The Nursing Competence Self-Efficacy Scale (NCSES): An Instrument Development

and Psychometric Assessment Study

by

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Dedication

Dedicated to Jack for gentle encouragement and constant support, to the memory of my parents

Evelyn and Alex Kennedy for always nurturing my self-efficacy and to the memory of Dock a

most faithful study companion

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ABSTRACT

The aim of this study was to develop and psychometrically assess an instrument to measure senior baccalaureate nursing student self-efficacy related to meeting entry level competencies required on acceptance to the nursing profession. The theoretical foundation of this study is social cognitive theory (Bandura, 1986). Social cognitive theory includes the construct of self-efficacy. The foundation of social cognitive theory guides the selection of study variables, the study design and the interpretation of the study findings. The conceptual framework for this study is The Health System and Health Human Resources (HHR) Planning Framework (O'Brien-Pallas & Tomblin Murphy, 2006). The framework links important elements in health human services and workforce planning to the self-efficacy of future registered nurses in relation to meeting expected professional competencies. A twenty-two item, Likert type measurement instrument entitled the Nursing Competence Self- Efficacy Scale (NCSES) was developed and validated by experts in nursing research and practice and in consultation with experts in instrument development and psychometric assessment. Nursing experts (n=8) participated in a two-step validation process consisting of two independent reviews of the instrument, before it was administered to senior baccalaureate nursing students (N=253). The NCSES has demonstrated evidence of internal consistency reliability, test-retest stability reliability, content validity, construct validity and contrasting group validity. This is the first study to develop and assess a scale to measure senior baccalaureate nursing students' self-efficacy for competent nursing practice. It contributes a practical 22 item instrument to evaluate senior baccalaureate nursing students' self-efficacy for nursing competence.

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CHAPTER 1

INTRODUCTION

Evidence suggests that nurse educators play an important role in enhancing student self-efficacy for future nursing practice (Benner, 2010; Duchscher, 2009; Eggertson, 2011). There is value in measuring the self-efficacy of graduating Canadian registered nurses in relation to meeting the competencies required to enter the profession. A measurement instrument designed to measure self-efficacy for nursing competence with this population does not exist (Cheraghi, Hassani, Yaghmaei, & Alavi-Majed, 2009; McLaughlin, Moutray, & Muldoon, 2008). This study aims to develop and psychometrically test an instrument to measure this construct. This chapter introduces the construct of self-efficacy for nursing practice and its relevance for contemporary nursing education.

Educating future generations of registered nurses requires courage and commitment. Paulo Freire, one of the world's most renowned educators, wrote a book in 1998 entitled *Teachers as Cultural Workers: Letters to Those who Dare Teach.* Hamilton (1999) suggests that "in this text Freire is writing about the educational dialectic of being and becoming ... about searching for ways of teaching that are relevant for learners as they are now and as they will be in the future" (p.1). One can only assume that the education of nursing students for a future health care system we cannot easily imagine, presents an even greater challenge. The responsibility to prepare graduates who are caring, capable and competent, as required by the Code of Ethics for Registered Nurses (Canadian Nurses Association[CNA], 2008), adds an additional accountability.

Graduates must be able to accurately analyze each situation within their practice. In the area of patient care, registered nurses must be both monitors and responders. They constantly search for salient symptoms that may suggest deterioration in their patient's condition and expeditiously intervene to improve the patient's physiological status (Benner, 2010). Registered nurses thus prevent potentially injurious outcomes by using professional skills, knowledge and judgement for sound decision making. Failure to do so has been termed as failure to rescue (Needleman & Buerhaus, 2007). Such is the responsibility of the registered nurse and therefore of the nurse educator.

Although the field of nursing education has always had its challenges, it can be argued that this is a particularly critical time to examine nursing education. Nurse educators are faced with challenges not apparent thirty or forty years ago. Examples of these challenges include: innovations in science, technology and communication; the increasing global burden of illness and poverty; the increasing cost constraints in health care systems; climate change; political uncertainty and greater public expectations. Today's learners will see the role of professional nurses evolve and change tremendously during their careers as innovative models of health care delivery are developed and implemented (Benner, 2010; Doherty, 2009). The Collaborative Model of Care recently initiated in Nova Scotia is one example. In this model it is estimated that 95% of technical skill is now shared between registered nurses and licensed practical nurses. The definition of actual scope of practice for a registered nurse evolves from the practice decisions around the technical skill rather than from the technical skill itself (Tomblin Murphy, Alder, McKenzie, & Rigby, 2010). Adjustment to newer models of care may initially lead to role confusion, added stress and turmoil in the workplace.

Benner (2010) discusses the need for graduates to develop an enhanced ability to integrate skilled knowledge, skilled *know-how* and ethical comportment. This terminology parallels the familiar and traditional notion of theory, practice and professional role development. However, in her latest text Benner provides new, vivid and concrete examples of increasing complexities for educators in each of these three traditional domains. For example, in the domain of theoretical knowledge for practice Benner suggests that the acuity of patients in general acute care beds (which she refers to as the ICU patients of the 1970s) requires nurses to know more than the range of normal lab values. She states that "current intravenous drugs must be carefully monitored and titrated based on sophisticated knowledge of pharmacokinetics, hemodynamic and cardiac function" (p. 27). In another example, Benner cites the increasingly overburdened health care system as a source of ethical dilemmas related to injustice and inequality in access to care. These types of complexities are related to both the present and anticipated future health care environments.

To work and thrive in our present and future health care environment nursing graduates require new and more complex skill sets (Benner, 2010). To develop the knowledge needed to achieve what is expected while also feeling empowered and proud of their ability, their skill and their unique contribution, they must develop resilience to education program stressors as students, and subsequently to workplace stressors as graduates. They require an ability to cope with constant uncertainty and change and they must be confident in their ability to do so (Benner, 2010). The capacity to manage complex patient situations, problem solve, seek and use evidenced based information on which to make skilled decisions, think critically and engage with colleagues is essential (Benner, 2010; Brown, Kirkpatrick, Mangum, & Avery, 2008).

A review of the nursing education literature related to best education practice provides as many questions as it does answers, with a variety of expert points of view as to what is considered to be of utmost importance (Eddy, 2009; Forbes & Hickey, 2009; Johnston, Rogers, Cross, & Sochan, 2005; Jones, 2008). Expanding the literature search to include recent data on trends and issues affecting the profession leads to a key underlying question: What types of curricula and support systems will best prepare future registered nurses with the knowledge, skills and abilities required to provide safe ethical nursing care within newer models of health care delivery, while feeling empowered, satisfied, productive and proud of their chosen profession? Key words in this question include empowered, satisfied, productive and proud. A review of education and nursing education literature undertaken to find a construct that best captured the concept of feeling empowered, satisfied, productive and proud revealed that the concept may be embedded in the construct of career or practice self-efficacy.

Self-efficacy is commonly defined as having a belief in one's capability to succeed. One feels up to the challenge of difficult tasks and is therefore intrinsically motivated by them (Bandura, 1993; Zeldin, Britner, & Pajares, 2008). Unfortunately, many registered nurses do not feel empowered and confident in relation to their practice (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Jacobs, Fontana, Hildalgo, Matarese, & Chinn, 2005; McKenna, Smith, Poole, & Coverdale, 2003; Peter, Macfarlane, & O'Brien-Pallas, 2004; Roche, Diers, Duffield, & Catling-Paul, 2010). Presently, trends and issues such as a nursing shortage, confusion over scope of practice competencies and attrition from nursing education and nursing practice contribute to stress and turmoil in the nursing profession (Benner, 2010; Beurhaus, 2008; Corpus Sanchez International Consultancy, 2007; Maddalena, & Crupi, 2008). A high percentage of new graduates leave their first position within the first one or two years (Bowles, 2005). A recent

survey of new graduates in Nova Scotia reports that currently 67% plan to leave their present position (College of Registered Nurses of Nova Scotia [CRNNS], 2011).

Student nurse attrition in Canada is estimated to be greater than 28%. This means that more than one in four exit before completion (Tomblin Murphy et al., 2009). Assuming the reasons student nurses provide for leaving are credible, nurse educators have much work to do (Kennedy, McIsaac, & Bailey, 2007). It is time to consider interventions to assist with health human resource retention and the delivery of safe quality effective and efficient care. Perhaps the timing is appropriate to examine some basic, practical and at hand interventions that aim to decrease stress and tension within the systems that sustain our heath care.

Many researchers have identified the potential benefits of self-efficacy building interventions within the education sector (Bates & Khasawneh, 2007; Fencl & Scheel, 2004; Margolis & McCabe, 2004; McLaughlin et al., 2008; Pajares, 2002, 2007; Sitzmann & Ely, 2011). This is also true within the employment sector (Judge & Bono, 2001; Luthans & Jenson, 2005; McNatt & Judge, 2008; Tsaousides et al., 2009). The findings of these researchers support Bandura's assertion that self-efficacy is task and domain specific and that it is malleable and open to influence from one's experiences and one's environment.

Increasing both individual and collective efficacy may foster independence, resilience and confidence (Bandura, 1993, 1994). Evidence exists to suggest that job satisfaction, intention to stay and commitment to the mission of one's employer, are all enhanced by a strong sense of practice self-efficacy (Duggleby, Cooper, & Penze, 2009; Lee & Ko, 2010; Levett-Jones, 2005; Luthans & Jenson, 2005; McLaughlin et al., 2008; Schoessler & Farish 2007; Stajkovic & Luthans,1998). Self-efficacy is frequently discussed in education programs and in education

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literature. However it is less frequently mentioned in nursing education literature. Can nursing student self-efficacy be developed and enhanced, or at the very least not damaged, by practices and approaches used during their education (Fencl & Scheel, 2004; Gibbons, 2010; Luthans & Jensen, 2005)? Can enhanced practice self-efficacy among students promote and develop a sense of resilience that will carry over into employment as graduates? The data and evidence in the literature suggest that it can (Bandura, 2004; Nielsen, Yarker, Randall, & Munir, 2009; Pajares, 2007). The evidence further suggests that nursing educators invest in learning environments that support increasing student self-efficacy towards competence development (Luthans & Jensen, 2005; Salonen, Kaunonen, Meretoja, & Tarkka, 2007; Townsend & Scanlan, 2011).

In summary, in this climate of uncertainty and change, a few facts are clear. Too many nursing students and practicing nurses are leaving the profession (Benner, 2010; Buerhaus, 2008; Kennedy et al., 2007; Maddalena & Crupi, 2008; Tomblin Murphy et al., 2009). Many nurses are not feeling strong self-efficacy as it relates to nursing practice. They are not feeling empowered, satisfied, productive and proud of their chosen profession (Gates, Gillespie, & Succop, 2011; Maddalena & Crupi, 2008; Peter et al., 2004; Roche et al., 2010).

Competence for nursing practice was selected as the construct to best describe the expected practice readiness of newly graduated registered nurses in this study. The document entitled *Entry Level Competencies for Registered Nurses in Nova Scotia* (College of Registered Nurses of Nova Scotia [CRNNS], 2004, 2009) informs and guides item writing for the scale development. This document's stated purpose is to provide a profile of practice expectations for newly graduating registered nurses. It is a summary of what employers and the profession

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should reasonably expect registered nurses to be capable of achieving upon entrance to the profession. *The Entry-Level Competencies for Registered Nurses in Nova Scotia* document first published in 2004 and updated in 2009, is essentially identical to that which has been adopted nationally in the *Framework for the Practice of Registered Nurses in Canada* (CNA, 2007). Therefore it is appropriate for use in the target population for this study, which includes all senior baccalaureate nursing students in Canada.

Self-efficacy is domain, situation and activity specific; it is concerned with the judgement of personal capabilities in unique situations and activities. It is considered both situation specific and malleable (Bandura, 1994; Pajares, 2002). Based on the existing evidence that supports the value of self-efficacy, further investigation in the area of self-efficacy building in nursing education is warranted. To do so, the development of a valid and reliable instrument is an important first step. This study is focused on the development and psychometric assessment of a scale that measures senior student nurse self-efficacy in relation to the profession's entry-level competencies.

CHAPTER 2

THEORETICAL FOUNDATION AND CONCEPTUAL FRAMEWORK

The theoretical foundation of this study is social cognitive theory (Bandura, 1986).

Social cognitive theory includes the construct of self-efficacy. One of the main tenets of social

cognitive theory is human agency; self-efficacy is described as the most central factor of human

agency. The foundation of social cognitive theory guides the selection of study variables, the

study design and the interpretation of the study findings.

The conceptual framework for this study is The Health System and Health Human

Resources (HHR) Planning Framework (O'Brien-Pallas &Tomblin Murphy, 2006). The

framework informs the present study by linking the self-efficacy of future registered nurses to

important elements in health human services and workforce planning. Therefore, the value of a

scientific focus on the self-efficacy of the future nursing workforce is enhanced when considered

in the context of the Health System and HHR Planning Conceptual Framework.

Social Cognitive Theory

Albert Bandura received his undergraduate degree in Psychology from the University of

British Columbia in 1949. He went on to the University of Iowa, where he received his Ph.D. in

1952. While there, he came under the influence of the behaviourist tradition and learning theory.

Bandura held many prestigious positions during his career and his accomplishments are

frequently recognized and honoured by his colleagues and peers (Pajares, 2002). Perhaps

because Bandura was influenced by the behaviourist tradition while attending the University of

Iowa, he is often referred to as a behaviourist. However he does not describe himself as such,

and takes exception at times to the fact that others do so. He suggests that at the time of his graduation there was a strong focus on behaviour modification through both rewarding and punishing consequences. Bandura focused more on the capacity for self-direction and regulation of one's behaviour, through setting personal standards and self-reflection.

Albert Bandura developed social cognitive theory, which is the foundation upon which the construct of self-efficacy is built. Recently there has been a renewed interest in positive psychology such as social cognitive theory, which is grounded in positive experience and is described as the study of human strength and optimal functioning, of which Bandura is a proponent (Pajares, 2001). Social cognitive theory proposes that people are self-reflective, self-regulating, self-organizing and proactive. Bandura refers to this interaction as human agency (Bandura, 1999). Social cognitive theory is one of many theories developed in an attempt to explain various root causes for human behaviour.

Behavioural theories are important because they affect what topics of interest are chosen by researchers for further study and therefore what methods are subsequently applied in practice. Therefore, theory also affects which types of human potential will be examined and cultivated and alternately, which will potentially be ignored and thereby underdeveloped (Bandura, 1986). Social cognitive theory suggests that individuals are not driven by an inner force or by an external stimulus. It instead purports a triadic reciprocity in which personal factors, behavioural factors and environmental factors all act together in greater or lesser degrees, to influence human functioning. The model of Triadic Reciprocity summarized in the schematic below (Figure 1) represents Bandura's (1986) conception of the interaction between the three determinants. The term 'determinants' refers to the production of effects by certain factors and the term 'triadic

reciprocity' refers to the mutual action between the three factors. Therefore, social cognitive theory is a causal model formed by three factors; personal factors, behavioural factors and environmental factors. All three influence each other, each one in a bidirectional manner.
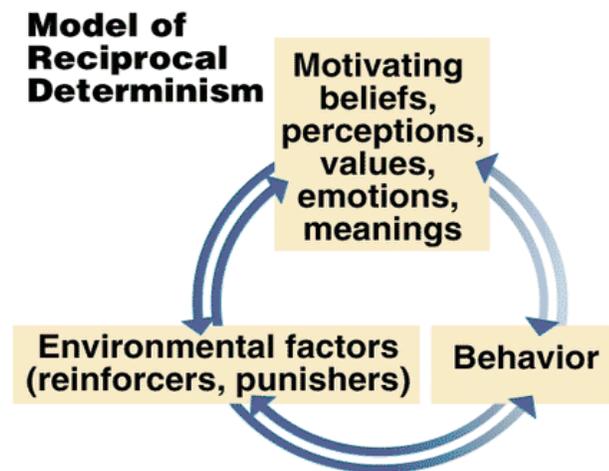
Figure 1. Bandura's model of triadic reciprocity (1986)

It is important to understand that reciprocity does not mean that all three factors contribute equally, nor does it imply that the strength of the influence of any one (or all of them together) is a constant. Strength of influence varies depending on the activity, the circumstance in which it occurs and with each individual. However the development and involvement of all three is made up of many related concepts. For example behaviour is made up of many different activities, each one also reciprocally related to the others. Reciprocity does not suggest that all three are operating at the same time. Bandura (1998) states, "Although each of the segments of reciprocity involves bidirectional processes, the mutual influences and their reciprocal effects do not spring forth all at the same time" (p. 25). He also states that theories or notions that believe they must do so are 'all or nothing at all' doctrines, that strongly inhibit the ability to study

causation empirically. "The body contains many numerous reciprocally activating systems, so that any gigantic attempt to study all of these at once would produce investigatory paralysis" (p. 25).

In 2004 Bandura writes about history, past trends and paradigm shifts in both the theory and the practice of personal change. The discipline saw a sweeping shift in acceptance of behaviourally oriented treatments including cognitive behaviour therapy. He writes about the early struggles; beginning with a critique of the psychodynamicists whom he describes as favouring psychic determinism and neglecting environmental influence. He describes the psychodynamic approach as based on an assumption that humans have no inherent agentic ability to make decisions and therefore are stripped of consciousness, phenomenological life and personal identity. He suggests that practitioners using this approach emphasized psychic determinism as their causal model influencing behavior. This influence operated below a person's level of consciousness, and neglected the person's environment and their interaction with it. Indeed he goes further in suggesting that their preferred intervention, the interpretive interview, was not scientifically defensible as a method of treatment, stating that empirical data to support evidence of positive outcomes or success with psychoanalysis does not exist. "Outcome studies showed that it is difficult to change human behaviour by talk alone; people gained all kinds of insight, but often exhibited little change in behaviour" (Bandura, 2004, p. 614).

The humanistic movement evolved over concerns that the psychoanalytic approach focused too much on abnormalities, and the behaviourist approach represented a passive view of human functioning. Humanists provided an enthusiastic renewal of interest in internal and

intrinsic motivational forces, as well as a renewed enhancement of concepts related to self, such as self-esteem and self-concept. The public was encouraged to enrol their children in programs such as the one launched in Minnesota called *I am a Very Important Kid* and to purchase self-esteem boosting gadgets such as *Happy to be Me* toys. Conversely, low self-esteem was to blame for a host of deviant behaviour from sexual assault to murder. However, once again a gap between the concept and actual practice outcomes became evident. Misguided attempts at nurturing and increasing the self-esteem of children resulted in excessive indulgence and ultimately in ridicule. Humanists encouraged a personal self-absorption that soon fell out of favour as fostering the positive self-esteem of children became mired in controversy (Pajares, 2002).

In contrast Bandura's social cognitive theory is based on humans' ability to be introspective and to find relationships between one's knowledge, beliefs and feelings and one's environment and in doing so to behave accordingly. Pajares (2002) posits that it is by looking into their own self-conscious mind that humans make sense of their options. "Social cognitive theory is rooted in a view of human agency ... key to this sense of agency is the fact that, among other personal factors, individuals possess self-beliefs that enable them to exercise a measure of control over their thoughts, feelings, and actions" (p. 2). Eventually, as evidence mounted suggesting that behaviour therapy could successfully treat the full range of psychosocial patterns, acceptance resulted in accommodating the therapy into various preferred theories (Bandura, 2004). Several branches of behaviourism developed; social cognitive theory was founded on an "agentic perspective of human self-development, adaptation, and change" (Bandura, 2004, p. 618).

Bandura (2004) wrote that by the year 1997 he had redirected his research to include a greater focus on the concept of self-efficacy. He further studied the origins of self-efficacy beliefs, how they worked and what they consisted of. He studied the effect of self-efficacy and most importantly for practice professionals, such as nurses and nurse educators, he studied the modes of influence by which self-efficacy can be developed, enhanced and strengthened for personal and social change, as well as how it might be diminished or destroyed unintentionally. Bandura is a proponent of "situation specific efficacy" which is the basis for the construct of role or career efficacy upon which this study is founded (Bandura, 1986).

For nursing students the concept of strong nursing role efficacy may embody exactly what nurse educators hope students will achieve during their education; they will believe that they have choices available to them and also that they must take responsibility for their actions and for their decisions. Nurse educators want to enable students and graduates to make the best choices for their patients as well as for themselves.

Self-efficacy for life. The concept of self-efficacy has been widely studied. The research literature supports the relevance of this self-belief including the influence it exerts on the various lifestyle choices individuals make (Bandura, 1993; Zeldin et al., 2008). Self-efficacy is commonly defined as having a belief in one's capability to succeed. One feels up to the challenge of difficult tasks and is therefore intrinsically motivated by them. Those with strong self-efficacy have an enhanced personal wellbeing and an increased ability to accomplish goals (Bandura, 1994; Schunk & Pajares, 2002). In fact the very goals they set are enhanced. They approach difficult tasks confidently and with interest. They become deeply engrossed in such activities and believe that they will eventually succeed if they work hard. In the face of failure

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they are likely to increase their efforts and attribute such failure to a lack of resources or insufficient effort on their part, rather than to any personal lack of ability or intelligence. Conversely, those who have a weak sense of self-efficacy doubt their capabilities and shy away from difficult tasks. Such difficult tasks or activities are perceived as personally threatening and therefore to be avoided (Bandura, 1993, 1994; Pajares, 2002). They set fewer goals and have a decreased commitment to those they do set. They see failure as a personal deficiency and therefore not within their control. When faced with adversity they will tend to slacken their efforts and give up quickly. People with low self-efficacy are also unfortunately slow to recover what sense of self-efficacy they have and therefore may quit prematurely. Unless people believe they can produce the effects they desire, the incentive to act is obliterated. They are also therefore more likely to feel stressed and depressed (Bandura, 1993, 1994; Margolis & McCabe, 2004; Pajares, 2002).

Self-efficacy specificity and differentiation. Bandura is a strong proponent of situation specific efficacy. This study is founded on the construct of nursing student self-efficacy related to entry-level competence. Therefore it is based on the concept of situation specific efficacy. Self-efficacy is domain, situation and activity specific. It is concerned with the judgement of personal capabilities in unique situations and activities, and not with a sense of personal self-worth, as is self-esteem, or with self-image, as is self-concept. Therefore it follows that individuals may consider themselves highly efficacious in an activity, even if they feel little or no societal pride in it, such as being a competent executioner. Conversely one can feel no efficacy in an activity and feel no loss of self-esteem or self-worth as a result, such as being inefficacious as an opera singer. The research literature supports the concept of situation specific efficacy and the notion that individuals can have strong efficacy beliefs in one area and low

efficacy beliefs in another (Bandura, 1986; Margolis & McCabe, 2004; Pajares, 2007). For this reason a measurement instrument designed to measure self-efficacy in a given situation must relate efficacy to the competencies that are required for success in that specific situation. It is important to understand that self-efficacy is a judgement of one's capability, rather than a measure of one's actual capability. Pajares writes that teachers should pay as much attention to a student's perception of competence as to their actual competence. He informs us that belief in one's personal competence is the self-belief that is most predictive of one's choice, one's work habit, and one's achievement (2000).

Self-efficacy is different from self-concept and from self-esteem, although this difference is not always distinguishable in research literature. In fact, they are considered to be entirely different self-beliefs (Pajares, 2007). Self-concept is considered a composite view of oneself that is developed over time based on feedback in various situations and from experiences and evaluations of significant others. Self-esteem depends on an estimation of one's own self worth, which is dependent on cultural valuing of personal attributes and tends to be resistant to change over time (Bandura, 1986). Whereas self-esteem is a general feeling of self-worth that may or may not be related to specific capabilities, self-efficacy is related to self-judgement of one's ability to perform specific actions. It is concerned with the judgement of one's own personal capabilities and is situation specific. Self-efficacy is much more task or domain specific than self-concept or self-esteem (Margolis & McCabe, 2004; Pajares, 2007). It is also considered malleable or open to influence over time in differing situations (Bandura, 1994; Margolis, 2006; Margolis & McCabe, 2004; Pajares, 2003).

Self-efficacy is also different from locus of control. Where-as self-efficacy is related to one's belief in one's capability to bring about and execute a specific course of action, "locus of control refers to one's beliefs that outcomes are either dependent on their actions or are the result of chance, fate or luck" (Bandura, 1991, p. 158).

Self-efficacy development. Bandura (2004) informs us that self-efficacy is developed by four major processes. They include mastery experiences which he describes as the most influential of the four, social modeling, social persuasion and individuals' physical and emotional states. Mastery experiences include achieving success in situations that require personal effort. Success builds on success and thereby enhances self-efficacy in one's ability. Social modeling, often referred to in the literature as vicarious experience, involves an individual having successful role models who are as similar to him or herself as possible. Social persuasion is the third method by which to build self-efficacy and is often referred to as verbal persuasion. People try harder and are more successful if they receive appropriate positive reinforcement and encouragement. On building student self-efficacy through social persuasion Pajares (2006) wrote, "It is usually easier to weaken confidence through negative messages than to strengthen it through positive encouragement. It can take many voices to see us through rough spots; only one voice is required to shatter us for a good long while" (p. 6). The fourth concept that affects an increase or decrease in one's self-efficacy is one's physiological state related to the issue or task. Those who experience high levels of stress and anxiety may interpret it as a personal deficiency in coping ability, in the same way as they may interpret fatigue or pain as indicative of weakness (Bandura, 2004).

In his book entitled 'Self-Efficacy: The Exercise of Control', Bandura (1997) reviews large bodies of existing knowledge related to the concept of self-efficacy. In it he suggests that strong self-efficacy is central to peoples' lives and its many diverse applications are prerequisites for positive personal and social change. He states (1993) that a major goal of formal education is to "equip students with the intellectual tools, self-beliefs, and self-regulatory capabilities to educate themselves throughout their lifetime" (p. 136). This mirrors the teaching of Paulo Freire who believed instilling a quest for knowledge was a worthy goal for educators (Freire, 1998). Development of nursing students' career or role self-efficacy should be a priority for nurse educators, given the reported stressors new nursing graduates frequently face as they embark upon their nursing careers (Duchscher, 2009; Eggertson, 2011).

Health System and Health Human Resources (HHR) Planning Framework

The Health System and HHR Planning Conceptual Framework (O'Brien-Pallas & Tomblin Murphy, 2006), is the conceptual framework that informs this study (Figure 2). The visual depiction of the framework highlights the reality that factors in the outside oval influence all others. It also provides a broad lens to consider the factors that influence and are influenced by the self-efficacy of senior nursing students about to enter the health care workforce.

The Health System and HHR Planning Conceptual Framework was revised by O'Brien-Pallas and Tomblin Murphy in 2006 and is based on prior work by O'Brien-Pallas, Tomblin Murphy, and Birch (2005), O'Brien-Pallas, Tomblin Murphy, Birch and Baumann (2001), O'Brien-Pallas and Baumann (1997) and Donabedian (1997). It was originally developed to guide health human resources planning and was subsequently adopted as a pan-Canadian

framework by the Advisory Committee on Health Delivery and Human Resources (ACHDHR)

(a federal, provincial and territorial committee) in 2005.

O'Brien-Pallas & Tomblin Murphy, 2005
Adapted from O'Brien-Pallas, Tomblin Murphy & Birch (2005), O'Brien-Pallas,
Tomblin Murphy, Birch & Baumann (2001) and O'Brien-Pallas & Baumann (1997)
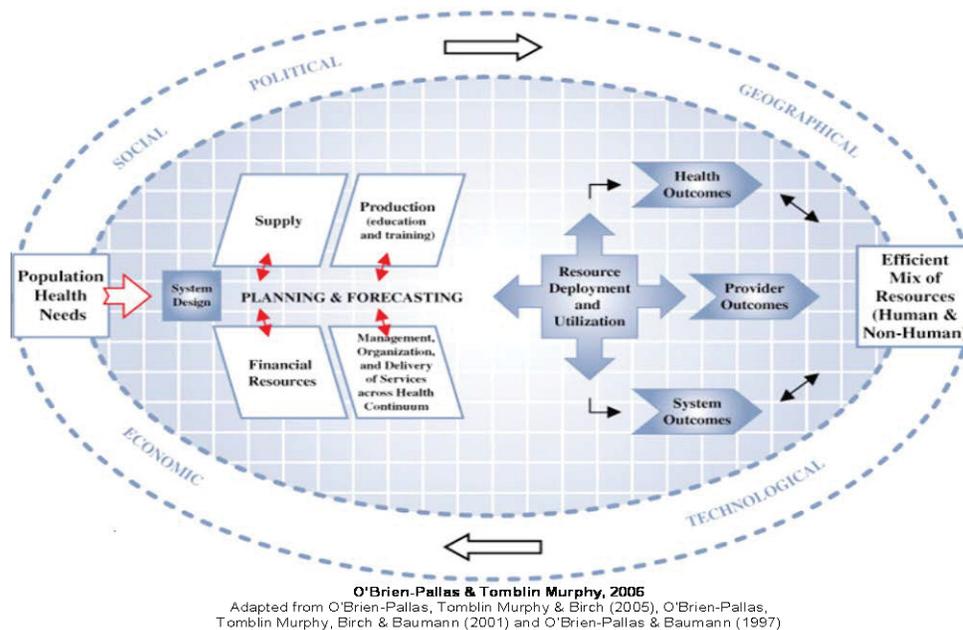
Figure 2. The health system and health human resources planning conceptual framework

The Health System and HHR Planning Conceptual Framework portray our Canadian

health care system as dynamic and the relationships between the various components of the

health care system as fluid (Tomblin Murphy, Birch, O'Brien-Pallas, Kephart, & MacKenzie,

2011). Over time the model has evolved to include a shift in focus from a demand- based model

to a needs- based model. This is significant in that the two concepts are distinctly different.

"*Population health needs* reflect people's various characteristics that create the need for

preventive as well as curative health services ... appropriate HHR planning starts with examining

the health-care needs of the region, province, territory or country in question" (Tomblin Murphy

et al., 2005, p. 23).

Another facet of the model's evolution is the incorporation and consideration of the vital factors in the outer oval. The outer broad band of the framework now includes the *"Context"* elements representing the context in which health human services are provided; placing them as encircling the other elements speaks to the need to recognize these factors. The Health System and HHR Planning framework's outer oval represents the social, political, geographical, technological and economic factors, which influence the health needs of people and the system design. It depicts the dynamic nature of the relationships among the many elements of the health care system. In more traditional approaches to planning these elements had been treated as separate and independent (Tomblin Murphy et al., 2011). As a result the model now demonstrates more clearly that all elements are fluid in nature rather than constant and assumes that all elements both change and yet remain interconnected, so that change in any one will ultimately affect all others.

The inner section of the oval includes supply, production, management and financial support upon which the health care system depends. The *"supply"* element reflects the actual number, type, and geographic distribution of healthcare providers. It recognizes that supply is fluid and is related to production elements, as well as to factors such as recruitment/retention, licensing, regulation, and scope of practice. The *"production"* element of the framework highlights the fact that future population health needs must be considered when setting targets for health education and training programs" (Tomblin Murphy et al., 2005, p. 23).

Productivity is a concept defined by Birch et al. (2007) as the average level of productivity of providers serving the needs of the population in question (e.g., per full-time equivalent [FTE] provider per year). Birch et al. suggest that productivity depends on a number of various factors including the intensity of the work, the way the workload is organized, the

availability and use of technology and the contributions of other types of professionals (2009). These are vital concerns for those who conduct HHR planning.

As evidenced in the visual representation of the model above: supply, production, financing, management and organization factors feed into planning and forecasting. *"Planning and forecasting"* reflect the varieties of available health human resources, planning practices and models, their assumptions, methods, data requirements, and limitations" (Tomblin Murphy et al., 2005, p. 24). These elements then inform resource deployment and utilization and are in turn directly related to provider outcomes.

"*Health, provider, and system outcomes"* refer to establishing the effectiveness and quality of health human resource practices by examining their effect on population health, provider health, job satisfaction, intention to stay, attrition rates and system costs and efficiencies"(Tomblin Murphy et al., 2005, p. 24). *"Provider outcomes"* include outcomes such as the health status of providers, their use of sick time, their job-satisfaction, their expressed levels of burn-out, their intention to stay and the manner in which they respond to their workplace environment (O'Brien-Pallas, Duffield & Alksnis, 2004).

To reiterate, the center of the oval depicts four core influences on the system related to meeting the population's health care needs. These four, supply, production, management and financial capacity are all interrelated and must be considered in any policy developed to meet health care needs; all four impact simultaneously on planning and forecasting for health care needs within the health care system. For example, the production of new registered nurses is dependent upon good management by educators, government and stake holders and their ability to draw on sufficient financial resources to sustain education and training (production) overtime. The manner in which all health care workers are deployed, utilized and distributed has

tremendous impact upon health outcomes for consumers of health care, providers of health care and the health care system. The central elements are also impacted by the factors in the outer ring.

Upon close examination of the conceptual framework above, it is clear that decisions related to how to best meet present and future health care needs of Canadians should be based on multiple contributing factors. Population health needs should determine the design of programs and interventions, as is depicted by the arrows through the center of the framework. Health planners, researchers and other stakeholders require accurate planning and forecasting data. The data required to make decisions, plan and forecast is based in part on data related to present supply and future supply needs, anticipated production outcomes, the needs of the population and the services required across the continuum. Ultimately all factors in the framework depend upon the provision of the financial means to support the design well into the future (Tomblin Murphy et al., 2009).

There is a strong link between this study and elements in the Health System and HHR Planning Conceptual Framework, most specifically those related to "*resource deployment and utilization*". The link becomes clear when the particular elements within the framework are considered. In addition to "*resource deployment and utilization*" additional framework elements linked to this study include: "*supply, health outcomes, provider outcomes and financial and planning elements*". Each of these elements and their link to the self-efficacy of senior nursing students is discussed next.

Resource deployment and utilization. It is important to note that registered nurses are the largest group of health care providers in most health care systems. Citizenship and Immigration

Canada (2010) state that RNs make up more than 75% of the regulated nurses in Canada and are the largest group of health-care providers in Canada. There is increasing recognition that registered nurses are not being utilized to their full potential within the Canadian health care system (Allard, 2010; Besner, 2006; Hudson, 2012; Corpus Sanchez International Consultancy, 2007). Registered nurses who are unable to practice to their full scope of practice, who lack the confidence to be strong patient advocates or who are not contributing fully and optimally to the health care team, negatively impact many factors in the framework. Researchers report that collective group efficacy is positively related to improved employee performance generally (Gully, Incalcaterra, Joshi, & Beaubien, 2002; Stajkovi et al., 2009) and improved nursing performance specifically (Lee & Ko, 2010).

Supply. The literature suggests that one main reason nursing students leave (among several) is general lack of faculty support combined with the occurrence of negative experiences (Kennedy et al., 2009; Pringle, 2004). In one study of nursing student attrition, 43% of respondents reported faculty were not supportive, 34% reported that faculty did not instil confidence in them and 13% reported that practicing registered nurses discouraged them (Pringle, 2004). The Kennedy et al. (2009) study included a literature review that examined students' reasons for leaving nursing education in Canada, the United States and the United Kingdom. The reported reasons were comparable in all three geographical areas and included such issues as chaos in the profession, not enjoying clinical practice, heavy course loads, unappealing work life and a general lack of faculty support. Given that the professional role of registered nurses is continuously evolving, the timing is opportune for a revised focus for nursing educators; a focus that includes a greater emphasis on instilling confidence and optimism for success; a focus that seeks to enhance nursing students' self-efficacy for practice competence.

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Health outcomes. Evidence of improved health outcomes due to improved care are reported in the final evaluation report of MOCINS (Model of Care Initiative Evaluation Report [MOCINS], 2010). The authors collected information from patients, families, health care providers and administrators. They reported positive outcomes on units where team climate is more positive, and where providers clearly understand their scope of practice. Collective self-efficacy contributes to a positive team climate (Stajkovic, Lee, & Nyberg et al., 2009). The positive outcomes included shorter lengths of stay in hospital for patients, and fewer repeat admissions. One of the main initiatives of MOCINS was the requirement for registered nurses to work to their full legislated scope of practice. Nurses with a strong sense of nursing competence self-efficacy may be more likely to do so.

Provider outcomes. There is an increased requirement for registered nurses who are creative and innovative; who are highly skilled and confident in those skills; who make significant positive contributions as members of efficient and effective health care teams (Lee & Ko, 2010). Nurse educators have a responsibility to ensure that graduates are prepared to meet the entry-level competencies of the profession. Graduates should also be prepared to adjust to continually expanding and evolving professional roles, and to function to their full scope of practice within a changing health care system. Therefore the development of nursing students' career or role efficacy should be a priority for nurse educators.

Financial and planning elements. Planning the number of seats allocated for nursing students involves statistical forecasts of anticipated need. Every student nurse who occupies a seat in an education program, but does not meet the requirements for licensure, both diminishes the potential supply and exerts a negative impact on the "*financial resource*" element in the Health System and HHR Planning conceptual framework. When a student abandons a seat in a

nursing education program, many tax payer dollars have been spent with zero return as each nursing seat has an associated cost. Loss of the anticipated benefit of this expenditure has a negative financial impact on the health care system. It is important to measure attrition rates from both nursing education and nursing practice and to adopt strategies that seek to reduce attrition from both. Evidence exists that reports an inverse relationship between nursing student self-efficacy and attrition from their education programs (Gibbons, 2010), and a positive relationship between the self-efficacy of practicing registered nurses and their intention to stay in the profession (Chang, Li, Wu, & Wang, 2010).

All elements in the Health System and HHR Planning Conceptual Framework are interdependent and related to each other. The framework provides support for the important role of confident self-efficacious registered nurses in our health care system.

Social Cognitive Theory, Health System HHR Planning Framework and Nursing Self-Efficacy

A review of the research evidence reveals a positive relationship between both individual self-efficacy and collective self-efficacy and positive outcomes. Evidence from several meta-analyses support the assumption that enhanced self-efficacy contributes to positive outcomes in a variety of situations and in a variety of environments (Gully et al., 2002; Holden, 1990; Holden, 1990; Judge & Bono, 2001, 2002; Moritz, Feltz, Fahrbach, & Mack, 2000; Multon, Brown, & Lent, 1991; Sadri & Robertson, 1993, Stajkovic et al., 2009; Stajkovic & Luthans, 1998). In the study by Stajkovic et al. (2009), they report findings based on 69 studies, 4,250 groups and 18,891 individuals. They state that the finding "collective efficacy is positively related to group performance" (p. 822) held up after outlier analysis and other such adjustments, and further describe their findings as both reliable and important.

Moritz et al. (2000), suggest "this meta-analysis offers clear evidence for a significant positive relationship between self-efficacy and performance" (p. 289). Unfortunately, it remains challenging to determine how to best measure self-efficacy in various settings and circumstances (Bandura, 2006; Henson, 2001). However, Moritz et al. (2000) suggest that it is essential in efficacy measurement to ensure concordance between the measure of efficacy and a description of the competence required for the task at hand. They offer the example "if you want to use win-loss as a performance measure then the measure should ask the respondent 'how confident are you that you can win the game" (p. 289).

As stated previously, although the benefits of strong self-efficacy, a key component of social cognitive theory, is frequently discussed in traditional education programs and in education literature (Bates & Khasawneh, 2007; Fencl & Scheel, 2004; Pajares, 2003), it is less frequently mentioned in nursing education literature (Lee & Ko, 2010; Luthans & Jenson, 2005; Nielson, Yarker, Randall, & Munir 2009). Nursing researchers (Benner, 2010; Duchscher, 2009; Eggertson, 2011; O'Brien-Pallas, 2004) report issues such as increasingly complex patient care, increasingly complex technologies, increase in overtime, unstable staffing and decreased support for new graduate nurses. As a result, there is an increased requirement for registered nurses who are creative, innovative, highly skilled and confident; the system needs nurses who make significant positive contributions as members of efficient and effective health care teams (Lee & Ko, 2009). Given the current issues facing registered nurses in present day health care systems, nursing educators should consider curricula interventions aimed at increasing students' self-efficacy for competent nursing practice.

A review of social cognitive theory and the value it places on a strong sense of professional efficacy, in combination with an examination of the Health System HHR Planning Conceptual Framework, provide support for the potential positive influence of a strong self-efficacious registered nurse workforce on the health care system. Bandura (2004) expresses the relationship to self-efficacy very succinctly: "In sum, a robust sense of coping self-efficacy is accompanied by ... weaker stress reactions, less rumination ... and faster recovery from any experienced distress" (p. 1133). Bandura (1986) indicates that those who are successful, innovative, not anxious and not despondent take an optimistic view of their efficacy. They become reformers who take steps to influence their lives and the lives of others.

There are questions that need to be addressed. Can nursing students' self-efficacy related to entry to practice be developed and enhanced during their nursing education? Can enhanced student nurse self-efficacy promote and develop a sense of resilience that will carry over into employment as graduate nurses? Research suggests that role specific self-efficacy can be nurtured and developed (Bandura, 1993; Gibbons, 2010; Pajares, 2002); it also suggests that doing so may lead to positive outcomes for our health care system (Lee & Co, 2010; Nielsen et al. 2009).

Current realities demand an appropriate and necessary focus on HHR planning and HHR provision that is based on accurate estimations and a precise accounting for fiscal expenditures. Too many new graduates are leaving the profession (Tomblin Murphy et al., 2009), and many who do stay, are not working to the full scope of their practice (Eggertson, 2005). Many are not strong, not empowered, and not proud of their ability, their skill and their unique contribution (Lim, Bogossian, &Ahern, 2010; Spence Laschinger, Grau, Finegan, & Wilk, 2010). The health

care system would benefit by employing registered nurses who intend to stay in the profession, who are as resilient to its stressors as they must be and who are both leaders and team players. Registered nurses must have developed the confidence to critically think through options in making difficult but correct patient care decisions, be secure in their critical role as patient advocate and be innovative in developing pathways to improve patient outcomes (Benner, 2010).

Summary

Although a greater focus on building efficacious registered nurses is important to health care consumers and therefore to health care planners and the health system, it may be most salient to nursing educators and their students. This is true because although career self-efficacy may be malleable to later influences, the general education research suggests that it is most malleable during the education period. Once employed, career self-efficacy subsequently seems to become somewhat resistant to change. It becomes an internally held belief related to one's capability (be it positive or negative) that is continually reinforced over time (Henson, 2001). Intuitively, one might assume this also applies to nursing graduates.

This study is focused on measuring senior student nurse self-efficacy related to the profession's entry-level competencies, through the development and psychometric assessment of a measurement instrument. This study will contribute to future research by providing a measurement instrument that does not presently exist (Cheraghi et al., 2009; McLaughlin et al., 2008). The potential long term benefit of this study may include the ability to better evaluate nursing education strategies aimed at enhancing nursing student self-efficacy. Additionally it provides the potential to examine relationships between the career self-efficacy of graduating

registered nurses, and their subsequent commitment to the employer, contribution to the profession and intention to stay.

The objective of this study is to develop a scale entitled the '*Nursing Competence Self-Efficacy Scale* (NCSES)'. It purports to measure senior nursing students' self-efficacy related to meeting the nursing competencies expected upon entry to the profession. Future studies may use the NCSES to examine, explore and measure education strategies aimed at enhancement of nursing student self-efficacy for practice. The value of a strong efficacious registered nurse workforce is strongly supported by the literature review in the following chapter.

CHAPTER 3

LITERATURE REVIEW

This chapter presents a literature review of evidence related to the construct of self-efficacy. It focuses on the important role self-efficacy plays in education and employment generally and in nursing specifically. The literature review is organized under the following headings: self-efficacy related to education; self-efficacy related to employment; self-efficacy related to nursing education; self-efficacy related to nursing employment; trends and issues in nursing that may benefit from enhanced self-efficacy for nursing practice; and measurement instruments specific to self- efficacy and nursing.

Search Strategy

The initial search began with the database PsycINFO. This database houses professional and academic literature in psychology and related disciplines. It includes references and abstracts to over 1,300 journals in more than 20 languages. The search terms used in this database were job performance (descriptor) AND self evaluation (descriptor) AND efficacy AND nursing (OR nurses OR nurse). Additional databases utilized include CINAHL, Academic Search Premier, Pubmed and Science Direct. Key words used in various searches include: role efficacy, career efficacy, social cognitive theory, job satisfaction, occupational stress, burnout, nurse, nurses and nursing, education, student nurse attrition and nurse retention. The search focused on peer-reviewed articles written in English between the years 2002 and 2012. The grey literature was searched to retrieve reports on trends and issues in nursing. The search included a review of the web sites of the Canadian Nurses Association (CNA), the Canadian Association of Schools of Nursing (CASN), the College of Registered Nurses of Nova Scotia (CRNNS), the Association of

Registered Nurses of Newfoundland and Labrador (ARNNL), the Department of Health and Wellness of Nova Scotia as well as the Department of Health and Community Services, NL. These sites were chosen because they represent the data collection sites, provide current, credible resources and their mandates include: nursing, nursing education, health matters and nursing priorities provincially and nationally.

Additionally a search for self-efficacy measurement instruments relevant to student nurses was conducted. The search began with Health and Psychosocial Instruments, which is a database produced by Behavioural Measurement Database Services. It provides comprehensive bibliographic coverage of a wide variety of evaluation and measurement tools for health and psychosocial studies for practitioners, educators, researchers, and students. Search words were self-efficacy AND nurse OR nursing.

In consultation with the librarian dedicated to heath studies at Cape Breton University, an EBSCO alert system (REF LB 1131 B7 test reviews EK) was set up. It automatically scans the literature every two weeks seeking published articles and measurement scales containing keywords: Nurse, Nursing, Nursing Student, Nursing Education, Efficacy and Self-efficacy. Periodic searches (approximately every six months over the last 36 months) of the above mentioned databases were conducted. Reference lists of relevant and related articles in which efficacy measurement instruments are mentioned were reviewed. The Emory University site (http://des.emory.edu/mfp/self-efficacy.html.) is dedicated to the work of Albert Bandura; it contains many tools and instruments related to the measurement of self-efficacy. It was frequently reviewed. A measurement instrument suitable to meet the objectives of this study was not found.

To reiterate, this literature review is organized under the following headings: self-efficacy related to education; self-efficacy related to employment; self-efficacy related to nursing education; self-efficacy related to nursing employment; self-efficacy related to issues in professional nursing and the health care system; and measurement instruments related to nursing and self-efficacy.

Self-Efficacy Related to Education

The education profession has traditionally paid heed to the teachings of psychology. Therefore psychological theory has influenced education and the various approaches educators have used as teaching methods. According to Pajares (2002), teachers in the 1920s to 1940s followed the tenets of William James with an emphasis on habit, Freud with a focus on unconscious motivation and Watson and Skinner who wrote about observable and measureable behaviour. As a result, the self was removed from discussions on student learning. During the humanistic movement that followed, the work of Maslow outlined a motivational process based on human needs that eventually led to the need to become self actualized or to reach one's potential, capability and talent (Maslow, 1943). Internal and intrinsic motivational processes came to the forefront in the 1960s and 1970s and many attempts were made to ensure that the self-esteem of children was especially enhanced. Some of these attempts resulted in provision of false praise and undeserved awards and ultimately in disappointing results. Empirical studies that sought significance between self-esteem and improved outcomes were repeatedly inconclusive (Pajares, 2002; Bandura, 1999).

Bandura's social cognitive theory led to an interest in the concept of self-efficacy in the classroom. His theory predicts that many students who struggle academically have suffered

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difficulties and failures and have as a result, developed low self-efficacy for academics (Pajares, 2003). Bandura reports that students with low levels of self-efficacy will tend to avoid situations that led to failure in the past (1994). When this occurs in academia, the resulting poor outcomes will likely have lasting implications. It is now widely accepted that students with low self-efficacy will, throughout their education, avoid specific tasks that they perceive may result in failure (Margolis & McCabe, 2004, 2006; Usher & Pajares, 2006). The key for reducing this perception is to systematically use classroom techniques that support the enhancement and development of student self-efficacy related to the topics under review. This suggests that classroom work must be at the appropriate level, which is a level that is moderately challenging. Course work that is overly challenging will cause frustration, thereby lowering self-efficacy. For classroom strategies to be most effective, students must see success on the very tasks they had expected to fail. Education literature includes several empirical studies that report positive statistical significance for interventions planned to enhance student efficacy for academic study at all levels of education (Dinther, Dochy, & Segers, 2011; Fencl & Scheel, 2004; Gaylon, Blondin, Yaw, Nalls, & Williams, 2012; Sitzmann & Ely, 2011).

The 2011 study by Dinther et al. reviewed evidence related to factors affecting students' self-efficacy for academics. The authors reviewed thirty-nine studies related to adult students in higher education and their self-efficacy for academic study. Their study inclusion criteria listed: a focus on self-efficacy as it is defined by Albert Bandura, a focus on higher education and a description of factors influencing self-efficacy. Examples of factors identified in the studies include programs designed to focus on the four sources of self-efficacy and provision of specific modules based on social cognitive theory. They report their findings allow them to confidently state that student self-efficacy can be positively influenced by intervention programs designed to

do so; interventions based on the tenets of social cognitive theory are most effective; and of the factors that influence student self -efficacy, mastery has the strongest influence on self-efficacy. Five studies were included that contained both an intervention program and a control group. In all five of these studies at least one factor was identified that influenced self-efficacy and in all studies such factors were measured and reported as significant. Authors of all five studies reported a positive relationship between identified factors and enhanced student self-efficacy. However authors of three of the studies mention sample size as a study limitation and suggest a need for longitudinal studies.

Fencl and Scheel (2004) considered the role of self-efficacy in their study of physics education in undergraduate students. They compared the effect of innovative mixed pedagogical approaches used in one section of students to the traditional classroom experiences used in another section. Their survey found significant self-efficacy differences between the sections, with mean confidence scores significantly higher in the mixed versus traditional taught section. The mixed pedagogical approach was superior to a traditional one on all variables measured; confidence change, the Sources of Self-Efficacy in Science Courses (SOSESC) scale and classroom climate. The authors state "initial results indicate that some teaching strategies introduced to improve student learning are also effective for building physics self-efficacy" (p. 175).

Galyon et al. (2012) examined the relationship between self-efficacy and student engagement in class discussion as well as student examination grades. They found all levels of reported self -efficacy (low, medium and high) were significant predictors of student participation in class and examination grades achieved. Self-efficacy was most strongly related

to both class participation and grades when combined with the highest level of grade point average (GPA) and least related at the lowest level of GPA. In response to this finding, the authors suggest their study highlights the importance of developing interventions specifically aimed at increasing students' academic self-efficacy. They further suggest that attaining high student self-efficacy should be a goal for educators, in that students should truly believe that they could definitely master a skill in order to see a positive performance result.

A meta-analysis was conducted by Sitzmann and Ely in 2011 in which they examined evidence from 369 research reports including 210 published studies, 135 dissertations and 24 unpublished studies. The participants were university students in 82% of study cases. The authors report that goal level, persistence, effort and self-efficacy were the self regulation constructs that had the strongest effect on learning. These four constructs accounted for 17% of variance in learning in this recent meta-analysis. Their study results support the assumption that self-regulation constructs are interrelated and that most exhibit a positive relationship with learning.

The published works of others who study aspects of self-efficacy in general education provide additional convincing evidence of the value of strong self-efficacy to student success. Researchers have measured and studied various aspects of the construct as well as various methods that may improve self-efficacy for academic achievement in individuals and groups. They agree that positive findings related to self-efficacy are not unexpected. Self-efficacy is associated with positive relationships, support from peers, encouragement from others, and provision of adequate resources (Judge & Bono, 2001; Margolis & McCabe, 2006; Usher & Pajares, 2006).

Self-Efficacy Related to Employment

Albert Bandura suggests that employees with strong self-efficacy tend to deal effectively with adversity and persist in the face of failure; therefore they are more likely to have satisfactory outcomes from their work (Bandura, 2004; Pajares, 2007). Studies that evaluate this theoretical proposition are discussed in this section.

A meta-analysis conducted by Stajkovic et al. (2009) examined relationships among collective efficacy, group potency, and group performance. Their review included 96 studies and their results were based on the 6,128 groups and 31, 019 individuals contained therein. The studies incorporated a variety of concepts including team characteristics, team performance, team potency, group characteristics and group effectiveness. Study participants were involved in activities such as: athletic teams; health organizations; industry; education and general employment. Sixty-five studies examined collective efficacy, defined as a sense of collective competence shared in response to a situational demand. Thirty-one studies examined group potency defined as the collective belief of a group that it can be effective. Four studies examined both constructs. They found that collective efficacy was significantly related to group performance in the first analysis. In the second and third analyses they found that group potency was positively related to group performance and to collective efficacy.

A meta-analysis was conducted by Judge and Bono (2001) of four core self- evaluation traits, self-esteem, generalized self-efficacy, locus of control and emotional stability. Study inclusion criteria included: studies in which the participants were all employed adults; studies that measured general self-efficacy as opposed to task specific self-efficacy; studies in which the criteria was either job performance or job satisfaction. The authors reviewed 135 studies that

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reported a relationship between one of the traits and job-satisfaction and 81 studies that reported a relationship between one of the traits and job performance. Based on 274 correlations the results suggest that these traits are the best dispositional predictors of job satisfaction and performance. With relation to job satisfaction, the estimated true score for generalized self-efficacy was 0.45 as compared to 0.26 for self esteem, 0.32 for internal locus of control and 0.24 for emotional stability. The authors further tested for statistically significant differences between the four traits by conducting pair wise comparisons. Of the possible 12 possible correlations that could be different, only three were significantly different. The three significant correlations involved generalized self-efficacy and job satisfaction. The authors suggest this was largely due to an influential study (N=9,987) with a strong correlation between generalized self-efficacy and job satisfaction and that the relationship between general self-efficacy and job satisfaction calls for further study.

McNatt and Judge (2008) conducted a quantitative study in which 71 new and recently hired (within one to two years) financial auditors were randomly assigned to treatment and control groups. Results showed that a self-efficacy intervention consisting of a self-efficacy building interview and follow up communication from management augmented the self-efficacy of the intervention group and also raised the job attitudes and retention rates of the recent hires five months later. The authors suggest that many organizations commit significant time, attention and funds to recruitment of potential hires. Once the new period ends much of the special attention stops, just as the recent hires begin to work independently and as many become frustrated by a challenging work environment. Their findings suggest further research related to the benefit of ongoing self-efficacy building personnel policies is warranted.

Conversely however, Gamber (2005) found no statistical relationship between self-efficacy and job satisfaction and job culture. The author describes the finding as unexpected, given the large body of research in existence that supports such a relationship. His study focused on self-efficacy and certified athletic trainers. It is suggested that one or more variables affecting job satisfaction for athletic trainers remain unidentified. He provides examples of what these variables might be, and offers them as suggestions for further study. Examples offered include the possibility that job satisfaction for athletic trainers is most strongly influenced by how well their team does in competitive sport, and the additional possibility that the model used for the study was miss-specified (Gamber, 2005).

Research evidence suggests a positive relationship between employees' individual self-efficacy, employees' collective efficacy and improved outcomes. The positive outcomes may apply to the employee, to the group, to the organization and to those affected by the quality of the organization.

Self-Efficacy Related to Nursing Education

The work of McLaughlin et al. (2008) refers to the relevance of research related to self-efficacy and self-efficacy building initiatives in nursing education. Their study examined the relationship between personality and self-efficacy in predicting academic performance and attrition from nursing programs. They used a longitudinal design and a scale that measured personality and occupational and academic self-efficacy. The scale was an adaptation of the Occupational Self-Efficacy Scale (Betz &Hackett, 2006) and was administered during the first year of student study. Upon completion of the students' program of study the students' attrition rates and final marks were reviewed. Results showed higher occupational self-efficacy was

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statistically significant in predicting higher final marks as well as higher rates of program completion.

In the recommendations section of a recent article examining stress and burn-out in nursing students, Gibbons (2010) states, "from the range of coping resources available, those that look to bolster self-efficacy, control and support are likely most beneficial" (p. 1300). Gibbons suggests student self-efficacy for nursing can be increased by many of the interactions we consider established practice, such as by verbally validating student learning, providing positive feedback and positively supporting contributions to lectures and tutorials. The author further suggests that such interventions are possible and that the self-efficacy of nursing students can be enhanced. The NCSES may provide evidence to support the development of protocols to intentionally enhance nursing student self-efficacy.

A study by Cardoza and Hood (2012) examined senior nursing students' (n=15) self-efficacy for providing family-centered care before and after simulated lab scenarios. They administered the General Self-Efficacy Scale (Schwartz & Jerusalem, 1995) on the first day of the semester and again on the last day of the semester. Student performance was videotaped and evaluated by a faculty member. The students received their evaluation during a debriefing immediately following the practice session. Their results indicate the senior students had an unrealistically high perceived level of self-efficacy prior to the simulated experiences when compared to the subsequent evaluations of their actual performance in the simulation lab. The authors suggest that completion of the scale early in the semester increased student self-knowledge. They became aware that their ability to assess their competence in this skill was limited. This self-knowledge may have motivated students to increase their study and practice

thereby leading to improved performance and more accurate self-efficacy measurement by the end of the term.

In their 2011 study Townsend and Scalan reported that "although self-efficacy has been incorporated into the work of many professions, minimal research has been conducted using this concept in clinical nursing education" (p. 1). They used concept analysis to examine the construct of self-efficacy for nursing student learning in the clinical setting. The authors state that concept analysis assists in clarifying attributes, antecedents and consequences of a concept so that those who use the term will more clearly understand its meaning. In keeping with Walker and Avant's framework (2005) they then developed model, borderline, related and contrary cases. The cases are examples of realistic situations that demonstrate the various impacts of the construct of self-efficacy in a variety of situations related to student nurse learning in clinical practice. These cases provide clear examples of what the construct is, what it is related to and what it is not. They state that "gaining a thorough understanding of the concept of self-efficacy is the first step for educators who strive to improve their pedagogical methods to facilitate the successful performance of nursing students in the clinical setting" (p. 2).

These published studies report on the potential value of enhanced student self-efficacy for practice within nursing education. Perceived benefits include improved self-knowledge, self-reflection and improved practice. Researchers suggest enhanced self-efficacy increases students' ability to engage in and learn from challenging situations, expend greater effort to reach those goals they believe to be attainable and to persevere in the face of inevitable setbacks. Unfortunately, Cheraghi et al. (2009) also reported that "in the area of nursing education little

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attention has been given to assess the contribution of beliefs, such as self-efficacy to clinical performance" (p. 215).

Although the construct of self-efficacy has not received the attention in nursing education research that it has in general education and employment research, self-efficacy research in nursing education is increasing. Additional studies related to nursing education and self-efficacy are included later in this chapter in the section entitled *Measurement Instruments Related to Nursing and Self-efficacy*.

Self-Efficacy Related to Nursing Employment

Studies related to nursing employment are included to provide evidence of the value of the construct to the profession. Studies reveal that strong practice self-efficacy has a positive effect on individual nurses and the care they provide which subsequently impacts the nursing unit as a whole. Improved outcomes for patients and the health care system may result (Chang et al., 2010; Lee & Ko, 2010; Luthens & Jenson, 2005; Manojlovich, 2005).

Chang et al. (2010) state it is important to take personality variables such as self-esteem, self-efficacy, proactive personality and negative affectivity into consideration when evaluating job satisfaction in nursing. Their cross sectional research consists of self-report surveys completed by registered nurses ($n=314$). Results indicate the personality variables referred to above are significant predictors of job satisfaction. The authors suggest their results are consistent with related studies. They caution that their study does not allow for a test of causality; therefore firm conclusions should not be drawn about causal relationships among the variables.

Findings from a non-experimental survey design indicate that self-efficacy partially

mediated the relationship between structural empowerment and professional behaviors

(Manojlovich 2005). Five hundred randomly selected practicing nurses were invited to respond

to the survey, resulting in a participation rate of 75% (*n=376*). The results demonstrated that

self-efficacy partially mediated the relationship between structural empowerment and

professional behaviors. The author suggests "it is belief in one's ability to get the job done, or

self-efficacy that must be fostered in order for nursing to have a more powerful influence in

healthcare" (p. 2). They conclude that nurse managers should consider opportunities to enhance

the practice self-efficacy of nurses through strategies such as positive role modeling and positive

verbal persuasion.

In an exploratory study, Luthans and Jenson (2005) include general self-efficacy as one

of three constructs referred to as self-reported positive psychological capital (PysCap). To be

included in this meta-analysis a study was required to have self-efficacy viewed according to the

conceptual definitions of the construct as defined by social cognitive theory. As well,

correlations representing the relationship between general self-efficacy and performance were

excluded in favor of those using situation specific measures of self-efficacy. They report highly

significant positive relationships between nurses' positive PysCap and their intention to stay as

well as their commitment to the mission of their organization. Their study builds on the results of

a meta-analysis conducted by Stajkovic and Luthans (1998), which included a review of 114

studies and 21,616 subjects. The authors report "self-efficacy was found to be positively and

strongly related to work-related performance. Given the scope of this meta-analysis, and the

extensive theoretical foundation of the whole research stream (Bandura, 1986, 1997b), the

findings represent something that … practicing professionals may rely on with a reasonable amount of confidence" (p. 255).

Nielson et al. (2009) studied the relationship between transformational leadership in nursing administration and the job satisfaction and psychological well being of health care professionals at elder care centers. Using a survey design they also measured the self-efficacy and team efficacy of the employees (*n*=279). The objective was to examine self-efficacy and team efficacy as two possible psychological constructs that might link transformational leadership to employee job satisfaction and well-being. Self-efficacy was found to fully mediate the relationship between transformational leadership and employee well-being. Team efficacy was found to partially mediate the relationship between transformational leadership and employee well being. Their findings indicate additional support for the value of individual efficacy and team efficacy in healthcare settings. This study therefore reports a very important outcome; health care team performance can be improved by both individual nurse self-efficacy and collective health care team efficacy. Therefore, the ability to measure factors affecting the performance of registered nurses, such as their self-efficacy related to competence is important. Indeed, it is increasingly important given the complex health care system in which registered nurses and other health care team members interact (Hoying & Allen, 2011).

The influence of group contextual factors such as collective efficacy on both the individual nurse and the hospital heath care team's performance was considered in a recent study by Lee and Ko (2010). Their study is a descriptive-correlation design involving a convenience sample of 1996 nurses from 182 nursing units in 28 hospitals in Korea. By completing a self-administered questionnaire respondents provided data on the influence of self-efficacy, affectivity and collective efficacy on nursing performance among hospital nurses in Korea.

Results show that individual level variables including self-efficacy were positively related to nursing performance. Two group level variables, collective efficacy and the number of in-service sessions provided, were significantly positively related to higher hospital level performance.

Positive relationships between self-efficacy and positive attitudes towards one's work and work environment have also been reported in qualitative studies (Levett-Jones, 2005; Schoessler & Farish 2007). In a review of the literature, Levett-Jones (2005) does not refer specifically to collective self-efficacy, however, highlights the importance of an educationally supportive clinical nursing environment that is conducive to learning and enhanced job satisfaction. The author states that little evidence exists to support the effectiveness of traditional graduate to professional transition programs stating "the limited research that does exist suggests that a clinical culture that is supportive and nurturing is at least as effective, if not more effective, than the formal programs aimed at improving initial transition and subsequent retention" (p. 44).

Findings from Schoessler and Farish's (2007) grounded theory study expand upon the findings of the quantitative studies. Participants were selected at random from a convenience sample of registered nurses who had a minimum of 7 years of nursing practice experience at one site. Although the study allowed for 60 participants, the authors decided that data saturation was achieved after 25 participants had been interviewed. The sample of participants was reviewed to ensure that at least some of the participants were considered expert nurses in their field of practice. The participants ($n=25$) reported four reasons for staying in a clinical position: enjoying the challenge; positive relationships with colleagues; experiencing fulfillment and finding a niche. Nurses who enjoyed their work described it as "challenging, intriguing,

endlessly fascinating and full of variety with something new to learn, to gain and to teach" (p.

174). These words correlate closely to descriptions and definitions of well developed self-

efficacy and of workplace practices that support self-efficacy.

Self-Efficacy Related to Issues in Professional Nursing and the Health Care System

The issue of nursing student attrition is global (Pryjmachuk, Easton, & Littlewood, 2009).

Studies from Canada, the United States and the United Kingdom report that over 25% of students

do not register to practice, some schools have attrition rates reportedly as high as 40% and most

report similar reasons that students leave (Taylor, 2005; Tomblin Murphy et al., 2009).

"Pressing realities such as a nursing shortage, increasing education costs and a growing concern

regarding the recruitment and retention of qualified nursing professionals have made attrition

from nursing education programs an urgent priority both in Canada and around the world"

(Kennedy et al., 2007, p. 1).

Health Canada (2004) commissioned a report on nursing student attrition. The principle

investigator of the report was Dr. Dorothy Pringle. Former students were asked to identify their

reasons for leaving their nursing program. Although a variety of reasons for leaving were

reported, when asked to list their top reasons seventy-eight of the eighty-seven respondents

reported difficulties related to the program and or the faculty. Of the eighty-seven respondents,

forty-three percent reported that faculty was not supportive of them; thirty- four percent reported

that faculty had not instilled confidence in them. Twenty-five percent of former students felt that

they could not live up to their own expectations. Another disturbing fact is that fully thirteen

percent of former students indicated discouragement from practicing nurses influenced their

decision to leave. In the executive summary of a study by Day et al. (2004) the author states,

"Some students leave because of the nursing program's structure and lack of academic support ... students withdraw because of negative impressions from practicing nurses and their treatment in clinical settings" (p. 3). In a CNA discussion paper, Ken Hoffman (2002) adds age, ethnicity, gender and low self-efficacy to causes for student attrition. Gardner (2005) reported discrimination and a lack of social justice within the programs had a negative impact on the retention of students from minority populations.

The nursing profession should be very concerned about the reasons provided by students for leaving nursing education. Nursing student attrition places an additional financial burden on an already financially strained health care system. The development of early interventions aimed at enhancing nursing student self-efficacy for practice may decrease attrition and thereby somewhat ease this burden. This issue highlights the potential positive impact of stronger student self-efficacy for nursing practice.

The attrition rate among graduates is equally concerning (Benner, 2010, Buerhaus, 2008; Tomblin Murphy et al., 2009). National and international nursing literature describe concerning workplace issues. Lim et al., (2010) state that work overload, role conflict, and experiences of aggression in the workplace lead to burn out among nurses. As a result, registered nurses suffer both physically and mentally (Davey, Cummings, Newburn-Cook, & Lo, 2009; Spence Laschinger, Grau, Fingan, & Wilk (2010). Poor working conditions impact the nursing profession and the heath care system, resulting in a high turnover of nurses and increased cost to the system. Patient care is negatively affected by these factors (Coomber & Barriball, 2007; Hutchinson, Jackson, Vickers, & Wilkes, 2006; Nelson & Gordon, 2006, O'Brien-Pallas, Tomblin Murphy, Shamian, Xiaoqiang, & Hayes, 2010).

Studies related to nursing report that registered nurses (RNs) are leaving the profession due to workplace related issues. RNs that leave the profession prematurely represent a tremendous loss, both human and financial, to the health care system (O'Brien-Pallas, Tomblin Murphy, Shamian, Xiaoqiang, & Hayes, 2010). Furthermore, Benner (2010) suggests that nursing is an increasingly challenging profession. Many authors agree and have recommended that policy makers, decision makers, employers, professional associations, unions and RNs develop and implement strategies to improve the workplace (Dunn, Wilson, & Esterman, 2005; Maddalena & Crupi, 2008; Corpus Sanchez International Consultancy, 2007; Nelson & Gordon, 2006; Tomblin Murphy et al., 2009). The real dilemma is that attrition from practice is contributing to the nursing shortage; in turn the nursing shortage is contributing to further deterioration in working conditions and thereby increasing attrition. The literature suggests that workplace initiatives aimed at increasing the resilience and self-efficacy of RNs may be a cost-effective means to address the alarming rate of attrition from nursing practice (Corpus Sanchez International Consultancy, 2007; Gibbons, 2010; Kravits, 2010; Maddalena & Crupi, 2008).

These issues are exacerbated by the fact that considerable uncertainty surrounds the concept of scope of practice and working to 'full' scope of practice. Scope of practice is influenced by government acts and regulations, practice standards, codes of ethics, entry-level competencies, guidelines, position statements and the context in which individual practice occurs (CRNNS, 2009). Ideally nurses should work within and to the full scope of their legislated, educated and individual scope of practice. More than legislation defines a nurse's individual scope of practice; it also includes an individual's level of education and experience (CRNNS, 2009). Some argue that confusion related to scope of practice in various settings is contributing to the turmoil in the profession (Benner, 2010).

A Canadian study of nurses by Spence et al. (2010) reported numerous accounts of bullying of new graduates leading to serious negative outcomes for the individual nurse and the system. As part of a longitudinal study of 415 newly graduated nurses in acute care hospitals, they tested a model linking new graduate nurses' perceptions of structural empowerment to their experiences of workplace bullying. Bullying had a statistically significant negative effect on newly graduated nurses' efficacy for practice. However, empowering structures implemented by institutions in an effort to mediate the effects of bullying and to increase the self-efficacy of nurses and thereby influence the collective efficacy of health care teams, were found to have a balancing influence on burnout and on self-efficacy beliefs. Examples of such empowering structures include recognizing and applauding achievements in visible ways, encouraging autonomy and providing team-building exercises.

In a literature review related to staff nurses functioning as preceptors and mentors for nursing students, Omansky (2010) reported that "providing preceptored clinical experiences for students creates a significant amount of stress for the nurse preceptors especially in terms of role overload with unclear benefits delivered to the student nurses" (p. 702). One can only assume that if the preceptor is so obviously stressed, overworked and undervalued, that the students are left feeling even more so. The practice environment described in Omansky's study does not appear conducive to the development and enhancement of nursing student self-efficacy for nursing practice.

A study by Bulut, Hisar and Demir (2010) offers an alternative approach to student skill assessment that might assist in enhancing student self-efficacy for practice skills. They describe an intervention that involves fourth year nursing students mentoring first year nursing students in various aspects of university life and in certain aspects of the profession. They report that

success of the junior students in the program improved and that leadership skills and confidence levels of the senior cohort were enhanced. Such a curriculum initiative seems a win-win situation on many levels. Students helping students, under the direction of faculty, may relieve some of the burden of overworked, underappreciated and perhaps reluctant preceptors in off-site practice experiences. It would also somewhat alleviate the daunting task of assessing first and second year nursing student practice skills in practice labs and guided practice sessions. This is reinforced by social cognitive theory literature which indicates that self-efficacy is developed in four ways; mastery, vicarious experience, positive social persuasion and a positive physiological state of the learner (Bandura, 1994). Having advanced students work with novice students in the practice labs may enhance practice efficacy beliefs in both groups. It is reasonable to suggest that following development and psychometric assessment, the NCSES may assist in future evaluation of similar curriculum initiatives aimed specifically at increasing student nurse self-efficacy for nursing practice.

In summary, the benefit of perceived self-efficacy related to one's ability to fulfill the expectations of one's career is well documented in the literature (Stajkovic et al., 2009; Townsend & Scanlan, 2011). Numerous examples of this evidence are provided in the introduction and literature review sections of this dissertation. Assessment of newly registered nurses' ability to withstand common work place stressors, such as role confusion, bullying and heavy workloads is important. Clearly a role exists for a psychometrically sound instrument to measure new nurses' self-efficacy related to their ability to practice competently in challenging workplace environments.

Measurement Instruments Related to Nursing and Self-Efficacy

In this section an overview of published measurement instruments that relate specifically to nursing practice and to self-efficacy is presented. Bandura (2005) states "the efficacy belief system is not a global trait but is a differentiated set of self-beliefs linked to distinct realms of functioning" (p. 307). Thus the use of a general self-efficacy scale is not supported by the tenets of social cognitive theory. It is imperative that the instrument used is specific to the tasks being measured. Although several measurement instruments were found with varying degrees of applicability and acceptability, none were found to be appropriate for the measurement of nursing student or new nursing graduate perceived self-efficacy related to their ability to meet the entry-level competency expectations of the nursing profession. The section includes: studies that apply general self-efficacy measurement to various nursing scenarios; studies that apply general self-efficacy measurement to nursing competence; and a description of two instruments that specifically measure self-efficacy for nursing but do not meet the aim of this study.

In the research study carried out by Manojlovich (2005) entitled *Promoting Nurses' Self-Efficacy: a Leadership Strategy to Improve Practice*, the author investigates the interactions among structural empowerment, nursing leadership and self-efficacy for nursing practice. This author concluded that given their lack of specificity to nursing, the use of general self-efficacy measures should be avoided in nursing research. No measures were found to be appropriate for the study; Manojlovich therefore used the Caring Efficacy Scale (CES) which measures nurses' beliefs in their ability to express caring attitudes and behaviours.

Although as the author stated "caring has been indentified frequently as being pivotal to the nursing role" (p. 273), caring does not encompass the entire construct of self-efficacy for

entry to practice competence, the construct of interest in this study. Additionally, while caring is required within the Code of Ethics for Nurses (Canadian Nurses Association [CNA] 2008), it is in no way exclusive or unique to the registered nurse role in the health care system. Thus the CES is not appropriate for this study since it lacks the specificity strongly recommended by Bandura (2006). The author reported on content and concurrent validity, but indicated that at least at the time of writing, the CES had not been subjected to factor analysis.

Davies and Hodnett (2002) developed a questionnaire to measure nurses' self-efficacy related to providing support to mothers during the labor and delivery process. They developed *The Self-Efficacy Labor Support Scale,* which they based on an existing measurement questionnaire entitled the *The Perinatal Nursing Efficacy Scale* (Murphy & Kraft, 1993). Cronbach's Alpha for the scale in their study was reported as 0.98 and test /retest correlation was 0.93. No further psychometric information was provided. The questionnaire is not relevant to this study's population or constructs of interest. Labour and delivery is a specialized area of nursing practice and one would not expect that a senior nursing student or new nursing graduate would perceive high efficacy beliefs in their competency in this area of practice upon entry to the profession.

Kameg, Clochesy, Mitchell, and Suresky (2010) measured the impact of high fidelity human simulation (HFHS) on nursing students' self-efficacy related to communication skills. One intervention involved the traditional lecture format while the other involved HFHS scenarios. After grouping all students together (*n*=38), results of a dependent *t*-test demonstrated a significant change in students' self-efficacy. The researchers used the 10 item General Self Efficacy Scale (GSES) developed by Jerusalem and Schwarzer (1993). Additionally, they

measured self-efficacy of communication skills on a single item visual analogue scale (VAS), which they developed. Self-efficacy measurement must be task specific (Bandura, 1997) and VAS analog scales are not appropriate for use in measuring the several items anticipated in the current study.

In 2011, Dykes et al. developed a measurement scale entitled *Scale for Assessing Self-efficacy of Nurses and Assistants for Preventing Falls*. This study is helpful as an example of a nursing self-efficacy scale development process. However, it is not an appropriate tool for this study's topic or population of interest because it focuses on just one specific competence.

Meretoja, Isoaho and Leino-Kilpi (2004) developed a scale to measure nurse competence. This work provides support to the value of self-measurement of competence by RNs, as well as support for the development of a self-efficacy for nurse competence measurement scale. They state, "Self-assessment assists nurses to maintain and improve their practice by identifying their strengths and areas that may need to be further developed … although competence recognition offers a way to motivate practicing nurses to produce quality care, few measuring tools are available for this purpose" (p124). Although these authors agree that study of registered nurses' self-assessed competence is important, their scale does not measure the nurses' self-efficacy in relation to their competence. Therefore their scale is not appropriate for use in the present study.

Lauder et al. (2008) measured nursing competence, self reported competence, and general self-efficacy. They explored the relationships among competence, self-reported competence, support and self-efficacy. The authors of this study used the ten item *General Perceived Self Efficacy Scale* developed by Schwarzer and Born (1997) rather than a measure specific to nursing competence as recommended by Bandura (1997) and Pajares (1996). They found small

to moderate correlations with actual observed competence and self- reported nursing competence. This result provides some support for the importance of using a self-efficacy measurement scale that is more specific to the construct being measured. The study author reminds readers, "one key distinction between competence and self-reported competence is who does the assessment" (p. 36).

A recent study by Stump (2010) used Item Response Theory (IRT) to measure student nurse self-efficacy related to caring for critically ill patients. The construct of 'critically ill' patient is not defined in Stump's study but is perhaps captured in the developed construct maps in which each dimension of nursing is ranked at varying hypothesized levels of difficulty, ranking them from easier tasks to much more difficult tasks. This type of ranking is in keeping with IRT methodology.

The author suggests that IRT is becoming more commonly used in the affective domain and suggests that the use of IRT is more appropriate than Classical Test Theory (CTT) for measurement of self-efficacy. However, the literature seems to be mixed in this regard. Several authors have produced publications to suggest that CTT is adequate for measurement in affective domains and find no advantage to using IRT (MacDonald & Paunonen, 2002; Sebille et al., 2010). In fact authors have suggested that given the increased sophistication and complexity of design required in IRT, it may not be the best choice for efficacy measurement when practical concerns such as level of required expertise, software and time are taken into account (MacDonald & Paunonen, 2002; Streiner, 2010).

Stump's measurement scale was designed using IRT. Therefore, because IRT requires that items be designed to measure incremental levels of ability, which the 2009 *Entry-Level*

Competencies for Registered Nurses in Nova Scotia document does not include, the

methodological design and the resulting scale is not appropriate for this study.

The scale most closely meeting this study's objective to measure student nurse self-

efficacy related to meeting entry-level competencies was published by Cheraghi et al., in *The*

International Nursing Review (2009). The study includes a rigorous methodology, which

resulted in development of the *Self-Efficacy for Clinical Performance (SECP)* measurement

scale. The researchers describe a two-phase process. In phase one the concept of self-efficacy

for practice was clarified by using semi-structured interviews with 28 senior nursing students and

three focus groups. The authors then conducted a comprehensive literature search. The item

pool was generated based on the student interviews, the focus groups and the literature review.

The tool went through revisions that resulted in 69 Likert-format items using a 1-100 answer

scale. Five subscales were developed based on the five steps in the nursing process (assessment,

diagnosis, planning, implementation and evaluation). In phase two the scale's reliability and

validity were tested in a randomized sample of 207 final year nursing students. In psychometric

development the SECP scale demonstrated evidence of content validity, construct validity,

concurrent validity, internal consistency reliability and stability. An exploratory factor analysis,

principle component method was performed. The eigenvalue method was used as the extracting

criteria with values loading 0.3 or over retained. Internal consistency was assessed by

Cronbach's *a* coefficient of 0.96. Test-retest reliability was measured as well with a Person

correlation of (r=0.94).

The scale developers are four university professors in either nursing or paramedical

faculties. They state, "In the area of nursing education, little attention has been given to assess

the contribution of beliefs, such as self-efficacy, to clinical practice" (p 216). The scale

developed by these Iranian authors served as a reference resource to the development of the

NCSES. Their SECP was originally considered an option for use in this study; however,

although the nursing process is potentially a sound construct to describe nursing practice, it has

limitations. It describes the process by which all nurses practice; it does not compare to the

comprehensiveness and the specificity of the *Entry Level Competencies for Registered Nurses in*

Nova Scotia (2009). Additionally, the authors of this article describe a need for cultural

specificity in scale development and use. They state, "The purpose of the current study was to

develop a tool to measure nursing students' SECP, which is sensitive and specific in Iranian

nursing education context" (p. 216). Therefore the authors of the SECP agree that this scale may

not be appropriate for use in the Canadian nursing context, and therefore not appropriate for use

in this study.

Finally, several other measurements instruments were found that measure nursing and

efficacy for nursing practice in some manner. It is worth noting that many researchers have

resorted to using instruments that measure general self-efficacy. Indeed the option of doing so

versus the onerous task of instrument development is a temptation hard to resist. In some cases it

may be the best option that circumstances allow. However, using a general self-efficacy

measurement in situation specific research is not in keeping with the theoretical foundation of the

construct of self-efficacy. Pajares (2006) cautions researchers that in doing so they ignore the

fact that Bandura's social cognitive theory is most predictive of behaviour when measurement of

one's own perceived ability is asked for in relation to specific tasks and situations.   Although

general self-efficacy scales are appropriate for use in certain studies, by definition they measure

a self-belief, and do not purport to measure context specific judgments. Bandura, (1997) informs

us that one can feel very efficacious in one situation and yet not at all in another. Pajares (1996) explains this further when he suggests that general self-efficacy measurement scales ask test takers to think about feeling efficacious, without any task specific competency in mind upon which to base their answers. On the other hand, he also cautions that the tasks measured should not be so specifically detailed as to limit the measurement instrument's utility by producing results that are not generalizable in any meaningful way (Pajares, 1996).

The instruments reviewed in this section offer evidence of increasing interest in self-efficacy for practice development and measurement within the nursing profession and can inform the development of future instruments. However, an appropriate instrument to measure student nurse self-efficacy for competent practice was not found in the current literature.

Summary

Increasing self-efficacy for practice within the nursing profession has relevance to nursing education, nursing employment and to current trends and issues affecting professional nursing practice. Bandura (1994, 1997) relates self-efficacy to increased resilience and enhanced innovation. He states that innovative achievements require an individual to have a resilient sense of practice efficacy because innovations require significant effort over long periods of time with uncertain results. He further states that those with resilient self-efficacy can withstand the negativity their innovative ideas usually produce.

The attributes of innovation and resilience are currently highly valued within the nursing profession (Benner, 2010; McSherry, 2011). It may be possible to nurture self-efficacy in nursing students and thereby in nursing graduates by adjustments in nursing education practice, curricula, and preceptored experiences. Townsend and Scanlan (2011) state that " by gaining a

more thorough understanding of self-efficacy in relation to student learning, nurse educators and researchers can use self-efficacy in curricular planning to improve clinical nursing education" (p. 1). Doing so depends on the ability to measure self-efficacy for nursing practice within that population. Although situation specific efficacy measurement tools exist in the nursing literature, an extensive search did not reveal a measurement tool specific to nursing students' perceived self-efficacy for competence to begin practice. The absence of an existing measurement tool substantiates the need for development of the NCSES, which is the aim of this study. The literature used to guide the development and psychometric assessment of the NCSES and the steps followed are described in Chapter Four, Methodology.

CHAPTER FOUR

METHODOLOGY

As evidenced by the literature review in Chapter Three of this study, self-efficacy building within the nursing profession has relevance to nursing education and practice. However, an extensive search using identified criteria did not reveal a tool to measure nursing students' self-efficacy related to their competence to begin practice. The purpose of this study is to develop and psychometrically assess a new tool entitled the *Nursing Competence Self-Efficacy Scale (NCSES)*. This methodology chapter is organized using the steps in a detailed '*Total error framework for scale development and assessment*' (Table 1.) The developed framework was based on a compilation of recommendations from various experts in instrument design (Aday & Cornelius, 2006; Polit & Beck, 2008; Frei et al., 2009; Walonick, 2004). The study purpose was accomplished by adherence to the steps outlined in this scale development and initial psychometric assessment framework.

The topic chosen for this measurement scale development and assessment study is guided by the author's keen interest in nursing education combined with a personal value system that places students at the center of all nursing education activities. The topic choice is also influenced by the literature; specifically the writings of Paulo Freire (1998), Frank Pajares (1996, 2001, 2006) and Albert Bandura (1994, 1997). These renowned educators were interested in models of education, as well as the impact of educational methodologies and ideologies on student learning and student self-efficacy for education and employment.

This study includes two constructs: one defined as senior nursing students' self-efficacy and the second defined as competence to begin nursing practice. The literature review suggests

that the concept of feeling empowered, satisfied, productive and proud of one's chosen profession may be best captured by the construct of career or role efficacy. The importance of a strong sense of self-efficacy related to one's profession is gaining interest, attention and respect in the nursing literature (Lee & Ko, 2010; McLaughlin, et al., 2008). In addition to the *Standards for Nursing Practice* (CRNNS, 2004) and the *Code of Ethics for Registered Nurses* (Canadian Nurses Association [CNA], 2008) which apply to all registered nurses) the College of Registered Nurses of Nova Scotia (CRNNS) has developed a document entitled *Entry Level Competencies for Registered Nurses in Nova Scotia* (2004, 2009). These are described by the CRNNS as "competencies that entry-level nurses in Nova Scotia are expected to demonstrate upon graduation from an approved nursing education program" (CRNNS, 2009).   The Nova Scotia entry-level competencies document developed in 2004 (updated in 2009) was used as a reference for the national entry to practice document *Competencies in the Context of Entry-level Registered Nurse Practice* (Jurisdictional Competency Project, 2008). As a result, both documents list identical competencies for entry to practice.

Methodological Design

The methodological design used to develop and assess the measurement instrument is guided and informed by the writing of experts in the field of survey development, implementation and analysis. The texts, *Designing and Conducting Health Surveys: A Comprehensive Guide* (Aday & Cornelius, 2006), *Nursing Research, Generating and Assessing Evidence for Nursing Practice* (Polit & Beck, 2008), *Research Methods for Nurses: Methods and Interpretation* (Gillis & Jackson, 2002), *Survival Statistics* (David Walonick, 2004) and an article related to design issues in measurement by Frei, Savarin, Steurer-Stey, & Puhan (2009)

were used as reference material in the design of this study. These researchers describe detailed steps and sequences that provide a focused approach to instrument planning and development. For example, Aday and Cornelius (2006), suggest the need for initial development of a total survey error framework stating "the focus has evolved from constructing estimates of the total magnitude of error that has occurred, to designing and monitoring the study so that the standards of quality are maintained throughout the survey design and implementation process" (p. 21).

The intent of the framework is to prevent, as much as possible, the two errors frequently made in survey design, which are normally classified as either systemic (bias) or random (variable) errors. The departure of a statistic, such as a measurement of the mean, across samples in either a positive or negative direction from the actual or true population mean is an example of bias. Errors of bias (systemic) result in sample values that are consistently higher or lower than the real population value. Varying departures from a true population statistic (sometimes in a positive and sometimes in a negative) direction is termed a random error. In this case the sample values vary or are spread out around the true value across samples. The total error can be expressed as the mean square error, or the sum of the random (variable) and systemic (bias) error squared (Aday & Cornelius, 2006). The formula is represented as:

$$MSE=random\ error + bias\ error\ squared$$

The following total error framework for scale development and assessment (Table 1) is a compilation of recommendations from various experts in instrument design (Aday & Cornelius, 2006; Frei et al., 2009; Polit & Beck, 2008; Walonick, 2004). It outlines a framework of methodological steps to designing and conducting a scale. Each of the following fifteen steps is

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discussed in relation to development and assessment of the NCSES thereby providing structure for the study's methodology:

Table 1

Total error framework for scale development and assessment

1. Decide on a Topic for the Study

2. Define the Aim of the Scale

3. Match the Scale Design to Scale Aim and Objectives

4. Define and Clarify the Domains

5. Determine a priori Considerations of Relationships between the Domains

6. Choose the Method and Format of Data Collection

7. Identify Potential Items for Inclusion

8. Format the Scale

9. Assess Validity with Experts Panel using a Two Step Process

10. Draw the Sample

11. Monitor and Administer the Scale

12. Prepare the Data for Analysis

13. Plan, Implement and Interpret Analysis of the Data

14. Select Final Items and Domains

15. Write the research Report

Note. Table 1 is based on recommendations by Aday & Cornelius, 2006; Frei et al., 2009; Polit & Beck, 2008; Walonick, 2004.

Since the decision for the topic (step one) has already been identified in the introduction to this chapter, the following sections begin with step two, which is defining the aim and objectives for the scale. For each step relevant methodological theory is discussed followed by the methods used in this study.

Aim of the Study

The aim of this study is to develop and psychometrically assess an instrument to measure senior student nurse self-efficacy related to meeting entry-level competencies required on acceptance to the nursing profession. In this study 'senior nursing students' refers to students in their final year of a baccalaureate degree in nursing. The main objective of the study was to develop and initially assess a measurement instrument to assist in evaluating the impact of curriculum initiatives aimed at practice efficacy enhancement. Frei et al. (2009) recommend that the aim of a measurement scale must be known prior to its development. They state "for the development of a new instrument it seems reasonable that the first step is to clearly define the aim of the scale. The subsequent development and validation process should then be designed to fulfill and test the aim of the instrument … the development and validation process should then be reported transparently in order to allow potential users to assess whether or not the scale is adequate for their purposes" (p. 7).

The main aim of the NCSES is evaluation, specifically senior nursing students' evaluation of their self-efficacy for entry-level nursing practice. It would seem that all self-efficacy scales would by definition belong in this category, as they ask individuals to evaluate themselves in relation to some defined concept. This study includes the development and initial psychometric assessment of the NCSES; Chapter 6 will encourage researchers to conduct further analyses of the psychometric properties of the developed scale. Replication of the exploratory factor analyses with a new, yet similar, set of data would contribute to validity; confirmatory factor analyses would assist in testing the fit of the predesigned scale to an observed set of data (Weiner, Freedheim, Schinka & Velicer, 2003; Frei et al., 2009).

Matching Scale Design to Scale Objectives

It is important to decide early on what type of scale should be developed, based on the objectives. This should be considered prior to item writing, because appropriate wording and characteristics of items can vary from one scale design to another. A psychometrically sound measurement instrument, which is applicable for use in both observational and experimental study designs, is envisioned.

It is important that the scale design be reflective of the study design in which it will be utilized. It is also important that it is representative of the 'who and what' embedded in the research question. In this present study, the 'who' is operationalized by the term senior nursing students; the 'what' is defined as perceived self-efficacy related to meeting the nursing profession's entry-level competencies.

An important step when planning a survey design is to give due consideration to the feasibility of carrying out the required steps in the study. Walonik (2004) provides three examples of such considerations: cost, researcher capacity and the availability of participants. The monetary cost of conducting this study was low. As to researcher capacity, the researcher presently teaches senior level nursing courses and has a well-developed network of colleagues within the profession and at universities offering baccalaureate nursing education provincially and nationally. Thus the researcher had access to a pool of clinical practice educators, nursing faculty, and nursing regulators who could serve as expert panel members. The researcher has expert knowledge in nursing, nursing education and the entry-level competencies and was involved in a consultative role during revisions to the CRNNS competencies document. Additionally the researcher is well read in the area of self-efficacy and has prior education

related to the study's theoretical framework. The doctoral committee consists of experts in nursing education, research, data analysis and measurement. The number of study participants required was dependent on the number of items in the scale and was available within the provinces of Nova Scotia and Newfoundland and Labrador.

Defining and Clarifying the Variables

The construct of self-efficacy is consistently defined as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (Bandura, 1994, p. 1). The variables in this study are referred to as competencies and are clearly defined for all novice Canadian nurses in the CRNNS document entitled *Entry Level Competencies for Registered Nurses in Nova Scotia* (2009), which is identical to the national entry-level competency document. Given that the ultimate objective was to have a tool that will measure Canadian senior student nurse self-efficacy related to the competencies required for entrance to the profession, this document was an obvious choice. This decision was also based on the importance of the document to nursing education. Developers of the document suggest that the competencies should inform education curriculum and education practice (CRNNS, 2009). Provincial reviewers for program approval consider the relevance of the curriculum to the competencies as they conduct program evaluations. Competencies refer to the "knowledge, skills, judgments and attributes required of a registered nurse to practice safely and ethically in a designated role and setting. The competencies expected of a registered nurse at initial registration are the basis on which all registered nurses build their practice and integrate their attributes and knowledge as they move along the continuum from novice to expert" (CNA, 2005a, p. 11).

Considering Relationships between the Variables

This required an in-depth examination of the definition, true meaning and intent of each individual competency statement. Thought provoking questions required due consideration, such as 'what do the competency statements actually imply'? And conversely 'what would the opposite imply'? The 127 individual competency statements are organized in five domains of nursing practice: Professional responsibility and accountability; knowledge-based practice; ethical practice; service to the public and self-regulation. At this stage it was also important to focus on the definitional level of the domains to determine if they appeared to cover the multi domains of nursing practice, to determine what the number of domains implies, as well as to question the number of items to include from each domain. This is known to be a labour intensive activity, involving considerable deliberation. It involved consultation with the authors of the competency document to ensure an understanding of the underlying intent and the development process.

Polit and Beck (2008) state that a large number of items should be generated although there is no agreed upon formula to determine exactly how many items should be used. They further state, "longer scales tend to be more reliable, so starting with a large number of items helps to ensure that you will eventually have a final scale with good internal consistency" (p. 478). As the scale development process evolves many of the original items are eliminated. DeVellis recommends starting with 3 to 4 times as many items as you intend to use, and a minimum of at least 50% more than planned (as cited in Polit & Beck, 2008, p. 478). Given that the entry-level document lists 127 competencies, it is not practical to include them all in one

measurement instrument. However in the preliminary stage of this study, over one hundred items were developed.

Choosing the Method and Format of Data Collection

The structure of this measurement scale is a self administered Likert scale design, which is appropriate for both the objectives of the study and social cognitive theory. Likert scales are based in classical measurement theory (CMT). They consist of declarative statements with response options that reflect a continuum from agree to disagree, or other similar appropriate anchors (Polit & Beck, 2008). An individual score is determined by adding together the item scores. This type of instrument is referred to as a summated tool. Likert measures are commonly used in researching personal attributes (Polit & Beck, 2008; Gillis & Jackson, 2002).

Bandura states that self-efficacy is concerned with 'perceived capability' and not with 'intention'. Therefore, he suggests that the wording in the stem of each item should reflect perceived capacity by using the phrase 'can do' versus the phrase 'will do'. Also he recommends that as many options as reasonably feasible be used in the response section to increase the amount of discrimination that is possible (Bandura, 2006; Pajares, Hartley & Valiante, 2001). In keeping with these recommendations, the NCSES consists of a stem that asks a question in the 'can you' format with a nine-point available response format. The midpoint is not specifically identified, as it is perhaps best to not have this choice stand out more than the others. Stump (2010) states that in her scale the marked midpoint was most frequently chosen (she specifically identified the midpoint selection with the words "moderately confident"). She suggests it seemed to be too obvious a choice for undecided respondents and

may have negatively affected her resulting data. This observation makes sense, as highlighting the midpoint may negatively affect discrimination in observed responses.

The scale was administered by the researcher to groups of senior students where they normally are together (i.e. the classroom). The rationale for this approach is explained in step ten *'monitoring and carrying out data collection'*.

Identifying and Formulating Potential Items for Inclusion

As stated, initially multiple items or questions were written. In writing items it was necessary to refer back to the research definition of the construct of self-efficacy, its theoretical underpinnings and the interpretation and definition of the competency and domain. The same questioning process was followed for each competency in each domain to ensure that no two questions actually asked the same thing.

Initial pruning of the items occurred at this stage. The initial pruning of the developed items began with a thorough review, thoughtful inspection and complete read through of the items several times by the researcher. Appropriate questions at this point include: "Is there too much redundancy?" and "Do additional items need to be developed to enhance the scale's content validity?" (Polit & Beck, 2008) The researcher decided that the draft scale was a reasonable representation of entry-level nursing competence. Following completion of this process, the original draft scale sent to expert readers contained 66 items for their consideration.

Format the Scale

In formatting the scale it was necessary to be mindful of the need to balance a desire for the instrument to completely capture the essence of the constructs with basic survey design

recommendations. Consideration of the impact of the length of the scale and the wording of the items effect on response rates was essential. The final number of items could not be decided upon at this stage in instrument design. The NCSES development and progression through various stages of assessment, testing, revising and retesting would factor in this determination.

At this point it was important to examine the instrument for grammar, flow, and readability. Jargon, big words and long sentences can be confusing for readers at any level. The reading level of the participants is a consideration with a self-administered scale. Given that respondents were senior university students familiar with nursing terminology; this was not a major consideration. That said, care was taken to ensure that all instructions were clear and easily interpreted and a Flesch-Kincaid measure of readability confirmed the reading level of the NCSES at grade 11 (Flesch, 1948). Additionally, care was taken to ensure that numbering patterns were consistent, the response options were in alignment, the instructions were clear and the presentation was professional in appearance (Bradburn, Sudman & Wansink, 2004).

Assess Content Validity with Expert Panel and Student Readers

A panel of experts was enlisted at this point to review the revised scale in a two-step process that provided the feedback on which further revisions to the scale were based. Face validity (a type of content validity assessment) is appropriate at this point in instrument development. Face validity is defined as, "A type of content validity that uses expert opinion to judge the accuracy of an instrument" (Lobiondo-Wood & Haber, 2009, p. 20). The first draft of the NCSES was presented to an expert panel consisting of three nurse educators who preceptor senior students in nursing practice, two members of nursing regulatory bodies (one is a primary author of the entry-level competencies document, the other a current member of a committee

struck to revise the Canadian competencies document) and three university faculty members currently teaching senior nursing students. One of the expert reviewers has developed a measurement instrument, co-authored a nursing research textbook and completed research involving the construct of self-efficacy.

The expert panel members were provided with an overview of the study objective and the researcher's perceived value and significance of the scale. An email with six attachments was sent separately to each of the eight expert panel members. The panel members were not informed of the identity of other panel members. The email included a requested return date and provided clear instructions. For example, "It is important to read attachment 1 and 2 prior to reviewing, examining and critiquing the NCSES scale." Attachment 1 (Appendix A) included a short summary of the topic, information on self-efficacy, its history and the potential value of nursing practice efficacy enhancement in student nurses. Attachment 2 (Appendix B) was a description of their role as an expert reader and directions for completion of their review including requested timelines.   Attachment 3 (Appendix C) was the draft 66-item NCSES scale. Attachment 4 (Appendix D) was the item rating sheet which listed each item followed by a section to score each item from one to four on both clarity and relevance as suggested by Lynn (1986). Suggestions and comments to support reviewers' assessments were encouraged and space was provided under each item. Attachment 5 was a recently published peer-reviewed Canadian article entitled *Self-Efficacy Related to Student Nurses in the Clinical Setting: A Concept Analysis* (Townsend & Scanlan, 2011) for optional perusal that discusses nursing student self-efficacy from a qualitative perspective. Attachment 6 was the CRNNS Entry Level Competencies (2009) document for reference purpose. The expert readers ($n=8$) all completed the ranking scales and rated each item from 1 to 4 on both relevance and clarity. Following this

step in the item development process, items were reworded, additional items were selected out and the instrument was revised by the researcher based on the feedback from the first group of expert readers.

The expert panel reviewed the instrument again ten weeks later (constituting a two step process), as recommended clearly by Polit and Beck (2008). "It is advisable to undertake two rounds of review if feasible, the first to weed out faulty items or to add new items to cover the domain adequately, and the second to formally assess the content validity of the items and scale" (p. 481). They further recommend that the second panel of experts be a researcher-selected subset of the first panel, that the panel be smaller in size, experts in the content area and have expertise with critical appraisal of measurement items. This recommendation was also followed. Membership of the panel (*n*=4) in step two was decided based on area of expertise and the quality of panel members' feedback received from step one. The second review was a repeat of the process followed in step one. Following this two step assessment all comments were reviewed, commonalities and similarities amongst suggestions were sought and measured. Items were selected out based on expert scores and their comments to support them. Examples included such comments as, "this is something they really need to know but I believe they will all rate themselves very low" and " the scale needs to contain more items related to ethical decision making". A Content Validity Index (CVI) was completed at this time by retaining those items that were scored as 3 or 4 on both relevance and clarity by the four expert readers (Lynn, 1986).

After sending the scale to expert readers, Polit and Beck (2008) recommend that it is often productive to get further preliminary feedback from a small sample of the target audience. In the case of this study it was appropriate and feasible to do so. A small group of senior nursing

students who were not included in the study sample were recruited as preliminary readers. Although they contributed to scale development, they were not included in the study. Students were asked to volunteer. A faculty member selected those who represented average grades and competencies from those who expressed an interest. Eight student readers were selected by the faculty member from those 12 who volunteered. The students completed the scale as a group in the presence of the researcher. They subsequently discussed the scale together. This was an opportune time to ask questions such as, 'Why did you pick the answer you did? What were you thinking about when you chose this answer? Were you confused at all by any of the questions? What did this question ask you? Which questions did you find hard to understand? This relatively simple process provided an additional opportunity for valuable information gathering, which was used to further modify and reduce the NCSES to 32 items.

As an example of the importance of this somewhat simple step in development, Stump (2010) states that many students informed her that they were unsure of the meaning of the word 'accurately' in the stem of each of the questions, as in "how sure are you that you can accurately assess". This was discovered only after a large survey of participants had been completed. The author suggests this confusion may have had a negative effect on her study.

In this study the volunteer student readers highlighted items in which they found wording confusing such as 'health disparities'; they noted that some items asked very similar questions; and they stated that adding specific examples to some items would improve their ability to determine their confidence. Members of the expert panel who worked closely with students in acute care practice also made this last suggestion; examples were added to items 9, 17, 18, 22, 23 and 31.

Draw the Sample

  The sampling plan for the study included senior nursing students in the province of Nova Scotia (NS) and Newfoundland and Labrador (NL). The decision to use convenience sampling within the provinces, versus random selection from the entire target population was based on considerations of finance and time. Steps were taken to ensure the sample met the requirements for 'known group analyses' to compensate as much as possible for use of a non-random sampling methodology. The study sample of senior nursing students in Nova Scotia and Newfoundland and Labrador appear to be representative of senior nursing students across Canada based on comparison to the survey data available on the Canadian Association of Schools of Nursing (CASN) website and in the *'Review of Nursing Education Data in Ontario Report'* (Nursing Health Services Research Unit [NHSRU], 2009).   Gillis and Jackson (2002) state, "A random sample of the non-respondents can be interviewed by phone on key descriptive items, and then compared with the respondents on these items" (p. 516). These authors suggest that if there is little difference between the two, it is likely the study sample is representative of the target population. Therefore, to further enhance the generalizability of results, an environmental scan of randomly selected Canadian universities offering a baccalaureate degree in nursing was undertaken by telephone. General demographic data for their senior nursing student body was requested and then compared to the demographic data in this study sample, thereby providing further support for the comparability of the study sample to the national senior nursing student population and the generalizabity of the study findings.

The number of student responses required for the appropriate statistical analysis is determined based on the number of items in the scale. Given the requirements of factor analysis, it was decided that at least 250 to 320 student nurse participants were required to meet study requirements. Polit and Beck (2008) suggest that there is no agreement among experts or exact rules for the ratio of participants to item. They state, "Recommendations range from 3 or 4 people per item to 40 or 50 per item ... ten respondents per item is the number that seems to be most often recommended" (p. 485).

Monitor and Administer the Scale

At this point the scale had been shortened considerably based on recommendations of the expert reviewers, the CVI assessment and careful decisions made by the researcher. Prior to the data collection, expert advice was solicited from Cape Breton University public relations department to ensure that the instrument was aesthetically pleasing and that the directions were clear.

A random sequence of items may be appropriate if proximity effect is a concern. This results when a pattern in the items or the responses to them encourages a participant to tend to weight all such items with the same value (Polit & Beck, 2008). Considerations during the formatting of the survey questionnaire included decisions related to the format and the order of the questions (Aday & Cornelius, 2006). Additionally, care was taken to format the instrument in such a way as to best facilitate data retrieval and data entry (Dillman, 2009). The items were scrambled randomly on two developed versions of the scale. Participants were made aware of this fact. This was so that participants would not have their responses influenced by the

responses of someone sitting near them. It also added to participant confidentiality insofar as no

one participant was able to determine how another was responding.

Once permission was obtained from appropriate ethics review boards and the universities,

a member of each university's nursing department was enlisted to send recruitment posters

(Appendix F) through email list serves to the senior student cohorts and to display the same

posters in the areas in which senior students congregate. Permission for the researcher to visit

each senior cohort shortly before the anticipated data collection date (i.e. one week in advance)

to discuss the research topic, objective, value, and process was requested and afforded in most

cases. This provided an opportunity to build a rapport with the potential participants, answer any

questions and to also read, discuss and hand out the consent forms. During this visit, students

were assured that participation was completely voluntary, that they would not be penalized in

any way by deciding not to participate and that if they did participate they could withdraw or not

complete the scale if they changed their minds.

An incentive was offered to all participants. This was based on the advice of Polit and

Beck (2008) and on the researcher's experiential knowledge of successful recruitment of student

participants. One seventy-five dollar gift certificate for *'Future Shop'* was drawn for at each site

immediately after the completion of data collection. This was accomplished by giving each

student an even split ticket number along with the scale on data collection days. A faculty

member or a student participant picked the winning raffle number once normal class routine

resumed. This maintained the anonymity of responses on the scale answer sheets. The amount

was judged to be high enough to provide incentive to participate but not so high as to be

coercive. The initial psychometric testing of any scale is dependent upon an appropriate participant to item ratio so a good response rate is required.

The data were collected by using a self-administered, pen and paper Likert scale presented to groups of senior students where they normally are together (i.e. the classroom), by the researcher with the assistance of a faculty member. In a scale development study such as this, there are many advantages to administering the scale personally rather than using a mail out or electronic process. Missing data on returned responses has potential to negatively affect the quality of the developed instrument. The researcher's presence provided the opportunity to remind respondents of this fact, to assure them of the anonymity of the data (only aggregate data reported), provide information as to how their confidentiality as participants would be safeguarded and to remind the respondents of the positive contribution of candid answers (Walonick, 2004). It was anticipated that assurances of anonymity would help to decrease social desirability in responses. It was hoped that assurances that there was no one 'correct' answer would enhance candour. In addition to the developed items, basic demographic questions were added to the last page of the scale.

Those senior nursing students at Cape Breton University (CBU), St Frances Xavier University (St FX), Dalhousie University (DAL) and Memorial University (MUN) who agreed to participate in the study were administered the scale by the researcher within a six week period. This timeline was an attempt to ensure the participants were all at a similar point in their nursing education. There were two separate sitting times per site (spaced at least an hour apart and in different rooms) to enhance anonymity of participation, in that those who participated at one time would assume that anyone not present was likely participating at the other sitting. This had

an added advantage in that it allowed for more participants simply because they had greater latitude in when to participate. Time allotted for actual scale completion at each site was twenty minutes.

The CBU students were administered the scale a second time two weeks following the first administration, allowing for an assessment of test -retest stability reliability as strongly recommended by Frei et al. (2009). Forty-seven of the initial 57 students participated in the retest. CBU senior students were asked to add their mother's middle name and their favorite pet's name to the response sheets at both sittings. Frequent reminders were provided. This process maintained student confidentiality, allowed for matching of data sets and reduced the potential risk of students forgetting the identifier to an acceptable level.

The newly developed NCSES was also administered to second year CBU nursing students using a known group technique. As these students are hypothesized to be less efficacious related to entry to practice competence, a lower group score would be expected. Known group comparison can contribute to construct validity if the results are in the expected direction (Polit & Beck, 2008). This comparison should demonstrate the responsiveness and precision of the NCSES. Precision as defined by Polit and Beck (2008) is as follows: "An instrument should discriminate between people with different amounts of an attribute as precisely as possible" (p. 467).

A second scale measuring locus of control, an internally held self-belief considered somewhat similar to self-efficacy, was simultaneously administered to the senior CBU students during their first testing session. If a good correlation was achieved, this would enhance convergent construct validity. The decision to use a measure of locus of control was based on a

review of the literature in search of a measure of self-efficacy that was considered to be a 'gold standard' to which the NCSES could be compared. Finding none, the construct of locus of control was chosen by the researcher because it is sometimes referred to as similar to self-efficacy. Although self-efficacy is different from locus of control, as explained by Bandura (1991), it is somewhat similar. Self-efficacy is related to belief in one's capability to bring about and execute a specific course of action, whereas "locus of control refers to one's beliefs that outcomes are either dependent on their own actions or are the result of chance, fate or luck" (Bandura, 1991, p. 158).

The Internal Control Index (ICI) developed by Duttweiler (1984) was chosen as it is described in the literature as a preferred measure of locus of control, is known to have good internal reliability and is generally considered to be a valid measure of locus of control (Meyers & Wong, 1998).

Summary

The development of the step-by-step framework for scale development (Table 1) was constructive in guiding the work of the researcher, as described in this chapter. It assisted in ensuring that no steps were missed nor misplaced and provided a pathway by which to move the scale development forward. As stated, the intent of the framework is to prevent (as much as possible) common errors in scale design. The results of the data collected through administration of the NCSES to 253 senior students are described in detail in Chapter 5.

CHAPTER 5

RESULTS

The goal of this study was to develop and psychometrically assess an instrument to measure senior student nurse self-efficacy related to meeting the entry-level competencies required on acceptance to the nursing profession. Therefore a 32 item Likert type measurement instrument was developed in consultation with experts in instrument development and psychometric assessment. Nursing expert readers ($n=8$) participated in a two step validation process consisting of two independent reviews of the instrument, before it was administered to senior student nurses ($N=253$). The step by step development of the NCSES was described in Chapter 4 (Methodology). The results of the initial psychometric assessment of the NCSES are described in this chapter.

Data Preparation

Prior to beginning data analysis it was important to closely examine the data provided by the participants. The coded demographic data were first reviewed by the researcher. For example, contingency checks were conducted to ensure that participants checked just one age category and one gender category. Participant responses to the 32 items in the NCSES were then examined to ensure that only one numerical choice was circled. Range checking was conducted to determine that all responses were within the valid response range of 1 to 9. No data were found to be inappropriately entered by participants. Missing data and outliers were evaluated and data were checked for data entry error.

The data were checked to determine the number and pattern of missing data entries. Decisions about whether to impute values for missing data should be based on the percentage of missing responses as well as the pattern of missing responses (Aday & Cornelius, 2006; Tabachnick & Fidell, 2007). A non-random pattern of missing data was found for one participant who did not complete items 23 to 32. As these items are on the last two pages of the NCSES, it seemed reasonable to assume that this student ran out of time and thereby was unable to complete the survey. Therefore data provided by this student were removed from the study. A random pattern for missing data was found for less than 1% of participants, ranging from one to two items per scale. Aday and Cornelius (2006) suggest that fewer biases are introduced by imputing reasonable values for cases in which data are missing than by excluding them altogether. Given that in this study missing data were random and less than 1%, the mean response for the given item was substituted for missing responses. This is described as a cold-deck imputation, which is an overall item mean imputation method considered appropriate when missing data are random and comprise less than 5 percent of the total data set (Aday & Cornelius, 2006).

An assessment of the data for the occurrence, validity, strength and percentage of outliers was undertaken as part of data preparation. Administration of the 32 item NCSES to 252 senior nursing students resulted in 8,064 individual responses. A total of 85 outliers (.01%) were identified, six of which were considered to be extreme based on the outlier labeling rule (Holguin & Iglewicz, 1987). The next step in the assessment was to determine if outliers were accurately entered in the data base. This was accomplished by a spot check of 20% of the outliers that included the six extreme cases. No errors in data entry were found. The extreme outliers were found to be related to items in which the researcher would anticipate a higher variance in

responses. An example is Item 2 which reads, '*How confident are you that you can make good*

practice decisions in the absence of agency policies and procedures?' Responses to this item

included 13 outliers, three of which were extreme. The outlier labeling rule was applied to the six

extreme cases and all six were found to be valid outliers (Holguin & Iglewicz, 1987). Based on

the occurrence, validity, strength and percentage of outliers, a decision to include them as valid

data was made by the researcher.

Analysis of Participant Data

Two hundred and fifty-three senior nursing students who volunteered to participate in the

study were administered the NCSES over a six week period. As stated, this timeline was an

attempt to ensure the participants were all at a similar point in their nursing education. Of the

potential 301 student participants, 253 volunteers completed the NCSES providing a

participation rate of 84%. Student participants were asked to identify the category corresponding

with their demographic information by marking an X in the appropriate section of the

questionnaire. Categories were subsequently numerically coded by the researcher prior to entry

in the database. The majority of participants were female (89.7%). As Table 2 shows, most

participants were under 29 years of age (86%), reported no dependents (82%), attained average

grades higher than 80% prior to beginning nursing education (68%), and attained average grades

over 70% in nursing education (89%).

Table 2

Participant demographic data

		Frequency	Percent
Age	20-29	217	86.2
	30-34	11	4.4
	35-39	5	2.0
	40-44	1	.4
	45-49	1	.4
	>49	1	.4
	Total	236	93.7
Missing		16	6.3
Total		252	100.0
Gender	Female	226	89.7
	Male	12	4.8
	Total	238	94.4
Missing		14	5.6
Total		252	100.0
Dependants	0	207	82.1
	1	13	5.2
	2	8	3.2
	>2	2	.8
	Total	230	91.3
Missing		22	8.7
Total		252	100.0
Average Grades pre Nursing	60-70	6	2.4
	71-80	59	23.4
	81-90	107	42.5
	>90	63	25.0
	Total	235	93.3
Missing		17	6.7
Total		252	100.0
Average Grades in Nursing	60-70	6	2.4
	71-80	104	41.3
	81-90	107	42.5
	>90	13	5.2
	Total	230	91.3
Missing		22	8.7
Total		252	100.0

Comparisons were made to student demographic data contained in the *'Review of Nursing Education Data in Ontario Report'* (NHSRU, 2009), survey data collected annually by the Canadian Association of Schools of Nursing (CASN), and an environmental scan of 15 randomly selected Canadian university schools of nursing conducted by the researcher by telephone. The age and gender of participants in this study were compared to the age and gender of senior Canadian undergraduate nursing students, the target population and found to be consistent. National results based on available data show the percentage of females is in the range of 85% to 90%; the majority of Canadian nursing students are under 30 years of age (approximately 85%); 12% are between 30 and 40 years of age and approximately 2% are over 40 years of age. Data collected through the environmental scan were comparable to data in the current study thereby adding to the generalizability of the study findings. It was not possible to make national comparisons in relation to student grades or the number of students with dependents. The required data were not available from the environmental scan nor from national or provincial data bases as it is not routinely collected.

Analysis of Item Derived Data

The statistical analysis was carried out using IBM SPSS Statistics 20 software (International Business Machines Corp.). Upon completion of data preparation the data were transferred from the completed paper surveys to the computer program by the researcher working with a student assistant. Each participant data sheet was rechecked by the student assistant following entry of the data into the computer program. Checks of all data were conducted by the researcher following entry of each university's data. The percentage of error

noted and corrected was less than 1% of the main data set. This process provided double checks for accuracy of data entry.

Gillis and Jackson (2002) recommend that researchers keep a record of decisions made during the data collection and data entry process. Therefore a logic sheet was developed as a means of retaining information about decisions made by the researcher during this process. The log allows for recall of data entry decisions, the rationale for those decisions and duplication for rechecking data if required. It contains such notations as recording the one student participant (ID number 28) who was removed from the study.

Participants were asked to circle a number from 1 to 9 on a Likert scale (1=certain cannot do; 9=certain can do). A descriptive analysis of the data obtained from participants' response to the items in the NCSES was conducted. The mean, standard deviation and range for each item in the scale were calculated. The lowest mean score was 5.9 on Item 23, *'As of today how confident are you that you can prepare clients for diagnostic procedures and treatments (e.g. colonoscopy)'*? The highest mean score was 7.9 on Item 27 *'As of today how confident are you that you can demonstrate a good understanding of informed consent'*? The average mean of the 32 items was high at 6.9. This accounts for the slight negative skew in data distribution. The range for the data in this study was 5 to 8. Variance was measured at values from 1 to 3.1; standard deviation was measured between 1 and 1.8. Table 3 displays the mean, standard deviation, and range for participant responses to the 32 item NCSES in this study.

Table 3

Mean, standard deviation and range of 32 item NCSES

	M	SD	Range
1 - Code of Ethics	6.9325	1.29	6.00
2 - Practice in Absence	6.4008	1.56	8.00
3 - Conflict Resolution	6.6905	1.31	7.00
4 - Challenge Orders	6.4167	1.64	8.00
5 - Near Miss in Care	6.7302	1.62	7.00
6 - Broad Knowledge	6.8968	1.36	8.00
7 - Global Health Issues	6.5000	1.53	7.00
8 - Identify Research	6.1389	1.60	8.00
9 – Assessment Tools	6.7698	1.39	8.00
10 - Interpret Data	6.6905	1.29	7.00
11 - Health Inequities	7.3849	1.20	5.00
12 - Assessments Timely	7.0238	1.40	8.00
13 - Critical Thinking	6.9325	1.27	6.00
14 - Anticipate Problems	6.7024	1.28	7.00
15 - Consult Team	6.9246	1.51	8.00
16 - Multiple Interventions	6.7143	1.32	8.00
17 – Assist in Rapid Change	6.8690	1.62	8.00
18 - Promotion Outcomes	7.5833	1.11	6.00
19 - Chronic Ongoing	7.3373	1.10	6.00
20 - Physiological Needs	7.0913	1.26	8.00
21 - Safety Principles	7.7857	1.04	6.00
22 - Therapeutic Interven.	6.5595	1.51	8.00
23 - Prepare Diag. Treat.	5.9325	1.77	8.00
24 - Hospice Palliative	6.3056	1.69	8.00
25 - Evidence Informed	6.7421	1.36	7.00
26 - Report Evaluation	7.6071	1.20	7.00
27 - Informed Consent	7.8929	1.17	6.00
28 - Ethical Dilemmas	7.1071	1.25	7.00
29 - Advocate for Clients	7.4365	1.21	6.00
30 - Demonstrate Respect	7.5675	1.29	7.00
31 - Abusive Situations	6.6468	1.56	8.00
32 - Fitness to Practice	6.2103	1.78	8.00

Item Data Distribution. Ideally all parametric analyses are best performed on data that demonstrate a multivariate normal distribution; however it is important to note that parametric inferential statistics are robust against slight deviations from normality (Tabachnick & Fidell, 2007). The data in this study are considered approximately normally distributed. This assessment is based on an analysis of the following statistics. The p value associated with the Shapiro Wilk statistic tests the null hypothesis that no difference exists between a sample distribution and the normal distribution (Tabachnick & Fidell, 2007). The NCSES data did produce a significant result on the Shapiro Wilk ($p=<.001$), however, in a study with a large sample size ($N=253$), the resulting p value in this statistic is prone to be significant with even small deviations from normality (Tabachnick & Fidell, 2007). The Shapiro Wilk statistic also demonstrates how correlated the observed data are with what would be expected if the data were perfectly normally distributed. For this study that correlation statistic is measured at 0.982, which is high (Tabachnick & Fidell, 2007). This correlation adds to the assumption of normal distribution of data in this study. Skewness (i.e., asymmetry) and Kurtosis (i.e., peakedness) statistics and their associated standard errors also suggest a normal distribution (Skewness -.541 and .155; Kurtosis .459 and .308). Given that -.541 is less than .155 x 2, and 0.459 is less than .308 x 2, these measures contribute to an assumption of normal distribution (Tabachnick & Fidell, 2007). Finally, a visual inspection of the histogram and normal QQ plot suggest a normal distribution, notwithstanding a slight negative skew. In light of all evidence of normality, the NCSES exhibits a distribution which is approximately normal. Explanations for the slight negative skew are discussed in Chapter 6.   Figures 3 and 4 below are SPSS visual depictions of the outputs fully reviewed in the paragraph above.
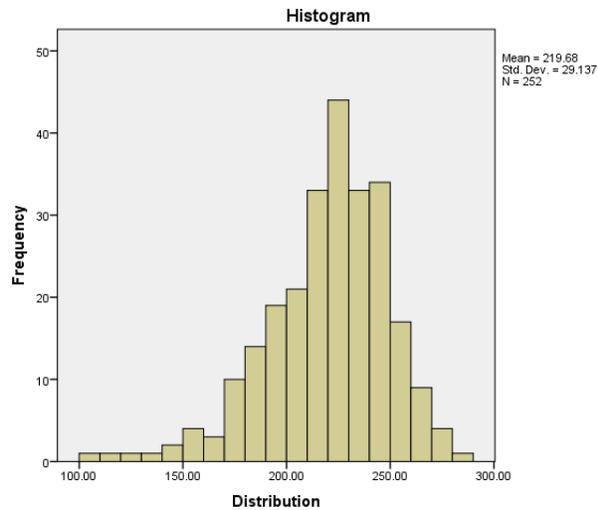
Figure 3 Histogram of 32 item NCSES scores   *Figure 4 QQ* plot of 32 item NCSES scores
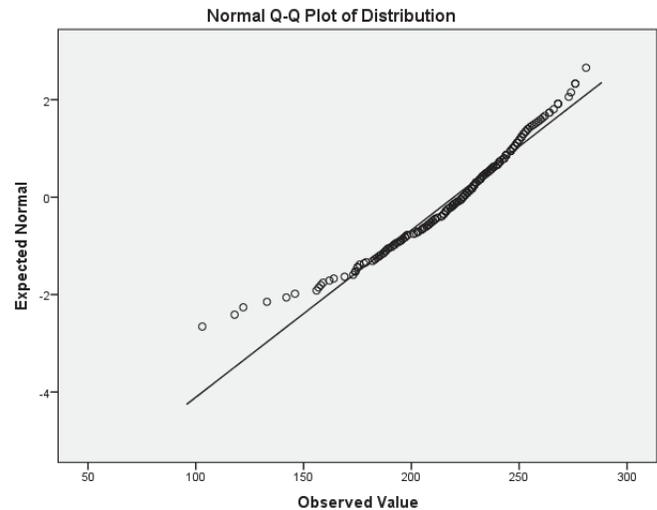
Readability

The Flesch-Kincaid measure of readability confirmed the reading level of the NCSES at

grade 11 (Flesch, 1948). Given that respondents are senior university students who are familiar

with nursing terminology, this reading level is appropriate. The clarity of wording, phrasing and

terminology of the NCSES is further supported by the fact that no participant asked the

researcher for clarification during administration of the NCSES, although encouraged frequently

to do so. The one exception was occasional requests for clarification of the word *'dependents'* in

the demographic section.

Validation

Construct validity. Construct validity is a broad term that includes various means of

measurement of validity (Streiner & Norman, 2008). In this study construct validity

measurements include measures of content validity, face validity, validity from contrasting

groups, convergent validity and validity from factor analysis.

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Content validity and face validity. As stated in Chapter 4, the initial pruning of the

developed items began with a thorough review, thoughtful inspection and complete read through

of the items several times by the researcher. Following pruning of the developed items, the

researcher decided that the draft 66 item NCSES was a reasonable representation of entry-level

nursing competence.

Content and face validity assessment are appropriate in instrument development (Streiner

& Norman, 2008). A panel of experts was enlisted at this point to review the revised scale in a

two step process that provided feedback on which revisions to the scale were made. The first

draft of the NCSES was presented to a carefully chosen expert panel for content and face validity

assessment as described on pages 92 to 94 in Chapter 4. The expert panel members (*n*=8) were

chosen based on expertise in nursing education theory, expertise in scale development, expertise

in development of the entry to practice competencies and expertise as preceptors of senior

nursing students in various areas of practice. The panel was provided with information required

to conduct the content and face validity assessment as previously described in Chapter 4. Once

all eight panel members provided their feedback, additional items were removed based on

agreements reached. Items that over 50% of the expert panel considered redundant, irrelevant or

not having power to discriminate (elicit an appropriate variety of responses) were removed. The

NCSES contained 42 items following the initial review of the eight member expert panel. Those

items noted to ask double questions, be poorly worded or unclear, were reviewed and evaluated

by the researcher. The written recommendations of the experts were appropriately incorporated

into the revised NCSES.

Select members of the expert panel (*n*=4) reviewed the instrument again ten weeks later

using the same process. Membership of the panel in step two was determined based on the

thoroughness and relevance of panel members' previous feedback. Following this two-step assessment, all comments were reviewed, commonalities and similarities among suggestions were sought and measured. Items were selected out based on expert scores and their comments to support them. A Content Validity Index (CVI) analysis as described by Lynn (1986) was completed at this time by retaining only those 32 items that were scored as 3 or 4 on both relevance and clarity by all of four expert readers in step two (CVI=.75). "If there are five or fewer experts, all must agree on the content validity for the rating to be considered a reasonable representation of the universe of possible ratings" (Lynn, 1986, p. 383).

Finally, a small group of senior nursing students (n=8) not included in the study sample volunteered as preliminary scale readers. These student readers completed the scale in the presence of the researcher. Valuable information was gathered on clarity of wording from the student perspective. Wording was changed for clarity in a few items. For example, 4 of the 8 readers found the phrase '*comprehensive knowledge base*' originally in Item 6, unclear. Item 6 was changed to '*As of today how confident are you that you can demonstrate the broad knowledge base required for nursing practice?'* Student readers suggested including meaningful examples in some of the items to allow participants to relate the item to a specific situation or scenario. An example was Item 17 which originally read: '*As of today how confident are you that you can recognize and seek immediate assistance in rapidly changing client conditions that could affect the client's health or safety?'* Based on student feedback, the following phrase was added to Item 17 '(*e.g. potential myocardial infarction or complication of surgery*)'. Students also requested an example for Item 22 which originally read: '*As of today how confident are you that you can manage therapeutic interventions safely?'* The phrase '(*e.g. drainage tubes*)' was added to Item 22. Following inclusion of student reader feedback, the thirty-two items deemed

to be most relevant and clear by the researcher, the expert readers in the two-step validation process and the student readers were included in the final NCSES. At this point it was deemed that the 32 item version of the NCSES was appropriate for administration to study participants.

Having received approval from the Research Ethics Boards of all four data collection sites, the NCSES was administered by the researcher to 253 senior baccalaureate nursing students who volunteered to participate. At each site the researcher was accompanied by a member of the faculty who volunteered to assist. Further attention to content validity of the NCSES was ongoing throughout the study through periodic scheduled reviews of the literature by the researcher. Research evidence was added to the study findings as deemed appropriate and meaningful (Grove, 2007). Further discussion of content validation of the NCSES is included in Chapter 6.

Contrasting groups validity. To measure contrasting group validity the newly developed NCSES was also administered to CBU nursing students enrolled in the second year of nursing education as described in Chapter 4. The NCSES scores of the senior participants (n=56) were compared to scores of student participants in the second year of the four year baccalaureate degree (n=70), by means of an independent group t-test statistic. Precision of the scale is also evaluated with this statistic. Precision in relation to scale construct validity in the social sciences is defined by Polit and Beck (2008) as follows: "An instrument should discriminate between people with different amounts of an attribute as precisely as possible" (p. 467). As these second year students are hypothesized to be less efficacious related to entry to practice competence, a lower group score was expected.

The resulting t-test statistic between the second year and senior year student scores rejects the null hypothesis of no difference in the means (p=<.001). The result of this known group comparison is in the expected direction; therefore results of this test contribute to the construct validity of the NCSES and demonstrate responsiveness and precision of the scale (Polit & Beck, 2008). The independent t-test determines whether there is a statistically significant difference between the means of two sets of continuous variables obtained from two unrelated groups. The independent t-test is considered robust against the assumption of equal variance if other assumptions are met (Triola, Goodman, & Law, 2002). However a log transformation was conducted on the student data to support the t-test, given that the second year student scores showed more variance than the senior student scores. Results of the t-test leads one to reject the null hypothesis of no difference in the means (p=<.001).

Convergent construct validity. A second scale measuring locus of control, a construct considered somewhat similar to self-efficacy, was simultaneously administered to the senior CBU students during their first testing session. The Internal Control Index (ICI) developed by Duttweiler (1984) was chosen as it is described in the literature as a preferred measure of locus of control, is known to have good internal reliability and is generally considered to be a valid measure of locus of control (Meyers & Wong, 1998). Forty-six students completed both the NCSES (*M*=228.91, *SD*=24.46) and the ICI (*M*= 111.45, *SD*=12.77). Assuming a positive correlation had been achieved, this test would have enhanced convergent construct validity of the NCSES. Unfortunately no correlation between the two measures was obtained. The Pearson Product Moment correlation coefficient between the ICI and the NCSES was *r*=. 06. The ICI scores were recalculated by the researcher to confirm accuracy. A 5 % error rate was noted and corrected; the Pearson correlation was recalculated; no convergent validity was obtained. It is

worth noting that although the constructs are similar, self-efficacy is different from locus of control, as explained by Bandura (1991). The outcome of the convergent validity test result is further discussed in Chapter 6.

Common Exploratory Factor Analysis. Construct validation was further explored by a common exploratory factor analysis (EFA) which contributed to the psychometric assessment of the instrument. As noted previously, the data in this study are approximately normally distributed, notwithstanding a slight negative skew. Principal axes factoring, the most common approach to exploratory factor analysis, does not require that data be normally distributed (Floyd, 1995; Streiner & Norman, 2008; Tabachnick & Fidell, 2007). Floyd (1995) further states that exploratory and confirmatory factor analyses are relatively robust to violations of normality. The one exception is when maximum likelihood method of item extraction is used.

As a first step in the EFA process, it was important to determine the sampling adequacy of the data in this study. Given the requirements of factor analysis, it was considered that at least 250 to 320 student nurse participants were needed to meet study requirements. Polit and Beck (2004) state that there is no agreement among experts in relation to the ratio of participants per item, therefore no exact rules exist. They suggest that recommendations vary widely and can range from 3 or 4 participants per item to 40 or 50 participants per item. As the sample for the current study equates to eight participants per item, this was considered an adequate sample size for this study.

It is appropriate to further test sampling adequacy by examining the Kaiser-Meyer-Olkin (KMO) output. A KMO output of .60 to .70 is considered an adequate determination of sampling adequacy to allow for meaningful analysis of an EFA output. The KMO measure

assessed for the NCSES in this study was .934. Additionally, at this stage it was important to

determine if the correlation matrix could be analyzed using EFA. If there is no relationship

evident among the items in a measurement scale the correlation matrix is deemed an identity

matrix and therefore not suitable for EFA. Bartlett's test of sphericity indicates a significant test

result when the matrix is not an identity matrix. "If the KMO correlation indicates sample

adequacy and Bartlett's test of sphericity indicates the item correlation matrix is not an identity

matrix, researchers can move forward with the factor analysis" (Burton & Mazerolle, 2011). In

this study, Bartlett's test of sphericity was significant (p= <.001), KMO =.934; the NCSES was

deemed appropriate for further psychometric assessment by EFA.

Gillis and Jackson (2002) suggest that an examination of item to total correlation is

appropriate to identify those items with loadings <.3 and >.7. They suggest that these items

should be removed prior to EFA because they are either not correlated or they are too highly

correlated respectively, to the other items in the scale. The NCSES had no items with

correlations < .3, however 5 items had corrected item to total correlations >.70. Items numbered

13, 14, 19, 20 and 25 had loadings > .7. These items were rechecked and evaluated by the

researcher. Given that the item scores were close to the recommended cut off and given that this

was the first EFA of the NCSES, the researcher decided to include these items at this time.

Therefore all 32 items in the NCSES were subjected to the initial EFA.

Table 4

Item-total correlations of 32 item NCSES

	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1 - Code of Ethics	.541	.946
2 - Practice in Absence	.527	.946
3 - Conflict Resolution	.549	.946
4 - Challenge Orders	.612	.946
5 - Near Miss in Care	.572	.946
6 - Broad Knowledge	.635	.945
7 - Global Health Issues	.450	.947
8 - Identify Research	.519	.947
9 - Assessment Tools	.697	.945
10 - Interpret Data	.661	.945
11 - Health Inequities	.417	.947
12 - Assessments Timely	.657	.945
13 - Critical Thinking	**.717**	.945
14 - Anticipate Problems	**.724**	.945
15 - Consult Team	.647	.945
16 - Multiple Interventions	.671	.945
17 - Assist Rapid Change	.660	.945
18 - Promotion Outcomes	.538	.946
19 - Chronic Ongoing	**.727**	.945
20 - Physiological Needs	**.750**	.945
21 - Safety Principles	.600	.946
22 - Therapeutic Interven.	.602	.946
23 - Prepare Diag. Treat.	.618	.946
24 - Hospice Palliative	.456	.947
25 - Evidence Informed	**.725**	.945
26 - Report Evaluation	.611	.946
27 - Informed Consent	.475	.947
28 - Ethical Dilemmas	.571	.946
29 - Advocate for Clients	.519	.946
30 - Demonstrate Respect	.496	.947
31 - Abusive Situations	.541	.946
32 - Fitness to Practice	.483	.947

Note. Bold font 5 items >.7

The data gathered by administration of the 32 item NCSES to 252 senior student nurse participants were analyzed by EFA. Given that the goal of EFA in this study is to determine if underlying factors or latent traits exist within the 32 item NCSES, a decision was made to use principal axis factoring (PAF) as the method of factor extraction (Burton & Mazerolle, 2011; Tabachnick & Fidell, 2007; Weiner, 2003).

In the first EFA, five factors were extracted. Following principal axis factoring extraction the communalities of the items were examined. Communality measures the amount of shared variance between an individual item and all the other items. Items with a measure of communality < .2 may be considered for deletion as a communality of <.2 indicates considerable heterogeneity among the items (Tabachnick & Fidell, 2007). Conversely, a communality which is high is only meaningful if it contributes to an interpretable factor. No items were removed based on measure of communality.

Three accepted criteria were considered when deciding how many factors to initially extract: the Kaiser criteria, the scree plot and prior theory (Burton & Mazerolle, 2011). The Kaiser criteria revealed five factors with eiganvalues greater than 1, accounting for 57% of the variance in the data set, which is considered acceptable (Burton & Mazerolle, 2011; Fereketich & Muller, 1990; Tabachnick & Fidell, 2007). The scree plot showed one main factor and four small factors prior to the bend in the elbow of the graph. Burton and Mazerolle (2011) clearly state that "researchers should include all factors before and including the one at the elbow … the elbow is the point at which the line straightens out" (p. 32).   In this EFA that particular point in the scree plot is in agreement with the eiganvalues > 1criteria, in that it also includes five identified factors. Most experts agree that in initial scale development it is considered preferable

to over factor than to under factor (Gillis & Jackson, 2002; Tabachnick & Fidell, 2007; Weiner, 2003). Therefore a decision was made to extract all five factors in the first EFA.

Orthogonal rotation. Rotation of factors allows for increased interpretability of the solution (Tabachnick & Fidell, 2007). The initial EFA was conducted using principal axis factoring (PAF) with orthogonal Varimax rotation. An oblique rotation was initially attempted, however reaching a meaningful interpretation of the resulting factor loadings proved difficult. Therefore orthogonal rotation was chosen because it maximizes the variance of the loadings between the factors so that those that were high (following extraction) become higher and those that were low become lower, thereby making identification and interpretation of resulting factors easier (Tabachnick & Fidell, 2007). Varimax is the most commonly used method of orthogonal rotation (Tabachnick & Fidell, 2007).

The initial output was promising as each factor loaded on at least five items and not highly on others, 57% of variance was accounted for, the scree plot and eiganvalues were in agreement and importantly four of the five factors were clearly theoretically meaningful. However the items were moderately loaded, there were cross loadings and factor 3 was not easily interpretable.

Table 5
Eigenvalues and variance explained by factors

Factor	Eigenvalues		
	Factor variance	% of variance explained	Cumulative variance
1	12.758	39.868	39.868
2	1.760	5.501	45.369
3	1.493	4.665	50.034
4	1.215	3.798	53.832
5	1.136	3.549	57.381
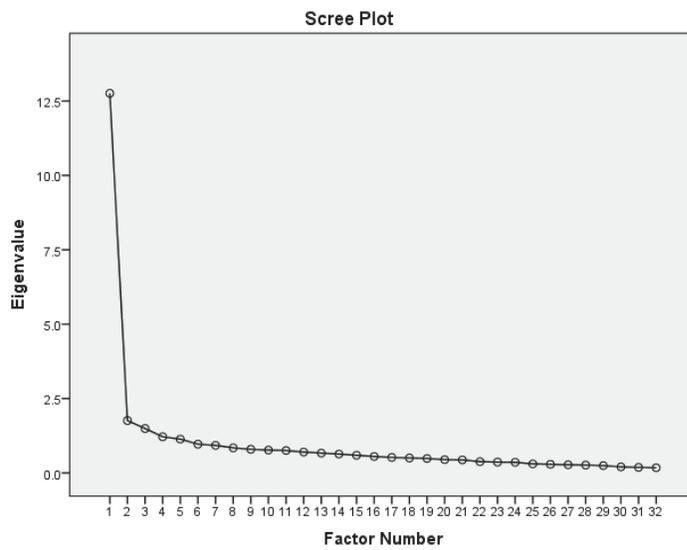
Figure 5 Scree plot for 32 item NCSES

Table 6

Initial EFA five factor solution for 32 item NCSES

	Factor				
	1	2	3	4	5
9 - Assessment Tools	**.612**	.120	.280	.215	.387
12 - Assessment Timely	**.599**	.110	.264	.331	.179
17 - Assist Rapid Change	**.359**	.243	.319	.348	.232
22 - Therapeutic Interven.	**.618**	.236	.204	.188	.056
23 - Prepare Diag.Treat.	**.680**	.304	.062	.162	.127
25 - Evidence Informed	**.470**	.463	.297	.235	.136
26 - Report Evaluation	**.375**	.358	.235	.275	.114
24 - Hospice Palliative	.177	**.460**	.110	.135	.133
27 - Informed Consent	.061	**.605**	.242	.068	.088
28 - Ethical Dilemmas	.145	**.675**	.132	.223	.101
29 - Advocate for Clients	.093	**.515**	.172	.312	.079
30 - Demonstrate Respect	.187	**.534**	.183	.109	.079
31 - Abusive Situations	.324	**.460**	.053	.190	.161
32 - Fitness to Practice	.361	**.423**	-.007	.080	.199
10 - Interpret Data	.408	.109	**.461**	.273	.310
13 - Critical Thinking	.368	.263	**.451**	.378	.187
14 - Anticipate Problems	.409	.282	**.421**	.332	.201
16 - Multiple Interventions	.441	.183	**.489**	.293	.121
18 - Promotion Outcomes	.061	.319	**.498**	.118	.298
19 - Chronic Ongoing	.353	.398	**.602**	.153	.154
20 - Physiological Needs	.434	.250	**.525**	.268	.255
21 - Safety Principles	.261	.398	**.446**	.082	.180
2 - Practice in Absence	.185	.278	.238	**.405**	.099
3 - Conflict Resolution	.179	.278	.045	**.496**	.284
4 - Challenge Orders	.286	.165	.156	**.694**	.127
5 - Near Miss in Care	.222	.239	.194	**.505**	.161
15 - Consult Team	.396	.250	.276	**.409**	.126
1 - Code of Ethics	.079	.382	.097	.311	**.428**
6 - Broad Knowledge	.314	.084	.340	.330	**.467**
7 - Global Health Issues	.155	.096	.176	.072	**.666**
8 - Identify Research	.211	.231	.107	.147	**.570**
11 - Health Inequities	.011	.096	.394	.146	**.427**

Oblique rotation. Although experts in factor analysis suggest that an orthogonal rotation provides a more interpretable solution in that it does not allow the items to correlate, many also recommend oblique rotation (Tabachnick & Fidell, 2007). Costello and Osborne (2005) suggest that in social science an orthogonal rotation may result in loss of important information because human behavior rarely fits into unique independent units. Some correlation among factors is generally expected (Costello and Osborne, 2005). Oblique rotation does allow items that are truly correlated to do so (Tabachnick & Fidell, 2007).

Therefore, the initial attempt to interpret an oblique rotation was repeated but with Items 13, 14, 19, 20 and 25 (item to total correlations > .7) removed from the scale prior to the EFA as recommended by Gillis and Jackson (2002) and Jeffreys (2000). The result was a 27-item scale with five factors very similar to the solution obtained through orthogonal rotation. In this EFA Items 26, 32 and 17 loaded moderately on more than one factor and the fifth factor was not interpretable. Items 26, 32 and 17 were not included in the next EFA as they were considered complex due to their high cross factor loadings. This 24-item EFA resulted in 5 factors loading all remaining 24 items moderately. The fifth factor was not easily interpretable.

Another EFA with 24 items and oblique rotation was conducted but this time requesting a four factor solution. This decision was made because the fifth factor continued to be hard to interpret, had an eiganvalue that just met the >1 rule (1.009), and accounted for only 4% percent of total variance. In this 24-item EFA solution Items 15 and 10 loaded moderately on two factors. The remaining 22 items loaded meaningfully on 4 factors. A fourth EFA was conducted with Item 15 removed. Twenty two of the 23 items were loaded highly or moderately by four meaningful factors. Item 10 still loaded moderately on two factors. A final EFA was conducted

with Item 10 removed. All 22 items were then loaded highly or moderately by four meaningful

factors for a final EFA solution (Table 7).

Table 7

Final EFA four factor solution for 22-item NCSES plus communalities

	As of today, how confident are you that you can:	Factor 1 Proficiency	Factor 2 Altruism	Factor 3 Prevention	Factor 4 Leadership	Communalities
22	manage therapeutic interventions safely (e.g. drainage tubes)?	**.722**	.104	-.086	-.031	.524
23	prepare clients for diagnostic procedures and treatments (e.g. colonoscopy)?	**.699**	.136	-.071	-.034	.545
12	complete your assessments in a timely manner following agency protocols?	**.591**	-.091	.130	-.199	.515
9	use the appropriate assessment tools and techniques for each body system (e.g. the neurological system) in consultation with clients and other healthcare team members?	**.588**	-.083	.333	-.064	.608
16	manage multiple nursing interventions for clients with complex co-morbidities, seeking appropriate consultation when needed?	**.457**	.080	.159	-.153	.500
28	apply the Code of Ethics to address ethical dilemmas?	-.013	**.706**	-.046	-.134	.519
27	demonstrate a good understanding of informed consent?	-.021	**.627**	.083	.038	.383
30	demonstrate respect and knowledge of the unique and shared competencies of various members of the healthcare team?	.166	**.590**	.019	.093	.398
29	advocate for clients especially when they are unable to advocate for themselves?	-.042	**.522**	-.018	-.253	.429
24	provide nursing care to meet hospice, palliative or end-of-life care needs?	.068	**.443**	.028	-.079	.308
21	apply safety principles to prevent injury to clients, self, other healthcare workers, and the public?	.295	**.378**	.251	.131	.493
31	take action in potentially abusive situations to protect self, clients and colleagues from injury (e.g. bullying, nurse-to-nurse violence)?	.223	**.349**	.035	-.113	.373
7	demonstrate awareness about the emerging global health issues?	.026	-.073	**.686**	-.005	.426
11	demonstrate awareness of the health inequities of people who are affected by various kinds of discrimination?	-.025	.037	**.610**	.035	.345
8	take part in nursing or health research by identifying research opportunities?	.038	.055	**.537**	-.066	.371
6	demonstrate the broad knowledge base required for nursing practice?	.230	-.118	**.500**	-.254	.546
18	assist clients to understand the link between health promotion strategies and health outcomes (e.g. dietary methods to lower cholesterol)?	.014	.269	**.441**	.001	.402
1	use the Code of Ethics to maximize collaborative interactions within the healthcare team?	-.123	.264	**.356**	-.269	.451
4	challenge questionable orders, decisions or actions of other healthcare team members?	.144	-.032	-.032	**-.760**	.510
3	use conflict resolution strategies when necessary?	.031	.131	.140	**-.482**	.433
5	report a near miss in care (a narrow escape from a serious complication)?	.141	.111	.068	**-.463**	.409
2	make good practice decisions in the absence of agency policies and procedures?	.091	.190	.065	**-.341**	.366

The final 4 factor EFA solution with PAF extraction and oblique rotation was compared to a 4 factor EFA solution with PAF extraction and orthogonal rotation. Both resulted in very similar 22-item 4 factor solutions. The only distinction in item inclusion between the two was that in the preferred oblique rotation solution Item 21 was added to factor 2 and Item 32 was removed from factor number three. Tabachnick and Fidell (2007), suggest that obtaining a similar result with differing processes indicates a good factor analysis. "Just as different methods of extraction tend to give similar results with a good data set, so also do different methods of rotation tend to give similar results if the pattern of correlations in the data is clear … a stable solution tends to appear regardless of the method of rotation used" (p. 614).

The final solution obtained by means of an oblique rotation is preferred by the researcher because it allows for correlation among the factors, the loadings are somewhat higher with no cross factor loadings and the solution is most interpretable. Table 8 represents correlations obtained among the four factors. As expected there exists a moderate positive correlation between all four factors.

Table 8

Correlations between factors

Factor	1	2	3	4
1	1.000	.450	.465	-.505
2	.450	1.000	.441	-.455
3	.465	.441	1.000	-.457
4	-.505	-.455	-.457	1.000

An interpretation of the four factors was conducted by the researcher. "Interpretation and naming of the factors depends on the meaning of the particular combinations of observed variables that correlate highly with each factor" (Tabachnick & Fidell, 2007, p. 583). This process involved reading the items that grouped together and thinking about what they might represent as a whole. It was important to interpret the theoretical underpinnings of each item and examine how the items within each factor were theoretically related to each other. The factors were then named by applying descriptive labels. Factor one is labeled '*Proficiency*'. It includes Items 22, 23, 12, 9 and 16 that relate to self -efficacy for competence in clinical practice skills. Factor 2 is labeled *'Altruism'*. It includes Items 28, 27, 30, 29, 24, 21 and 31 that relate to self-efficacy for competence in caring and patient advocacy. Factor 3 is labeled '*Prevention'*. It includes Items 7, 11, 8, 6, 18 and 1 that relate to self-efficacy in research, a global view, primary health care and prevention of complications. Factor 4 is labeled *'Leadership'*. It includes Items 4, 3, 5 and 2 that relate to self-efficacy in competencies required for nursing leadership, mirroring those competencies currently included in many nursing leadership texts and courses.

It is interesting that student scores in the four factors may reflect certain aspects of professional nursing practice in which groups of students feel more or less self-efficacy. Attributes such as altruism and confidence in leadership may be influencing student scores on the NCSES. The resulting factors may relate to certain aspects of nursing practice that students feel more or less comfortable with based on self-held beliefs. The four factor solution, the labels and the potential implications for nursing education are discussed in Chapter 6.

Given that the final 4 factor 22 item solution (PAF extraction with Oblique rotation) is one of many potential solutions, and given that many authors suggest is it best to over factor than

to under factor in a development study, two solutions are provided. The initial 5 factor 32 item

(PAF extraction with Orthogonal rotation) and the final 4 factor 22 item (PAF extraction with

Oblique rotation) are reported in Table 6 p. 96 and Table 7 p. 98 respectively. Suggestions for

future study, development and additional psychometric assessment of the NCSES are also

discussed in Chapter 6.

Reliability

Internal consistency reliability and homogeneity.

The degree to which a measurement instrument is considered internally consistent and

homogeneous is based on whether or not the items it contains consistently measure the same

construct or trait (Polit & Beck, 2008). All items in a homogenous scale will illustrate strong

correlations to each other. One method of assessing the homogeneity of an instrument is to

compare each item's individual correlation to the total index score.

The coefficient alpha statistic was used to measure the internal consistency of the 32 item

NCSES. This measure is considered the best approach to use in assessing an especially

important aspect of a measurement instrument development, the sampling of items (Streiner &

Norman, 2008). Item sampling is considered an important source of error in the development of

psychosocial measurements such as the NCSES (Polit & Beck, 2004). Internal consistency

reliability of the entire original 32 item NCSES was examined using Cronbach's coefficient

alpha. Polit and Beck (2004) state that reliability coefficients of .70 and above are generally

considered adequate, however measures greater than .80 are preferred. For a newly developed

scale such as the NCSES a reliability of .70 is acceptable. The Cronbach's alpha for the entire 32

item NCSES was high at .947. Items 13, 14, 19, 20 and 25 have item to total scores of .7 or

slightly higher. This suggests that these items may be redundant and therefore not contributing something unique to scale development. Cronbach's alpha remained high at .933 when those five items were removed from the NCSES. The final EFA solution chosen in this study revealed a 4 factor 22 item scale. The Cronbach's alpha for the revised 22 item NCSES remained high at .919. Reliability for each of the four factors was measured and found to be acceptable; factor 1 loaded 7 items (.789); factor 2 loaded 5 items (.845); factor 3 loaded 6 items (.783); factor 4 loaded 4 items (.753).

Stability reliability.

The stability of the NCSES was established by assessment of test-retest reliability. The CBU senior students were administered the NCSES a second time. The second administration of the scale to these same students occurred two weeks following the first administration, allowing for an assessment of test-retest stability reliability (Polit & Beck, 2008). Forty-seven of the initial 57 students participated in the retest. Agreed upon unique identifiers were added to the scale by the participants at each sitting. The researcher was therefore able to match the data for each respondent at time one to the same respondent at time two. The Pearson correlation coefficient is an appropriate statistical test when examining the relationship between two variables with ordinal level data. Burns and Grove (2009) suggest that for test-retest analysis a Pearson correlation is considered strong if it is .50 or higher ($r > 0.5$). The computed statistic indicates a strong positive correlation between NCSES administration on time one and time two based on a test-retest stability reliability Pearson correlation coefficient of ($r = .831$). The stability of scores on repeated measures of the NCSES is supported by this statistic.

Summary of results

Following appropriate preparation of data for analysis as discussed above, the following results were obtained from conducted analyses. *Normal Distribution:* The data in this study are considered approximately normally distributed. The Shapiro Wilk statistic is measured at 0.982, which demonstrates how correlated the observed data are with what would be expected if the data were perfectly normally distributed. Skewness and Kurtosis statistics and their associated standard errors also suggest a normal distribution (Skewness -.541 and .155; Kurtosis .459 and .308). A visual inspection of the histogram and normal QQ plot also contribute to the assumption of an approximately normally distributed data set.

Validation.

The Flesch-Kincaid measure of readability confirmed the reading level of the NCSES at grade 11 (Flesch, 1948). An expert panel contributed to content validity by completion of a two step assessment of items for potential inclusion in the NCSES. Student readers evaluated the NCSES for clarity and ease of interpretation from the student perspective. Contrasting group validity was enhanced by the t-test statistic which rejected the null hypothesis of no difference in the means ($p=<.001$) between the scores of second year CBU nursing students and senior CBU nursing students.

An EFA was preceded by an assessment of sample size adequacy. Eight participants per item was considered an adequate sample size for the study, a KMO output of .934, plus a significant ($p= <.001$) Bartlett's test of sphericity, all contributed to the assumption of sampling adequacy. The final EFA solution consisted of 22 items each moderately or highly loaded by one of four factors. This resulted in a four factor solution that was deemed by the researcher to be

both interpretable and parsimonious. The factors seemed reflective of self-held beliefs that may have resulted in increased student comfort, confidence and self-efficacy in specific domains of nursing practice. The labels of Proficiency, Altruism, Prevention, and Leadership were chosen for the four factors respectively. Convergent validity was not supported as a positive correlation between the ICI and the NCSES was not obtained.

Reliability.

The final EFA solution revealed a 4 factor 22 item scale. The Cronbach's alpha for the revised 22 item NCSES remained high (.919). Reliability for each of the four factors was measured and found to be acceptable; factor 1 loaded 7 items (.789); factor 2 loaded 5 items (.845); factor 3 loaded 6 items (.783); factor 4 loaded 4 items (.753*).*

The stability of the NCSES is supported by the computed statistic which indicates a strong positive correlation between NCSES administration on time one and time two to paired groups of senior nursing students based on a test-retest stability reliability Pearson correlation coefficient of (r=.831).

Conclusion

The analyses of the data collected in this study produced promising results for the initial psychometric assessment of the NCSES. With the exception of an attempt to contribute to convergent validity by a comparison between the NCSES and the ICI, all results of data analyses were in the expected direction. Further discussion of the contribution of this study, the results of the study analyses, the limitations of the study and recommendations for future research are included in Chapter 6 Discussion.

CHAPTER 6

DISCUSSION

Discussion in Chapter 6 begins with an overall summary of the study. The results reported in Chapter 5 are further discussed. Reference is made to social cognitive theory and The Health System and Health Human Resources (HHR) Planning Framework (O'Brien-Pallas & Tomblin Murphy, 2006), both of which inform this study. Limitations to the study are offered for consideration. Recommendations for future research are proposed. The contributions of this study to the field of nursing education, practice, administration and research are declared.

The stated goal of this study has been achieved by the development and psychometric assessment of a scale to measure senior nursing students' self-efficacy for nursing competence. The final NCSES is a 22-item scale with EFA resulting in four identified factors labeled as *Proficiency, Altruism, Prevention and Leadership*. These four factors are deemed by the researcher to be both interpretable and parsimonious. The factors seem to reflect self-held beliefs that may have resulted in student's feeling more or less self-efficacy and confidence within specific domains of nursing practice.

The NCSES development and assessment follows well documented and recommended steps in measurement instrument design as recommended by experts in the field (Aday & Cornelius, 2006; Gillis & Jackson, 2002; Polit & Beck, 2008). It is worth noting that the development and assessment of a measurement instrument combines both qualitative and quantitative approaches to reach a common goal. The influence of both methodologies is used to frame the discussion of the study.

Items for inclusion in the NCSES were initially developed based on a nationally approved registered nurse competence for entry to practice document *Entry-Level Competencies for Registered Nurses in Nova Scotia* (CRNNS, 2004, 2009). It is very similar to that which has been adopted nationally in the *Framework for the Practice of Registered Nurses in Canada* (CNA, 2007). The documents were developed and validated by Canadian regulatory bodies through consultative focus groups held with new graduates, nurse managers, nurse educators and other key stakeholders.

The influence of social cognitive theory was evident in the formatting of the items in the NCSES. The format of the measure was recommended by Dr. Albert Bandura (2006). Each item in the scale begins with the stem, '*As of today how confident are you that you can?*' Bandura suggests that self-efficacy is concerned with 'perceived capability' and not with 'intention'. Therefore, he suggests that the wording in the stem of each item should reflect perceived capacity at that point in time by using the phrase 'can do' versus the phrase 'will do'. In applying the Health System and Health Human Resources (HHR) Planning Framework (O'Brien-Pallas & Tomblin Murphy, 2006) a linkage of the practice self-efficacy of future registered nurses to important elements in health human resources and workforce planning is made. Specifically, health human resources planning (i.e. the gap between the supply of and requirements for RN's) is negatively affected by new graduates who either leave, plan to leave, or are not working to their full scope of practice. The cost of student and registered nurse attrition and the cost of lost productivity when registered nurses are unable to work to their full scope of practice, negatively impacts the ability of the health system to address the gap and to sustain Canadian health care in the future.

Qualitative methodology used in this study included the incorporation of feedback on the proposed items for inclusion in the scale from eight expert readers, eight student readers and the subsequent assessment of both perspectives by the researcher. Quantitative methods used in scale development included both descriptive statistics and parametric statistical analyses as reported in Chapter 5 and recommended by experts in measurement instrument development (Aday & Cornelius, 2006; Tabachnick & Fidell, 2007). Measurement of validity and reliability are presented in Chapter 5 and further discussed in Chapter 6. Validation of the NCSES was enhanced by an EFA, which includes both qualitative decisions and quantitative measures. In an EFA there is little generalization across factors because the variables of one factor do not correlate highly with variables of another factor, so factor analysis identifies qualitatively different dimensions. Within each factor qualitative generalizations exist that were identified quantitatively (Weiner, 2003). Finally qualitative interpretations of quantitative measures such as the slight negative skew in data distribution are discussed in this chapter.

In consideration of these facts, it is reasonable to suggest that decisions based on qualitative methods in scale development informed those decisions based on quantitative methods and vice versa. For example items were deleted based on the opinions of the expert readers; some retained items were subsequently deleted based on quantitative analyses of the participants' response to those items. The psychometric assessment of the NCSES is further discussed in the next section of this chapter.

Validation

Contrasting group validity.

Contrasting group validity was assessed at the Cape Breton University (CBU) site. An assumption was made by the researcher that second year CBU student scores on the NCSES should be lower than senior CBU student scores. This assumption was based on the fact that the second year student experience at CBU consists of in-house lab practice and testing in addition to a few hours of offsite long-term care practice experience. The bulk of practice hours and the classroom theory to support it is covered later in the second year, and continues from that point forward to program completion. Second year students have had little practice outside of university labs and they may be unable to envision themselves as registered nurses. They are not yet indoctrinated into the culture of nursing practice and should not feel confident in their ability to meet entry level competence. Therefore, it makes sense that the significant ($p=<.001$) difference between the group means is as expected and supports the contrasting group validity of the NCSES.

Convergent construct validity.

Bandura (1991) describes the difference between self-efficacy and locus of control. "Self-efficacy is related to belief in one's capability to bring about and execute a specific course of action, whereas locus of control refers to one's internal belief that outcomes are either dependent on their own actions or are the result of chance, fate or luck" (p. 158). Self-efficacy is in no way based on a belief in chance, fate or luck. Bandura (1994) informs us that those with low self-efficacy attribute failure to personal deficiencies in aptitude and give up quickly; following a setback or failure they are slow to recover what sense of efficacy they do have.

Dinther (2011) states that self-efficacy and other self-beliefs such as locus of control are sometimes confused with each other. He states that they represent different constructs in that "locus of control refers to an individual's belief about the main underlying cause of events in his or her life" (p.96). Self-efficacy refers to one's judgement of one's capability (Bandura, 1997). So it is not entirely surprising that a positive correlation between a measure of The Internal Control Index (ICI), which measures locus of control developed by Duttweiler (1984) and the NCSES was not obtained.

Immediately prior to completing the ICI scale the CBU students had completed the NCSES for the second time, to allow for measurement of test-retest reliability. Therefore, the senior students were asked to complete two scales at one sitting. The ICI is a complicated scale in that 50% of items are reversed response items randomly scattered throughout the scale. This may have negatively affected the time and attention provided to the task at hand by those students. Students may have found completion of the ICI immediately following the 32 item NCSES tedious (Polit & Beck, 2008).

Finally senior CBU students were attending university on that particular day to begin a review class for the CRNE exam and perhaps were anxious to complete the scales in a timely manner so that they could proceed to the exam preparation class. Therefore the results may have been somewhat negatively influenced by the timing of the second sitting because it was just prior to an important review class. Additionally, the length of time it would take to adequately read and complete the two scales may have been considered too time consuming by students, negatively impacting the accuracy of responses on the second scale and as a result the assessment of convergent construct validity. Streiner and Norman (2008) state that an increase

in the length of time it takes to complete a measurement scale may decrease the attention participants pay to the task.

Further, it is recommended that convergent validity results are most valid if based on the comparison of a new scale to one recognized as a 'gold standard' measure of the construct (Steiner &Norman, 2008). These authors also offer for consideration the idea that if a gold standard does exist, it by definition negates the need to develop another similar measurement instrument. A gold standard of self-efficacy for nursing competence with which to compare the NCSES does not exist. However comparison to a valid and reliable general self-efficacy scale may have provided a positive correlation. General self-efficacy scales have been long critiqued for being used without adequate development and psychometric assessment (Henson, Kogan, & Vacha-Haase, 2001; Scherbaum, Cohen-Charasj, & Kern, 2006). However Scherbaum et al. (2006) compared three general self-efficacy scales using Item Response Theory. Their study suggests that contrary to that belief, all three measures demonstrated acceptable psychometric properties with the most recent scale by Chen, Gully and Eden (2001) providing the most satisfactory results. Perhaps comparison of the NCSES to a general self-efficacy scale such as the scale developed by Chen et al. 2004 may have produced evidence of convergent construct validity. In a future study convergent construct validity assessment of the NCSES may be attained by a comparison with the New General Self-Efficacy Scale by Chen et al. (2001). This suggestion is discussed further in the recommendations section of this chapter.

Exploratory common factor analysis (EFA).

Several EFA solutions were examined as recommended in the literature (Costello & Osborne, 2005; Ferketich & Muller, 1990; Tabachich & Fidell, 2007). Costello and Osborne

(2005) state that in the social sciences the optimum solution is likely obtained when a true factor analysis extraction method such as Principal Axis Factoring (PAF) is followed by an oblique rotation and an examination of scree plots in combination with multiple test runs. The multiple test runs provide information on how many meaningful factors might exist in a data set. In this study the initial EFAs were conducted with PAF extraction and orthogonal rotation. Decisions were based on eiganvalues, scree plots, prior theory and complexity of item loadings. The same process was then repeated using PAF extraction with an oblique rotation. Numerous test runs were conducted and items considered complex were removed based on low to moderate loadings by more than one factor. The final EFA solution consisted of 22 items each moderately or highly loaded by one of four meaningful factors. This resulted in a four-factor solution that was deemed by the researcher to be both interpretable and parsimonious.

With either orthogonal or oblique rotations the same items tended to group together in similar factors. Although, as described in detail in Chapter 5, the strength of loadings changed and consequently the number of items and factors varied, overall the outputs were quite similar. "One test of the stability of an EFA solution is that it appears regardless of which extraction technique is employed" (Tabachich & Fidell, 2007, p. 609).

Discussion of factors. An interesting outcome of the factor analysis in this study was the seeming influence of self-held beliefs on the resulting factors. As stated in Chapter 4 Cheraghi et al. (2009) developed a measurement scale to assess student nurse self-efficacy for competent practice. Items were informed by literature reviews and focus groups with practicing nurses in Iran. The authors decided in advance that the items to be included would be based on the nursing process. The four factors they obtained in in the EFA analysis reflected steps in the

nursing process. The authors labeled them as planning, assessment, intervention and evaluation.

Similar studies based on student nurse self-efficacy for practice were not found. Meretoja et al.

(2004) developed a nursing competence scale based on nursing practice in Finland. They labeled

the seven factors they found as various domains of nursing practice. However, their scale did not

measure the construct of self-efficacy for nursing practice competence.

Choosing a label that seems to best describe a factor is based on the researcher's

assessment of the items contained within that factor. Often the decision is based on an

examination of the item that is most heavily loaded by the factor (Gillis & Jackson, 2002). The

decision is subjective and is described by Tabachich and Fidell (2007) as incorporating both art

and science. These authors state "one tries to identify some underlying dimension that unifies a

group of items loaded by a factor" (p.625). They further state that future researchers may decide

that different labels are more appropriate.

Factor labels. All items in the NCSES begin with the same stem which reads '*As of*

today, how confident are you that:' Factor one is labeled '*Proficiency*'. All of the items in factor

one relate to self-efficacy for competence in clinical practice skills and assessment. Factor one

includes Items: 22. *You can manage therapeutic interventions safely (e.g. drainage tubes)*? 23.

You can prepare clients for diagnostic procedures and treatments (e.g. colonoscopy)? 12. *You*

can complete your assessments in a timely manner following agency protocols? 9. *You can use*

the appropriate assessment tools and techniques for each body system (e.g. the neurological

system) in consultation with clients and other healthcare team members? and 16.*You can*

manage multiple nursing interventions for clients with complex co-morbidities, seeking

appropriate consultation when needed?

Factor 2 is labeled *'Altruism'*. It includes the largest number of items. These items relate to self-efficacy for competence in caring and focus on patient safety and public advocacy. Factor 2 includes Items: 28. *You can apply the Code of Ethics to address ethical dilemmas?* 27. *You can demonstrate a good understanding of informed consent?* 30. *You can demonstrate respect and knowledge of the unique and shared competencies of various members of the healthcare team?* 29. *You can advocate for clients especially when they are unable to advocate for themselves?* 24. *You can provide nursing care to meet hospice, palliative or end-of-life care needs?* 21. *You can apply safety principles to prevent injury to clients, self, other healthcare workers, and the public?* and 31. *You can take action in potentially abusive situations to protect self, clients and colleagues from injury (e.g. bullying, nurse-to-nurse violence)?*

Factor 3 is labeled *'Prevention'*. These items relate to self-efficacy in research, broad determinants of health, a global view, primary health care and prevention of complications. Factor 3 includes Items: 7. *You can demonstrate awareness about the emerging global health issues?* 11. *You can demonstrate awareness of the health inequities of people who are affected by various kinds of discrimination?* 8. *You can take part in nursing or health research by identifying research opportunities?* 6. *You can demonstrate the broad knowledge base required for nursing practice?* 18. *You can assist clients to understand the link between health promotion strategies and health outcomes (e.g. dietary methods to lower cholesterol)?* and 1. *You can use the Code of Ethics to maximize collaborative interactions within the healthcare team?*

Factor 4 is labeled *'Leadership'*. These items relate to self-efficacy in competencies required for nursing leadership, mirroring those competencies currently included in many nursing leadership texts and courses. Factor 4 includes Items: 4. *You can challenge questionable*

orders, decisions or actions of other healthcare team members? 3. You can use conflict resolution strategies when necessary? 5. You can report a near miss in care (a narrow escape from a serious complication)? and 2. You can make good practice decisions in the absence of agency policies and procedures?

Upon further reflection, the seeming influence of self-held beliefs on the resulting factors is not surprising. The *Entry Level Competencies for Registered Nurses in Nova Scotia* (CRNNS, 2004, 2009) lists 127 competencies that newly registered nurses are expected to meet upon acceptance to the profession. In this document the competencies are organized under five domains: professional responsibility and accountability; knowledge-based practice; ethical practice; service to the public and self-regulation. The 127 competencies are expected of new graduates upon entry to professional nursing practice. In this study, the expert readers, the student readers, the participant responses and the exploratory factor analysis influenced item selection and subsequently the four factors in the 22 item NCSES. Although item development was based on the 127 competencies, the NCSES was in fact designed to measure levels of the construct of self-efficacy for practice which is considered an internally held self-belief. The scale therefore measured the construct of self-efficacy in relation to a variety of nursing competencies.

In fact, self-efficacy is a self-belief specifically concerned with feelings of confidence and competence in specific areas and situations as defined by the tenets of social cognitive theory and the writings of Dr. Bandura. It is also malleable based on previous personal experience, be it positive or negative and on the emotional state of the individual in relation to that experience (1994). Those who study self-efficacy report that success builds on success. One therefore develops a strong sense of self-efficacy in that area. The opposite is also true in

that failure may lead to further failure and thereby lower one's sense of self-efficacy in a given area (Dinther et al. 2011; Henson, 2001; Margolis &McCabe, 2004, 2006). Self-efficacy is an internally held belief that becomes reinforced over time, and may eventually become resistant to change (Bandura, 1994).

It may well be that students have had previous experiences either in life or in nursing practice that they felt most comfortable with based on a self-assessment. They may have embraced those experiences and thereby increased their self-efficacy in those areas. Conversely, Bandura (1994) states that people will avoid situations in which they feel low self-efficacy as they feel threatened by those situations. It seems completely reasonable to suggest that students may, in keeping with what is known about self-efficacy development, have shied away from situations in which they felt low self-efficacy, such as comforting a palliative patient, thereby not increasing their self-efficacy in those areas. Margolis and McCabe (2004) state "According to social cognitive theory, low self-efficacy causes motivational problems. If students believe they cannot succeed on specific tasks, they will superficially attempt them, give up quickly, and avoid or resist them" (p. 219).

Registered nurses would likely agree that the profession benefits from a variety of personal attributes within the membership. It may well be that self-held beliefs such as altruism or leadership assist graduate nurses in finding their special niche within the nursing profession, and in doing so increase their self-efficacy for that practice area. Several authors have discussed personal characteristics that contribute to nurse burnout, leaving or staying in the profession, and success in nursing education (Chang, Wu & Wang, 2010; Garrosa, Rainho, Moreno-Jiménez & Monteiro, 2010; O'Brien-Pallas, Tomblin Murphy, Shamian, Xiaoqiang & Hayes, 2010; Pitt,

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Powis, Levet-Jones & Hunter, 2012); few studies focus on personal attributes influencing a nurse's chosen area of practice. A literature review by Borges and Savickas (2002) focussed on physicians' personality traits and choice of specialty practice. The authors suggest that their findings were inconsistent and although existing stereotypes were not supported, the review indicated only a loose relationship between a few personality factors and particular medical specialties. No recent studies were found that discussed personality traits or self- beliefs in relation to nurses' chosen area of practice.

However, Borges and Savickas (2002) were able to locate over 20 studies for their literature review on the topic within the medical profession. It is worth noting that they suggest their findings do not detract from the value of medical students having personality assessments done. The assessments help increase the students' self-knowledge in relation to their personality traits. They state that the results of these self-analyses help medical students decide upon which specialty to explore. The authors suggest further research is appropriate to determine how different personalities flourish within the specialties. Few studies have explored personality traits, attributes or self-beliefs of registered nurses in relation to specialty practice. This is a topic appropriate for future consideration within the field of nursing education research.

Reliability

The Cronbach's alpha reliability coefficient for the NCSES in this study was originally measured at .947. This was based on a 32 item scale. Based on item to total correlations of >.70, five items were deemed redundant and were deleted from the NCSES (Ferketich & Muller, 1990; Gillis & Jackson, 2002). The reliability of the scale was then calculated as .933. The final 22 item NCSES reported as the preferred solution following EFA in Chapter 5, maintains a

Cronbach's Alpha reliability coefficient of .919. The reliability of the NCSES is high for a

newly developed scale (Steiner & Norman, 2008). Given that the reliability of the scale is

currently high, it allows for consideration of revisions in future studies. For example, in future

studies, revisions of the NCSES may result in deletion of items that are deemed to be somewhat

redundant (due to high correlations with other items) resulting in an even more parsimonious

scale. Conversely, items with greater power to discriminate may be developed and added to the

scale. In this study and at this point in the scale's development the reliability of the NCSES is

excellent and shows promise for further assessment, replication and confirmation with similar

populations.

Test re-test reliability measures the reliability of an instrument on repeated measures with

a matched group. The test re-test stability reliability measure was excellent at (r=.831). This

result suggests that the NPSES has the ability to produce a similar score with the same

participants under the same conditions over time. Thus the stability of the NCSES was

established by this assessment of test-retest reliability.

In summary, the current psychometric assessment of the NCSES has provided promising

results in that with the exception of convergent construct validity, all results are in the expected

and desired direction. Additionally the EFA provided a stable and theoretically meaningful

solution containing 22-items divided among 4 interpretable factors.

Limitations

The current study has a few limitations that warrant discussion. First, it is valuable to

determine that a study sample is representative of the target population so that the results are

generalizable. The populations in this study were comparable on age and gender and all were

students in the senior year of a Canadian baccalaureate nursing program. However it is not possible to make comparisons related to student grades prior to entrance and dependents, as these data are not presently available for nursing students nationally. The uppermost purpose of this study and the data collection associated with the study was to develop a valid and reliable measurement scale. Given that it is an initial scale development and psychometric assessment study, its focus is more on the internal validity of a series of studies aimed at assessing the psychometric properties of a measurement scale, than it is on the external validity (i.e., generalizability) of these assessments. The evaluation of generalizability usually involves much more subject-matter judgment than internal validity (Last, 2001). The fact that this study was conducted on students in the senior year of a Canadian baccalaureate-nursing program should, in the judgment of the researcher, render the measurement scale applicable to other such Canadian students since all must demonstrate the same entry-level competencies.

The data in this study do show a slight negative skew. This is because the majority of students chose answers of 5 and above on most items. A skew toward the favorable end is commonly seen in scales that measure perceived ability (Streiner & Norman, 2008). This may reflect participants envisioning a future they have been planning for. It is reasonable to suggest that this may have played a role in student scores on the NCSES. Senior students have had significant nursing practice and nursing theory and are but a few months away from graduation. Additionally, student scores may have been influenced by the presence of a member of their faculty resulting in a slight social desirability influence (Polit & Beck, 2008).

The reliability of the entire NCSES is high for a newly developed scale at .919 for the final 22 item version. Although Streiner and Norman (2008) suggest the current trend in scale

development is towards more homogeneity of items and grounding of items in theory, future researchers may consider revisiting the competency documents with a view to new items for inclusion. Researchers may consider developing and adding items that will better discriminate between those students with high and low levels of self-efficacy for competent practice.

The most meaningful solution to the EFA in this study was judged to have been achieved by using PAF extraction with an oblique rotation of 22 of the original items resulting in four extracted factors. Given that this was an initial development study the obtained solution is but one of many potential solutions. Weiner (2003) states "one can never state one number of factors is the only number that can be, just that it is one of the possible replicable solutions" (p. 161). Therefore the researcher invites further replication of this study with similar but perhaps larger student populations drawn from other Canadian universities.

Finally convergent construct validity for the NCSES was not confirmed in this study.

The limitations in this study have been noted in this chapter. However these limitations are not of a magnitude to detract from the contribution of the NCSES to the field of nursing education. Suggestions for addressing the limitations where appropriate are offered in the recommendations section of this chapter.

Recommendations

As stated earlier in this chapter researchers have been critiqued for using general self-efficacy scales without adequate evidence of proven validity and reliability. Additionally Bandura (1997) suggests that measurement of self-efficacy is best made when specific examples of the activity being studied are provided. Given the fact that the nursing competencies are very

specific and it follows that the items in the NCSES are specific as well, the researcher was

initially reluctant to use a general self-efficacy scale in this study. However, as stated,

Scherbaum et al. (2006) found the New General Self-Efficacy Scale by Chen et al. (2001) has

adequate psychometric properties. Therefore it is recommended that participants' scores on the

NCSES be compared to matched participants' scores on the New General Self-Efficacy Scale by

Chen et al. (2001) to assess the convergent construct validity of the NCSES in a new study. In

so doing one would expect a positive correlation.

The NCSES requires additional psychometric assessment (Weiner, 2003). Therefore the

researcher recommends replication of this study with a similar, perhaps larger sample.

Replication of this study will provide support for the psychometric properties of the NCSES

reported in this study; it will provide additional assessment of the scale's validity and reliability;

it will improve the NCSES by refining the psychometric properties of the scale. It is most

appropriate to conduct replications of this study with a similar group and methodology. This

approach may support the factor structure described in this study or provide new data to support

appropriate modifications to the NCSES. Once a meaningful and stable factor solution is agreed

upon through additional EFA studies, a confirmatory factor analysis (CFA) would then be

appropriate (Weiner, 2003).

Confirmatory factor analysis is recommended following a further exploratory factor

analysis. Weiner (2003) suggests that although a CFA could confirm the EFA results of this

study with a new sample, it is most appropriate to first repeat the EFA in a new study similar to

the original study. He states that "although both approaches are useful, a preferred initial

approach is to confirm the EFA solution in a new EFA study" (p. 161). Further validation and

confirmation of psychometric properties are appropriate for all newly developed scales. Doing so will ensure a high quality measure of student nurse self-efficacy for practice is added to the professional literature. The potential contribution of the scale is discussed in the following section of this chapter.

It is recommended that once further psychometric assessment of the NCSES is completed the scale be utilized to empirically evaluate new or existing curriculum interventions aimed at enhancement of nursing students' self-efficacy for competent nursing practice. The interventions should be developed based on the tenets of social cognitive theory. Examples of such interventions are further discussed in the following section of this chapter.

It is recommended that qualitative studies be conducted to better understand the influence of curriculum initiatives and evaluation methods on nursing students' self- efficacy. Given that in all cases it is vital to listen and attend to the voices of nursing students and nursing educators, qualitative studies are appropriate. Such studies conducted in relation to curriculum initiatives or adaptations based on social cognitive theory, will increase current understanding of the construct in nursing education and in so doing enhance, inform and provide meaning to the quantitative data the NCSES provides.

Contribution to profession

Contribution 1: In comparison to other areas of education literature such as general education and health education, nursing education literature provides relatively little information about the contribution of internal self-beliefs such as self-efficacy. Dinther et al. (2011) included 39 studies in their literature review that focused on empirical studies related to factors affecting student self-efficacy in higher education. The search included the years from 1990 onwards and

revealed over 500 studies. Their final inclusion criteria stated that studies have the construct of self-efficacy defined and developed based on the original work of Dr. Bandura, the level had to be higher education and finally, research on factors that influence self-efficacy had to be included. The fact that no nursing studies were included in this literature review suggests that few nursing studies meeting the inclusion criteria were found, thereby adding to the significance, value and unique contribution of this study to the profession.

Specifically, little attention has been paid to the role that nurse educators play in increasing self-efficacy for nursing competence within the student body (Cheraghi et al., 2009; Townsend & Scanlan, 2011). This study contributes to the profession by providing an increased focus on this important role for nurse educators. Further investigation in the area of self-efficacy building in nursing education is warranted. Based on their systematic literature review, Dinther et al. (2011) state "we certainly are convinced after reading all the studies and the presented evidence that self-efficacy is vital to academic performance and that self-efficacy of students can be affected positively" (p.105).

Nurse educators and preceptors have the opportunity to enhance student self-efficacy with each and every encounter; they also unfortunately have equal opportunity to damage it. Teachers can damage student self-efficacy for academics unintentionally by not rewarding effort, by not providing appropriate praise for progress, or by not providing timely assistance as needed which leads to frustration (Margolis & McCabe, 2006). Development of the NCSES may lead to an increased awareness of this reality within the nursing education profession. This is a valuable contribution. Nurse educators frequently comment that actual competence and safety are their top priority; this is certainly true. Nursing education programs must ensure that numerous

checks and balances are in place, to ensure as much as is possible, that graduates are safe and competent practitioners. Canadian schools of nursing are required to meet the standards of excellence set by provincial regulatory bodies to maintain their approval status. Most schools of nursing also seek and receive accreditation from the Canadian Association of Schools of Nursing (CASN). The CASN accreditation process (which is mandatory in some provinces) encourages schools to continually work towards excellence in nursing education, and scholarship. During their years of undergraduate education nursing students are graded on exams, papers, reports, assignments, reflective journals, nursing practice and skill testing that is frequent and ongoing. Finally, entrance to the profession following graduation from an approved nursing program is conditional upon a student's subsequent success on a national examination based on various aspects of professional nursing. Nurse educators are very cognizant of the need for competence assessment, attend to it with intention and are diligent in ensuring that all requirements are met.

A focus on the value of self-efficacy development within the student population is an important contribution of this study; the evidence presented throughout this dissertation suggests that nurse educators should also attend with due diligence to the development of student self-efficacy for practice with each student interaction. Pajares (2000) writes that teachers should pay as much attention to a student's perception of competence as to their actual competence.

Contribution 2: The exploratory factor analysis of the NCSES resulted in factors that seem to reflect underlying self-held beliefs contributing to increased self-efficacy in particular areas of nursing competence. For students this may have implications as they consider their preferred area of nursing practice. For nurse educators, given that entry-level competence is required in all areas of practice the NCSES may allow both educators and students to focus on

those areas of practice (as defined by the factors) in which individual students feel the least self-efficacy. For example a student who scores low in items most related to nursing leadership may be offered and encouraged to accept a leadership responsibility such as taking a leadership role with her group of peers in clinical practice, under the observation of her preceptor. Another example would be a student who feels low self-efficacy for proficiency in practice skills may be invited, encouraged or mandated to practice in the lab with peers so as to further improve both proficiency and self-efficacy in a safe environment prior to entering practice. Providing additional experience leading to positive outcomes in weakest practice areas may assist students and educators in meeting the required goal of overall practice competence. The NCSES contributes an enhanced ability to do so.

Contribution 3: Evidence exists to suggest that nurses with strong self-efficacy contribute in positive ways to their workplace (Luthans & Jenson, 2005). The NCSES provides nurse educators with an ability to measure students' self-efficacy for practice. This may help determine if graduates have been provided with a level of education that prepares them to not only be competent and safe practitioners as mandated by regulation, but to also thrive, prosper and become positive innovators for change within the profession. This is an important goal for educators (Benner, 2010; Duchscher, 2009; Eggertson, 2011). Chapter 1 provides convincing evidence of the increasingly stressful healthcare work environments faced by new graduates (Benner, 2010; Beurhaus, 2008; Maddalena & Crupi, 2008; Brown et al., 2008; Bowles, 2005; Doherty, 2009). New graduates find the transition from student nurse to registered nurse very difficult (Benner, 2010; Duchscher, 2009). Employers suggest that new graduates need to be better prepared to accept their role as a registered nurse (Benner, 2010). Therefore the fact that a recent survey of new graduates in Nova Scotia reports that currently 67% plan to leave their

present position (CRNNS, 2011), is not unexpected. Social cognitive theory suggests that those with strong self-efficacy for a specific set of competencies develop increased resistance to stress as well as increased resilience (Bandura, 1993).

A search of the social cognitive theory literature provides evidence of the benefit of collective-efficacy within teams. Increasing both individual and collective efficacy may foster independence, resilience and confidence (Bandura, 1993, 1994)**.** The benefit of collective-efficacy in health care teams includes improved outcomes for individual nurses, the health care team and the recipients of the service provided as reported in recent studies (Lee & Ko, 2010; Stajkovic et al., 2009).

Contribution 4: Many health and human resource experts have suggested the introduction of unique identifiers for all professional health care providers including nursing students. This initiate was recently reviewed in a *National Unique Identifier Feasibility Report* (CIHI, 2010). Unique identifiers would enable researchers to track both movement and outcomes for health practitioners without jeopardizing the confidentiality of individuals (Kennedy, McIsaac, & Bailey, 2007). With implementation of unique identifiers it may be possible that student scores on the NCSES can be compared with future outcomes such as movement, attrition and contribution to the practice of professional nursing over time.

Contribution 5: Finally, this study's most significant contribution is the development of the NCSES, a measurement scale that did not previously exist. The addition of this scale provides nurse educators with a tool by which to measure the self-efficacy of nursing students for competent nursing practice. Following further development and confirmation of the NCSES as a valid, reliable and stable scale, nurse educators will have the ability to initiate curriculum

interventions aimed at increasing self-efficacy for practice competence that will include a method to empirically evaluate the outcome of such curriculum initiatives. Interventions aimed at increasing student self-efficacy based on the tenets of social cognitive theory can and should be developed. The new scale will allow the impact of such initiatives to be evaluated empirically. One such initiative, as described by Bulet et al. (2010) involves senior students interacting with first year students in a formal peer-mentoring program organized and supervised by faculty. In this study seniors were provided with education and information to assist them in their new role. This resulted in a win-win scenario for students as improved outcomes were noted in both groups.

Another example would be development of programs to allow senior students who have received instruction in social cognitive theory and self-efficacy enhancement, to preceptor first year student practice in lab sessions, including the testing of first year skills, under the direction of faculty. This example would ideally include all four strategies for self-efficacy enhancement as suggested by the tenets of social cognitive theory (Bandura 1993): mastery experience (increased amount of supervised practice), social modeling (vicarious learning with a model similar to one's self), lower physiological stress (faculty not standing watch) and social persuasion (appropriate positive encouragement).

The adoption of initiatives aimed at increasing student self-efficacy for nursing practice need not mean major changes to curriculum initiatives currently in place; it does mean adapting existing processes to incorporate methods designed specifically to increase (and conversely not decrease) student self-efficacy for nursing practice. Gibbons (2010) suggests that student self-efficacy can be enhanced by increasing the awareness of the value in doing so, within many

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current student interactions considered established practice. When curriculum initiatives are based on the tenets of social cognitive theory, the potential exists to create a variety of learning scenarios that meet the requirements of regulators and accreditation bodies while also incorporating self-efficacy enhancing practice. Such initiatives will further support student nurse success within the program and also success in the transition to professional nursing practice. The ability to provide such curriculum initiatives will be enhanced by a valid and psychometrically sound NCSES for use in combination with other forms of evaluation. The impact of such initiatives can be made quantitatively for both individual students and for groups of students. This would be similar to the types of initiatives, measures, and research studies currently conducted in general education (Bates & Khasawneh, 2007; Fencl & Scheel, 2005; Margolis & McCabe, 2004; McLaughlin et al., 2008; Pajares, 2002, 2007; Sitzmann & Ely, 2011).

The 2011 study by Sitzman and Ely was a meta-analysis of self- regulated learning, training and education studies. They reviewed 430 studies with a total of 90,380 participants. They report four constructs: self-efficacy, goal setting, persistence and effort as the self-regulating constructs with the strongest effects on learning. Dr. Bandura (1994) states that strong self-efficacy in a specific situation allows individuals to accomplish three things; to set higher goals for themselves, to persist in the face of failure, to interpret failure as a motivation to increase effort. The three outcomes of strong self-efficacy previously cited by Bandura are the three additional constructs identified in the 2011 meta-analysis. Therefore it would seem based on the basic tenets of social cognitive theory and strong evidence provided by this study and similar research, that attention to the development of strong student self-efficacy specific to nursing competence has relevance for nurse educators.

Conclusion

This study is the first to develop and assess a scale to measure senior nursing students' self-efficacy for competent nursing practice. This study contributes a practical 22 item instrument to evaluate senior nursing students' self-efficacy for nursing competence. The NCSES has demonstrated evidence of internal consistency reliability, test-retest stability reliability, content validity, construct validity and contrasting group validity.

The benefit of strong self-efficacy in one's ability to fulfill the expectations of one's profession is well documented in the literature (Stajkovic et al., 2009; Townsend & Scanlan, 2011). Following additional testing and confirmation of the scale's accuracy, the NCSES will be useful as a measure of students' perceived self-efficacy for entrance to the profession. Additionally, there is a role for the NCSES in assessment of curriculum initiatives developed specifically to increase student self-efficacy for nursing practice. This study provides nurse educators and researchers with an assessment instrument that did not previously exist. Finally, the development of the NCSES fosters awareness of the construct of self-efficacy for nursing competence and the nurse educators' role in self-efficacy development within the student nurse population.

"It is usually easier to weaken confidence through negative messages than to strengthen it through positive encouragement. It can take many voices to see us through rough spots; only one voice is required to shatter us for a good long while."

Pajares, 2006, Great Teacher Lecture Series

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APPENDIX A   EXPERT READER STUDY SUMMARY

Attachment 1

Study Objective

To develop and psychometrically assess a scale to measure senior student nurses' self-efficacy in relation to meeting the Entry Level Competencies expected on acceptance to the nursing profession.

Study Method

An X item, Likert type measurement instrument will be developed and psychometrically assessed based on evidence from experts in nursing research and practice and in consultation with experts in instrument development and psychometric assessment. Nursing experts (n=8) are asked to participate in a two-step validation process consisting of two independent reviews of the instrument, before it is administered to senior student nurses in Nova Scotia and NL (n=X).

Self-Efficacy, its History and Development

The concept of self-efficacy has been widely studied and the research literature supports the value and importance of this character attribute including its ability to influence the various lifestyle choices we make (Bandura, 1993; Lenz, 2002; Zeldin, Britner & Pajares, 2008). Self-efficacy is commonly defined as having a belief in one's capability to succeed. One feels up to the challenge of difficult tasks and is therefore intrinsically motivated by them. Those with strong self efficacy have an enhanced personal well-being and an increased ability to accomplish goals (Bandura, 1994; Schunk & Pajares, 2002). In fact the very goals they set are enhanced. They approach difficult tasks confidently and with interest. They become deeply engrossed in such activities and believe that they will eventually succeed if they work hard. In the face of

failure they are likely to increase their efforts and attribute that failure to a lack of resources or insufficient effort on their part, rather than to any personal lack of ability or intelligence. Conversely, those who have a low sense of self-efficacy doubt their capabilities and shy away from difficult tasks. Such difficult tasks or activities are perceived as personally threatening and therefore to be avoided (Bandura, 1993, 1994; Pajares, 2002). They set fewer goals and have a decreased commitment to those they do set. They see failure as a personal deficiency and therefore not within their control. When faced with adversity they will tend to slacken their efforts and give up quickly. People with low self-efficacy are also unfortunately slow to recover what sense of self-efficacy they have and therefore may quit prematurely. Unless people believe they can produce the effects they desire the incentive to act is obliterated. They are also therefore more likely to feel stressed and depressed (Bandura, 1993, 1994; Pajares, 2002; Margolis & McCabe, 2004). Pajares suggested in a lecture delivered at Emory University in 2007 that these facts would seem no more than common sense. In doing so he also commented on the apparent scarcity of common sense.

Self-Efficacy Specificity and Differentiation

Bandura is a strong proponent of situation specific efficacy. This study is founded on the construct of nursing student self-efficacy related to entry level competence. Therefore it is based on the concept of situation specific efficacy. Self-efficacy is domain, situation and activity specific. It is concerned with the judgement of personal capabilities in unique situations and activities, and not with a sense of personal self-worth, as is self-esteem, or with self-image, as is self concept. Therefore it follows that individuals may consider themselves highly efficacious in one activity, even if they feel little or no societal pride in it, such as a competent executioner.

Conversely one can feel no self-efficacy in an activity and feel no loss of self-esteem or self-worth as a result, such as being inefficacious as an opera singer. The research literature supports the concept of situation specific efficacy and the notion that individuals do have strong efficacy beliefs in one area and low efficacy beliefs in another (Bandura, 1986; Pajares, 2007; Margolis & McCabe, 2004).

For this reason a measurement instrument designed to measure self-efficacy in a given situation must relate efficacy to the competencies that are required for success in that specific situation. It is important to understand that perceived self-efficacy is a judgement of one's capability, rather than a measure of one's actual capability. Pajares wrote that teachers should pay as much attention to a student's perception of competence as to their actual competence. He informed us that belief in one's personal competence is the self-belief that is most predictive of one's choice, work habit, fear, apprehension and achievement (2000).

Potential Value of Enhancement of Student Self-Efficacy for Nursing Practice

For nursing students the concept of strong nursing role efficacy may embody exactly what we hope students will achieve during their education; they will believe that they have choices available to them and also that they must take responsibility for their actions and for their decisions. As nursing educators we want to enable students and graduates to make the best choices for their patients as well as for themselves.

Current realities demand an appropriate and necessary focus on HHR planning and HHR provision that is based on accurate forecasting and a precise accounting for fiscal expenditures. Too many new graduates are leaving the profession (Tomblin Murphy et al., 2009), and many who do stay, are not working to the full scope of their practice (Eggertson, 2005). Many are not

strong, not empowered and not proud of their ability, their skill and their unique contribution (Lim, Bogossian &Ahern, 2010; Spence Laschinger, Grau, Finegan & Wilk, 2010). The health care system needs registered nurses who intend to stay in the profession, who are as resilient to its stressors as they must be and who are both leaders and team players. They must have developed the confidence to critically think through options in making difficult but correct patient care decisions, be secure in their critical role as patient advocate and be innovative in developing pathways to improve patient outcomes (Benner, 2010).

Greater attention to self-efficacy building interventions within nursing education is warranted. Although a greater focus on building efficacious registered nurses is important to health care consumers and therefore to health care planners and the health system, it may be most salient to nursing students and nurse educators. This is true because general education research suggests that teaching efficacy is most malleable during pre-service years and then subsequently seems to become somewhat resistant to change; it is an internally held belief related to one's capability (be it positive or negative) that is continually reinforced over time (Henson, 2001). Intuitively, given the current stressors of the nursing workplace, one can assume this likely applies to nursing graduates as well.

The present study is focused on measuring senior student nurse perceived efficacy related to the profession's entry level competencies, through the development and psychometric assessment of a measurement instrument. This study will contribute to future research by providing a measurement instrument that does not presently exist (McLaughlin, Moutray & Muldoon, 2007; Cheraghi, Hassani, Yaghmaei & Alavi-Majed, 2009). The potential long term benefit of this study may include the ability to better evaluate nursing curricula interventions

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aimed at enhancing nursing student self-efficacy for competent practice or to examine relationships between the professional efficacy of graduating registered nurses and their subsequent commitment to the employer, their contribution to the profession and their intention to stay.

Increasingly we are made aware of the inability to continue to sustain the system over time as it presently operates; this is due to both increasing population health needs and decreased financial stability (Corpus Sanchez International Consultancy, 2007). The production and the supply of well-prepared registered nurses who are to become strong leaders, resilient to change and uncertainty, who willingly embrace challenge, would likely exert a positive influence on the entire health care system (Benner, 2010). This influence might include an increase in both the quality and quantity of service they provide in that they may contribute more fully and productively to the health care system. They may also intend to remain productively committed to their profession over a longer period of employment. Given that substantial evidence exists within Social Cognitive Theory and self-efficacy literature to support the value of enhanced efficacy toward one's profession and given that all elements in the Health System and HHR Planning conceptual framework are related one to another, a strong efficacious registered nurse workforce seems a goal well worth striving towards.

APPENDIX B   EXPERT READER ROLE

Attachment 2

Content Validity

In the context of measurement instrument development validity is an important criterion

that must be met to ensure that the instrument actually measures the constructs that it purports to

measure. For example, is a self-efficacy scale really measuring self-efficacy? Content validity is

defined as the extent to which the items in a developed instrument are measuring and adequately

representing the universe and dimensions of the content implied by the intended construct (Gillis

& Jackson, 2002; Polit & Beck, 2008). Content validity is dependent on "judgments about

whether the questions chosen are representative of the concepts they are intended to reflect"

(Aday & Cornelius, 2006, p.62). A thorough review of the literature focusing on the dimensions

of the construct, including a review of existing measurement instruments based on the same

construct, will assist in development of content validity. Additionally, content validity is

measured by a formal process of seeking the judgments of expert consultants.

Role of Expert Reader

At this point in my study you as a member of a panel of experts will review the revised

scale in a two-step review process. These steps will provide the feedback on which further

revisions of the scale will be based. Face validity (a type of content validity assessment) is

appropriate at this point in instrument development. Face validity is defined as "A type of

content validity that uses expert opinion to judge the accuracy of an instrument" (LoBiondo-

Wood, Haber, Cameron & Singh, 2009, p. 100). The first draft will be presented to an expert

panel consisting of three nurse practice educators who are members of faculty and who also

accompany senior students to nursing practice as preceptors, two members of CRNNS who have

involvement in the competency document development and revisions, three nursing faculty members, one of whom has developed a measurement instrument and has conducted prior research involving the construct of self-efficacy.

Please remember that a self- efficacy scale should measure what the student thinks and feels about their ability and not their actual ability. Also we are not looking for competencies that you consider the most important; rather we are looking for a broad selection that covers all categories in the competency document. Please try to determine if the items capture all or at least most of the categories of competence that the complete document describes. In other words are any areas of practice completely left out?

As a member of the expert panel, I ask that you review the items in the scale to determine that they measure competencies on which you would expect some students to score themselves highly, some moderately and some at the lower end of the confidence scale. These items best contribute to the scale's dimensionality which is necessary for scale development and validation. Items on which you think a large majority of students will be very high or very low are not desirable. I have left room under each item for you to comment on its individual value; i.e. to keep the item, to remove the item and why, to revise the item and in which way. Finally the scale needs to be shortened and therefore suggestions as to any items that you feel may be redundant, confusing for the student or not contributing to the construct would be most welcome.

The last page of the scale is an invitation for you to provide general comments, critiques, suggestions for improvement etc. Please be candid in your response as I truly seek and need your advice.

Following this process, additional items will be selected out by me as the instrument is revised based on the results of your analysis. A decision has been made that the instrument should be reviewed again by the expert panel, (constituting a two step process) as recommended clearly by Polit & Beck (2008) "It is advisable to undertake two rounds of review if feasible -the first to weed out faulty items or to add new items to cover the domain adequately, and the second to formally assess the content validity of the terms and scale" (p. 481). This suggestion is appealing because it relatively easily done and it makes best sense to conduct face (content) validity assessments on the revised and improved version. They further recommend that the second panel of experts might be a researcher selected subset of the first panel and that they be fewer in number.

I realize that this is a very busy time of year...end of vacations and preparation for a new school year; however I am requesting a 6 week turn around if you manage it. I will of course understand completely if your circumstances do not permit this. Alternately I will certainly be thrilled if an even faster response time suits you.

Once again thank you for your contribution to my research. For questions please see contact information below,

Evelyn

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APPENDIX C   DRAFT 66 ITEMS TO EXPERT READERS

Attachment 3

Note: Bandura suggests scale title as above without mention of self-efficacy…the actual scale will have the numbers 1-9 under each item for student selection.

The following scale lists different nursing competency activities. Please rate how **confident** you are that you **can** do them **as of now**. Rate your degree of confidence by recording a number from 1 to 9 using the scale provided below each question. Please clearly circle your choice.

1	2	3	4	5	6	7	8	9
Certain Cannot Do								Certain Can Do

1. How **confident** are you that you **can** articulate the role and responsibilities of a registered nurse?

2. How **confident** are you that you **can** demonstrate leadership in client care by promoting culturally safe work environments?

3. How **confident** are you that you **can** encourage collaborative interactions within the healthcare team?

4. How **confident** are you that you **can** exercise professional judgement when practising in the absence of agency policies and procedures?

5. How **confident** are you that you **can** organize your own workload so that you meet your professional responsibilities?

6. How **confident** are you that you **can** communicate honestly about work you did not complete?

7. How **confident** are you that you **can** use basic conflict resolution strategies to transform situations of conflict into healthier interpersonal interactions?

8. How **confident** are you that you **can** protect clients by recognizing and reporting unsafe practices when client safety and well-being are potentially compromised?

9. How **confident** are you that you **can** question /challenge unclear or questionable orders, decisions or actions made by other healthcare team members?

10. How **confident** are you that you **can** report near misses and errors, including your own?

11. How **confident** are you that you **can** demonstrate knowledge of the contribution of registered nurse practice to the achievement of positive client health outcomes?

12. How **confident** are you that you **can** demonstrate a knowledge base in the health sciences, including nursing, physiology, pathophysiology, psychopathology, pharmacology, microbiology, epidemiology, genetics, immunology and nutrition?

13. How **confident** are you that you **can** demonstrate a knowledge base about workplace health and safety, including ergonomics, safe work practices, prevention and management of aggressive or violent behaviour?

14. How **confident** are you that you **can** demonstrate a knowledge base concerning the growth and development of groups, communities, and population health perspectives?

15. How **confident** are you that you **can** demonstrate awareness about emerging global health issues?

16. How **confident** are you that you **can** demonstrate understanding of the significance of primary care for population health?

17. How **confident** are you that you **can** demonstrate how the determinants of health influence client health?

18. How **confident** are you that you **can** engage in nursing or health research by identifying research opportunities?

19. How **confident** are you that you **can** use appropriate assessment tools and techniques in consultation with clients and other healthcare team members?

20. How **confident** are you that you **can** analyze and interpret data obtained in client assessments to draw correct conclusions about clients' health status?

21. How **confident** are you that you **can** demonstrate knowledge of the health disparities of people who are affected by various kinds of discrimination?

22. How **confident** are you that you **can** collaborate with other healthcare team members to identify actual and potential client healthcare needs?

23. How **confident** are you that you **can** complete assessments in a timely manner following agency protocols?

24. How **confident** are you that you **can** use existing nursing information systems to manage nursing and healthcare data during client care?

25. How **confident** are you that you **can** use critical inquiry to support reasoned decision-making to develop healthcare plans?

26. How **confident** are you that you **can** facilitate the appropriate involvement of clients in identifying their preferred health outcomes?

27. How **confident** are you that you **can** anticipate potential health problems and their consequences for clients?

28. How **confident** are you that you **can** initiate appropriate action to deal with potential staff safety concerns?

29. How **confident** are you that you **can** facilitate client ownership of the outcomes of care developed in their healthcare plans?

30. How **confident** are you that you **can** determine when consultation is required with other team members?

31. How **confident** are you that you **can** provide nursing care that is informed by a variety of theories and models relevant to health and healing (e.g., communication, crisis intervention, systems)?

32. How **confident** are you that you **can** incorporate evidence from research, clinical practice, client preference, client and staff safety to make decisions about client care?

33. How **confident** are you that you **can** offer culturally-safe nursing care?

34. How **confident** are you that you **can** manage multiple nursing interventions for clients with complex co-morbidities with consultation as needed?

35. How **confident** are you that you **can** recognize, seek immediate assistance, and help others in rapidly changing conditions of clients that could affect a client's health or safety (e.g., myocardial infarction, surgery complications)?

36. How **confident** are you that you **can** assist clients to understand the link between health promotion strategies and health outcomes?

37. How **confident** are you that you **can** assist clients to access health resources in their communities (e.g., support groups, home care)?

38. How **confident** are you that you **can** provide supportive care to clients with chronic and persistent health challenges (e.g., diabetes, problematic substance use)?

39. How **confident** are you that you **can** apply knowledge consistently when providing care for physiological needs to prevent development of complications (e.g., fluid and electrolyte balance, tissue integrity)?

40. How **confident** are you that you **can** apply safety principles consistently (e.g. infection control measures; appropriate protective devices), when providing nursing care to prevent injury to clients, self, other healthcare workers, and the public?

41. How **confident** are you that you **can** implement strategies related to the safe, appropriate administration and use of medication?

42. How **confident** are you that you **can demonstrate** environmentally responsible practice (e.g. safe disposable of waste, efficient energy use)?

43. How **confident** are you that you **can** manage therapeutic interventions safely (e.g., intravenous therapy, drainage tubes)?

44. How **confident** are you that you **can** apply evidence-informed practices of pain prevention and management with clients using non-pharmacological measures (e.g., distraction, traditional practices)?

45. How **confident** are you that you **can** prepare clients for diagnostic procedures and treatments; interpret and report findings and provide follow-up care as appropriate?

46. How **confident** are you that you **can** provide nursing care to meet hospice, palliative or end-of-life care needs (e.g., advocacy, support for significant others)?

47. How **confident** are you that you **can** monitor the effectiveness of client care in collaboration and consultation with individuals, families, groups, communities, and other members of the healthcare team?

48. How **confident** are you that you **can** modify client care based on the emerging priorities of the health situation in collaboration with clients and other members of the healthcare team?

49. How **confident** are you that you **can** report and document client care and its ongoing evaluation in a clear, concise, accurate and timely manner?

50. How **confident** are you that you **can** demonstrate an understanding of informed consent as it applies in multiple contexts (e.g., refusal of treatment, release of health information)?

51. How **confident** are you that you **can** use an ethical reasoning decision-making process to address situations of ethical dilemmas?

52. How **confident** are you that you **can** provide care for all clients; being respectful of personal dignity, privacy, diverse health status, diagnosis, experiences, beliefs, and health practices?

53. How **confident** are you that you **can** advocate for clients or their representatives, especially when they are unable to advocate for themselves?

54. How **confident** are you that you **can** use ethical principles when working with health care team members to maximize collaboration in client care?

55. How **confident** are you that you **can** demonstrate leadership in the coordination of health care by assigning and monitoring appropriate workloads for selected healthcare team members?

56. How **confident** are you that you **can** monitor the performance of delegated nursing activities by selected healthcare team members?

57. How **confident** are you that you **can** direct and coordinate selected team members in emergency situations?

58. How **confident** are you that you **can** promote collaborative practice by building partnerships with healthcare team members based on respect for the unique and shared competencies of each member?

59. How **confident** are you that you **can** take action in potentially abusive situations to protect self, clients and colleagues from injury (e.g. bullying, nurse-to-nurse violence)?

60. How **confident** are you that you **can** use safety measures and healthcare resources to ensure a safe work environment related to staffing levels?

61. How **confident** are you that you **can** support professional efforts in nursing to achieve a healthier society (e.g., lobbying government)?

62. How **confident** are you that you **can** demonstrate an awareness of emergency preparedness planning and resources?

63. How **confident** are you that you **can** demonstrate an understanding of the mandates of regulatory bodies, professional associations and unions?

64. How **confident** are you that you **can** distinguish the difference between the registered nurse legislated scope of practice and a registered nurse's individual scope of practice based on her/his own level of competence?

65. How **confident** are you that you **can** understand the significance of the concept of fitness to practise within the context of individual self-regulation and public protection?

66. How **confident** are you that you **can** develop support networks with other health care team members?

APPENDIX D   EXAMPLE OF EXPERT RATING SHEET

Attachment 4

Item Rating Sheet

You can highlight responses, type comments, submit electronically, OR print, circle and send by regular mail.

Although it is not necessary for you to comment on each item, please **rate each of the 66 items for relevance** to the constructs in the scale (i.e. measurement of self-efficacy and measurement of competence for practice) and **for clarity** for the reader.

I ask that you review the items in the scale to determine that they measure competencies on which you would expect **some** students to score themselves highly**, some** moderately and **some** at the lower end of the confidence scale. Items on which you think a large majority of students will score very high or very low are not desirable, because they cannot contribute to the scale's ability to discriminate among people with varying degrees of the underlying construct (Polit & Beck, 2008). If you believe this is the case please suggest removal of the item and state the reason.

Please feel free to comment on an item's value; i.e. to keep the item, to remove the item and **why or** to revise the item and in **which way.**

Finally, suggestions as to any items that you feel may be **redundant, confusing for the student or not contributing to the constructs** would be most welcome.

1   **Relevance:** 1   2   3   4   **Clarity**: 1   2   3   4

      Comments:

2. **Relevance:** 1   2   3   4   **Clarity:** 1   2   3   4

      Comments:

3. **Relevance:** 1   2   3   4   **Clarity:** 1   2   3   4

      Comments:

Appendix E   **Competency Appraisal Scale**

The following scale lists different nursing competency activities. Please rate your degree of confidence by recording a number from 1 to 9 using the scale provided below each question.

As of today, how confident are you that:

1.	You **can** use the Code of Ethics to maximize collaborative interactions within the healthcare team?							
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

2.	You **can** make good practice decisions in the absence of agency policies and procedures?							
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

3.	You **can** use conflict resolution strategies when necessary?							
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

4.	You **can** challenge questionable orders, decisions or actions of other healthcare team members?							
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

5.	You **can** report a near miss in care (a narrow escape from a serious complication)?							
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

6.	You **can** demonstrate the broad knowledge base required for nursing practice?							
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

7.	You **can** demonstrate awareness about the emerging global health issues?							
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

As of today, how confident are you that:

8. You **can** take part in nursing or health research by identifying research opportunities?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

9. You **can** use the appropriate assessment tools and techniques for each body system (*e.g.* the neurological system) in consultation with clients and other healthcare team members?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

10. You **can** interpret assessment data to draw correct conclusions about clients' health status?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

11. You **can** demonstrate awareness of the health inequities of people who are affected by various kinds of discrimination?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

12. You **can** complete your assessments in a timely manner following agency protocols?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

13. You **can** use critical thinking to make decisions when developing healthcare plans?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

14. You **can** anticipate potential health problems and their consequences for clients?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

15. You **can** independently determine when consultation with other team members is required?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

As of today, how confident are you that:

16. You **can** manage multiple nursing interventions for clients with complex co-morbidities, seeking appropriate consultation when needed?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

17. You **can** recognize and seek immediate assistance in rapidly changing client conditions that could affect the client's health or safety (*e.g.* myocardial infarction, surgery complications)?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

18. You **can** assist clients to understand the link between health promotion strategies and health outcomes (*e.g.* dietary methods to lower cholesterol)?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

19. You **can** provide appropriate care to clients with chronic ongoing health challenges?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

20. You **can** apply nursing knowledge to meet the clients' physiological needs and to prevent the development of potential complications?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

21. You **can** apply safety principles to prevent injury to clients, self, other healthcare workers, and the public?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

22. You **can** manage therapeutic interventions safely (*e.g.* drainage tubes)?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

As of today, how confident are you that:

23. You **can** prepare clients for diagnostic procedures and treatments (*e.g.* colonoscopy)?

Certain Cannot Do								Certain Can Do
1	2	3	4	5	6	7	8	9

24. You **can** provide nursing care to meet hospice, palliative or end-of-life care needs?

Certain Cannot Do								Certain Can Do
1	2	3	4	5	6	7	8	9

25. You **can** make evidence informed decisions to adjust client care-plans based on changing priorities, in collaboration with clients and health care team members?

Certain Cannot Do								Certain Can Do
1	2	3	4	5	6	7	8	9

26. You **can** document and report an accurate ongoing evaluation of client care?

Certain Cannot Do								Certain Can Do
1	2	3	4	5	6	7	8	9

27. You **can** demonstrate a good understanding of informed consent?

Certain Cannot Do								Certain Can Do
1	2	3	4	5	6	7	8	9

28. You **can** apply the Code of Ethics to address ethical dilemmas?

Certain Cannot Do								Certain Can Do
1	2	3	4	5	6	7	8	9

29. You **can** advocate for clients especially when they are unable to advocate for themselves?

Certain Cannot Do								Certain Can Do
1	2	3	4	5	6	7	8	9

30. You **can** demonstrate respect and knowledge of the unique and shared competencies of various members of the healthcare team?

Certain Cannot Do								Certain Can Do
1	2	3	4	5	6	7	8	9

As of today, how confident are you that:

31. You **can** take action in potentially abusive situations to protect self, clients and colleagues from injury (*e.g.* bullying, nurse-to-nurse violence)?								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

32. You **can** define 'fitness to practice' in relation to self – regulation and public protection.								
Certain Cannot Do								**Certain Can Do**
1	2	3	4	5	6	7	8	9

Demographic Data									
Age:		**Sex:**		**Dependents:**		**Average grades pre nursing:**		**Average grades in Nursing**	
< 20		Female		0		> 90		> 90	
20-24		Male		1		80-90		80-90	
25-29				2		70-80		70-80	
30-34				> 2		60-70		60-70	
35-39									
40-44									
45-49									
> 49									

Attention Senior Memorial Nursing Students!!

How confident are you that you can meet the competency expectations of your chosen profession?

Seeking volunteers to take part in a study that asks senior nursing students how confident they feel about meeting the entry level competencies for registered nurses in Canada.

As a participant in this study, you would be asked to:

Complete a short anonymous questionnaire regarding how confident you feel in meeting entry-to-practice competencies

Your participation would involve one fifteen minute session on site and scheduled around one of your senior classes.

One seventy-five dollar gift certificate will be awarded to a participating Memorial student

In appreciation for your time, you will be entered in a draw to receive a seventy-five dollar gift certificate from **Future Shop**

More information about this study will be provided to you by the researcher in one of your senior nursing classes or you may contact:

Evelyn Kennedy, Cape Breton University

902-563-1928 OR evelyn_kennedy@cbu.ca

This study is approved by: Dalhousie Health Sciences Research Ethics Board and the Health Research Ethics Authority, NL.