research involving Humans (2018) and in abidance with British Columbia's Freedom of Information and Protection of Privacy Act (FIPPA). As such, to be hired for the position of Peer Research Participant Recruiter you must understand and agree to abide by the following statements:
Note: The study has been reviewed for its adherence to ethical guidelines and approved by the Research Ethics Board at Trinity Western University and [redacted] College.

As an employe, Research Participant Recruiter, I will:

a) not disclose personal information, expressed thoughts and opinions, and personal communication regarding individuals invited to participate in the research study.
b) keep all the research information shared with me confidential by not using, discussing, or sharing the information in any form or format (e.g., verbal/electronic communications, and recruitment materials/activities) with anyone other than the research team.
c) keep all research information in any form or format (e.g., training communications and materials, and recruitment materials and activities) secure while it is in my possession.
d) securely erase or destroy all information pertaining to the recruitment process of the research study in any form or format (e.g., all printed materials, and electronic information stored on a computer hard drive, external storage device, or email server) once I have completed the research tasks at the end of the employment period.

□ Yes, I have read, understand, and agree to abide by the above statements.
□ No, I do not agree to abide by the above statements.
Employee Student Name: Date:
e-Signature:

Appendix J

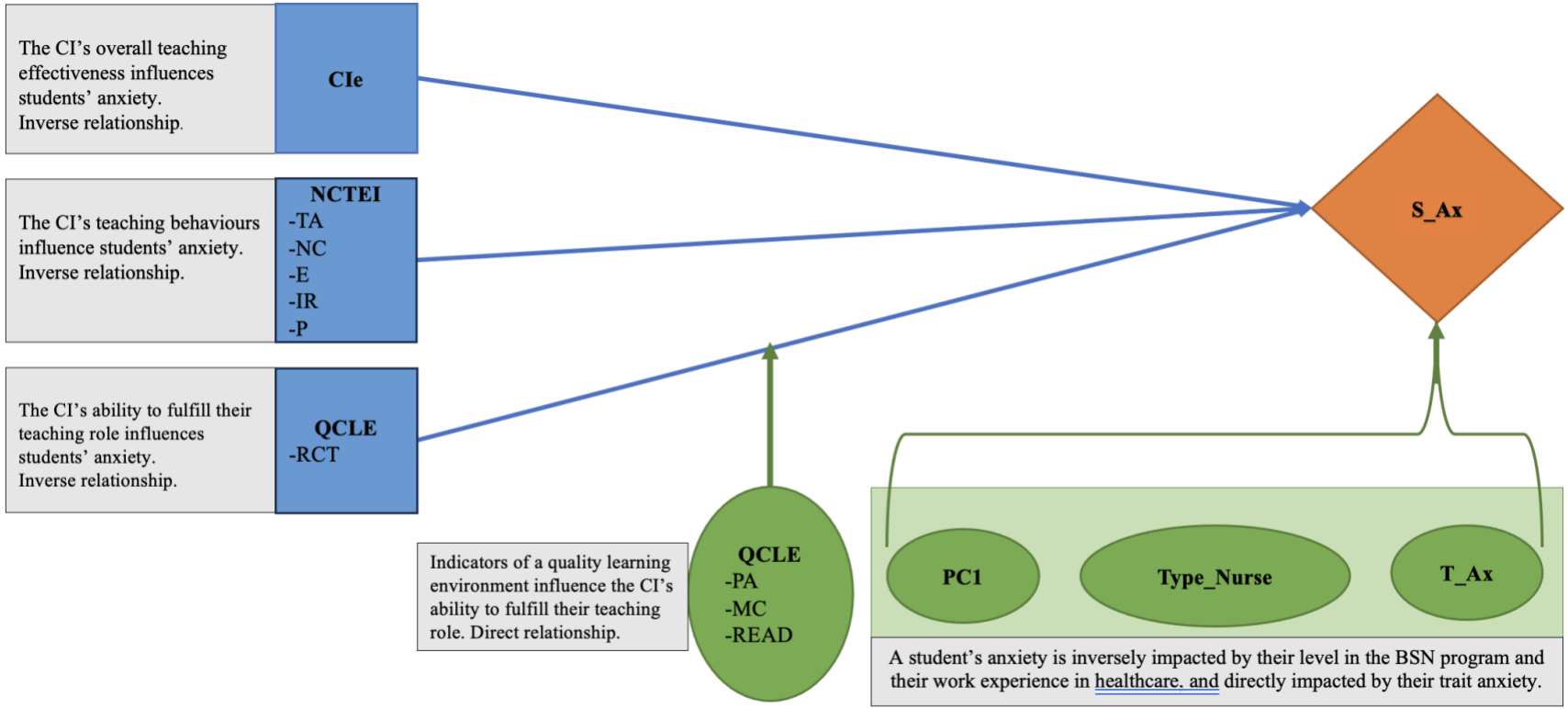
MR Analysis Assumptions Testing

Assumptions	Results
1. The DV is continuous.	This assumption was fully met. The DV was measured on a 4-point Likert scale.
2. There are two or more IVs, either continuous or categorical (dichotomous).	This assumption was fully met. Continuous IVs were measured on a 5 to 7-point Likert scale and categorical IVs were transformed into dichotomous variables.
3. There is independence of observations (i.e., independence of residuals).	This assumption was fully met by the Durbin-Watson statistic. The Durbin-Watson statistic checks for first-order autocorrelation to determine if adjacent observations, specifically their errors, are either correlated or independent (range equals 0-4 where 2 indicates independence). Test results from this study were 2 in the untransformed dataset and 1.7 in the transformed dataset.
4. There is a linear relationship between (a) the DV and each of your IVs, and (b) the DV and the IVs collectively.	This assumption was only fully met after the DV was transformed by the "logarithmic" method (best for strongly positively skewed data) and the IVs were transformed by the "reflect and inverse" method (best for extremely negatively skewed data). The results of this transformation procedure were determined sufficient by comparing standardized residuals against unstandardized predicted values in scatter plots and comparing partial regression plots between each IV and the DV.
5. The data needs to show homoscedasticity of residuals (equal error variances).	This assumption was only fully met by the transformed dataset. Homoscedasticity means that residuals are equal for all values of the predicted DV (i.e., the variances along the line of best fit remain similar as you move along the plotted line).

Assumptions	Results
6. The data must not show multicollinearity.	Multicollinearity occurs when there are two or more IVs that are highly correlated with each other. This leads to problems with understanding which variable contributes to the variance explained and technical issues in calculating a multiple regression model. Multicollinearity is determined to be present when correlation coefficients exceed 0.7 or when Tolerance values are less than 0.1 and VIF values are not greater than 10 (VIF is the reciprocal of Tolerance). In this study, correlations exceeding 0.7 existed between all five domains of the NCTEI, Role of CI, and Overall CI Effectiveness. Granted, all the variables displayed normal Tolerance and VIF values.
7. There should be no significant outliers, high leverage points or highly influential points	This assumption was fully met by inspection of the Casewise Diagnostic table. This statistical analysis procedure detects unusual points in the data that are greater than ±3 standard deviations, which is a common cut-off criterion used to define whether a particular residual might be representative of an outlier or not. The "residual" value represents the "degree of error" in the prediction. It is important to identify significant outliers because they can have a very negative effect on the regression equation by reducing the predictive accuracy and statistical significance of the results. The results of this test on the untransformed data compared to the transformed data ranged from -1.5 to 2 and -0.3 to 0.4, respectively.
8. Residuals (errors) are approximately normally distributed	This assumption was fully met most strongly in the transformed data. To be able to obtain accurate results from inferential statistics, the residuals or errors in prediction need to be normally distributed. Using histograms with a superimposed normal curve and P-P plots, residuals were determined to be approximately normally distributed.

Appendix K

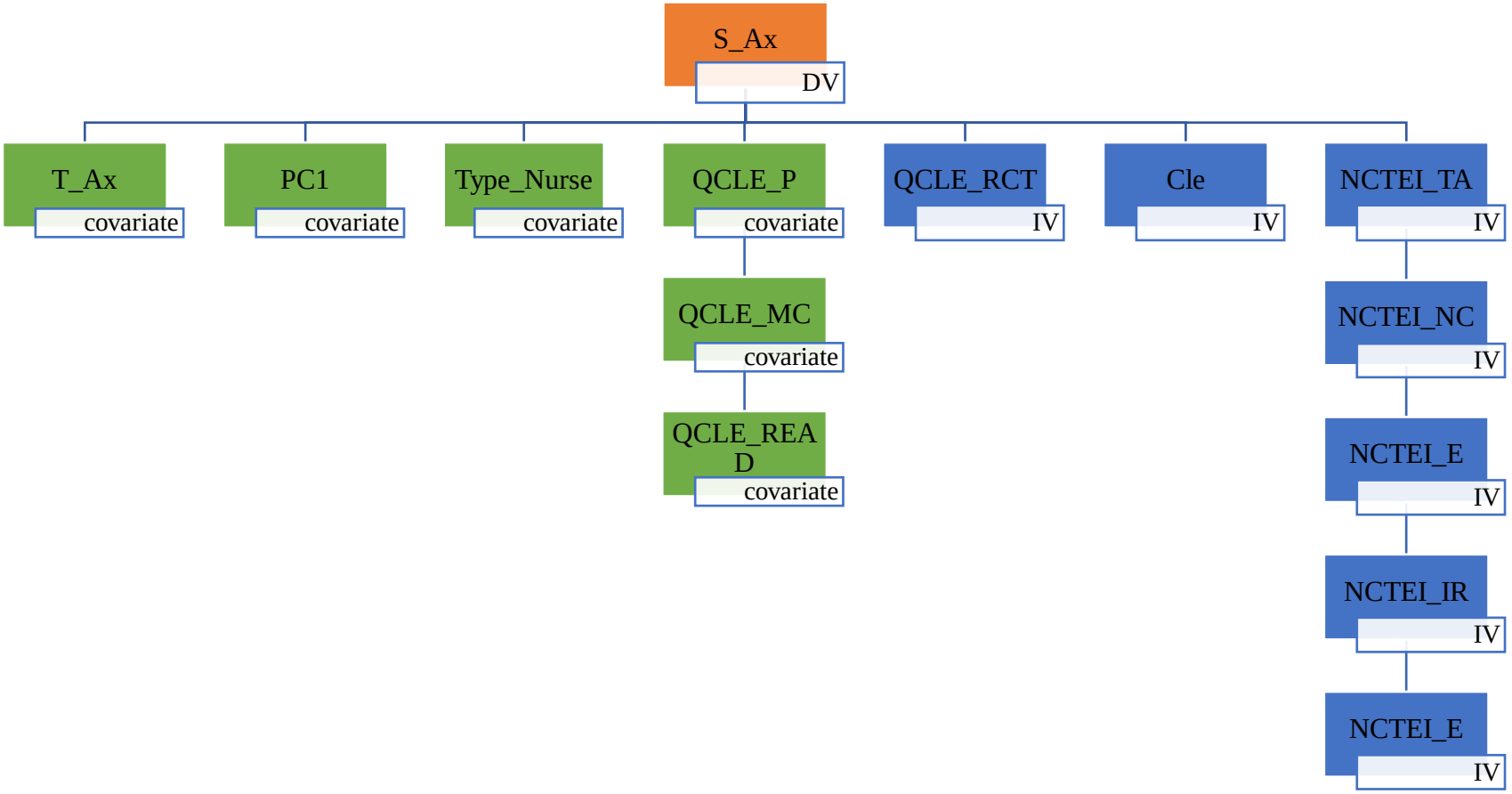
Predicted Variable Relationships



Note: Orange denotes the DV. Blue denotes the IVs. Green denotes covariates. See Table 1 for variable names and description.

Appendix L

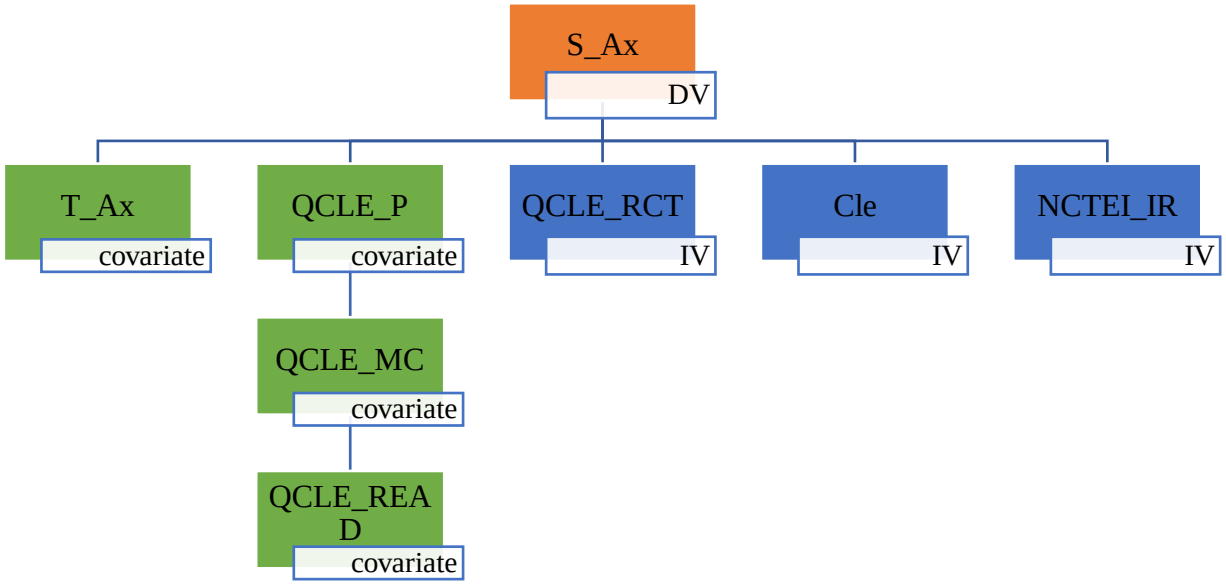
Initial Model of the HMR Analysis Procedure



Note: See Table 1 for variable names and description.

Appendix M

Final Model of the HMR Analysis Procedure



Note: See Table 1 for variable names and description.