BEYOND MEN'S EXPERIENCES: DEVELOPING A PSYCHOMETRIC SCALE TO MEASURE PERCEPTIONS OF MEN'S FITNESS FOR PROFESSIONAL NURSING

by

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May, 2022

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Background: According to the 2021 United States (U.S) Bureau of Labor Statistics, men represent only 13% of Registered Nurses in the U. S. This minority portion of the workforce has been extensively explored through qualitative research studies. Men have indicated they feel unwanted and perceived as unfit for nursing. The purpose of this study was to quantify perceptions of men's fitness for nursing, which was accomplished by developing and testing psychometric properties of the Fitness in Nursing Scale – Men (FiNS-M©) to quantitatively measure perceptions of men's fitness for nursing.

Methods: This study was guided by social role theory and employed a cross-sectional descriptive design. Scale development was informed by a systematized literature review. Chain referral sampling was used to recruit participants, (N = 635) through professional nursing organizations and nursing groups on multiple social media platforms respectively. Participants were asked to complete a survey during which they indicated their level of agreement with statements pertaining to men in nursing. Data were analyzed in R using confirmatory factor analysis (CFA) and multiple group confirmatory factor analysis to model data.

Results: The final model was a unidimensional latent variable model that loaded on 25 items indicating men's fitness for nursing. The model had good fit to the data, χ^2 (273, N = 635) =

964.55, *RMSEA* = .053, 90%*CI* [.049,.058], *SRMR* = .036 *CFI* = .940, *TLI* = .934. Configural, metric, and scalar invariance held. Scale scores across groups were not significantly different, $\Delta\chi^2$ (1) = 0.93, *p* = .335, for women (*M* = 5.94) compared to men (*M* = 5.99).

Conclusion: This was a novel study that provides valuable data and insight into men in the nursing workforce. Results suggested that both women and men "agree" that men are fit for nursing. Future research will be aimed at continuing exploration in this area of inquiry by testing additional multiple group models and conducting multi-level analyses, in hopes of strengthening the nursing workforce by using findings to guide recommendations for change. Recommendations should be aimed at improving nursing culture and diversity in the workplace for all nurse clinicians and academic faculty.

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A Dissertation

Presented to the Faculty of the Department of Nursing Science

East Carolina University

In Partial Fulfillment of the Requirements for the Degree

Doctor of Philosophy in Nursing

by

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May, 2022

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DEDICATION

To Gavin –My beautiful son, I am humbled and inspired daily by your kindness, consideration, and compassion for others. You display humility and wisdom that eludes many adults' who are decades older than you. Your presence has brought me peace and comfort in my darkest hours. Thank you for your willingness to sacrifice so that I could reach my goal of becoming a scientist. I think it's time to adopt that puppy you have wanted for so long.

To Pam – Thank you for sharing your life with me. After 22 years of togetherness, you are still the most amazing person I have ever met. I am humbled by your humility, dwarfed by your greatness, and outshined by the light you radiate. Thank you for your support and encouragement every day. Thank you for not letting me give up. Thank you for listening when you were tired. Thank you for believing in me when I could not muster an inkling of confidence in myself. You have always encouraged me to rise above – maybe I have finally done so.

To Harry – My life would not have been the same without you, little brother. No matter the distance, we always found our way back to each other. Despite the odds, we succeeded where they said we would fail. We climbed the mountain they said we could not scale. I am forever grateful for your support and encouragement. Brothers' keepers, until the end.

To the 10-year-old version of me – There is nothing left to prove.

To all child abuse survivors struggling to survive – Perhaps few of you will ever read these words, but you are my people. You are my tribe. I know your pain and feelings of brokenness. But we are not broken. I did this for us. All of us. So, I say to you:

Be brave in the face of those you fear.

Be strong but let yourself bend so that you do not break.

Find the light inside yourself when you are engulfed by darkness.

Never stop fighting.

Never give up.

Rise above.

ACKNOWLEDGEMENTS

Anything I have achieved as a doctoral student is not a reflection of me, but rather a reflection of the many people who have affected my experience. There is not enough space to give proper credit to everyone who deserves it, but I would like to thank the following individuals:

Dr. Susan Lane for influencing me to be the best version of myself, inspiring and encouraging me to pursue doctoral education, and leading by example; Dr. Dana Brackney whose advice helped me accept that it's OK to not be great at everything and see the return on investment from focusing on my strengths; Dr. Elaine Scott for suggesting that I pursue a graduate certificate in quantitative methods; Dr. Patricia Crane for offering me an opportunity to serve as a GRA and setting an example of greatness which I will most certainly strive for but am unlikely to reach; Dr. Carolyn Horne for tireless support, inspiration, and encouragement, 3 years of mentorship during my doctoral program and continued mentorship, guiding me through and coauthoring my first two peer reviewed publications, and being a staggeringly awesome human being; Dr. Thompson Forbes for encouraging me to "break the mold;" Dr. Mark Hand for a second opportunity, unaware; Dr. Pam Reis for her honesty, support, and nonjudgement after reading my first philosophy paper – she is truly one of the most kind and humbling humans I have ever met; Dr. Alex Schoemann who was one of the most amazing professors with whom I have ever worked, welcomed me into his quantitative methods certificate program despite not being a psychology student, and whose passion for doing science is incomprehensibly infectious; Dr. Mark Bowler who is beyond amazing, always showed interest in my research and turned me on to psychometrics – this dissertation would not have happened without the influences of Dr.'s Alex Schoemann and Mark Bowler; Dr. Karl Wuensch, whose knowledge of quantitative methods is recognized globally and who single-handedly saved me from almost sabotaging myself; There are so many other people who deserve acknowledgement, but there is simply not enough space to do so. To those people, I offer a sincere apology.

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CHAPTER 1: INTRODUCTION

Men are an underrepresented demographic in professional nursing. Men comprised 49% of the U.S. population (U.S. Census Bureau, 2021) and 68% of the U.S. workforce in 2021 (U.S. Bureau of Labor Statistics, 2021b). Yet, men represented only 13% of the professional nursing workforce in 2021 (U.S. Bureau of Labor Statistics, 2021a). This figure was only a marginal increase since 2005 when men comprised only 9.7% of the nursing workforce (American Association of Colleges of Nursing [AACN], 2006). Reasons for persistently low numbers of men in nursing remains poorly understood. Despite efforts to attract more men to nursing (Clow et al., 2015; Trossman, 2003) and a sociocultural climate shifting toward increased diversity and gender equality (Carabez et al., 2015), little progress appears to have been made toward increasing men's presence in nursing.

During the last two decades men in nursing have consistently reported the same classroom and workforce barriers and deterrents. Specifically, men in nursing believe they are perceived within a framework of role expectations that are mostly based on stereotypes (Hollup, 2014; Kouta & Kaite, 2011; O'Connor, 2015; O'Lynn, 2013; O'Lynn & Tranbarger, 2007). These stereotypes define which roles men are, and are not, expected to perform. Role expectations are entangled in normative definitions of masculinity which further complicates men's experiences (Hollup, 2014; Kouta & Kaite, 2011; O'Connor, 2015; O'Lynn, 2013; O'Lynn & Tranbarger, 2007). Role expectations appear to have created unfavorable social and professional environments for men in nursing. In a recent study, participants reported mixed perceptions of how they had been received in the nursing workplace (Smith et al., 2020). However, participants agreed that persistent gender stereotypes had been a barrier during their careers. Moreover, participants believed they were unwanted and perceived as lacking the attributes required to provide professional nursing care. Other authors have reported similar findings (Kane et al., 2021; Myklebust, 2020). Justification for the view that men are unfit for nursing has been attributed to the belief that nursing is a caring profession and women are

"innately more caring and empathetic than men" (Myklebust, 2020, pp. 8–9). These perceptions of men are concerning and not dissimilar from views espoused by Florence Nightingale (Dossey et al., 2005; Dunphy, 2015; O'Lynn & Tranbarger, 2007; Seymer, 1954). However, despite indications that men continue to be perceived as unfit for nursing, studies have failed to quantitatively measure perceptions of men's fitness for professional nursing, which constitutes a gap in the literature. Additionally, there are no psychometric scales available to measure perceptions of men's fitness for nursing.

Background

Florence Nightingale, the founder of modern professional nursing, believed men were unfit for professional nursing (Dossey et al., 2005; Dunphy, 2015; Summers, 1988). Nightingale was motivated by a political agenda to establish nursing as a woman's profession. Her express intention was to demonstrate that women were the professional equals of men (Seymer, 1954). Nightingale believed "natural divisions of labor" (Dunphy, 2015, p. 48), which was a concept that framed men's and women's roles as specialized and determined by differences in biological, social, and ecological structures. These differences between men and women entailed role expectations that dictated which roles men should and should not perform. Specifically, Nightingale believed practicing medicine was the purview of men and nursing was the purview of women.

Sullivan (2002) contended that Nightingale actively "fought to get men out of nursing" (p.17). Nightingale consistently employed feminine pronouns in her writings to describe nurses and refrained from using *him, his,* or *he* (Beck, 2005). She espoused the belief that "A good nurse must be a good woman" (Dossey et al., 2005, p. 276). Nightingale also wrote that men's "hard and horny hands" were unfit "to touch, bathe, and dress wounded limbs, however gentle their hearts may be" (Summers, 1988, p. 35). Nightingale's writings reflect an unambiguous vision of nursing that excluded men except for small contributions of physical strength to help lift and move patients and supplies (O'Lynn & Tranbarger, 2007; Villeneuve, 1994).

Nightingale's vision of nursing reinforced sociocultural narratives and gendered role expectations with respect to men and nursing. This pervasive narrative was evident throughout the history of professional nursing and extended into modern healthcare. Nightingale's blueprint for excluding men from nursing was realized with the enactment of the Nurses Registration Act (NRA) of 1919 in England (Bendall & Raybould, 1969; Mackintosh, 1997; O'Lynn & Tranbarger, 2007). The NRA guaranteed that nursing was the first all-female occupation and exiled men who were interested in nursing to become wardens in psychiatric institutions (Mackintosh, 1997; O'Lynn & Tranbarger, 2007; Sasa, 2019). Nightingale's vision of nursing has had lasting negative effects on men (Christensen & Knight, 2014; Codier & MacNaughton, 2012; Diño, 2021; O'Lynn & Tranbarger, 2007; Sasa, 2019; Smith et al., 2020).

Experiences that men have associated with feelings of unwantedness disconnectedness, and perceived as unfit for nursing have included the overwhelming majority of nursing faculty being women, persistent use of the word she to refer to nurses, discriminatory clinical experiences for male students, and failing to include men's contributions to nursing during nursing history lectures (Kouta & Kaite, 2011). A survey conducted by the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) demonstrated that 42% of male nursing students experienced discriminatory treatment from nursing faculty in the classroom and in clinical settings from licensed nursing staff (Kouta & Kaite, 2011)

Role expectations have influenced perceptions of men in nursing and impacted men's experiences, deterred men from nursing (Smith et al., 2020), and contributed to persistently low numbers of men in the U.S. and international nursing workforce (Boniol et al., 2019). Subsequently, nursing has been reported to be one of the most gender segregated job markets in the Western world (Jordal & Heggen, 2015). The World Health Organization (WHO) analyzed the health workforce of 104 countries and discovered men accounted for only 14% to 21% of nursing workforces in most countries in 2019, except in African regions where 35% of nurses were men (Boniol et al., 2019). Little difference exists in nursing academe where nursing

education programs are comprised of almost 90% women. These statistics indicate that nursing is one of the most segregated college majors in undergraduate education (Speer, 2020).

Men's Experiences

Research on men in nursing is usually aimed at students' experiences or men's experiences in the workplaces. Both students and working men have reported unfavorable experiences that they attributed to discrimination resulting from being men in an environment predominantly populated by women. Men have been allowed to enter nursing, but their experiences have indicated they feel a sense of social disconnectedness, unwantedness, and perceived as unfit for "women's work" (Blackley et al., 2019; Gedzyk-Nieman & Svoboda, 2019; Jamieson et al., 2019).

Students' Experiences

Men who pursue nursing careers experience unique challenges that begin in nursing school. Much of the literature aimed at men in nursing reflects barriers experienced by male students (Abushaikha et al., 2014; Al-Momani, 2017; Auster, 1978; Aynaci & Gulmez, 2019; Baldacchino & Galea, 2012; Barkley Jr & Kohler, 1992; Bell-Scriber, 2008; Buerhaus et al., 2005; Carnevale & Priode, 2018; DeVito, 2016; Eddy, 1989; Garvin, 1976; Kargin et al., 2020; Liu et al., 2019; Ma et al., 2020; Meadus & Twomey, 2011; Petges & Sabio, 2020; Powers et al., 2018; Sedgwick & Kellett, 2015; Shin et al., 2017; Turnipseed, 1986; Yang et al., 2017). Most studies aimed at practicing male nurses have reported similar barriers and persistent biases (Bartfay et al., 2010; Blackley et al., 2019; Clow et al., 2015; Codier & MacNaughton, 2012; Colby, 2012, 2012; Harding, 2007; Hollup, 2014; Joseph, 2014; Kellett et al., 2014; Kouta & Kaite, 2011; Limiñana-Gras et al., 2013; Mackintosh, 1997; MacWilliams et al., 2013; O'Connor, 2015; O'Lynn & Tranbarger, 2007; Poole & Isaacs, 1997; Sasa, 2019; Simpson, 2011; Smith et al., 2020; Stanley et al., 2016; Trossman, 2003; Trueland, 2020; Yi & Keogh, 2016; Younas & Sundus, 2018a; Zamanzadeh et al., 2013; Zhang & Liu, 2016). Studies have shown that an indicator of discrimination and primary barrier for men in nursing is being referred to as a "male

nurse," as opposed to "nurse" (DeVito, 2016; Jordal & Heggen, 2015; McLaughlin et al., 2010; Petges & Sabio, 2020). Distinctions between "male nurses" and "nurses" reinforce narratives that define gender role expectations, polarize classroom experiences, and lead to feelings of isolation for men students (Powers et al., 2018; Yang et al., 2017)

Studies have reported inhospitable and discriminatory academic environments that men students reported as barriers (Jordal & Heggen, 2015; Kouta & Kaite, 2011). Similar findings have been reported in more recent literature. Carnevale and Priode (2018) found undergraduate nursing students experienced bias from both nursing faculty and clinical instructors. In their study, students reported feeling excluded from the "girls' club" (p. 287). Most recently, male students reported being explicitly informed by nursing faculty that faculty did not like men students (Kane et al., 2021). In the same study, men reported being perceived as unfit for professional nursing and incapable of providing nursing care in clinical settings because they were men. In another study, women students perceived men as unfit for nursing (Myklebust, 2020). Women students' perceptions of men were based on the belief that nursing is a caring profession and women are "innately more caring and empathetic than men" (Myklebust, 2020, pp. 8–9).

Faculty have singled out men students in the classroom and clinical settings because of being men (Christensen & Knight, 2014; Powers et al., 2018; Yang et al., 2017). In almost all instances, men believed they were singled out because they were assumed to be unfit or incapable of nursing. This phenomenon was most prevalent in women's healthcare and in clinical areas involving female patients. Men reported their experiences as inhospitable environments which made men feel uncomfortable (Christensen & Knight, 2014; Powers et al., 2018; Yang et al., 2017).

Workplace Experiences

Barriers for men in nursing persist after licensure. Studies aimed at men in nursing have found that practicing nurses experience similar barriers as those reported by nursing students

(Abushaikha et al., 2014; Blackley et al., 2019; Buthelezi et al., 2015; Carnevale & Priode, 2018; Christensen & Knight, 2014; Clow et al., 2015; Codier & MacNaughton, 2012; Colby, 2012; Cudé & Winfrey, 2007; Harding, 2007; Jordal & Heggen, 2015; Kellett et al., 2014; MacWilliams et al., 2013; McLaughlin et al., 2010; O'Connor, 2015; Powers et al., 2018; Sedgwick & Kellett, 2015; Simpson, 2011; Smith et al., 2020; Yi & Keogh, 2016; Zamanzadeh et al., 2013). A 2012 study found men experienced inequities in the workplace that were specifically related to being men (Colby, 2012). The study found that men are not perceived as unfit for nursing but did note that caring from men is viewed as taboo (Colby, 2012). In addition, a 2015 study by Clow et al. (2015) compared perceptions of men and women nurses. The study found that men were rated significantly more "deviant" than women or "manly" nurses. Clow et al.'s study is not dissimilar from a more recent study which found men in nursing are stigmatized as sexually deviant or sexual predators (Sasa, 2019).

Some authors have compared differences in men's and women's caring. Stanley et al. (2016) found that men were perceived as unfit for nursing and less caring and compassionate than women. Multiple authors have agreed that caring may look different but not inferior when it is provided by men (Jordal & Heggen, 2015; Kellett et al., 2014; Limiñana-Gras et al., 2013; Zhang et al., 2020). In fact, men appreciate the caring concept and are at least equally capable of caring in a way that represents the essence of nursing (Colby, 2012; O'Connor, 2015; Zhang & Liu, 2016)

Studies have found that men feel excluded by women in the workplace (Blackley et al., 2019; Gedzyk-Nieman & Svoboda, 2019; Smith et al., 2020). These findings suggest women may perceive men in nursing differently than they do other women, which is supported by Clow et al.'s (2015) study. Additionally, Smith et al. (2020) found that men's experiences include feeling perceived as unsuitable for nursing and unwanted by women nurses. These barriers in the workplace have left men feeling isolated and marginalized (Gedzyk-Nieman & Svoboda, 2019; MacWilliams et al., 2013; Smith et al., 2020).

Men have also reported workplace barriers that include gender normative stereotyping (Kellett et al., 2014; Stanley et al., 2016) and overt biases (MacWilliams et al., 2013). Despite efforts to attract more men to professional nursing (Clow et al., 2015; Trossman, 2003) and a sociocultural climate shift toward increased diversity and gender equality (Carabez et al., 2015), men have continued to report feeling excluded and unwanted (Smith et al., 2020). Socialization problems, role strain, and isolation and marginalization can drive men to leave the nursing profession altogether (Hollup, 2014).

Most studies exploring men in nursing have focused on men's experiences. This field of inquiry has consistently reported the same barriers for men for the last two decades with a predominant theme of feeling socially disconnected, unwanted, and unfit for nursing. Men's experiences have mostly been framed in the context of role expectations and have included beliefs about how they are perceived in nursing. However, the literature has fallen short of quantifying perceptions of men in nursing. Additionally, women have been largely excluded from this area of research. Smith et al. (2022) noted that continuing to exclude women from research aimed at men will be counterproductive and efforts should be made to include women's voices. Clow et al. (2015) and Myklebust (2020) included women in their sample, but their studies were not aimed at measuring perceptions of men fitness for nursing.

Caring

Authors have contended that caring is the ontological and epistemological foundation for professional nursing (Finfgeld-Connett, 2008, Leininger, 2002; McCance et al., 1997, 1999; Mudd et al., 2020; Sargent, 2012; Sebrant & Jong, 2021; Smith, 1999; Smith et al., 2012). Thus, it can be deduced that nursing fitness is indicated by behaviors and characteristics that reflect caring. However, the caring concept is poorly defined in the literature. Some authors have suggested that the nurse-patient relationship is a critical component of caring (McCance, 2003; McCance et al., 1997; McFarland & Wehbe-Alamah, 2014; Smith et al., 2012). This suggestion seems intuitive but does not advance articulating the concept of caring, which is an otherwise

complex and vague concept that has not been well defined in the literature (Sebrant & Jong, 2021). The ambiguity of caring as a concept has presented challenges for modeling caring in practice.

Prominent nursing theorists including Madeleine Leninger, Martha Rogers, and Jean Watson proposed frameworks to guide caring nursing practice. However, as some authors have noted, these theorists' appeals to pseudoscience and pseudoscientific language is a hindrance for advancing professional nursing in a modern science-driven healthcare environment (Garrett, 2013; Garrett, 2016; Garrett & Cutting, 2015, 2017). Specifically, Leninger developed the theory of culture care diversity and universality as a framework to guide caring nursing practice across many cultures (Leininger, 2002; McFarland & Wehbe-Alamah, 2014). Rogers (1970) proposed frameworks to guide caring nursing practice, in which she referred to people as unitary human beings. She described characteristics of nurse-patient relationships as infinite, and continuously flowing energy fields that are pandimensional. Rogers defined pandimensionality as "a nonlinear domain without spatial or temporal attribute" (Rogers, 1992, p. 29). Watson advanced the theory of human caring in her unitary caring science model to explain the core tenets of caring (Watson, 2012, 2015). In her theory, Watson (2012) appealed to pseudoscientific language to describe human interaction processes, metaphysics, and centered her theory around mysticism (Garrett, 2013; Garrett, 2016).

Nursing theories proposed by Leninger (2002), Watson (2012, 2015), and Rogers (1992) are difficult if not impossible to falsify. Nurses who do not subscribe to their pseudoscientific perspectives may be fallaciously viewed as necessarily less fit, or unfit for nursing. Today's nurses practice in diverse and often highly skilled care settings. Current literature should reflect modern science driven healthcare environments and practice settings. Furthermore, variables aimed at measuring caring in modern science driven environments should reflect modern ways of caring. Nursing theories that hinge on unfalsifiable pseudoscience are sophistry and

undermine efforts toward advancing professional nursing in a science driven era (Garrett, 2013; Garrett, 2016; Thorne, 2014).

Determining which variables reflect modern ways of caring, and thus indicators of nursing fitness, can be accomplished by reviewing the literature. Studies have shown that nurses and patients agree about some characteristics that constitute expert nursing care while disagreeing about others (Hajinezhad et al., 2012; Papastavrou et al., 2012; Romero-Martín et al., 2019; Thomas et al., 2019). These studies illustrate the importance of including both nurses' and patients' perspectives when appraising the literature for indicators of nursing fitness. This study identified nurses' and patients' perspectives of characteristics that indicate men's fitness for professional nursing.

Masculinity

Seminal studies suggest there are feminine and masculine models of caring which lead men and women to care differently (Gilloran, 1995; Milligan, 2001; Watson & Lea, 1998). The literature also indicates that masculine caring occurs within a social context that undervalues men's contributions to the nursing caring environment (Bartfay, 2010). The impetus for this claim is that the post-Nightingale nursing model is necessarily a feminine model due in large part to the majority of nurses being women. Thus, men's caring is undervalued because it may not be consistent with the prevailing feminine-based model of caring (O'Lynn & Tranbarger, 2007).

The incongruency that may arise from differences in masculine and feminine models of caring may contribute to the widespread belief that men are incapable of caring or filling nurturing roles associated with nursing (Hollup, 2014) and explain a portion of the role strain experienced by men in nursing. For example, participants in Milligan's (2001) study felt socially expected to prioritize technical skills and avoid interpersonal relations involving emotions. In another study, men were more likely to develop a professional model of caring in which caring focused on task-completion, problem solving, and efficient resource management (Thompson,

2002). These caring models emphasizes control and allow compartmentalization of psychosocial and emotional involvement associated with caregiving, which effectively prevents the caregiver from emotional burnout. Lastly, one author suggested that caring from men is an "amalgamation of styles" (O'Lynn & Tranbarger, 2007, p. 132) resulting from time spent in schools and clinical environments that are predominantly populated by women. O'Lynn's and Tranbarger's (2007) claim suggests that men care in ways that are similar to women in nursing but also share unique contributions with the caring environment. Other studies have confirmed findings related to men caring differently than women (Jordal & Heggen, 2015; Kellett et al., 2014; Limiñana-Gras et al., 2013; O'Lynn, 2013; O'Lynn & Tranbarger, 2007; Zhang & Liu, 2016).

Measuring Men's Nursing Fitness

Men comprised 2.7% of the nursing workforce in 1970, 4.1% in 1980, and 6.4% in 1990 (U. S. Census Bureau, 2013). The historically small numbers of men in nursing may explain why early nursing theorists such as Watson and Rogers failed to reflect men's contributions to the caring environment in their theories. Instead, caring concepts in professional nursing have been framed as uniquely feminine characteristics and associated with traditional feminine models of caring. Indicators of caring have included characteristics such as "having a warm heart" (Scheel et al., 2008, p. 633) or "smothering and irrational emotionalism" (Scheel et al., 2008, p. 633). Role expectations that have emerged within these frameworks suggest that men are unfit for professional nursing.

The commonly used caring behaviors inventory (CBI, Wolf, 1986, 2019; Wu et al., 2006) was premised on Watson's transpersonal caring theory. Initial scale testing was conducted in a sample of patients (n = 263), and nurses (n = 278). Men accounted for only 6.8% of the nurses in the study, which increases the likelihood that men's unique strengths were unaccounted for in the inventory. Non-random sampling and small percentages of men nurses may have biased parameter estimates during psychometric testing. The CBI inventories have not been tested for

structural invariance across groups of men and women. Therefore, factor structures may not hold for men in nursing when using a CBI to measure caring. Lastly, the CBI was designed to measure patients' perceptions of nurses caring behaviors. The CBI was not constructed to measure nurses' perceptions of men in nursing, nor has it been tested in such an application.

Significance

Men are an untapped resource in professional nursing (Daley, 2017; Nurseplus, 2021). However, the rate at which men enter nursing has been significantly outpaced by the rate women have entered traditionally male dominated professions such as medicine (American Mobile Nurses [AMN] Healthcare, 2015; Association of American Medical Colleges [AAMC], 2012). Refining strategies to bring more men into nursing can improve healthcare by improving nursing shortages in the United States and around the globe. An ongoing COVID-19 pandemic has worsened nursing shortages and cast a spotlight on associated implications (Lasater et al., 2020). For example, The International Council of Nurses (ICN; 2021) reported that COVID-19 has been responsible for more than 2,200 nurse deaths, increased patient-care workloads, psychological distress, and abuse by anti-vaccine protestors. These phenomena are known as "the COVID-19 effect" and categorized as a "complex form of trauma" (ICN, 2021). Increasing numbers of men in nursing can provide a pathway toward improving these conditions by increasing numbers of nurses in the workforce.

Nursing shortages are expected to worsen as the aging post-World War II baby boomer generation reaches age 70 and older by 2030, retires from the workforce, and simultaneously increases nursing demand (Buerhaus et al., 2017). One million nurses are expected to retire by 2030, which will significantly worsen clinical workforce and faculty shortages. The net effect is that there will be fewer nurses to care for patients and fewer students accepted into nursing programs due to lowered numbers of faculty (Buerhaus et al., 2017). Growing nurse shortages are projected to have a substantively negative impact on healthcare as numbers of nursing faculty and students decline and nursing shortages increase.

In 2010, the Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing report (Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing & Institute of Medicine, 2011) called for significant changes in the nursing workforce to sustain the future of the profession. The report petitioned for increased focus on diversity in nursing. The report targeted gender representation in the nursing workforce as an area where change is needed in nursing. Specifically, the report cited increased diversity in the nursing workforce, including gender, as a path toward *improving quality of patient care.* Increasing diversity in nursing is expected to improve the nursing shortage as well. A recent report from the Committee on the Future of Nursing National Academy of Medicine's 2020-2030 (2021) addressed strategies aimed at improving nursing in the future. Their new statement remains aimed at increasing diversity in the nursing workforce by reducing barriers and improving system facilitators to achieving a workforce that is diverse in gender, race, and ethnicity, across all levels of nursing education as a priority (Committee on the Future of Nursing 2020–2030 et al., 2021).

The significance of this study is the potential to improve diversity and inclusivity in the nursing workforce and classroom environments by developing an instrument to quantitatively measure perceptions of men's fitness for nursing. Discovering perceptions of men's fitness for nursing is expected to illuminate men's qualitative experiences, guide recommendations for change, and inform cultural awareness strategies within the classroom and workplace to improve diversity and inclusivity. Illuminating men's experiences can improve nursing shortages by informing recruitment strategies and guidelines for change to create a more welcoming nursing workforce and classroom environment for men.

Purpose

Previous studies have primarily included qualitative explorations of men's experiences in nursing (Abushaikha et al., 2014; Blackley et al., 2019; Buthelezi et al., 2015; Carnevale & Priode, 2018; Christensen & Knight, 2014; Clow et al., 2015; Codier & MacNaughton, 2012;

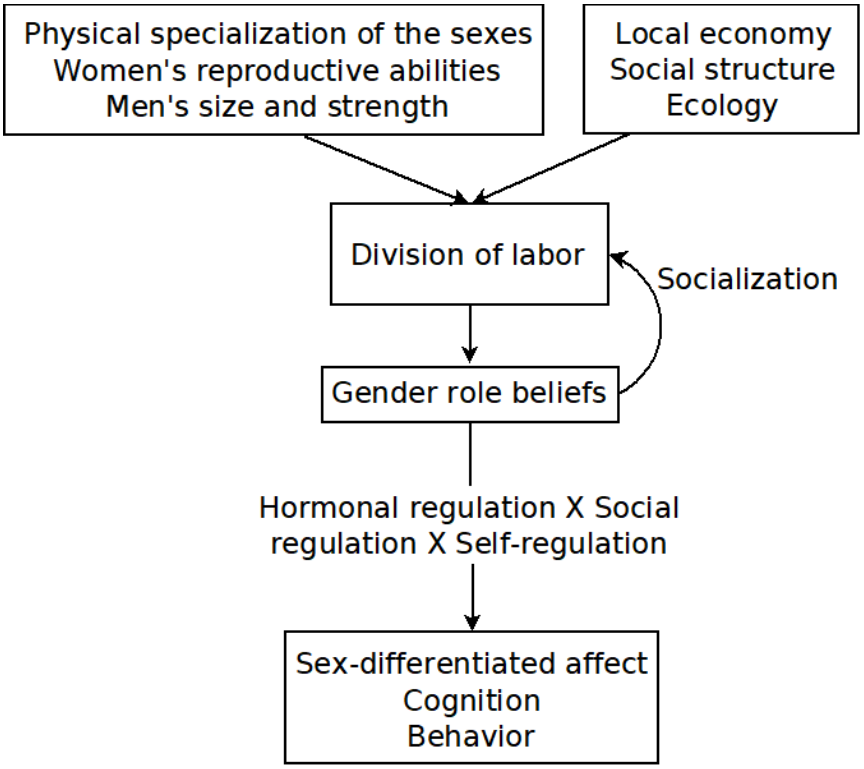
Colby, 2012; Cudé & Winfrey, 2007; Gedzyk-Nieman & Svoboda, 2019; Harding, 2007; Jamieson et al., 2019; Jordal & Heggen, 2015; Kellett et al., 2014; MacWilliams et al., 2013; McLaughlin et al., 2010; O'Connor, 2015; Powers et al., 2018; Sedgwick & Kellett, 2015; Simpson, 2011; Smith et al., 2020; Yi & Keogh, 2016; Zamanzadeh et al., 2013). Men's experiences are consistent with feeling unwanted and being perceived as unfit for nursing. However, perceptions of men's fitness for nursing have not been measured quantitatively. Furthermore, no psychometric scales exist to measure perceptions of men's fitness for nursing. Advantages of quantitative methodologies include generalizability to the population of interest, increased reliability, objectivity, accuracy, and efficiency of data collection (Carr, 1994; Howell, 2013). Therefore, the purpose of this study was to quantify perceptions of men's fitness for nursing, which was accomplished by developing the Fitness in Nursing Scale – Men© (FiNS-M©). Scale development included testing the scale's psychometric properties.

Theoretical Framework

This study was guided by Eagly and Wood's social role theory (SRT) (Eagly & Wood, 2012). Eagly and Wood constructed the core components of SRT in the 1980s. Social role theory was based on research in evolutionary psychology and sociology. The earliest version of SRT predicted that divisions of labor result in stereotypes of men and women, which shape behavior through awareness of group or societal expectations. Social role theory was later revised to account for divisions of labor arising from interactions between sociology and evolutionary biology. Specifically, the model was adjusted for the effects of hormonal regulation on social behavior and evolutionary origins of labor division between the sexes. Figure 1 illustrates the SRT model (Eagly & Wood, 2012).

Figure 1

Social Role Theory Model



Major theoretical concepts

Physical specialization. Physical differences between men and women are attributed to sex hormones effecting musculoskeletal structures. Men are predisposed to have increased agility, speed, and physical strength. Therefore, men are most fit for task-oriented roles focused on these physical characteristics. On the other hand, women can bear children and nurse them. Likewise, women are thought to be better suited for socioemotional roles that involve nurturing, caregiving, and group social maintenance. These physical differences predispose men and women to specialize in certain tasks with each performing certain activities more efficiently than the other. In the SRT model (see Figure 1), biological differences between sexes, local economy, and social structure influence the division of labor.

Local economy, social structure, and ecology. Role specialization is influenced by local economy, social structures, and ecologies that reflect gender specific role divisions. Role

specialization is necessary to achieve and maintain a harmonious social climate where men's and women's roles are complementary. These role specializations yield divisions of labor.

Divisions of labor. Biological sex differences between sexes and specialized social roles give rise to sociological unions. Sociological unions reflect divisions of labor. The divisions of labor may look different across cultures but emerge in ways that benefit the community's interests.

Gendered role beliefs. Characteristics and traits of men and women can be inferred by observing divisions of labor structures. Beliefs about and expectations of gendered roles follow from observations and give rise to role expectations, which are beliefs and expectations about men's and women's roles. According to SRT, a person experiences behavioral reinforcement to conform to role expectations when adhering to expectations entails positive feedback, or when failure to conform to expectations results in negative feedback. Role expectations inform gender identities, which are responsible for individuals' sense of self and may be internalized. Role expectations may act to prevent or limit the extent to which a person deviates from perceived role expectations. In the model (see Figure 1), gender role beliefs reinforce divisions of labor.

Hormonal regulation. Activation of hormonal processes and changes, especially the primary sex hormones testosterone and estrogen, are partly responsible for guiding differences in behaviors associated with gender roles. The influence of these hormonal processes is thought to have emerged from naturally selective evolutionary mechanisms. According to SRT, these hormonal regulatory processes constrain sociocultural influences on men and women.

Sex-differentiated cognition and behavior. Complex neural pathways are thought to regulate hormonal mechanisms that differentiate defining biological characteristics of men and women. Men's and women's cognitive processes and observed behaviors differ. For example, men may be predisposed toward roles involving competition or where aggression is advantageous, and women may be predisposed toward nurturing or socially stabilizing roles.

In accordance with SRT, perceptions of men's fitness for nursing are influenced by gender role beliefs, or role expectations. In this context, SRT predicts that men may be perceived as unfit for nursing because nursing labor is associated with nurturing and caregiving roles traditionally ascribed to women, whereas role expectations for men emphasize physical strength, competition, and aggressive behaviors. However, traditional role expectations may not be valid in a modern healthcare environment due to differences in culture, social climates and evolving divisions of labor.

Research Questions & Aims

Perceptions of men's fitness for nursing were not identified in the literature, which constituted a gap. The literature gap supported the research question of interest:

- Are men perceived as unfit for professional nursing?

The research question was answered by quantitatively measuring perceptions of men's fitness for nursing. However, no psychometric scales existed to measure men's fitness for nursing. Thus, this study had two aims. The first aim was to develop a scale to measure perceptions of men's fitness for nursing. The second aim was to test the scale's psychometric properties.

Scale Development

Scale development was accomplished by conducting a systematized review of the literature. This facilitated discovery of requisite characteristics associated with expert nursing practice that are valued by both nurses and patients. Characteristics identified in the literature indicated men's fitness for nursing and included men's unique strengths in the caring environment. The rationale for using existing literature for scale development was supported by the abundance of available literature by which to identify characteristics consistent with men's fitness for nursing.

Scale development was guided by interactional nursing practice theory (Scheel et al., 2008). Interactional nursing practice theory posits that the nurse-patient interaction is dynamic

and reciprocal, and involves dialogue, verbal and nonverbal communication, and actions within clinical practice environments. According to Interactional nursing practice theory, the power dynamic between nurses and patients is balanced (Scheel et al., 2008). Interactions between nurses and patients convey mutual respect. Nurses and patients contribute equally to the nurse-patient interaction, which results in a dynamic exchange of thoughts, intentions, and purposeful actions. Patients' outcomes and nurses' sense of well-being is influenced by the nurse-patient interaction. Therefore, the interactional nursing practice theory was a suitable framework for guiding identification of requisite nursing characteristics indicating men's fitness for professional nursing.

Conceptual and Operational Definitions

Nursing

Conceptual Definition. Perceptions of men's fitness for nursing was the primary phenomenon of interest in this study. The American Nurses Association (ANA, n.d., para. 3) defined nursing as "both an art and a science; a heart and a mind." The ANA also noted that the foundation of nursing is a fundamental respect for human dignity and natural insight of patients' needs, which is supported by continued rigorous learning. McEwen (2019) defined nursing as a practice profession that is valued by society for providing beneficial services to the members of the society, and an academic discipline with an identifiable philosophy and epistemology. Nurses were conceptualized as persons who engage in the practice of nursing.

Operational Definition. Nursing was operationalized by participants self-reporting registered nursing licensure by a state governing board of nursing and affirming active nursing practice. Nursing was allowed to be in the form of academic or clinical practice.

Fitness

Conceptual Definition. The American Psychological Association (APA, n.d.) defined fitness as a set of attributes enabling a person to perform their professional duties with mental

clarity, physical alertness, and without depleting energy required to enjoy recreational activities in one's personal life. The conceptual definition of fitness was applied to nurses. The result conceptualizes nurses as persons who (a) has completed a rigorous academic study to learn nursing, (b) respects the dignity of others, (c) has natural insight into the physical and emotional needs of persons who are sick or injured, (d) seeks new learning opportunities to benefit their practice, and (e) works toward improving society by providing beneficial nursing care to persons in need.

Operational Definition. Nursing fitness was operationalized in accordance with scale indicators that reflected requisite nursing characteristics. The scale was developed by the principal investigator. Higher scale scores indicated higher levels of participant agreement, and lower scale scores indicated lower levels of participant agreement related to men's fitness for professional nursing. Scale development is discussed in chapter 2.

Perceptions

Conceptual Definition. Perceptions were conceptualized as including four components (a) multifaceted and complex concepts that originate from sensory and cognitive processes, which entail forming mental constructs of the world and its contents, (b) ways of viewing one's environment and objects within the environment that results from knowledge gained through the process of coming to know or understand something, (c) uniquely individual phenomena whereby individuals interpret their awareness and observations in a personal way, and (d) personal manifestations of uniquely individual ways of viewing one's environment and are shaped by sociocultural influences including gender (McDonald, 2012). Defining attributes of perceptions include sensory or cognitive awareness of an experience, personal experience, and comprehension of the experience (McDonald, 2012).

Operational Definition. Perceptions were operationalized in accordance with McDonald's (2012) concept analysis:

1. An individual's or group's unique way of viewing a phenomenon

2. Involving the processing of stimuli
3. Incorporating memories and experiences in the process of understanding phenomenon

Perceptions were operationalized as participants' unique way of viewing men's fitness for nursing based on their personal experiences with male nurses. Participants were asked to indicate their level of agreement with statements related to characteristics of men in nursing which were indicators of men's fitness for nursing.

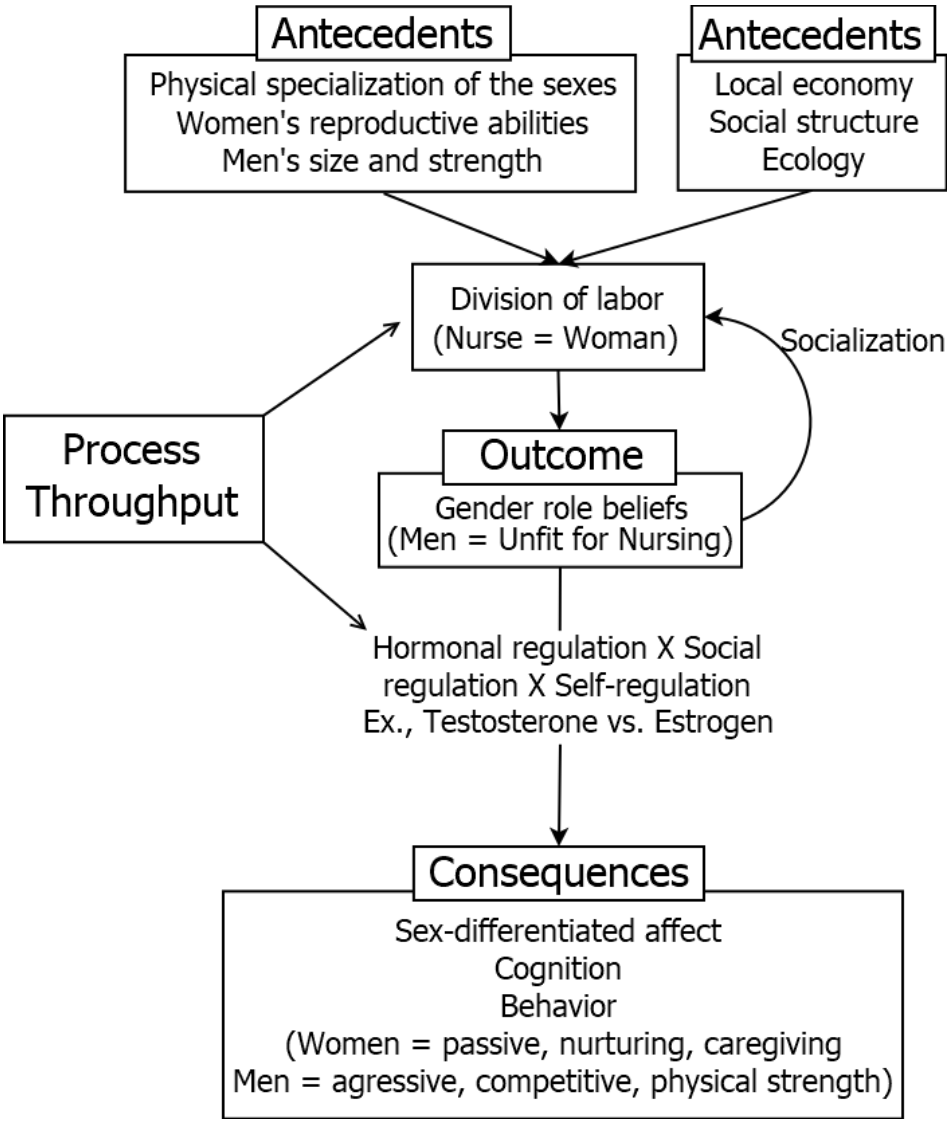
Assumptions

The conceptual model (see Figure 2) framework for perceptions of men's fitness for nursing used in this study was based on Eagly's and Wood's (2012) SRT. Assumptions inherent in SRT are conceptualized in the context of this study as follows:

1. Women and men are biologically dissimilar
2. Biological differences are largely hormonal which entail phenotypic differences
3. Biological differences predispose women and men to specialized roles when local economy and social structures are constrained.
4. Role specialization entails natural divisions of labor which encourage women to assume passive, nurturing, and caregiving type roles. Men are encouraged to assume aggressive, competitive, and physically demanding roles.
5. Divisions of labor result in gender role beliefs or expectations about men and women's roles.
6. Role beliefs act to reinforce or challenge divisions of labor.
7. Gender role beliefs lead to differences in affect, cognition, and behavior, which reinforce or challenge role expectations. This process is moderated by physiological or hormonal regulatory mechanisms and social and self-regulation.

Figure 2

Proposed Conceptual Model, SRT



Summary

Professional nursing was premised on the belief that natural divisions of labor rendered men unfit for nursing. This abject view of men seems to persist and may be partly responsible for men's experiences and the historically low numbers of men in nursing despite efforts to improve inclusivity and recruitment. Men's experiences in nursing have been mixed but are consistent with being perceived as unfit for nursing. However, perceptions toward men's fitness

for nursing have not been measured quantitatively prior to this study. Additionally, there were no scales to measure this phenomenon of interest. Therefore, this study aimed to develop and test the FiNS-M© to measure perceptions of men's fitness for nursing.

This dissertation is formatted as a two-manuscript option. Scale development and psychometric testing are discussed in subsequent chapters of this dissertation. Specifically, literature review and scale development are discussed in chapter two. Methodological procedures are discussed in chapter three. In lieu of a traditional results chapter, item development is discussed in chapter four, which is formatted as a manuscript for submission to the Journal of Nursing Measurement. In lieu of a traditional discussion chapter, psychometric testing is discussed in chapter five, which is also formatted as a manuscript for submission to the Journal of Nursing Measurement.

CHAPTER 2: LITERATURE REVIEW

Professional nursing practice is founded on intimate nurse-patient partnerships aimed at empowering patients, increasing their well-being, and reducing their suffering through nursing actions, which are informed by personal, experiential, and professional knowledge (Finfgeld-Connett, 2008). According to Nightingale, nursing practice is contingent on "three points of interest in nurses' work: "an intellectual interest in the case, a higher, hearty interest in the patient, and a technical, practical interest in the patient's care and cure" (Seymer, 1954, p. 366). Nightingale envisioned nurses as educated women practicing with compassion and using science to inform nursing actions (Dossey et al., 2005). Three dimensions of nursing fitness identified in this systematized review are consistent with Nightingale's vision of nursing including knowledge, skills, and interpersonal relations. A summary of the literature reviewed is shown in Appendix C.

Nursing has been described as a caring profession (McCance, 2003). Caring concepts in nursing have been analyzed repeatedly to elucidate nurse-patient partnerships and nursing actions that are foundational to professional nursing. Multiple conceptual frameworks have been proposed but a clear definition of caring has eluded nursing theorists (McCance, 2003). Caring is a central concept in nursing that has been devalued because of changing healthcare landscapes, evolving scopes of practice, rapid changes in medicine, scientific inquiry, and technological advances that have shifted focus to curative pursuits and improved treatment options for patients. These changes have transformed perspectives of nursing fitness, which is especially relevant for men who often gravitate toward more technologically advanced nursing subspecialties (Hollup, 2014; Thompson, 2002).

In the absence of a well-defined, unifying, and agreed upon concept of caring, a systematized review was conducted to identify requisite characteristics of men's fitness for nursing. Specifically, characteristics of nursing fitness were identified that apply to all nurses. Characteristics of nursing fitness that indicate men's strengths were also identified. Findings

from the systematized review informed scale development. The systematized review aimed at identifying characteristics that indicate men's fitness for nursing are discussed in this chapter.

Purpose

The purpose of conducting a systematized review was to identify requisite characteristics of expert nursing practice in the literature which indicate men's fitness for nursing. Indicators of men's fitness for nursing were identified in the literature. Therefore, there was no need to conduct a separate qualitative study because such a study would not make a substantive contribution to the literature or scale development. Requisite nursing characteristics indicating nursing fitness identified in the literature informed development of the FiNS-M© to measure perceptions of men's fitness for nursing.

Nursing Fitness

Three dimensions of nursing fitness were synthesized from or directly identified in this review. Dimensions included knowledge, practice skills, and interpersonal relations. These dimensions were indicated to covary. Specifically, knowledge informs practice skills and both dimensions translate to nursing actions and are foundational for expert nursing practice. Nursing actions occur in the context of meaningful interpersonal relationships that are grounded in compassionate care. Studies included in this review confirmed that these dimensions of nursing fitness are valued by both patients and nurses and are discussed in detail in this chapter.

Add that I defined these from synthesized lit and reflects the latent variables. Knowledge, skills, and interpersonal relations reflect latent variable meanings and are defined in accordance with the latent variables. The knowledge dimension represents nurses' knowledge related to nursing practice and includes continued learning so that nurses' practice reflects up-to-date evidence-based standards. The skills dimension represents nurses' ability to perform nursing interventions and practice related skills in an expert manner. For example, interventions and skills may include intravenous catheter cannulation, operating technical equipment, multi-tasking, and thinking critically. The interpersonal relations dimension represents meaningful

relationships founded on being physically and emotionally present for patients, showing compassion, listening attentively, and communicating effectively.

Knowledge Dimension

Fourteen studies indicated that a strong knowledge base is an indicator of nursing fitness. The literature included five qualitative studies (Alavi et al., 2015; Leyva et al., 2015; Pavlish & Ceronsky, 2009; Radwin, 2000; Wei et al., 2018), four quantitative studies (Afaya et al., 2017; da Silva & Ferreira, 2011; Waugh et al., 2014; Widiyaningsih et al., 2019), one mixed-methods study (Karlou et al., 2018), and five multi-study analyses (Darch et al., 2017; Feo et al., 2018; Finfgeld-Connett, 2008; Lee & Seomun, 2016; Nicholls & Webb, 2006). Strengths of these studies included heterogenous samples, practice settings, and geography. Additionally, most samples of nurse participants included similar percentages of men as are seen in the nursing workforce.

Finfgeld-Connett's (2008) metasynthesis included 49 qualitative reports and six concept analyses of caring. Their metasynthesis is included in this review because caring underpins the intimate relationships developed between nurse and patient. Finfgeld-Connett found that the depth of interpersonal relationships between nurses and patients is related to nurses' knowledge. Specifically, the ability to form meaningful interpersonal relationships is related to level of professional maturity and interpersonal sensitivity, which are related to knowledge. In the literature these concepts were antecedents to compassionate nursing practice and reflected nurses' knowledge base.

Pavlish and Ceronsky (2009) investigated nurses' perspectives of palliative nursing care in a group (N = 33) of oncology nurses. Nurses emphasized knowledge as a dimension of nursing fitness that enabled them to provide expert nursing care to their patients. In Pavlish and Ceronsky's study, clinical expertise in palliative nursing was inextricable from nurses' knowledge and was related to improved patient outcomes. Nurses reported that knowledge was the foundation of expert nursing practice and an expert knowledge base enabled them to be better

nurses. Nurses' knowledge was directly attributed to improved patient comfort and outcomes. Nurses in the study also associated knowledge with the ability to educate their patients about matters requiring patients to make informed decisions related to their healthcare. Higher levels of knowledge were equated with better ability to educate patients.

In comparison, Karlou et al. (2018) conducted a mixed-methods study with oncology nurses (*N* = 72) in Greece. Karlou et al. used the revised self-reported 24-item caring behavior inventory (CBI-24) (Wu et al., 2006) to measure nurses caring behaviors. Knowledge and skills collectively constitute a single subscale on the CBI-24. Karlou et al. reported that the highest scored subscale was knowledge and skills. Subscale items include skillfully administering injections, managing equipment, demonstrating professional knowledge and skill, maintaining patient confidentiality and confidence in providing care. Reasons for not using the CBI to conduct this study are discussed later in this review.

Karlou et al. (2018) also recruited oncology nurses (*N* = 18) for focus group interviews. Professional knowledge was an indicator of nursing fitness and highly valued by participants. Additionally, Karlou's findings indicated that knowledge is requisite for mastering nursing skills. In Karlou's study, knowledge was reflected by nurses continuing education and possessing specialized professional knowledge related to nursing practice. Knowledge was associated with nurses' professional identities, competent practice, and unique contributions to interprofessional teamwork and the healthcare environment. Nurses in the focus groups devalued psychosocial skills and placed more value on raw professional knowledge, which is a departure from the caring models of mid nineteenth century nursing theorists' which emphasize the importance of psychosocial skills (Levelink et al., 2020). Psychosocial skills emphasized by mid nineteenth century nursing theorists remain relevant, but may no longer be the focal point of nursing practice in a modern, science driven healthcare environment where medical science and evidence-based practice models are prioritized (Levelink et al., 2020).

Afaya et al. (2017) and Widiyaningsih et al. (2019) also used the CBI-24 (Wu et al., 2006) to measure patients perceptions of nurses' caring behaviors. Most patients (91.8%) in Afaya's study rated items on the knowledge and skills subscale as the most important caring behaviors. Widiyaningsih et al. (2019) measured caring behaviors in a cohort of new nurses (*N* = 104). Participants scored items on the knowledge and skill subscales as most important indicators associated with caring. Knowledge and skills were found to be distinctly separate indicators of nursing fitness in the literature. However, studies indicated that knowledge is foundational for skill development and thus these dimensions are thought to be positively related (Afaya et al., 2017; Karlou et al., 2018; Pavlish & Ceronsky, 2009; Widiyaningsih et al., 2019).

Nicholls and Webb's (2006) integrative review included a methodologically and internationally diverse sample (*N* = 33) of publications. Their aim was to identify characteristics of nursing fitness among nurse midwives. Eight key concepts were identified. Four of the eight concepts represented a knowledge dimension that included education, research skills, characteristics that make a good midwife, and imparting knowledge to enable decision making. Ten studies in the review emphasized the importance of midwifery educational curricula that prioritize "knowledge, skills and attitudes" (p. 423). Four studies in the review underscored the importance of midwives conducting research and incorporating research findings into their nursing practice. Eleven studies in the review identified perspectives that make a good midwife and included being perceived as knowledgeable and imparting knowledge in a way that enables patients to make informed decisions.

A little more than a decade after Nicholls' and Webb's (2006) integrative review, Waugh et al. (2014) identified perceptions of requisite nursing characteristics and skills in a diverse sample (*N* = 502) of prelicensure and midwifery student nurses (*n* = 226), and registered nurses and advanced practice midwives (*n* =276). Participants' responses varied by group (clinicians, managers, academics). Most attributes on the survey reflected indicators of nurses'

interpersonal relations. However, 56% of participants strongly agreed that knowledge was an important indicator of nursing fitness. Educators and senior managers emphasized the importance of knowledge. Similarly, Widiyaningsih et al. (2019) investigated relationships between clinical nursing instructors and the caring and commitment of new hospital nurses. In their study, new nurses highly valued instructors they perceived as knowledgeable. Instructors' knowledge was related to instructors' competency and was a significant predictor ($p < .05$) of new nurses' professional development.

In comparison, nurses in Waugh et al.'s (2014) study emphasized the value of soft skills, which contrasts with findings elsewhere in the literature (Karlou et al., 2018), and may reflect differences in advanced practice midwives compared to other nursing specialties. Specifically, midwifery practice environments are more emotionally charged settings compared to other practice settings. Nicholls and Webb's (2006) integrative review indicated communication, kindness, and supportive nursing care were especially important in midwifery as well, which supports the unique emotional needs of patients in midwifery settings.

Leyva et al.'s (2015) integrative review included an internationally diverse sample of studies, $N = 86$. In their review, knowledge was corequisite with skills and enabled nurses to provide kind, compassionate, and empathic nursing care to patients. Similarly, Lee and Seomun (2016) emphasized the importance of nurses' knowledge in their concept analysis of compassion competence. They specifically noted that characteristics of compassionate nursing practice had not been clearly identified or reported in the literature. However, they identified three influential factors associated with compassionate nursing care including knowledge acquisition, emotional communication and self-regulation skills, and respectful and empathetic social interactions. Leyva et al. and Lee and Seomun contended that knowledge is a vital requisite to providing compassionate nursing care, which aligns with Nightingale's view regarding nurses' education, knowledge, and compassionate nursing practice (Dossey et al., 2005).

Feo et al. (2018) expanded the intersection of nursing knowledge and compassionate care. Their scoping review included (*N* = 49) publications comprised of globally diverse and heterogenous participant pools. Knowledge was cited as a foundational concept for developing a proficient and skilled nursing practice (Feo et al., 2018) which is consistent with findings elsewhere in the literature (Lee & Seomun, 2016; Leyva et al., 2015). Feo et al. found that nurses' knowledge was foundational for providing compassionate nursing care and a requisite indicator of nursing fitness. Specifically, Feo et al. found that knowledge enabled nurses to provide clear explanations about procedures, interventions, and care rationales. These components of nursing practice empowered and enabled patients to be informed participants in their care and reflected compassionate nursing practice.

The importance of nurses' knowledge is also underscored elsewhere in the literature. Darch et al.'s (2017) three-phase hybrid concept analysis aimed to establish theoretical clarity for nurses and nursing students who model healthy behaviors. Participants, *N* = 39, included prelicensure nursing students, registered nurses, and nurse educators from the United Kingdom. Darch et al. contended that nurse clinicians often role model health behaviors, and role modeling requires nurses to be exemplars of healthy behaviors. The implication of role modeling healthy behaviors is that role modeling healthy behaviors is a manifestation of and evidence for nurses' knowledge. In this context, knowledge is an indicator of nursing fitness that fosters promoting healthy behaviors, and ultimately leads to improved patient outcomes.

Nurses' knowledge was found to directly contribute to patient outcomes and care quality. Radwin (2000) studied patients' perceptions of attributes and outcomes related to the quality of nursing care they received. Radwin identified eight attributes of quality nursing care in a diverse sample of oncology patients (*N* = 19). Specifically, knowledge was related to nurses' technical competence and experiences with similar patients.

Similarly, Wei et al. (2018) found that nurses' knowledge was related to nursing practice competency. Their study was aimed at identifying parents of children undergoing heart surgery

perceptions of nursing practice. Nurses' professional knowledge was highly valued. Wei et al. argued that professional knowledge was the foundational component of nursing practice rooted in humanism. Four themes were identified including competence, responsibility, altruism, and empathy. Knowledge served as the basis for competence and responsibility. Altruism and empathy were identified as indicators of interpersonal relations. Parents' perceptions of expert nursing practice included nurses possessing the medical knowledge to better understand the experience of the pediatric patients. Expert medical knowledge was associated with providing efficient care in a respectful and empathetic manner. Trust was also associated with parents' perceptions of nurses' knowledge in Wei et al.'s (2018) study. Continuity of care and time spent with patients was related to parents' trust in nurses' ability to care for their children. Wei noted that nursing care founded on expert knowledge strengthened patients' "healing, trust, and well-being" (p. 188). Wei et al.'s study was the only study focused on pediatric patients' and their parents' experiences.

Alavi et al. (2015) explored characteristics of nurse's caring practice among a cohort of, *N* = 27, pediatric nurses (*n* = 19 clinicians, *n* = 4 head nurses, *n* = 1 supervisor, and *n* = 3 pediatric nursing instructors). Researchers found four prominent themes in their study. Three of the four themes were directly related to nurses' professional knowledge and included professional communication, management of care, and clinical proficiency. Relevant subthemes included therapeutic relationships between nurses and patients, communication with inter-professional teams, process-oriented care management, proficiency in clinical skills and creativity in care, respectively. Alavi et al. found that nurses' ability to employ knowledge in pediatric clinical settings was a vitally important indicator of nursing fitness.

Lastly, the demand for increased nursing proficiency in highly skilled settings such as intensive care units underscores the importance of nurses knowledge. da Silva and Ferreira (2011) investigated characteristics of nurses working in intensive care settings, *N* = 24 (*n* = 11 novice nurses, *n* = 23 veteran nurses), in Brazil. Authors reported that interest and desire to

seek knowledge, and a willingness to learn are requisite characteristics indicating nursing fitness among intensive care nurses. In their study, knowledge fostered proactive attitudes to seek more knowledge. This is an important characteristic in ICUs due the required accuracy and precision in nursing skills, increased acuity of patients, and rapidly evolving technologies.

Practice Skills Dimension

Findings in the literature for the last two decades have consistently indicated the importance of well-developed nursing practice skills (McCance, 2003; Radwin, 2000; Wiman & Wikblad, 2004). Nineteen studies indicated that a nurse's practice skillset is an indicator of nursing fitness. Literature reviewed in this study included nine qualitative studies (Alavi et al., 2015; Bahrami et al., 2018; Costello, 2017; da Silva & Ferreira, 2011; McCance, 2003; Pavlish & Ceronsky, 2009; Radwin, 2000; Wei et al., 2018; Wiman & Wikblad, 2004), three quantitative studies (Afaya et al., 2017; Waugh et al., 2014; Widiyaningsih et al., 2019), one mixed-methods study (Karlou et al., 2018), and five multi-study analyses (Feo et al., 2018; Finfgeld-Connett, 2008; Lee & Kim, 2020; Lee & Seomun, 2016; Leyva et al., 2015). Practice skills indicating nursing fitness are related to patient care interventions and include skills aimed at relieving patients' pain, meeting patients' nutritional needs, and improving patients' mobility and sleeping (McCance, 2003).

Three of the quantitative studies used the CBI-24 to measure patients' ratings of nurses' caring behaviors (Afaya et al., 2017; Karlou et al., 2018, Widiyaningsih et al., 2019). Results indicated knowledge and practice skills are collectively the most important characteristic of nursing fitness. Knowledge and practice skills received highest scores across all three studies. Specifically, Afaya et al. (2017) measured medical surgical patients' (N = 183) ratings of most important nursing caring behaviors. Afaya et al. (2017) found that patients perceived knowledge and practice skills as the most important caring behaviors. Similarly, Karlou et al. (2018) measured nurses' (N = 72) perceptions of most important caring behaviors of nurses caring for patients receiving chemotherapy. Karlou et al. (2018) also identified knowledge and practice

skills as the most important caring behaviors among oncology nurses. Widiyaningsih et al. (2019) examined relationships between clinical instructors' competencies and caring behaviors of new nurses (*N* = 104). They found new nurses rated knowledge and practice skills as extremely important behaviors.

One quantitative study (Waugh et al., 2014) used a non-validated 23-item online questionnaire developed by the study authors to measure registered nurses' and midwives' (n = 276) and student nurses' (*n* = 226) perceptions of most important nursing attributes and practice skills. The questionnaire was based on attributes and skills listed on two career websites (NHS Careers, 2012; PlanIT plus, 2012) and the Nursing and Midwifery Council of London, England, (Nursing and Midwifery Council, 2010). Waugh et al.'s (2014) study broadened the concept of nursing fitness by spotlighting practice skills not included in the CBI-24 inventory. Significant indicators of nursing fitness reported by Waugh et al. included listening, teamwork, reflectivity, multi-tasking, and teaching (100%, 99%, 96%, 89%, 90%, respectively).

In a 2008 meta-synthesis, Finfgeld-Connett (2008) noted that well-honed assessment skills and expert "physical, psychosocial and spiritually oriented nursing interventions" (p. 199) aimed at empowering patients to care for themselves indicate professional maturity and are indicators of nursing fitness. Finfgeld-Connett (2008) did not differentiate practice skills and knowledge, which is consistent with the CBI-24's structure. However, other and more recent studies and multi-study analyses (Lee & Seomun, 2016; Leyva et al., 2015; Nicholls & Webb, 2006; Pavlish & Ceronsky, 2009) suggest practice skills and knowledge should be treated as related but distinctly separate, which is consistent with the findings of this review.

In Lee and Kim's (2020) integrative review, patients valued nurses skills. In their review, patients stressed the importance of nurses' skills such as' "knowing how to find a vein" (p. 161), being technically competent, and critically thinking through patient care processes aimed at enhancing patients' physical comfort and psychological well-being. Similarly, nurses' practice skills were considered tantamount to nursing fitness in Leyva et al.'s (2015) integrative review.

Leyva et al. contended that mastery of clinical nursing practice skills such as intravenous catheter cannulation, physical assessment, and technological competence is vital to nursing fitness. Nursing practice skills were perceived by patients in specialty environments such as intensive care units and highly technological environments (Leyva et al., 2015) as equally meaningful compared to psychosocial interventions and caring-type soft skills. As mentioned previously, this finding is a departure from early nursing theories that emphasize soft skills as the foundation of nursing. This departure may be a reflection of clinical environments that are more highly specialized, and house higher acuity patients compared to mid-19th century patient care environments. In addition, men often gravitate to these higher acuity care environments (Hollup, 2014; Thompson, 2002) where patients stress the importance of knowledge and practice skills. These findings indicate traditional views of caring that emphasize soft skills have lost value as focus has shifted toward instrumental tasks and technological based skillsets (McCance, 2003) to which men are well adapted (Hollup, 2014; Thompson, 2002; Zhang & Liu, 2016).

Feo et al. (2018) found nursing practice skills include nurses' clinical leadership abilities and motivational behaviors, practicing in accordance with best evidence, and critically analyzing care delivery and patient outcomes. Leadership skills indicated nursing fitness in five other studies (Alavi et al., 2015; da Silva & Ferreira, 2011; Darch et al., 2017; McCance, 2003; Widiyaningsih et al., 2019). These indicators of nursing fitness are consistent with unique strengths of men in nursing (Gilloran, 1995; O'Lynn, 2013; Thompson, 2002).

Lee and Seomun (2016) found that nurses' competence in practice skills is correlated with reductions in patients' suffering and improvements in patients' physical and psychological well-being. Insight, self-awareness, and an ability to control one's emotions were cited as important elements of nurses' practice skillsets. Lee and Seomun conceptualized attributes of self-awareness and controlling one's emotions as a single attribute labeled "self-regulation" (p. 65). Radwin's (2000) and Alavi et al.'s (2015) studies expand and support Lee and Seomun's

findings. Specifically, Alavi et al. suggested that self-awareness is a requisite skill that enables nurses to develop attentiveness, which is evidenced by being emotionally and physically present with patients (Alavi et al., 2015). In Radwin's study, patients perceived attentiveness as an indicator of nursing fitness.

In a 2015 study, pediatric nurses (*N* = 27), including pediatric nursing instructors (*n* = 3), reported a variety of practice skills associated with nursing fitness (Alavi et al., 2015). Commitment, self-efficiency, and responsibility in managing care were considered vital nursing skills in the context of today's rapidly evolving healthcare environment. Alavi et al. (2015) contended that these skills are foundational for empathy, compassion, and altruism in nursing. Similarly, McCance (2003) argued that nurses should not approach nursing as a job. Instead, McCance suggested that nurses should frame their perspectives about nursing in terms of commitment, dedication, and genuine desire to care for persons in need. McCance's view of nursing affirms Nightingale's prescription for interests in the case and in the patient, which supports the need to develop technical and practical skills to serve the best interests of patients (Seymer, 1954). McCance (2003) also argued that prioritizing care in the setting of heavy workloads and demands is an indicator of professional competence and a required practice skill in today's high acuity and highly demanding nursing environments where men gravitate (Hollup, 2014).

Possessing the ability to explain complex healthcare topics to patients in an understandable way empowers patients and enables them to make informed decisions related to treatment options (Pavlish & Ceronsky, 2009). Similarly, providing easy to understand explanations to parents about simple procedures such as establishing intravenous access is an important skill and indicator of nursing fitness (Alavi et al. 2015). Wei et al. (2018) noted the significance of being able to explain esoteric concepts to parents of children with congenital heart defects (CHD) undergoing surgery. In Wei's study, drawing diagrams and explaining complex medical concepts in relatable and understandable way to children's parents entailed

parents perceiving care as higher quality. Lastly, this skill translates to faculty. Widiyaningsih et al. (2019) found teaching skills were important clinical instructor competencies for nursing students and were related to students caring behavior in clinical environments.

The ability to negotiate more complex critical thinking and decision-making skills are important indicators of nursing fitness (Alavi et al., 2015). Alavi et al. contended that nurses should possess the knowledge and skills to care for patients but should also be able to navigate changing medical scenarios. For example, complex critical thinking skills are paramount when caring for pediatric patients with fevers whose illness is complicated by vomiting. In this scenario, nurses need well-developed critical thinking and decision-making skills that enable them to provide appropriate patient care versus being order-focused and waiting for a physician to arrive. According to Alavi et al., this scenario entails self-awareness and self-regulation, which was also identified by Lee and Seumon (2016). Self-awareness and self-regulation were indicators of nursing fitness elsewhere in the literature (Bahrami et al., 2018; da Silva & Ferreira, 2011; Darch et al., 2017; Feo et al., 2018; Lee & Seomun, 2016) Other requisite skills included the ability to maximize use of available resources and opportunities in innovative ways (creativity in care) and being able to translate knowledge into practice to improve patient outcomes because knowledge alone is insufficient. The importance of translating knowledge into skilled patient care delivery to improve patient outcomes was also valued among oncology nurses (*N* = 33) (Pavlish & Ceronsky, 2009).

Leadership and team skills were identified as essential indicators of nursing fitness (da Silva & Ferreira, 2011; Widiyaningsih et al., 2019). This is an especially relevant finding because men have been identified as having strong leadership skills (Gilloran, 1995; Sundus & Younas, 2020), which may partially explain some of the reason men gravitate to high acuity care departments (Hollup, 2014; Zhang & Liu, 2016). Leadership skills indicative of nursing fitness include making team decisions in unpredictable and complex patient care situations. Leadership skills also take the form of care coordination. Radwin (2000) discussed the importance of care

coordination, which was related to patients' trust in nurses. In Radwin's study, patients valued nurses' who coordinated care across multiple specialties and who were able to synthesize and explain to patients interprofessional team approaches in an understandable way.

This review concluded that knowledge and practice skills are independent indicators of nursing fitness. These findings are supported by multiple reports that knowledge and practice skills are related but distinctly separate indicators of nursing fitness (Lee & Seomun, 2016; Leyva et al., 2015; Nicholls & Webb, 2006; Pavlish & Ceronsky, 2009). The rationale for treating knowledge and practice skills as separate indicators of nursing fitness can be illustrated by considering that knowledge is required for skill development, but knowledge does not ensure skillful development or proficiency. For example, a nurse may have knowledge of how to perform venipuncture and fail to develop skill proficiency.

Interpersonal Relations Dimension

Twenty-two studies indicated that interpersonal nurse-patient relationships, is a requisite indicator of nursing fitness. The literature included 10 qualitative studies (Alavi et al., 2015; Bahrami et al., 2018; Costello, 2017; da Silva & Ferreira, 2011; McCance, 2003; Pavlish & Ceronsky, 2009; Radwin, 2000; Sundus & Younas, 2020; Wei et al., 2018; Wiman & Wikblad, 2004), four quantitative studies (Afaya et al., 2017; Newcomb et al., 2017; Waugh et al., 2014; Widiyaningsih et al., 2019), one mixed-methods study (Karlou et al., 2018), and seven multi-study analyses (Darch et al., 2017; Feo et al., 2018; Finfgeld-Connett, 2008; Lee & Kim, 2020; Lee & Seomun, 2016; Leyva et al., 2015; Nicholls & Webb, 2006). Meaningful interpersonal relations are foundational for nursing fitness by both nurses and patients alike (Karlou et al., 2018). Additionally, 90% of students in Widiyaningsih et al.'s (2019) study reported nursing faculty had role modeled good interpersonal relations, which supports the importance of this dimension of nursing fitness.

Empathy and compassion have been considered foundational for nursing fitness since Florence Nightingale (Seymer, 1954). In the literature, empathy and compassion are identified

as indicators of nursing fitness which facilitate development of meaningful interpersonal relations between nurse and patient. Interpersonal relationships in nursing occur in the context of compassionate and empathic care. Precise definitions of compassion and empathy are sparse in the reviewed literature but attributes of each were discussed.

Empathy was identified as a requisite for nursing fitness in nine studies (Alavi et al., 2015; Costello, 2017; Darch et al., 2017; Feo et al., 2018; Karlou et al., 2018; Lee & Kim, 2020; Lee & Seomun, 2016; Pavlish & Ceronsky, 2009; Wei et al., 2018). Lee and Seomun (2016) described empathy as the cognitive and emotional aspects of nurses' interactions with patients and entails patient-centered care. Patients identified empathy as nurses' willingness to recognize patients' difficult experiences and to take part in patients' experiences across studies. Feo et al. (2018) defined empathy as a demonstration of compassion. Attributes of empathy included showing kindness and being aware of and attentive to patients' feelings. These descriptions of empathy are consistent across the literature reviewed in this study.

Parents of pediatric patients reported empathy as one of the top four caring characteristics of nurses (Wei et al., 2018) and one of six central indicators of caring nurses (Karlou et al., 2018). Empathetic gestures included demonstrating concern for the patient, acknowledging the impact of illness, and physical gestures such as reassuringly placing a hand on a patients' shoulder to demonstrate understanding and concern (Wei et al., 2018). Patients perceived nurses as empathetic in multiple studies when nurses shared their own personal experiences with patients (Costello, 2017; Darch et al., 2017). In pediatric settings, parents regarded nurses as empathetic if nurses interacted with children as they would their own while still providing expert care interventions (Alavi et al., 2015). Nurses equate empathy with "tuning into" patients (Pavlish & Ceronsky, 2009, p. 6). Tuning in was described as an intuitive form of paying attention to subtle cues that indicate patients' needs. This process enabled nurses to become more empathetic and to develop perceptual awareness of their patients' needs. Empathy was also equated with "being with" (Karlou et al., 2018, p. 13; Lee & Kim, 2020)

patients during vulnerable moments. Being with patients means being physically present as well as emotionally present with the patient. Emotional presence was defined as being focused on the patient in the moment and interacting in a soft manner. Intravenous catheter cannulation was identified as a practice skill that conveyed nurses' emotional states and indicated the presence or absence of empathy (Karlou et al., 2018, p. 13).

Other studies failed to emphasize empathy and compassion directly (da Silva & Ferreira, 2011; Finfgeld-Connett, 2008; Wiman & Wikblad, 2004). This may have reflected the nature of care delivery and patient expectations in high acuity environments including intensive care units (ICUs) and emergency departments (EDs) that emphasize technical skills. However, deeply intimate relationships built on trust, honesty, and sharing personal experiences were considered integral to nursing fitness in these departments. Patients interpreted attentiveness to their needs and efficiency in care delivery as indicators of deeply meaningful interpersonal relations.

Compassion was identified as an indicator of nursing fitness in 11 studies (Alavi et al., 2015; Bahrami et al., 2018; Finfgeld-Connett, 2008; Karlou et al., 2018; Lee & Kim, 2020; Lee & Seomun, 2016; Newcomb et al., 2017; Nicholls & Webb, 2006; Waugh et al., 2014; Wei et al., 2018; Wiman & Wikblad, 2004). Compassion was defined by Lee and Seomun (2016) as an intense awareness and desire to relieve someone from suffering. In their study, interpersonal relations supported by compassionate nursing practice reflected high-quality care and nursing fitness. Compassion was requisite for nursing fitness across specialties, but especially important in areas that are emotionally charged. In a study aimed at midwifery candidates, compassion was demonstrated by listening to patients and was ranked third most important indicator of nursing fitness by 81% of the cohort of registered and student nurses and midwives (Waugh et al., 2014). In Waugh et al.'s (2014) study, honesty and communication ranked first and second most important indicators respectively, both of which are thought to reflect compassionate nursing practice. Similar findings related to communication and compassionate care delivery

were discussed in Nicholls and Webb's (2006) study aimed at identifying characteristics of good midwives.

Both patients and nurses' perceptions of care were positively affected by demonstrations of compassion. Parents of children with CHD undergoing surgery perceived nurses' professional knowledge and practice skills as more valuable when delivered in a compassionate manner (Wei et al., 2018). In the same study (Wei, 2018), parents' trust in nurses was enhanced when nursing care was perceived as compassionate. Similarly, positive effects of compassion on patients' perceptions of nursing care were reported elsewhere in the literature (Bahrami et al., 2018; Lee & Kim, 2020; Newcomb et al., 2017). Nurses equated compassionate care delivery with higher levels of nursing expertise and self-efficiency in two studies (Alavi et al., 2015; Lee & Kim, 2020).

Empathy and compassion frame interpersonal relations between nurse and patient. Empathy and compassion are reflected by nursing actions that occur within the context of nurse-patient relationships. Simple gestures such as listening attentively (Bahrami et al., 2018; da Silva & Ferreira, 2011; Feo et al., 2018; Finfgeld-Connett, 2008; Pavlish & Ceronsky, 2009; Sundus & Younas, 2020; Waugh et al., 2014; Wei et al., 2018; Wiman & Wikblad, 2004), being physically and emotionally present (Costello, 2017, 2017; Finfgeld-Connett, 2008; Lee & Kim, 2020; McCance, 2003; Pavlish & Ceronsky, 2009; Radwin, 2000; Wiman & Wikblad, 2004), and offering reassurance to patients and their families (Alavi et al., 2015; Bahrami et al., 2018; Feo et al., 2018; Finfgeld-Connett, 2008; Pavlish & Ceronsky, 2009; Radwin, 2000; Wei et al., 2018) demonstrate empathy and compassion and are fundamental elements of meaningful interpersonal relationships indicating nursing fitness (Finfgeld-Connett, 2008). Nurses who were emotionally available, able to grieve with patients who were grieving, and displayed happiness with patients who were happy were perceived as more fit (Finfgeld-Connett, 2008). These abilities indicated personal relatedness and are consistent with views of empathy and compassion in other literature reviewed. Similarly, patients in emergency departments (EDs)

value nurses who are emotionally attentive, physically present, and expert listeners (Wiman & Wikblad, 2004). These attributes contribute to patients perceiving nurses as expert and caring practitioners. Compassion and feeling valued were significant predictors of patient satisfaction in a study aimed at patient satisfaction among patients with frequent ED visits (Newcomb et al., 2017). Lastly, nurses in the ICU with strong relationship skills, emotional stability, and who were perceived as expert communicators were considered optimally fit for nursing (da Silva & Ferreira, 2011).

Other features of meaningful interpersonal relationships that indicate nursing fitness include effective communication and listening skills (Afaya et al., 2017; Bahrami et al., 2018; Feo et al., 2018; Finfgeld-Connett, 2008; Pavlish & Ceronsky, 2009; Radwin, 2000; Sundus & Younas, 2020; Waugh et al., 2014; Wei et al., 2018), nonjudgmental approach (Darch et al., 2017; Feo et al., 2018; Sundus & Younas, 2020), honesty and trustworthiness (Darch et al., 2017; Finfgeld-Connett, 2008; Pavlish & Ceronsky, 2009; Waugh et al., 2014; Wei et al., 2018), calm and gentle demeanor (Bahrami et al., 2018; Darch et al., 2017; Karlou et al., 2018; Sundus & Younas, 2020; Waugh et al., 2014), altruism (Alavi et al., 2015; Wei et al., 2018), sensitivity to patient vulnerability (Feo et al., 2018; Radwin, 2000; Wei et al., 2018; Wiman & Wikblad, 2004), positive or cheerful attitudes (Bahrami et al., 2018; Darch et al., 2017; Sundus & Younas, 2020; Waugh et al., 2014; Wei et al., 2018), and the ability to work well on a professional team (Alavi et al., 2015; Bahrami et al., 2018; da Silva & Ferreira, 2011; Karlou et al., 2018; Lee & Kim, 2020; Pavlish & Ceronsky, 2009; Waugh et al., 2014; Wei et al., 2018). These indicators of nursing fitness were framed in the context of empathetic and compassionate nursing practice across studies.

Men's Strengths

There is a paucity of studies aimed at exploring differences between men and women's caregiving behaviors in nursing. Differences between men and women are not well understood. O'Lynn (2013) reported that most of our knowledge about men's expressions of caring come

from research on men in fathering roles, which may not be transferable to the nursing environment. However, multiple authors agree that caring looks different when it is provided by male nurses versus female nurses (Jordal & Heggen, 2015; Kellett et al., 2014; Limiñana-Gras et al., 2013; O'Lynn, 2013; Zhang & Liu, 2016). Specifically, the literature suggests men in nursing attempt to incorporate characteristics traditionally associated with both masculine and feminine qualities when providing nursing care (Sundus & Younas, 2020). According to O'Connor (2015), qualities traditionally associated with masculinity include autonomy, rationalism, non-emotionalism, independence, and leadership abilities. Qualities traditionally associated with feminine behaviors include nurturing, compassion, empathy, motherly guidance, and assisting others O'Connor (2015). These qualities are consistent with role expectations predicted from social role theory (Eagly & Wood, 2012). However, O'Connor (2015) also noted that men can and do provide nursing care without having to incorporate feminine qualities. These unique implications faced by men in nursing provide a compelling reason to account for differences between men and women's ways of caring when measuring perceptions of men's nursing fitness.

Watson and Lea (1998) noted that men in their study were more likely to associate nursing with psychosocial aspects of care. It is unclear if men were more likely to focus on psychosocial skills in nursing environments. Milligan (2001) discovered that men in nursing perceive caring as meeting biological and psychological needs, teamwork, effective communication, and modeling care within a societal context. Men developed concerns for patients' partners and included them in communication and emotional support efforts. Men also reported that they felt expected to gravitate toward technical skills and avoid interpersonal relations involving emotions. In another study, men were more likely to develop a professional model of caring in which caring focused on task-completion, problem solving, and efficient resource management (Thompson, 2002).

Gilloran (1995) noted that men showed more confidence in decision-making than their women colleagues. Gilloran did not address differences in care delivery. O'Lynn (2013) noted that men develop meaningful interpersonal relationships with patients and colleagues but men's interactions in the relationship resemble those of friendships compared to women in nursing whose interactions favor maternal and nurturing styles that are equated with and expected in nursing environments. O'Lynn's view is consistent with an earlier study that found men in nursing incorporated humor to facilitate building trusting interpersonal nurse-patient relationships (Evans, 2002). On the other hand, women in Evans' (2002) study used more hands on touch. Men may refrain from physical touch or physical closeness to avoid being sexual misinterpreted and professionally vulnerable. When physical touch is necessary, men are more likely to wear gloves to avoid skin to skin contact to minimize misinterpretations about their intent (Harding et al., 2008).

One explanation for observed differences in men's and women's ways of caring may be that traditional views of masculinity encourage men to provide care from an emotionally safe distance (Thompson, 2002). An implication of Thompson's position is that emotional distance may entail men focusing on instrumental tasks instead of affective tasks, which may partially explain reasons men in nursing gravitate to "islands of masculinity" (Hollup, 2014, p. 757) where nursing tasks and clinical responsibilities are emphasized and affective tasks are minimized. Islands of masculinity include anesthesia, psychiatry, emergency departments, and administration (Hollup, 2014). Other reasons that may account for men's and women's differences in clinical environments includes men attempting to avoid the stigma associated with being a man in an occupation predominantly comprised of females (Zhang & Liu, 2016).

Recently published literature supports the idea that men make unique contributions to caring environments (Sundus & Younas, 2020). In Sundus and Younas' (2020) study, patients reported five specific characteristics of men in nursing based on their experiences. Most patients in the study reported that men showed awareness and respect for their feelings and

emotional needs. Nurse-patient interactions associated with respectfulness included ensuring privacy during physical care for women, caring for patients' needs even when needs might be considered trivial, advocating for patients' needs, and allowing patients to share reproductive or urinary issues without judgement. Similarly, patients in the study said men were considerate. This characteristic was described as similar to respectful but was noted to require active participation versus passivity. Patients discussed how men were knowledgeable about patients' health problems, put patients first, and interacted with a deliberative approach when addressing patients' concerns. One participant described the male nurse caring for her as "one of the kindest I have known" (p. 577). Men were described as good listeners. Men's listening skills were evidenced by spending extra time at patients' bedsides, actively developing connections early in the course of care, frequently inquiring about patients' needs, and interacting with patients in a positive manner. Men were perceived as nonjudgmental. Participants in the study said men treated all patients equally, thought carefully before reacting to patients' negative comments, and tried to understand patients' feelings and viewpoints. Lastly, men were described as supportive. Participants talked about men's kindness and way of establishing professional but friendly relationships with patients. Additionally, men were good team players, collaborated well with unit managers to address patients' needs, and provided timely and informative education about patients' complex needs.

Caring Instruments

Four studies (Afaya et al., 2017; Karlou et al., 2018, 2018; Widiyaningsih et al., 2019) were identified in this literature review which used the 24-item Caring Behaviors Inventory (CBI-24) to measure how often patients observed nurses displaying caring behaviors. The CBI-24 is a revised version of its 42-item parent inventory (CBI-42) developed to measure patients' perceptions of nurses caring behaviors (Wu et al., 2006). The CBI 24 has demonstrated reliability with Cronbach's alpha ranging from $\alpha = .87$ to $\alpha = .97$ among heterogeneously diverse patient populations across 14 studies (Wolf, 2019). The CBI-42 has demonstrated reliability with

Cronbach's alpha ranging from α = .87 to α = .98 among heterogeneously diverse patient populations across 17 studies (Wolf, 2019). Both inventories have been administered to nurse clinicians, (N = 33 – 1195), and nurse practitioners, (N = 30 – 348) (Wolf, 2019).

Psychometric property testing of the CBI-24 and CBI-42 with larger samples of nurses were conducted outside the United States, where cultural differences may impact perceptions of men in nursing (Wolf, 2019). However, neither CBI was developed to measure nurse's perceptions of nurses' caring behaviors specifically related to men in nursing. Additionally, neither CBI has been administered in nurse pools with sufficiently heterogenous samples of men and women. Thus, both scales may reflect bias and fail to capture unique differences between men and women's caring, which may negatively impact psychometric properties. This is an important point because, as discussed in the preceding literature review, patients' perceptions of nursing fitness indicators do not necessarily reflect nurses' perceptions of nursing fitness indicators. Nurses and patients may rank the importance of caring behaviors differently. For example, in Leyva et al.'s (2015) review, patients in ICU rated practice skills such as intravenous cannulation as equally important as nurturing type social skills traditionally associated with women's caring, which exacerbates the impact of the disagreement because men gravitate toward ICU settings.

The groundwork for the CBI-24 was conducted in 1986 (Wolf, 1986) when men constituted approximately five percent of the nursing workforce (US Census Bureau, 2013). This fact supports the suspicion that Wolf's (1986) data was likely biased toward nursing characteristics traditionally associated with feminine qualities but failed to capture indicators of nursing fitness relevant for men. The scale's measurement structure may not hold for men. Neither CBI scale was developed to capture unique differences between men and women's caring. Thus, the CBI-24 and CBI-42 are not optimal starting points to gauge men's fitness for nursing. Lastly, both CBIs were founded on Watson's unitary model (Wolf, 1986, 1994, 2019)., which utilizes an epistemological foundation built on pseudoscientific concepts and language

that are inconsistent with science-driven healthcare environments and do not adequately represent men's caring.

Conclusions

This literature review was conducted to identify characteristics of nursing fitness that served as the foundation of scale development. Three dimensions of nursing fitness were identified in this literature review, including knowledge, skills, and interpersonal relations dimensions. These dimensions were synthesized from or directly identified in studies reviewed. Indicators of nursing fitness were identified from the perspectives of both nurses' and patients' and included men's strengths.

Additionally, four studies utilized the CBI to measure nurses' caring behaviors. However, the CBI was intended to measure patients' perceptions of nurses, fails to account for men's specific strengths, and may lack measurement invariance between men and women. Therefore, a gap exists with respect to instruments aimed at measuring men's nursing fitness. This study was aimed at developing a psychometric scale to measure men's nursing fitness.

CHAPTER 3: METHODS

The purpose of this study was to measure perceptions of men's fitness for nursing quantitatively. This was accomplished by first developing the Fitness in Nursing Scale for Men (FiNS-M©) and then testing its psychometric properties. Item development for the FiNS-M© was informed by a systematized review of the literature and developed in accordance with recommendations from DeVellis and Thorpe (2022) and Furr (2015). An inductive methodological approach was used to conduct a qualitative synthesis of the literature that was identified in the systematized review. Literature synthesis informed scale development and is discussed in chapter 2. A quantitative cross-sectional design was used to test the scale's psychometric properties. The FiNS-M© was determined to be a valid and reliable measure of perceptions of men's fitness for professional nursing. This chapter provides details related to the methodological procedures that guided scale development and psychometric testing. First, the procedure for item development will be discussed. Methods for psychometric testing are discussed following item development.

Item Development

Scale development was guided by the following questions:

1. Is the content of the scale valid for measuring perceptions of men's fitness for professional nursing?
2. Is the scale internally and externally reliable among academic and clinical registered nurses with at least one year nursing experience?

Item development was informed by a systematized review of the literature aimed at identifying requisite characteristics of nursing practice from both nurses' and patients' perspectives, which indicate fitness for nursing. Additionally, measurement of men's fitness for nursing included indicators of men's unique strengths which were identified in the literature. The FiNS-M© was developed in accordance with recommendations from Devellis and Thorpe (2022) and Furr (2015). Specifically, a four step process was used to develop the FiNS-M©, which

included (a) articulating the construct to differentiate it from other constructs, and articulating the context in which the scale will be used (e.g., intended population, demographic characteristics); (b) an iterative process of selecting a response format and assembling an initial item pool; (c) collecting data from respondents representing the target population; and (d) conducting a psychometric analysis to determine psychometric properties of the scale.

First, the latent construct of interest was established and clearly defined. A guiding theoretical framework was aided in clarifying the construct and context. Next, a literature search was conducted to appraise the literature for sufficient availability of studies to support scale development. Findings from the literature review indicated there was enough literature from which to develop the FiNS-M©. The rationale for using existing literature to support scale development was based on the abundance of available literature identifying characteristics consistent with nursing fitness. Multidimensional latent factors and an initial item pool were generated and were informed by findings in the literature. Next, a 7-point Likert response scale was selected as the scale's measurement format. Finally, the initial item pool was reviewed by internal and external content experts from relevant field including nursing science, workforce diversity, and psychometric evaluation to determine content validity.

Internal expert reviewers were members of the study team and included three nurse scientists (L. Bolin, C. Horne, and M. Hand) with expertise in the subject area and a psychometrician (M. Bowler) with expertise in scale development. The scale was revised in accordance with feedback from internal reviewers. The revised scale was reviewed by external experts including four doctoral prepared nurse scientists. The FiNS-M© was revised based on discussion with study team members and feedback provided from external reviewers. Scale items were measured as continuous variables using a 7-point Likert-type response scale. The scale was administered in a population of nurse clinicians and academic nursing faculty in the U.S.

Design

This study employed a quantitative cross-sectional descriptive design to test psychometric properties of the FiNS-M©.

Sample and Setting

Power Analyses

The appropriate sample size needed for structural equation modeling and confirmatory factor analyses (CFA) is a complex issue. Criteria to consider include model convergence, accuracy of parameter estimates, power to detect model misspecification, and power to test parameter estimates. An important issue to consider in determining sample size is whether the sample is a sufficiently strong representation of the population such that a variance/covariance matrix can be calculated and indicator means reflect the population of interest (Brown, 2015). Recommendations for absolute sample sizes vary across the literature and are dependent on model size and complexity, strength of factor loadings and magnitude of factor correlations. Suggestions for sample size have ranged from a minimum of 50 participants to 400 or more participants (Furr, 2015). Suggestions for sample sizes have also been calculated as "participant-to-variable" ratios with recommendations ranging from 3:1 to 20:1 or more (Boateng et al., 2018; Furr, 2015; Mundfrom et al., 2005; Wolf et al., 2013).

Little's rule addresses model convergence. Specifically, Little (2013) found that sampling error reaches asymptote between approximately 100 – 120 observations in single group models. Multiple group models require a minimum or approximately 50 observations per group. More recent advances in statistical computing techniques allow more precise estimations of minimum required sample size using analytic methods (e.g., Satorra's and Saris' (1985) method) and Monte Carlo simulation (MacCallum et al., 2006; Muthén & Muthén, 2002; Satorra & Saris, 1985; Schoemann et al., 2014). These techniques are optimal to determine sample size to reach power to detect model misspecification and test for parameter significance.

Power analyses were conducted a priori in R (Version 4.1.3; R Core Team, 2022) (see Appendix X). Multiple estimates of minimum sample size were obtained. Estimates were based on a three-factor model ($\Psi = 1$, $\Psi cov = .3$), with each factor loading ($\lambda = .7$), on 10 indicators ($\theta = .51$). Satorra's and Saris' method (1985) and Monte Carlo simulation (Brown, 2015; Muthén & Muthén, 2002; Schoemann et al., 2014) were used to estimate minimum required sample size for this study. The first estimate of minimum required sample size was based on Satorra's and Saris' analytic method using the *semTools* package (Jorgensen, et al., 2021) to estimate power = .80 for parameter estimates by fixing three covariances to zero. Next, Monte Carlo simulation was conducted using the *simsem* package (Pornprasertmanit, 2021) with 1,000 replications. Additionally, Little (2013) found that sampling error reaches asymptote between approximately 100 – 120 observations in single group models and that multiple group models require a minimum of approximately 50 observations per group. As shown in Table 1, power analyses indicated a minimum sample, $n = 100 – 125$, was sufficient for analyses. However, model complexity and Little's rule and recommendations for multiple group models were also considered when estimating the minimum sample size. Therefore, this study aimed to recruit a minimum sample, $N = 250$, to allow for multiple group analyses.

Table 1

A Priori Power Analyses

Method	*N*	Power Estimate
Satorra & Saris 1		
1	100	.714
2	120	.798
3	125	.816
4	150	.886
Monte Carlo Sim 1		
1	100	.822, .826, .805
2	105	.844, .835, .819

3	110	.851, .870, .840
4	120	.873, .893, .893

Inclusion Criteria

Participants were considered eligible to participate if they self-reported:

1. Being a registered nurse with an active license to practice in the United States
2. At least one year in academic or clinical nursing practice
3. Having professional work experience with men in nursing
4. Ability to read and understand English

Recruitment

Participants were recruited through multiple professional organizations, university listservs, and online nursing related social media groups using chain referral sampling (Arigo et al., 2018; Gelinas et al., 2017; Penrod et al., 2003). Chain referral sampling has grown in popularity in recent years because heavily trafficked social media platforms often provide researchers access to a larger and more diverse portion of their target population (Arigo et al., 2018; Gelinas et al., 2017; Penrod et al., 2003). Targeted professional organizations for participant recruitment included American Association for Men in Nursing (AAMN), American Nurses Association (ANA), Southern Nurses Research Society (SNRS), North Carolina Nurses Association (NCNA), National League for Nurses (NLN), and American Association of Colleges of Nursing (AACN). The ANA, NCNA, and AACN were unable to participate in recruitment efforts. Study recruitment information was distributed to deans and department chairs of nursing programs at multiple universities across the United States including the top 25 historically black colleges (*The Best Historically Black Colleges and Universities*, 2022). Study recruitment information was advertised on multiple nursing related social media groups including LinkedIn, Facebook, Twitter, and Reddit social media platforms. Permission to advertise this study was obtained from social media page administrators. Participants were provided an opportunity to

participate in one of 20 random drawings for a $25 visa gift card to compensate them for their time spent successfully completing the survey. Participation was optional.

Data Collection Procedure

Detailed study information in the form of a recruitment flyer and an email broadcast was sent to participating professional organizations that agreed to participate, including American Association for Men in Nursing (AAMN), Southern Nurses Research Society (SNRS), and National League for Nurses (NLN), for distribution to organization members. The same study information was provided to deans and graduate program chairs to be distributed via university listservs and shared with graduate students who hold active nursing licenses. A recruitment flyer was posted on multiple professional nursing groups social media platforms.

Data Screening

Data screening is an important part of data analysis. Reliability and validity are threatened when data are not properly screened. (Albert et al., 2010; Brown, 2015; Howell, 2013; Sauro, 2017). However, data screening is not a straight forward process, but rather an iterative process of carefully examining cases for the presence of outliers and nonnormal data that might bias parameter estimates and threaten the integrity of findings, as well as cues that suggested threats to data integrity. A total sample, *N* = 825 participants consented to participate. Prior to screening data, the PI completed the survey by reading each question carefully and selecting an appropriate response to estimate the time required to complete the survey with sincerity. This allowed the PI to estimate the time required to complete the survey. The recorded time for the PI completing the survey was five minutes. Therefore, cases less than four minutes were flagged for the possibility of insincerity and these cases were carefully inspected for other indicators of insincerity. For example, data were inspected for cases where all responses were identical (e.g., all 1's, 2's, 3's, 4's, 5's, 6's, or 7's). This was in accordance with Albert et al.'s (2010) recommendations. Three validity check items were included in the survey. Validity check items consisted of instructions for participants to select a specific

response (Devellis & Thorpe, 2022). Prior to beginning the survey, participants were informed that failure to correctly respond to validity check items would result in removing their data from the study. Surveys were removed for incorrect responses to two of three validity check items. Survey responses from outside the U. S. were identified by IP address and associated latitude/longitude coordinates recorded in Qualtrics® (2021) and were removed in accordance with eligibility criteria. Lastly, survey entries were removed if < 80% of survey items were completed since this amount of data loss would threaten data integrity. As shown in Table 2, 190 cases were removed prior to data analysis. The remaining cases, *N* = 635 were included in analysis.

Table 2

Cases Removed, n = 190

Rationale	*n*
Failure to complete survey	95
Failure to complete 2 of 3 validity check items	15
Responses deemed insincere	5
Survey completed outside the U.S.	5
Survey completed in < 4 minutes	70

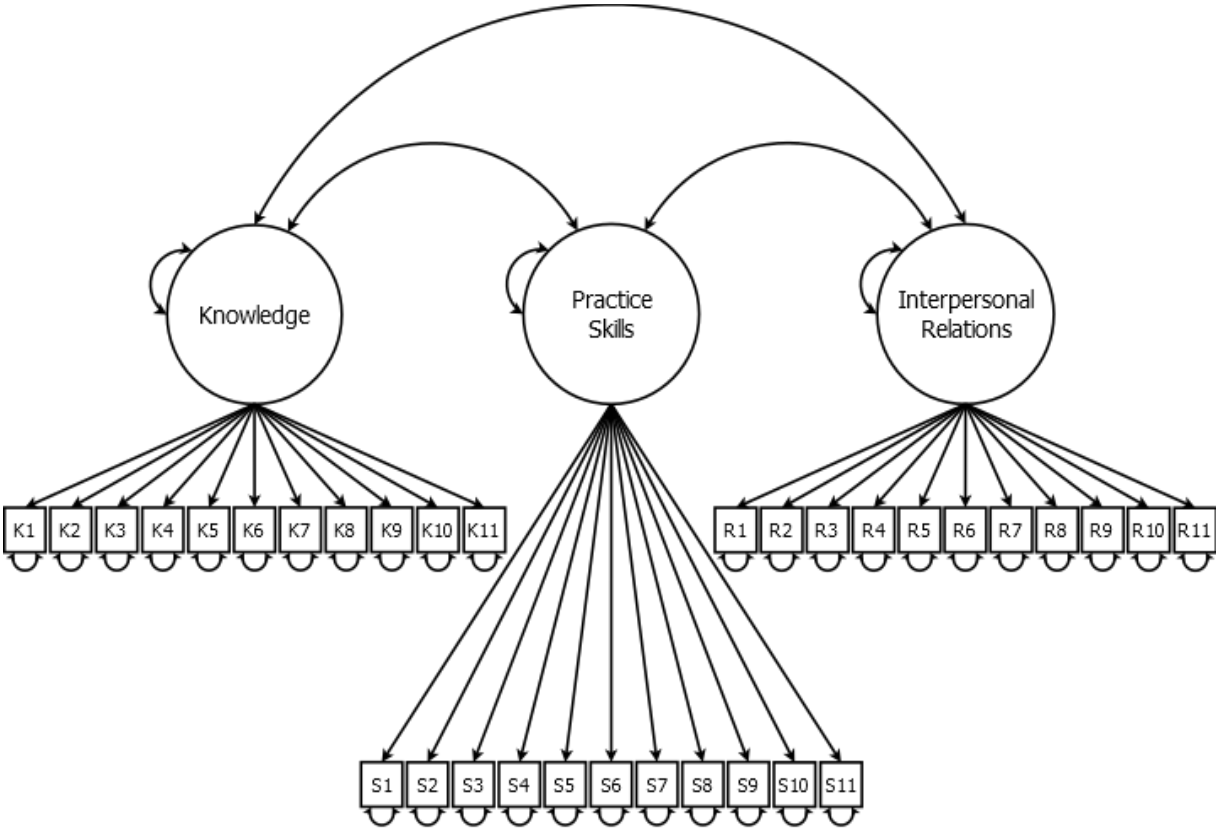
Data Analysis

Psychometric testing was conducted in R (Version 4.1.3; R Core Team, 2022). Data were modeled using the *lavaan* (Rosseel, 2012) package and maximum likelihood estimation to estimate all CFA models in the analyses. No prior study data was available from which to estimate population parameters. Therefore, CFA was conducted in an exploratory framework. Latent variables were allowed to covary based on literature and theory that suggests relationships between the factors. Residual variances were presumed to be uncorrelated in the hypothesized three-factor model. The initial three-factor model path diagram was constructed

using *Dia* (Larsson, 2007) and is shown in Figure 3. Measurement and structural invariance were estimated with multiple group CFA across groups of men and women.

Figure 3

Three-factor Model Path Diagram, Knowledge, Practice Skills, and Interpersonal Relations



Reliability and Validity

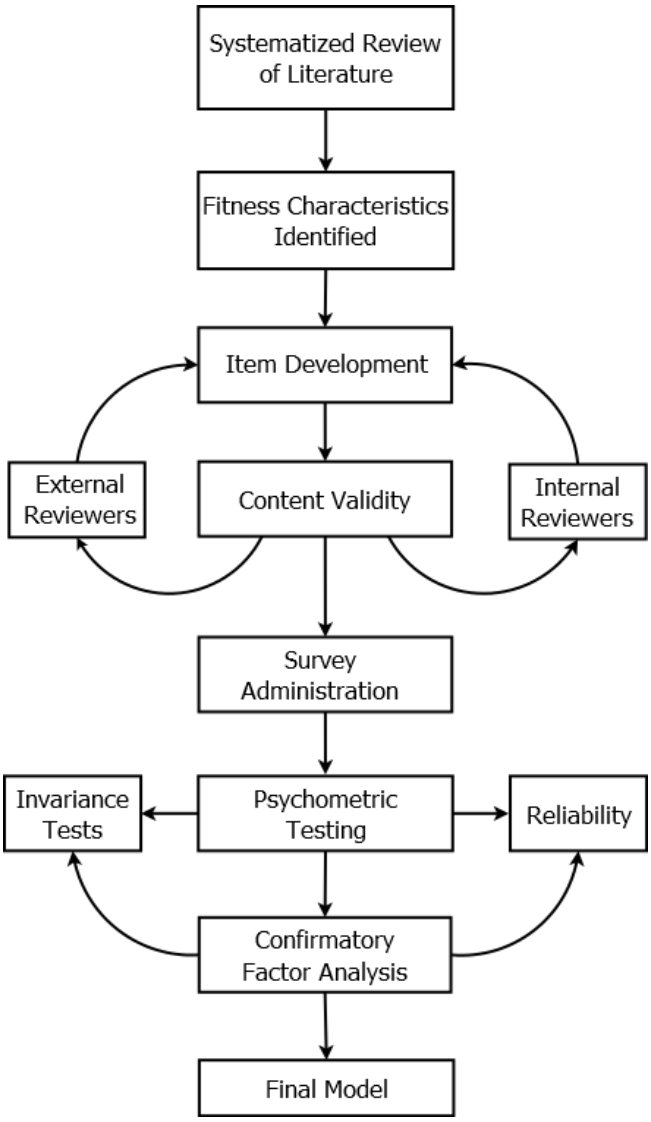
Using CFA to evaluate reliability is less common but has advantages over traditional methods such as exploratory factor analyses. The accuracy of coefficient alpha depends on meeting underlying assumptions that may not be valid (Furr, 2015). Coefficient alpha's accuracy is affected by items' psychometric properties including the presence of correlated error, and Tau equivalence, which is an often-violated assumption. Discrepancies between traditional coefficient alpha estimates and CFA based reliability estimates reflect coefficient alpha's tendency to mis-estimate reliability (Miller, 1995). When the assumption of Tau equivalence is

met, coefficient alpha and McDonald's omega are identical. However, McDonald's omega is a robust measure of reliability in structural equation models and is not sensitive to residual covariances and violation of Tau equivalence. Tau equivalence was violated in this study.

The *psych* package (Revelle, 2020) was used to estimate McDonald's omega. The reliability estimate for the final model was, ω_t = .95. Model invariance and parameter estimates suggested good convergent and discriminant validity. The scale development and testing are depicted in Figure 4.

Figure 4

Scale Development and Testing



Summary

This study employed a quantitative cross-sectional design to test psychometric properties of the investigator developed FiNS-M© to measure perceptions of men's fitness for professional nursing. Scale development was based on a systematized review of the literature to maximize the scale's conceptual and theoretical soundness. Content validity was assessed by a panel of scientists with relevant content expertise and their feedback informed scale revisions. After content validity was established, participants were recruited through multiple professional nursing organizations and social media platforms to maximize the probability of recruiting a representative sample. The FiNS-M© was administered in a population of nurse clinicians and nursing faculty, *N* = 635. Data security and storage procedures followed university standards set forth by East Carolina University. The scale's psychometric properties were tested using CFA and included reliability estimates and indicators of validity. The data were analyzed using R (Version 4.1.3; R Core Team, 2022) statistical software and multiple structural equation modeling packages to estimate CFA model parameters and conduct multiple group CFA to test measurement invariance.

Protection of Human Subjects

Study approval was obtained from East Carolina University's (ECU) institutional review board (IRB, seen Appendix A) prior to conducting the study. Participants were provided details of the study, including a study description, study purpose, ways anonymity was maintained, method of data protection, explanation that participation was voluntary and without obligation, statement informing participants that no potential risks or harms were expected from participating in this study, statement explaining how study results may be used, and contact information for the primary investigator (PI) and IRB. Data was stored on a secured university server.

CHAPTER 4: ITEM DEVELOPMENT

Introduction

Men represent a small minority in professional nursing. Despite comprising 49% of the U.S. population (U.S. Census Bureau, 2021) and 68% of the U.S. workforce in 2021 (U.S. Bureau of Labor Statistics, 2021b). Yet, men represented only 13% of the professional nursing workforce in 2021 (U.S. Bureau of Labor Statistics, 2021a). This figure was only a marginal increase since 2005 when men comprised only 9.7% of the nursing workforce (American Association of Colleges of Nursing [AACN], 2006). Despite efforts to attract more men to nursing (Clow et al., 2015; Trossman, 2003) and a sociocultural climate shifting toward increased diversity and gender equality (Carabez et al., 2015), little progress has been made toward increasing men's presence in nursing.

Reasons for persistently low numbers of men in nursing remains poorly understood. However, men in nursing have consistently reported the same barriers and deterrents for two decades (Abushaikha et al., 2014; Blackley et al., 2019; Buthelezi et al., 2015; Carnevale & Priode, 2018; Christensen & Knight, 2014; Clow et al., 2015; Codier & MacNaughton, 2012; Colby, 2012; Cudé & Winfrey, 2007; Gedzyk-Nieman & Svoboda, 2019; Harding, 2007; Jamieson et al., 2019; Jordal & Heggen, 2015; Kellett et al., 2014; MacWilliams et al., 2013; McLaughlin et al., 2010; O'Connor, 2015; Powers et al., 2018; Sedgwick & Kellett, 2015; Simpson, 2011; Smith et al., 2020; Yi & Keogh, 2016; Zamanzadeh et al., 2013, 2013). Role expectations based on gender stereotypes that define masculinity seem to have created social and professional environments that do not favor men in nursing (Smith et al., 2020). Recently, men reported mixed perceptions of how they had been received in the nursing workplace (Smith et al., 2020). However, there was agreement among participants that persistent gender stereotypes was a professional barrier. Moreover, participants reported feeling unwanted and perceived as unfit for nursing (Smith et al., 2020). Their experiences are concerning and consistent with views of men espoused by Florence Nightingale (Dossey et al., 2005; Dunphy,

2015; Summers, 1988). However, despite indications that men continue to be perceived as unfit for nursing, studies have failed to measure perceptions of men's fitness for nursing quantitatively.

Increasing diversity and inclusion in nursing has been prioritized by the National Institute of Nursing Research, Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing report, and the National Academy of Medicine's Committee on the Future of Nursing 2020-2030 However, little change is likely if perceptions toward men are not investigated. There are no psychometric scales available to measure perceptions specifically related to men's fitness for nursing. The aim of this study was to develop a psychometric scale to measure this construct of interest. Scale development will be discussed in this chapter. Additionally, this dissertation is formatted in accordance with a two-manuscript option. This chapter is the first of the two manuscripts. The Journal of Nursing Measurement will be considered for manuscript submission.

Background

Florence Nightingale, the founder of modern professional nursing, believed men were unfit for nursing (Dossey et al., 2005; Dunphy, 2015; Summers, 1988). Nightingale believed "natural divisions of labor" (Dunphy, 2015, p. 48) allowed men to practice medicine but excluded men from nursing. Natural division of labor was a concept that framed men's and women's roles as being specialized and determined by biological, social and ecological structural differences. This abject view entailed expectations that men would practice medicine, and women were best suited for nursing. Nightingale's vision for nursing has had lasting negative effects for men and is manifested in sociocultural narratives that reinforce the belief that men are ill-suited for nursing (Christensen & Knight, 2014; Codier & MacNaughton, 2012; Diño, 2021; O'Lynn & Tranbarger, 2007; Sasa, 2019; Smith et al., 2020).

Gender-based role expectations are believed to influence perceptions of men in nursing, which have led to negative experiences for men, deterred men from nursing (Smith et al., 2020),

and contributed to persistently low numbers of men in the nursing workforce in the U.S. and internationally (Boniol et al., 2019). Men's experiences have been described in terms of being socially disconnected, unwanted, and being perceived as not fit for "women's work" (Blackley et al., 2019; Gedzyk-Nieman & Svoboda, 2019; Jamieson et al., 2019). Therefore, it is not surprising that nursing is one of the most gender segregated job markets in the Western world (Jordal & Heggen, 2015).

Barriers for men nursing students are unique and have included inhospitable and discriminatory academic environments (Jordal & Heggen, 2015; Kouta & Kaite, 2011). Carnevale and Priode (2018) found undergraduate nursing students experienced bias from both nursing faculty and clinical instructors. In their study, students reported feeling excluded from the "girls' club" (p. 287). Most recently, male students reported that nursing faculty explicitly verbalized their dislike of men students (Kane et al., 2021). In the same study, men students reported being perceived as unfit and incapable of being nurses (Kane et al., 2021). Women students also perceive men as unfit for nursing, basing their perceptions of men as unfit for nursing on the belief that nursing is a caring profession and women are "innately more caring and empathetic than men" (Myklebust, 2020, pp. 8–9). The views expressed by these women are consistent with Nightingale's view of a nursing profession that excludes men.

Male students have reported being singled out by faculty in the classroom and clinical settings because of being male (Christensen & Knight, 2014; Powers et al., 2018; Yang et al., 2017). . In almost all instances, men believed they were singled out because they were assumed to be unfit or incapable of nursing. This phenomenon was most prevalent in women's healthcare and in clinical areas involving female patients. These clinical areas are historically inhospitable environments for men students and make them feel uncomfortable (Christensen & Knight, 2014; Powers et al., 2018; Yang et al., 2017). In a survey conducted by the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN), 42% of male nursing students

experienced discriminatory treatment from both nursing faculty in the classroom and licensed nursing staff in clinical environments (Kouta & Kaite, 2011).

Barriers for men in the clinical workplace are not dissimilar from students' experiences. Men have reported gender normative stereotyping (Kellett et al., 2014; Stanley et al., 2016) and overt bias in the workplace (MacWilliams et al., 2013) to be deterrents. Studies have found that men feel excluded by women in the workplace (Blackley et al., 2019; Gedzyk-Nieman & Svoboda, 2019; Smith et al., 2020). Specifically, Smith et al. (2020) found men believed they were perceived as unsuitable for nursing and unwanted by their women colleagues. Workplace barriers have left men feeling isolated and marginalized (Gedzyk-Nieman & Svoboda, 2019; MacWilliams et al., 2013; Smith et al., 2020). Socialization problems, role strain, and isolation and marginalization are barriers that precipitate men leaving nursing (Hollup, 2014). These findings may suggest women perceive men differently than they do women in nursing, which was noted by Clow et al. (2015).

One facet of these phenomena worth noting is the inherent differences in men's and women's caring. A 2012 study found men experienced inequities in the workplace that were specifically related to being men and are consistent with men being perceived as unfit for nursing (Colby, 2012). The same study noted that caring from men is viewed as taboo (Colby, 2012). These findings may represent inherent differences between men's and women's caring reported in seminal studies (Gilloran, 1995; Milligan, 2001; Watson & Lea, 1998). Furthermore, Colby's (2012) discovery may reflect O'Lynn's and Tranbargers (2007) claim that masculine caring occurs within a social context that undervalues men's contributions to the nursing caring environment because caring from men may not be consistent with feminine-based models of caring. These incongruencies in perspectives about caring may partially explain men experiencing role strain due to the widespread belief that men are incapable of caring or filling nurturing roles associated with nursing (Hollup, 2014; Kane et al., 2021; Myklebust, 2020; Smith et al., 2020).

A concerning aspect of the views discussed above is the vilification of men based on assumptions that men are intrinsically unfit for nursing. A 2015 study compared perceptions of men and women nurses, and found men were rated significantly more “deviant” than women or “manly” nurses (Clow et al., 2015). Men in nursing have also been stigmatized as sexually deviant or sexual predators (Sasa, 2019). Stanley et al. (2016) found that men are perceived as not suited for nursing and less caring and compassionate than women. Multiple authors agree that caring may look different when it is provided by men (Jordal & Heggen, 2015; Kellett et al., 2014; Limiñana-Gras et al., 2013; Zhang et al., 2020). However, other studies have found that men appreciate the caring concept and are at least equally capable of providing care in a way that represents the essence of nursing (Colby, 2012; O’Connor, 2015; Zhang & Liu, 2016). Perceptions that men in nursing are deviant or less capable than women are unfounded, stigmatizing, and constrains efforts toward increased diversity and inclusion in nursing.

Significance

The significance of this study is discovering perceptions of men’s fitness for nursing to improve understanding of men’s experiences in the workplace and classroom and to guide change aimed at improving diversity and inclusivity in the nursing workforce. In 2010, the Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing report (Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing & Institute of Medicine, 2011) called for significant changes in the nursing workforce to sustain the future of the profession. This report petitioned for increased focus on diversity in nursing. The report discussed gender representation in the nursing workforce as a specific area of change needed in nursing. Specifically, the report cited increased diversity in the nursing workforce, including gender, as a pathway toward *improving quality of patient care.* Increasing diversity in nursing is expected be a pathway toward improving the nursing shortage as well. The National Academy of Medicine’s Committee on the Future of Nursing 2020-2030 (2021) recent report discussed strategies aimed at improving nursing in the future. Their new statement remains

aimed at increasing diversity in the nursing workforce by reducing barriers and improving system facilitators to achieving a workforce that is diverse in gender, race, and ethnicity, across all levels of nursing education as a priority (Committee on the Future of Nursing 2020–2030 et al., 2021).

The aging post-World War II baby boomer generation highlights the nursing shortage. Baby boomers are expected to reach age 70 and older by 2030, which has been predicted to increase nursing demand (Buerhaus et al., 2017). As a result of the aging baby boomer generation, one million nurses are expected to retire by 2030, worsening the shortage while simultaneously decreasing the number of students accepted into nursing programs due to insufficient number of faculty (Buerhaus et al., 2017). Declining numbers of nursing faculty coupled with the increasing nursing shortage is projected to have a substantively negative impact on healthcare. An ongoing COVID-19 pandemic has worsened the existing nursing shortage and cast a spotlight on the implications of pandemic conditions and nursing shortages (Lasater et al., 2020). For example, The International Council of Nurses (ICN, 2021) reported that COVID-19 has been responsible for more than 2,200 nurse deaths, increased patient-care workloads, psychological distress, and abuse by anti-vaccine protestors. These phenomena have been coined the “COVID-19 effect” and categorized as a “complex form of trauma” (ICN, 2021).

Men are an untapped resource in professional nursing (Daley, 2017; Nurseplus, 2021). Increasing numbers of men in nursing may provide a pathway to improve the healthcare environment, conditions resulting from the rapid exodus of nurses from the profession, and the increasing workloads. However, the rate at which men enter nursing has been significantly outpaced by the rate women have entered traditionally male dominated professions such as medicine (American Mobile Nurses [AMN] Healthcare, 2015; Association of American Medical Colleges [AAMC], 2012). Additionally, men nursing students have a higher attrition rate

compared to women (Jordal & Heggen, 2015). and post licensure men in nursing may be driven to leave the profession altogether (Hollup, 2014).

Commonly used caring inventories have failed to account for differences between men and women's caring. Additionally, non-random sampling and small percentages of men participants may have biased parameter estimates when testing psychometric properties. Other scales have not tested structures across genders, work groups (e.g., clinicians versus faculty) or conducted multilevel analyses. Men represent a minority across all levels. Therefore, factor structures may not hold for men in nursing when using other caring measures. Additionally, an updated analysis of both patients and nurses' perspectives about care is warranted to reflect the evolution of nursing practice and patients' needs with respect to nursing care in today's healthcare environment.

A better understanding of men's experiences is needed. Men have indicated that women in nursing continue to view men in accordance with the Nightingale paradigm that suggests men are unfit for professional nursing. However, no studies exist that have investigated perceptions of men in nursing and there are no scales to measure these perceptions. This study was aimed at developing a psychometric scale to quantitatively measure perceptions of men's fitness for nursing.

Aims

The primary aim of this study was to develop a scale to measure perceptions of men's fitness for professional nursing.

Theoretical Frameworks

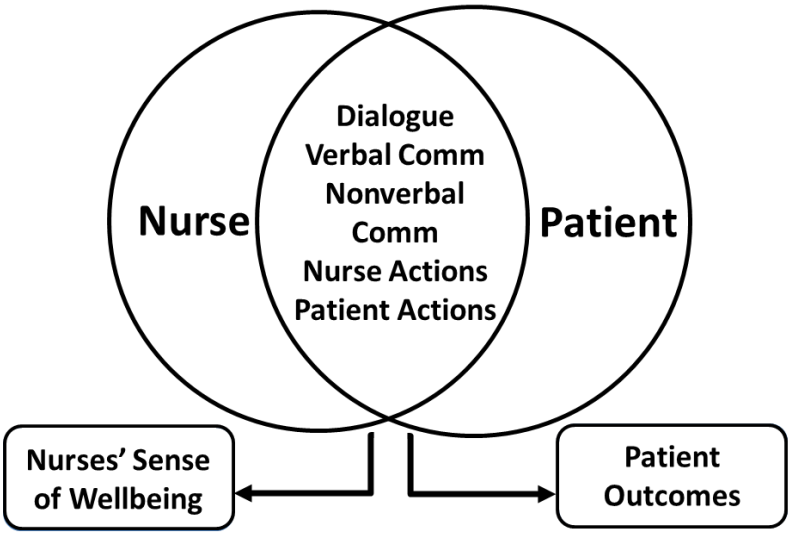
The theoretical framework that guided assumptions and directional hypotheses related to this field of inquiry is Eagly and Wood's (2012) social role theory (SRT). However, no psychometric scales exist to measure perceptions of men's fitness for nursing. Therefore, this study was aimed at developing a psychometric scale to measure these perceptions. Scheel et al.'s (2008) interactional nursing practice theory was used to guide scale development.

Interactional Nursing Practice Theory

The theoretical framework that guided the literature review that supported scale development was Scheel et al.'s (2008) interactional nursing practice theory. The goal of this literature search was to identify requisite characteristics of nursing practice that indicate professional fitness from nurses' and patients' perspectives. Therefore, the interactional nursing practice theory was a well-suited framework to guide the literature search. Interactional nursing practice theory asserts that interactions occurring between nurse and patient are dynamic and reciprocal and involve verbal and nonverbal communication along with actions within clinical practice environments. Interactional nursing practice theory frames the nurse-patient power dynamic as one that is balanced (Scheel et al., 2008). Nurses and patients interact in a mutually respectful manner and contribute equally in the relationship. According to interactional nursing practice theory, nurse-patient relationships involve dynamic exchanges of thoughts, intentions, and purposeful actions. A nurses' sense of well-being is substantively influenced by the interaction as are patients' outcomes. A conceptual model depicting interactional nursing practice theory is shown in Figure 5.

Figure 5

Conceptual Model, Interactional Nursing Practice Theory



Institutional Review Board

Institutional review board (IRB, see Appendix A) approval was obtained from East Carolina University.

Scale Development

The Fitness in Nursing Scale - Men (FiNS-M©) was developed in accordance with recommendations from Devellis and Thorpe (2022) and Furr (2015). This scale is intended for a population of nurses in modern clinical and academic environments. First, the latent construct of interest was established and clearly defined, and a guiding theoretical framework was identified to aid in construct clarification. Second, a literature search was conducted to appraise the literature for the availability of studies sufficient to support generating an item pool indicating nursing fitness from nurses' and patients' perspectives identified in the literature. The literature was appraised and determined to be sufficient for supporting scale development. The rationale for using existing literature to support scale development was based on the abundance of available literature identifying characteristics consistent with nursing fitness. Third, multidimensional latent factors and an initial item pool were generated consistent with findings in the literature. Fourth, a 7-point Likert scale was selected as the scale's measurement format. Finally, the initial item pool was reviewed by experts who provided feedback. Feedback was discussed with a nursing scientist (C. Horne) with expertise in the subject area and a psychometrician (M. Bowler). Lastly, the FiNS-M© scale was revised based on feedback provided from expert reviewers and discussion with the nursing scientist and psychometrician.

Literature Search

The literature search process was iterative and began by the PI discussing the study with the library liaison for the College of Nursing at East Carolina University and two nurse scientists (C. Horne and H. Wei) with expertise in nursing and caring theory, workforce development, and men's issues in nursing. Study aims, concepts, and methods were discussed on multiple occasions with members of the team. The literature search process began after

establishing consensus agreement that the study's aims, concepts, and methods were well defined.

A preliminary literature search was conducted by the PI to generate a pool of test articles from which to refine concepts and search terms for subsequent searches. Databases included in the preliminary search were selected based on relevancy to the study aim and concepts being explored. Five electronic bibliographic databases were searched and included CINAHL, Medline, PsychINFO, and Pubmed. MeSH terms and subject headings were consistent and available for key search words across all databases. Titles and abstracts were searched for key terms including nurses' characteristics, emotional intelligence, personality traits, and traits. Minimal variation in search terms was required to obtain comprehensive search results and identify exemplary source articles. The preliminary literature search was conducted in August 2020 and included primary sourced empirical peer reviewed studies published within 40 years, with full text availability, printed in the English language, using human participants. Twelve articles (Baldacchino & Galea, 2012; Başoğul et al., 2019; Giménez-Espert & Prado-Gascó, 2017; Mahoney et al., 2020; Niederriter et al., 2017; Takase et al., 2018; Wan et al., 2019; Wei et al., 2017, 2018, 2019; Wei & Watson, 2019; Yazdanian et al., 2016) were identified as relevant test articles. Study concepts, aims, test articles, and search terms and strategy were discussed between the PI, library liaison and both nurse scientists. Discussion facilitated refining subsequent iterations of the literature search.

After refining the search strategy, a second search was conducted to appraise the literature for the availability of studies. Databases included in the search were relevant to the study aims and concepts being explored. Five electronic bibliographic databases were searched and included CINAHL, PsychINFO, ProQuest, Pubmed, and Scopus. MeSH terms and subject headings were consistent and available for key search words across all databases. Titles and abstracts were searched for key terms including nurses' characteristics, qualities, and traits. Minimal variation in search terms was required to obtain comprehensive search results. The

second literature search was conducted in September 2020. Eligibility criteria included primary sourced empirical peer reviewed studies. The search yielded a total of 160,573 articles. The search was updated to limit results to 20 years and the ProQuest database was limited to peer-reviewed and scholarly journals. After these filters were applied, results across all databases totaled 27,757 articles. Results included 8,120 duplicates. After accounting for duplicates, 19,637 articles remained. These results were discussed between the PI, library liaison, and two nurse scientists. Subsequent discussion facilitated further refinement of the search strategy.

After discussing the second search, the PI, library liaison, and two nurse scientists concluded that ProQuest did not contribute substantive or meaningful results to the search. The library liaison recommended removing ProQuest from the search. The PI and two nurse scientists agreed to remove ProQuest from the search. Following this discussion, a third iteration of the literature search was conducted in October 2020. Databases included in the search were CINAHL, PsychINFO, Pubmed, and Scopus. MeSH terms and subject headings remained consistent and available for key search words across all databases. The search remained limited to 20 years. Titles and abstracts were previously searched for key terms including nurses' characteristics, qualities, and traits. Qualities was removed from the third search and variations of nurses' attributes and characteristics were instead used. Search terms required minimal variation to obtain comprehensive search results. Results across all databases totaled 26,028 articles. The results of the third search were discussed between the PI, library liaison, and two nurse scientists.

Following the third search, the PI, library liaison, and two nurse scientists discussed study aims and concepts extensively to generate ideas related to refining the search. A decision was reached to include the Boolean phrase "AND caring" in the search. A fourth iteration of the literature search was conducted in October 2020. Databases included in the search were unchanged and included CINAHL, PsychINFO, Pubmed, and Scopus. MeSH terms and subject headings remained consistent and available for key search words across all databases. Titles

and abstracts were searched for key terms including nurses' caring, attributes, and characteristics. Search terms required minimal variation to obtain comprehensive search results. Search results were limited to 20 years. Results across all databases totaled 2,065 articles. After deduplication, 966 articles remained for screening.

The PI and one nurse scientist (C. Horne) used Covidence systematic review software (Veritas Health Innovation, 2021) to screen 966 articles' titles and abstracts for inclusion in full text review. The PI and nurse scientist were blinded to each of the other's screening decisions. Articles that received two yes votes were automatically advanced to full text screening review. Disagreements were decided by a third-party nurse scientist (H. Wei) who was blinded to the initial screenings. The PI and nurse scientist C. Horne agreed on 798 articles during the preliminary screening. Of the 798 agreements, 58 were in favor of advancing to full text review. There were 168 disagreements, which were arbitrated by H. Wei. Of the 168 disagreements, 10 were advanced to full text review. As shown in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses flowchart (PRISMA, Page et al., 2021) (see Appendix B), a total of 68 articles were advanced to full text review.

Study Selection

Inclusion criteria included studies aimed at identifying nursing characteristics associated with expert nursing practice or nursing fitness as defined in this study or discovering characteristics of nurses attributed to patient outcomes. Studies' sample demographics were restricted to registered and advanced practice nurses, patients, and parents of pediatric patients. Studies were excluded from the review if they were not available in full-text, English, or peer reviewed. Studies aimed at measuring personality traits were excluded. Sixty-eight studies underwent full text review. Of those 68 studies, 22 studies met inclusion criteria and were used for scale development. Findings from the literature appraisal suggested the availability of literature was sufficient to support scale development. Six additional primary sources related to characteristics of men in nursing or men's unique contributions to nursing were identified during

full text article review and book review and were included in scale development. In total, 28 primary sourced publications were used to derive requisite characteristics consistent with nursing fitness for men.

Latent Factors

Studies were analyzed thematically. Three latent factors were identified during the analysis and included knowledge, practice skills, and interpersonal relations. Knowledge is a multidimensional factor that indicated men's knowledge related to nursing practice and modern clinical environments. The knowledge dimension includes learning across nurses' careers to facilitate maintaining up-to-date evidence-based practice standards. Skills is a multidimensional factor that represents men's performance related to nursing interventions and practice skills. Interpersonal relations is a multidimensional factor that reflects men's professional relationships with patients and/or families of patients.

Item Development

Item development was guided by Babbie (2010), Bernard (2000), Choemprayong and Wildemuth (2009), Devellis and Thorpe (2022), Furr (2015), and Spector (1992). The following recommendations were implemented:

1. Clearly define the construct of interest and articulate the context in which it will be used (Devellis & Thorpe, 2022; Furr, 2015).
2. Examine existing instruments related to the construct of interest (Choemprayong & Wildemuth, 2009; Spector, 1992).
3. Use items from several existing measures to use as a starting point for generating an initial item pool (Spector, 1992). If no instruments measuring the construct of interest exist, attempt to identify instruments related to the construct of interest and use relevant items in the initial item pool (Choemprayong & Wildemuth, 2009).

4. Consider deriving items from instruments related to the construct of interest (Choemprayong & Wildemuth, 2009).
5. If no instruments exist measuring or related to the construct of interest, the scale developer can generate items by carefully considering creative ways to query the construct of interest (Devellis & Thorpe, 2022).
6. Use existing literature related to the research question and construct of interest to generate items (Bernard, 2000).
7. Items should be phrased parsimoniously (i.e., no double-barreled items) (Bernard, 2000; Devellis & Thorpe, 2022; Spector, 1992).
8. Commonalities among items should reflect the same underlying latent variable and not merely a category (Devellis & Thorpe, 2022).
9. The item pool should be exhaustive and reflect the construct of interest as defined by the scale developer (Choemprayong & Wildemuth, 2009; Devellis & Thorpe, 2022).
10. Avoid exceptionally or unnecessarily lengthy wording when generating items (Devellis & Thorpe, 2022; Furr, 2015).
11. Items should be short and simple (Bernard, 2000; Devellis & Thorpe, 2022).
12. The reading level of the items should reflect the reading level of the population in which the scale will be used (Devellis & Thorpe, 2022; Spector, 1992).
13. Do not use colloquialisms, culturally-based expressions, and jargon (Spector, 1992).
14. Items should mirror the specificity of the construct but should not be overly specific or general with respect to the construct of interest (Babbie, 2010; Devellis & Thorpe, 2022).
15. Consider including validation items to address undesirable response tendencies (Devellis & Thorpe, 2022; Furr, 2015).
16. Using an even number of positively and negatively worded items are recommended by some authors (Bernard, 2000; Spector, 1992) to avoid acquiescence bias.

However, Devellis & Thorpe (2022) noted that repeatedly reversing item polarity may confuse participants and lead to greater problems that benefits.

17. According to Devellis & Thorpe (2022) the number of items generated should be greater than is planned to include in the final scale. This method provides insurance against poor fitting models by allowing the developer more options when choosing which items to include in the final scale (Devellis & Thorpe, 2022).
18. Experts in the field of inquiry should be consulted and feedback used to guide scale development (Choemprayong & Wildemuth, 2009; Devellis & Thorpe, 2022)

The initial item pool (see Appendix D) was generated based on findings in the literature (see Appendix C). The topic of categorical versus continuous scales of measurement has been widely debated. A response scale amenable to interval measurement was desired for this study. First, interpreting parameter estimates of categorical variables using regression-based procedures is difficult (Furr, 2015). Secondly, wider ranges of scale responses facilitate finer gradations and thus increase the potential to discover subtler variances across samples. The cost of more response options is increased potential for random error due to participants' interpretations of response subtleties. This possibility was thought to be less problematic in developing the FiNS-M© scale since the planned analysis is a confirmatory factor analysis, which models error separately. Additionally, Lubke and Muthén (2004) noted that parameter estimates are unbiased with Likert scale data when distribution assumptions were met. Similarly, Glass et al. (1972) discovered that analyses of variance can yield accurate p-values under appropriate conditions. Another controversial topic is scale midpoints, or neutral response scale options. Furr (2015) noted that including a neutral option may be an "easy way out" (p.19). However, any negative effect associated with this practice is likely to be offset by the potential benefits associated with including a neutral scale response. Specifically, data from participants who choose neutral responses as easy ways out is unlikely to skew data when samples are sufficiently large. Furthermore, including a neutral response option improves psychometric

quality (O'Muircheartaigh et al., 2000) by increasing accuracy of scale scores since participants are not forced to select a non-representative response (Furr, 2015). Therefore, a seven-point Likert scale with a midpoint (strongly disagree = 1, disagree = 2, somewhat disagree = 3, neither agree nor disagree = 4, somewhat agree = 5, agree = 6, and strongly agree = 7) was determined to be the best scale of measurement option for the FiNS-M©.

Content Validity

Content validity was assessed in accordance with guidelines recommended by Devellis and Thorpe (2022). First, Devellis and Thorpe noted that face validity and content are often confused for being the same assessment. Devellis and Thorpe noted the inherently flawed assumptions that underlie evaluating face validity and suggested that whether or not a scale's face validity is evident has "little or nothing to do with validity" (p. 89). Content validity of the FiNS-M© scale was established following Devellis and Thorpe's method which included having multiple content experts review the item pool and subsequent scale revisions. This process is elaborated below.

Determination of Content Validity by Internal Review. The process of determining the scale's content validity began by randomizing the initial item pool to yield the first iteration of the 39-item FiNS-M© scale (see Appendix E). Devellis and Thorpe (2022) recommended the scale be reviewed by persons knowledgeable in the content area. Therefore, the scale was reviewed by three nurse scientists (L. Bolin, C. Horne, and M. Hand) and a psychometrician (M. Bowler). All internal reviewers were members of the study team and affiliated with East Carolina University. Study team members were familiar with details of study including background, significance, purpose, aims, conceptual and operational definitions of study concepts prior to review. The PI provided internal reviewers with the first iteration of the 39-item FiNS-M© scale, which included participant instructions, item response scale, construct of interest, and latent factors with definitions and the items upon which each factor loaded. Written recommendations

with explanations for scale revisions were provided to the PI and discussed between the PI and reviewers.

As shown in Table 3, scale revisions consisted of transforming linking verbs to action verbs for items 3, 5, 8, 9, 10, 13, 19, 20, 21, 22, 26, 27, 29, 30, 34, and 38. Revisions necessitated amending items' phrasings to insure meaning, clarity, and coherence. The revised FiNS-M© scale is shown in Appendix F.

Table 3

Item Revisions Based on Internal Reviewer Feedback and Discussion

Version	Item	Item #
Initial	are emotionally present with patients.	# 3
Revised	display emotional presence with patients.	
Initial	are knowledgeable about fundamental aspects of nursing practice	# 5
Revised	demonstrate proficiency in fundamental aspects of nursing practice.	
Initial	are effective leaders	# 8
Revised	exhibit effective leadership.	
Initial	are empathetic toward patients.	# 9
Revised	show empathy toward patients.	
Initial	are good role models in nursing.	# 10
Revised	exemplify "good role model" in nursing.	
Initial	are honest with patients.	# 13
Revised	employ honesty during patient interactions.	
Initial	are competent in nursing practice.	# 19
Revised	practice nursing in a competent manner.	
Initial	are self-aware.	# 20
Revised	display self-awareness.	
Initial	are physically present with patients.	# 21
Revised	maintain physical presence with patients.	
Initial	are knowledgeable about operating technical equipment.	# 22

Revised	operate technical equipment proficiently.	
Initial Revised	are knowledgeable about patients' health problems address patients' health problems in a knowledgeable manner.	# 26
Initial Revised	are critical thinkers. think critically.	# 27
Initial Revised	are effective teachers. incorporate teaching during patient care.	# 29
Initial Revised	are nonjudgmental. care for patients in a nonjudgmental manner.	# 30
Initial Revised	are emotionally restrained. restrain themselves emotionally.	# 34
Initial Revised	are good problem solvers. solve problems well.	# 38

Determination of Content Validity by External Expert Review. Four external experts reviewed the FiNS-M© for content validity. Expert reviewers were doctoral prepared nurse scientists. Three of the nurse scientists hold faculty appointments and were affiliated with Chamberlain University College of Nursing and Public Health, University of Nevada at Las Vegas School of Nursing, and University of Louisville School of Nursing. One nurse scientist is retired from his faculty appointment and is now professor emeritus. Two nurse scientists are active members of the AAMN, one of which is an internationally recognized scholar and current co-chair of research for the AAMN and one of which held every major office including serving two presidential terms for AAMN. One nurse scientist edited the AAMN journal "Interaction" for six years and coauthored the first book on the history, challenges, and opportunities for men in nursing (O'Lynn & Tranbarger, 2007). Additionally, one nurse scientist reviewer is the only man to serve as President of the North Carolina Nurses Association and the first man to chair the North Carolina Board of Nursing. One nurse scientist reviewer has authored multiple peer reviewed articles on men in nursing, co-authored the first book on the history, challenges, and

opportunities for men in nursing (O'Lynn & Tranbarger, 2007), and more recently authored a book designed to guide men through their nursing careers (O'Lynn, 2013). One nurse scientist has co-authored multiple articles on the unique experiences of men in nursing and is a well published and accomplished scholar. One reviewer is an associate professor and psychometrician with extensive scholarship and knowledge related to survey development.

External reviewers were provided the initial scale, which included participant instructions, item response scale, construct of interest, and latent factors with definitions and the items upon which each factor loaded. Additionally, reviewers were provided details of study including background, significance, purpose, aims, conceptual and operational definitions of study concepts. The consensus was that the scale overall content had good content validity but required revisions.

Two reviewers were concerned that the latent factors may require collapsing into a single multidimensional factor. This concern was discussed among the study team. We recognized that there is overlap between factors. Specifically, knowledge informs skills, knowledge and skills inform interpersonal relations, and interpersonal relations may affect knowledge acquisition and skill improvement. However, the literature suggests there is differentiation between these factors. Thus, no revisions were made to the scale's factor structure. Additionally, reviewers offered feedback related to the factors that loaded on 10 of the scales' items. Feedback included suggestions for item revision or factor reassignments. Feedback and subsequent revisions for items 4, 5, 10, 13, 18, 19, 22, 27, 28, 30, 33, 35, 37, and 38 are shown in Table 4. As shown in Appendix G, revisions based on external reviewer feedback yielded the second iteration of the FiNS-M© scale.

Table 4

Item Feedback and Revisions Based on External Reviewers' Feedback

	Item	Factor Review Revision	Item #
Initial	Men in nursing perform invasive nursing interventions (e.g., nasogastric tube, foley catheter) in a caring manner.	IR	
Feedback	Original item denotes practice skill. Rephrase if "caring manner" is what's most important. Example: "Employ a caring manner when performing invasive nursing interventions."	PS or rephrase	# 4
Revision	Rephrased to "Men in nursing employ a caring manner when performing invasive nursing interventions."	IR	
Initial	Men in nursing demonstrate proficiency in fundamental aspects of nursing practice.	K	
Feedback	"Demonstrate proficiency" makes this a practice (e.g., applied) skill item rather than knowledge.	PS or rephrase	# 5
Revision	Rephrased to "Men in nursing are knowledgeable about nursing care."	K	
Item	Men in nursing exemplify a "good role model" in nursing.	PS	
Feedback	Could be an interpersonal relations or practice skill depending on one's definition of role model. Recommended rephrasing for clarity or change factor to interpersonal relations.	IR or rephrase	# 10
Revision	No changes made to item.	PS	
Item	Men in nursing employ honesty during patient interactions.	IR	
Feedback	Men in nursing use honesty when interacting with patients	IR	# 13
Revision	Verb employ changed to use for better clarity.	IR	
Item	Men in nursing develop meaningful relationships with patients.	IR	
Feedback	Men in nursing develop meaningful professional relationships with patients.	IR	# 18
Revision	Added "professional" to qualify type of relationship.	IR	

Item	Men in nursing practice nursing in a competent manner.	K	
Feedback	The verb “practice” makes this a practice skill.	PS or rephrase	# 19
Revision	Rephrased to “Men in nursing practice nursing with competence” and reassigned item to practice skill factor.	PS	
Item	Men in nursing operate technical equipment proficiently.	K	
Feedback	This is a practice skill - phrasing reflects a psychomotor task. Consider rephrasing for clarity or changing factor assignment.	PS or rephrase	# 22
Revision	Rephrased to “Men in nursing know how to operate technical equipment.”	K	
Item	Men in nursing think critically.	PS	
Feedback	This is a knowledge item since item reflects a cognitive activity.	K	# 27
Revision	Reassigned item to knowledge factor.	K	
Item	Men in nursing function autonomously.	K	
Feedback	This is a practice skill.	PS	# 28
Revision	Reassigned to practice skill factor.	PS	
Item	Men in nursing care for patients in a nonjudgmental manner.	PS	
Feedback	The item reflects interpersonal relations.	IR	# 30
Revision	Reassigned item to interpersonal relations factor.	IR	
Item	Men in nursing contribute well to team efforts (good team players).	PS	
Feedback	The item reflects interpersonal relations.	IR	# 33
Revision	Rephrased to “Men in nursing contribute well to team efforts (good team players)” and reassigned to interpersonal relations factor.	IR	
Item	Men in nursing are knowledgeable about healthcare research.	K	# 35

Feedback	Men in nursing are knowledgeable about health-related care research.	K	
Revision	Healthcare amended to health-related for precision.	K	
Item	Men in nursing promote healthy behaviors.	K	
Feedback	Reevaluate item's factor assignment and clarity of phrasing. Consider rephrasing to, "Encourage patients to adopt healthy behaviors."		# 37
Revision	Rephrased to "Encourage patients to adopt healthy behaviors."	K	
Item	Men in nursing solve problems well. (PS)	PS	
Feedback	This item is a knowledge item if it reflects critical thinking and clinical judgment.	K	# 38
Revision	Rephrased to "Men in nursing solve problems skillfully."	PS	

Lastly, there was concern that the stem, "men in nursing," may bias responses by implying that items apply to all men always. One reviewer suggested revising the stem to, "For the most part, men in nursing" or, "Men in nursing usually." Recommendations were discussed at length between the PI, M. Bowler and C. Horne, who concluded the 7-point Likert response scale addresses the potential for bias by providing alternate levels of agreement and therefore mitigates the concept of "all men always." Therefore, no changes were made to the stem.

Final Scale Revisions. Scale revisions for the FiNS-M© were iterative. The PI reviewed the second iteration of the scale (see Appendix G), which entailed revisions based on external reviewer feedback. The second iteration of the scale, which was based on external reviewers' feedback, was analyzed and compared against study aims, conceptual definitions, theory, and reviewers' feedback

Survey instructions were amended to reflect sensitivity toward gender inclusivity in accordance with American Psychological Association guidelines (American Psychological Association [APA], 2020). Specifically, the phrase "For this survey, men are defined as persons

who self-identify as men" was added to participant instructions. The instructional phrase "Please consider your work experience with men in nursing and indicate your level of agreement with the following statements" was changed to "Please consider your *professional* work experience with men in nursing and indicate your level of agreement with the following statements." This revision was aimed at qualifying "work experience."

Final item revisions were based on discussion between the PI, L. Bolin, M. Bowler, and C. Horne and were related to team discussion, literature, theory, and external reviewer feedback. Items 3, 6, 7, 9, 10, 12, 16, 25, 27, 28, 30, 33, 36, and 39 underwent revisions. Details of the revisions are shown in Table 5. Additionally, three validation items were added which instructed participants to select a specific response (e.g., "Please select 'strongly agree' for this item. This is a validity check"). Adding validation items was consistent with Devellis and Thorpe's (2022) and Furr's (2015) recommendations for methods of handling undesirable response tendencies. These revisions yielded the final version of the FiNS-M© scale (see Appendix H).

Table 5

Item Feedback and Final Revisions Based on External Reviewers' Feedback

Revision	Item	Item #
Item	Men in nursing display emotional presence with patients.	
Revision	Men in nursing make themselves emotionally available to patients.	# 3
Rationale	Phrasing amended for increased clarity and precision.	
Item	Men in nursing multi-task patient care.	
Revision	Men in nursing multi-task patient care competently.	# 6
Rationale	Phrasing amended to qualify the action.	
Item	Men in nursing stay up to date with evidence-based nursing practice.	# 7

Revision	Men in nursing stay current with evidence-based nursing practice.	
Rationale	Phrasing amended for increased clarity and precision.	
Item	Men in nursing show empathy toward patients.	
Revision	Removed item from scale.	# 9
Rationale	Empathy cannot be directly observed.	
Item	Men in nursing exemplify “good role model” in nursing.	
Revision	Removed item from scale.	# 10
Rationale	“Good role model” not well defined.	
Item	Men in nursing are knowledgeable about nursing care related to their specialty (e.g., ER, ICU, med-surg, cardiac, peds, etc.).	
Revision	Removed item from scale.	# 12
Rationale	Item is ambiguous not directly observable.	
Item	Men in nursing are emotionally distant with their patients.	
Revision	Removed item from scale.	# 16
Rationale	Emotional distance is not directly observable.	
Item	Men in nursing deliver nursing care compassionately.	
Revision	Men in nursing deliver nursing care with compassion.	# 25
Rationale	Phrasing amended for increased readability.	
Item	Think critically.	
Revision	Reassigned item to knowledge factor.	# 27
Rationale	Critical thinking was believed to reflect knowledge levels.	
Item	Men in nursing function autonomously.	
Revision	Reassigned item to practice skill factor.	# 28
Rationale	Action verb is consistent with practice skill.	

Item	Men in nursing care for patients in a nonjudgmental manner.	
Revision	Reassigned item to interpersonal relations factor.	# 30
Rationale	Qualifier “nonjudgmental manner” thought to reflect interpersonal relations.	
Item	Men in nursing contribute well to team efforts (good team players).	# 33
Revision	Reassigned item to interpersonal relations factor.	
Rationale	Interaction within a team thought to better reflect interpersonal relations.	
Item	Men in nursing meet patients’ emotional needs.	
Revision	Item removed from scale.	# 36
Rationale	Item is not directly observable.	
Item	Men in nursing avoid skin to skin physical touch when caring for patients.	
Revision	Item removed from scale.	# 39
Rationale	Item is ambiguous and not well defined.	

Demographic Metrics

A demographic questionnaire (see Appendix I) was created. Demographic data were selected based on relevance to the study of interest and planned data analyses.

Conclusion

Nursing was founded on the belief that men are not fit to be nurses. Studies indicate that these beliefs may persist socially and within the nursing profession. Men in nursing have indicated they feel unwanted and perceived as unfit for nursing. The purpose of this study was to quantitatively measure nurses’ perceptions of men’s fitness for nursing. However, no instrument exists for that purpose. Commonly used caring scales have failed to account for men’s unique strengths and factor structures for these scales have not been tested for measurement invariance across genders or work groups. Therefore, the aims of this study were

to develop and test a scale to measure perceptions of men's fitness for professional nursing. To accomplish this aim, a systematized review of the literature was conducted to discover characteristics of nurses that indicate professional fitness from both nurses' and patients' perspectives to reflect nursing practice in today's healthcare environment. Scale development was informed by the review and consistent with recommendations from Devellis and Thorpe (2022) and Furr (2015). Content validity was established by both internal and external content experts. Subsequently, the 33-item FiNS-M© scale was developed to quantitatively measure perceptions of men's fitness for nursing. Psychometric properties of this scale will be tested in a population of nurses.

Funding

This study was grant funded by Sigma Theta Tau, Beta Nu chapter. The funding agency had no role in study design, literature review, scale development, decision to publish, or preparation of this manuscript.

CHAPTER 5: PSYCHOMETRIC PROPERTIES

Introduction

Studies aimed at men in nursing have primarily been qualitative explorations of men's experiences. Despite the research conducted, little appears to have changed for men in nursing, which is reflected in men's underwhelming presence in nursing. Specifically, men constituted only 13% of the professional nursing workforce in 2021 (U.S. Bureau of Labor Statistics, 2021a). The abundance of available studies has reported similar barriers and deterrents for men in nursing for the last two decades (Abushaikha et al., 2014; Blackley et al., 2019; Buthelezi et al., 2015; Carnevale & Priode, 2018; Christensen & Knight, 2014; Clow et al., 2015; Codier & MacNaughton, 2012; Colby, 2012; Cudé & Winfrey, 2007; Gedzyk-Nieman & Svoboda, 2019; Harding, 2007; Jamieson et al., 2019; Jordal & Heggen, 2015; Kellett et al., 2014; MacWilliams et al., 2013; McLaughlin et al., 2010; O'Connor, 2015; Powers et al., 2018; Sedgwick & Kellett, 2015; Simpson, 2011; Smith et al., 2020; Yi & Keogh, 2016; Zamanzadeh et al., 2013, 2013). Men reported feeling unwanted, disconnected, and perceived as unfit for nursing (Blackley et al., 2019; Gedzyk-Nieman & Svoboda, 2019; Jamieson et al., 2019; Smith et al., 2020), which is concerning and warrants further exploration. However, studies have not quantitatively measured perceptions of men in nursing.

This study is novel in two ways. First, this study is novel by testing the psychometric properties of the newly developed FiNS-M© to measure perceptions of men's fitness for nursing. Secondly, this study is novel by quantitatively measuring those perceptions to inform understanding related to men's experiences in nursing and to improve efforts toward diversity and inclusivity in nursing academia and in the nursing workforce. Psychometric testing of the FiNS-M© will be discussed in this chapter. Additionally, this dissertation is formatted in accordance with a two-manuscript option. This chapter is the second of the two manuscripts. The Journal of Nursing Measurement will be considered for manuscript submission.

Background

The earliest recorded accounts of trained nurses were men who were most likely supervised by physicians in Ancient Greece during the Hippocratic period (O'Lynn, 2013; O'Lynn & Tranbarger, 2007). Most nurses were affiliated with religious or military orders during the earliest history of nursing. Numbers of nurses began to decline between the 16th and 19th centuries as a direct result of three social changes: (1) declining numbers of monasteries and increasing numbers of women's convents, (2) loss of discipline and quality among nurses working in secular hospitals, which lowered the status of and respect for nurses, and thus lowered nurses' pay, and (3) the Industrial Revolution which drew men to factory work that required heavy physical labor and extended stays away from home, both of which were incongruent with women's roles at that time (O'Lynn, 2013; O'Lynn & Tranbarger, 2007). Simultaneously, Florence Nightingale began to reform nursing. Nightingale excluded men from nursing based on the belief that men were unfit for the profession (Dossey et al., 2005; Dunphy, 2015; Summers, 1988).

Nightingale actively "fought to get men out of nursing" (Sullivan, 2002, p. 17) during her ascension in the 19th century. She believed there are "natural divisions of labor" (Dunphy, 2015, p. 48). These divisions of labor entail that men and women are individually better suited for roles that reflect differences in biological characteristics, which inform social structures. According to Nightingale, men are best suited for roles where increased strength and physical fitness, and less nurturing are required. Men in modern nursing continued to be stigmatized by Nightingale's abject view that men are unfit for nursing (Kane et al., 2021; Myklebust, 2020; Smith et al., 2020).

Nightingale espoused that "A good nurse must be a good woman" (Dossey et al., 2005, p. 276). Nightingale also wrote that men's "hard and horny hands" were unfit "to touch, bathe, and dress wounded limbs, however gentle their hearts may be" (Summers, 1988, p. 35). Nightingale's vision of nursing is reflected in her writings, which acknowledged that men's increased physical strength was helpful in lifting and moving patients and supplies, but

otherwise unambiguously declared that men are unfit to be nurses (O'Lynn & Tranbarger, 2007). Nightingale's reformation left an indelible impression that defines who is fit for the nursing profession, which is reflected by the persistently low numbers of men in nursing and men's experiences that have consistently included feeling unwanted, disconnected, and perceived as unfit for nursing during the last two decades.

Some authors have postulated that men's experiences in nursing may be complicated by the lens through which they are viewed. Specifically, men and women share similarities in the ways they approach caring, but there is also evidence of inherent differences in the way men and women care (Blackley et al., 2019; Colby, 2012; Evans, 2002, 2004; Gilloran, 1995, 1995; Harding et al., 2008; Hollup, 2014; Milligan, 2001, 2001; O'Lynn, 2013; O'Lynn & Tranbarger, 2007; O'Lynn & Krautscheid, 2011; Sundus & Younas, 2020; Thompson, 2002; Watson & Lea, 1997, 1998; Younas & Sundus, 2018a, 2018b; Zhang & Liu, 2016). Post Nightingale professional nursing is built on a caring model that aligns more closely with the way women care. O'Lynn and Tranbarger (2007) noted that masculine caring is undervalued specifically because men's ways of caring may be inconsistent with feminine models of caring. Thus, if differences in caring exist between men and women, it stands to reason men will be perceived as unfit for nursing as a result of being viewed through the default lens of the women's caring model.

Significance

The significance of this study is quantitatively measuring perceptions of men's fitness for nursing with a novel and psychometrically constructed tool. Measuring this phenomenon is expected to reframe discussions related to men's experiences in nursing by providing a foundation to guide recommendations for cultural awareness and change within the classroom and in the workplace to improve diversity and inclusivity. This study invited participants of all genders, sexes, and ethnicities to gain a better perspective about differences between

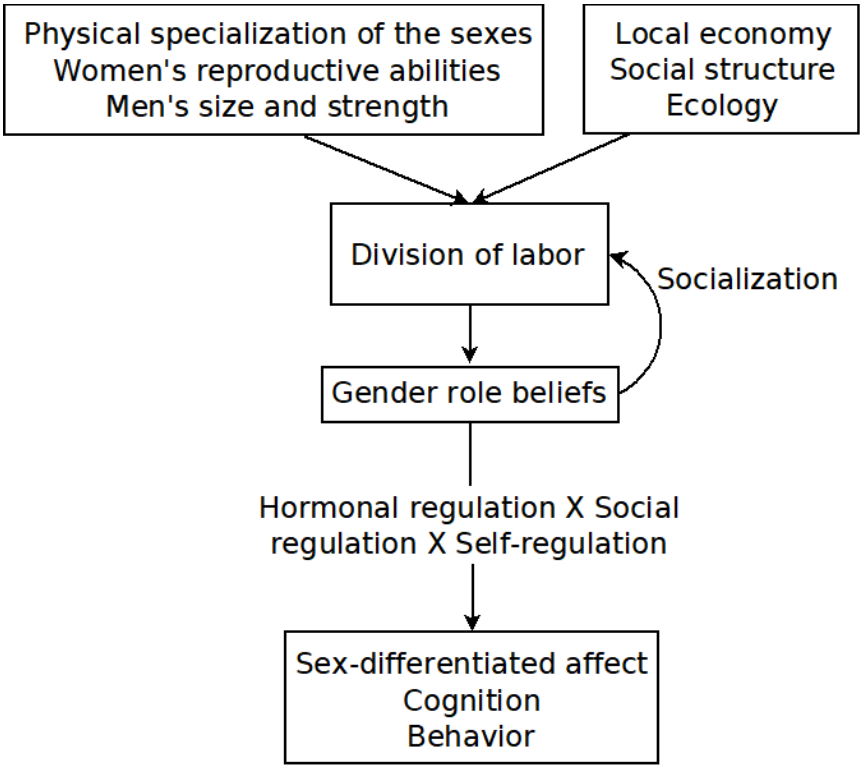
perceptions across groups. Understanding where differences lie is integral to improving nursing environments for all nurses.

Theoretical Frameworks

The theoretical framework that guided assumptions and directional hypotheses related to this field of inquiry is Eagly and Wood's (2012) social role theory (SRT). The SRT framework was constructed by Eagly and Wood in the 1980s. Social role theory was based on research in evolutionary psychology and sociology. The earliest version of SRT was premised on gendered divisions of labor that result in gendered stereotypes, which shape behavior through a person's awareness of a group or society's expectations. Social role theory was later revised to account for divisions of labor between women and men that arose from interactions between sociology and evolutionary biology. Specifically, revisions to the model accounted for the effects of hormonal regulation on social behavior and evolutionary origins of labor division between the sexes. Figure 6 illustrates the SRT model (Eagly & Wood, 2012). SRT predicts that characteristics associated with nursing fitness differ between men and women. Specifically, men and women are likely to portray characteristics that are consistent with socially imposed role expectations and biological differences that entail divisions of labor. This hypothesis is consistent with findings in the literature that postulate feminine and masculine caring models differ (Gilloran, 1995, 1995; Milligan, 2001; O'Lynn & Tranbarger, 2007; Watson & Lea, 1997).

Figure 6

Social Role Theory Model



Aims

The primary aim of this study was to test the psychometric properties of a newly developed Fitness in Nursing Scale for Men (FiNS-M©) to quantitatively measure perceptions of men's fitness for professional nursing. The secondary aim of this study was to test for differences in perceptions of men's fitness for nursing across groups of men and women participants.

METHODS

Design

This study employed a quantitative cross-sectional descriptive design to test the psychometric properties of the newly developed FiNS-M© scale. Psychometric property testing was conducted using confirmatory factor analysis (CFA).

Sample

Power analyses

Power analyses were conducted a priori in R (Version 4.1.3; R Core Team, 2022) (see Appendix J). Multiple estimates of minimum sample size were obtained. Estimates were based on a three-factor model ($\Psi = 1,\ \Psi cov = .3$), with each factor loading ($\lambda = .7$), on 10 indicators ($\theta = .51$). The first estimate of minimum required sample size was based on Satorra's and Saris' (1985) analytic method using the *semTools* package (Jorgensen, et al., 2021) to estimate power = .80 for parameter estimates by fixing three covariances to zero. Next, a Monte Carlo simulation-based power analysis was conducted with 1,000 replications using the *simsem* package (Pornprasertmanit, 2021) to estimate power = .80 for parameter estimates. Additionally, Little (2013) found that sampling error reaches asymptote between approximately 100 – 120 observations in single group models and that multiple group models require a minimum of approximately 50 observations per group. As shown in Table 6, power analyses indicated a minimum sample, *n* = 100 – 125, was sufficient for analyses. However, model complexity and Little's rule and recommendations for multiple group models were also considered when estimating the minimum sample size. Therefore, this study aimed to recruit a minimum sample, *N* = 250, to allow for multiple group analyses.

Table 6

A Priori Power Analyses

Method	*N*	Power Estimate
Satorra & Saris 1		
1	100	.714
2	120	.798
3	125	.816
4	150	.886
Monte Carlo Sim 1		
1	100	.822, .826, .805

2	105	.844, .835, .819
3	110	.851, .870, .840
4	120	.873, .893, .893

Inclusion Criteria

Participants were considered eligible to participate by self-reporting:

5. Being a registered nurse with an active license to practice in the United States
6. At least one year in academic or clinical nursing practice
7. Having professional work experience with men in nursing
8. Ability to read and understand English

Recruitment

Participants were recruited through multiple professional organizations, university listservs, and online nursing related social media groups using chain referral sampling (Arigo et al., 2018; Gelinas et al., 2017; Penrod et al., 2003). Chain referral sampling has grown in popularity in recent years because heavily trafficked social media platforms often provide researchers access to a larger and more diverse portion of their target population (Arigo et al., 2018; Gelinas et al., 2017; Penrod et al., 2003). Targeted professional organizations for participant recruitment included American Association for Men in Nursing (AAMN), American Nurses Association (ANA), Southern Nurses Research Society (SNRS), North Carolina Nurses Association (NCNA), National League for Nurses (NLN), and American Association of Colleges of Nursing (AACN). The ANA, NCNA, and AACN were unable to participate in recruitment efforts. Study recruitment information was distributed to deans and department chairs of nursing programs at multiple universities across the United States including the top 25 historically black colleges (*The Best Historically Black Colleges and Universities*, 2022). Study recruitment information was advertised on multiple nursing related social media groups including LinkedIn, Facebook, Twitter, and Reddit social media platforms. Permission to advertise this study was

obtained from social media page administrators. Participants were provided an opportunity to participate in one of 20 random drawings for a $25 visa gift card to compensate them for their time spent successfully completing the survey. Participation was optional.

Protection of Human Subjects

Study approval was obtained from East Carolina University's (ECU) institutional review board (IRB, see Appendix A) prior to conducting the study. Participants were provided details of the study, including a study description, study purpose, way anonymity was maintained, method of data protection, explanation that participation was voluntary and without obligation, statement informing participants that no potential risks or harms were expected from participating in this study, statement explaining how study results may be used, and contact information for the primary investigator (PI) and IRB. Data was stored on a secured university server.

Data Collection Procedure

Detailed study information in the form of a recruitment flyer and an email broadcast was sent to participating professional organizations that agreed to participate, including American Association for Men in Nursing (AAMN), Southern Nurses Research Society (SNRS), and National League for Nurses (NLN), for distribution to organization members. The same study information was provided to deans and graduate program chairs to be distributed via university listservs and shared with graduate students who hold active nursing licenses. A recruitment flyer was posted on multiple professional nursing groups social media platforms.

Instrument

Fitness in Nursing Scale – Men

A literature review was conducted prior to developing the FiNS-M© and was guided by Scheel's et al.'s (2008) interactional nursing practice theory. Men's fitness for nursing was described by a three-factor model with each factor loading on 11 indicators. Scale construction was consistent with guidelines from Devellis and Thorpe (2022) and Furr (2015) and included (a) articulating the construct to differentiate it from other constructs, and articulating the context

in which the scale will be used (e.g., intended population, demographic characteristics); (b) an iterative process that entailed selecting a response format and assembling an initial item pool, (c) collecting data from participants representing the target population; and (d) psychometric analysis to determine psychometric properties of the scale. Item development was in accordance with recommendations from Babbie (2010), Bernard (2000), Choemprayong and Wildemuth (2009), Devellis and Thorpe (2022), Furr (2015), and Spector (1992).

The initial FiNS-M© was a 39-item measure. Content validity was assessed in accordance with guidelines recommended by Devellis and Thorpe (2022). Scale development yielded a 33-item measure. The 33-item FiNS-M© was administered in this study. The FiNS-M© utilizes a 7-point Likert response scale (strongly disagree = 1, disagree = 2, somewhat disagree = 3, neither agree nor disagree = 4, somewhat agree = 5, agree = 6, and strongly agree = 7). Higher scores indicate higher levels of agreement, and lower scores indicate lower levels of agreement that men are fit for nursing. Latent variables and indicators are shown in Table 7.

Table 7

Latent Variables and Indicators

Factor	Indicator
Knowledge	1. Value professional knowledge
	2. Knowledgeable about nursing care
	3. Stay current with evidenced-based nursing practice
	4. Explain complex healthcare topics in an understandable way
	5. Provide clear explanations to patients
	6. Know how to operate technical equipment
	7. Address patients' health problems in a knowledgeable manner
	8. Think critically
	9. Pursue advanced educational degrees.
	10. Knowledgeable about health-related research
	11. Encourage patients to adopt healthy behaviors

Practice Skills	1. Perform IV insertions skillfully. 2. Multi-task patient care competently 3. Exhibit effective leadership 4. Reduce patients' suffering 5. Practice nursing with competence 6. Display self-awareness 7. Communicate effectively 8. Operate technical equipment skillfully 9. Function autonomously 10. Incorporate teaching during patient care 11. Solve problems skillfully
Interpersonal Relations	1. Make themselves emotionally available to patients 2. Employ a caring manner when performing invasive nursing interventions 3. Listen attentively to patients 4. Use honesty when interacting with patients 5. Develop meaningful professional relationships with patients 6. Maintain physical presence with patients 7. Deliver nursing care with compassion 8. Care for patients in a nonjudgmental manner 9. Include patients' families in communication 10. Contribute well to team efforts (good team players). 11. Restrain themselves emotionally

Participants were provided details of the study including a study description, study purpose, manner in which anonymity was maintained, method of data protection, explanation that participation was voluntary and without obligation, and a statement explaining study expectations and how study results may be used. An electronic informed consent statement was provided to participants, who were required to click, "Yes, I agree to participate" prior to beginning the survey. The second screen presented to participants contained information related to participation in 20 random drawings for $25 Visa gift cards for time spent completing

the survey. The second screen also provided contact information for the primary investigator and the University Medical Center Institutional Review Board and informed participants of the presence of validity check questions within the survey and the need to answer the questions correctly to be eligible to participate in the random drawings. Finally, participants were presented with a demographic questionnaire (see Appendix I) and study measures.

Data Screening

A total of *N* = 825 participants consented to participate. Prior to screening data, the PI completed the survey by reading each question carefully and selecting an appropriate response to estimate the time required to complete the survey with sincerity. The recorded time for the PI completing the survey was five minutes. Therefore, cases less than four minutes were inspected for other indications of insincerity. Data were also inspected for indications of insincere responses (e.g., all responses = “strongly agree”). Prior to beginning the survey, participants were informed that failure to correctly respond to validity check items would result in removing their data from the study. Surveys were removed for incorrect responses to two of three validity check items. Survey responses from outside the U. S. were identified by IP address and associated latitude/longitude coordinates recorded in Qualtrics© (2021) and were removed in accordance with eligibility criteria. Lastly, survey entries were removed if < 80% of survey items were completed. As shown in Table 8, 190 cases were removed prior to data analysis. The remaining sample, *N* = 635 was analyzed.

Table 8

Cases Removed, n = 190

Rationale	*n*
Failure to complete survey	95
Failure to complete 2 of 3 validity check items	15
Responses deemed insincere	5
Survey completed outside the U.S.	5

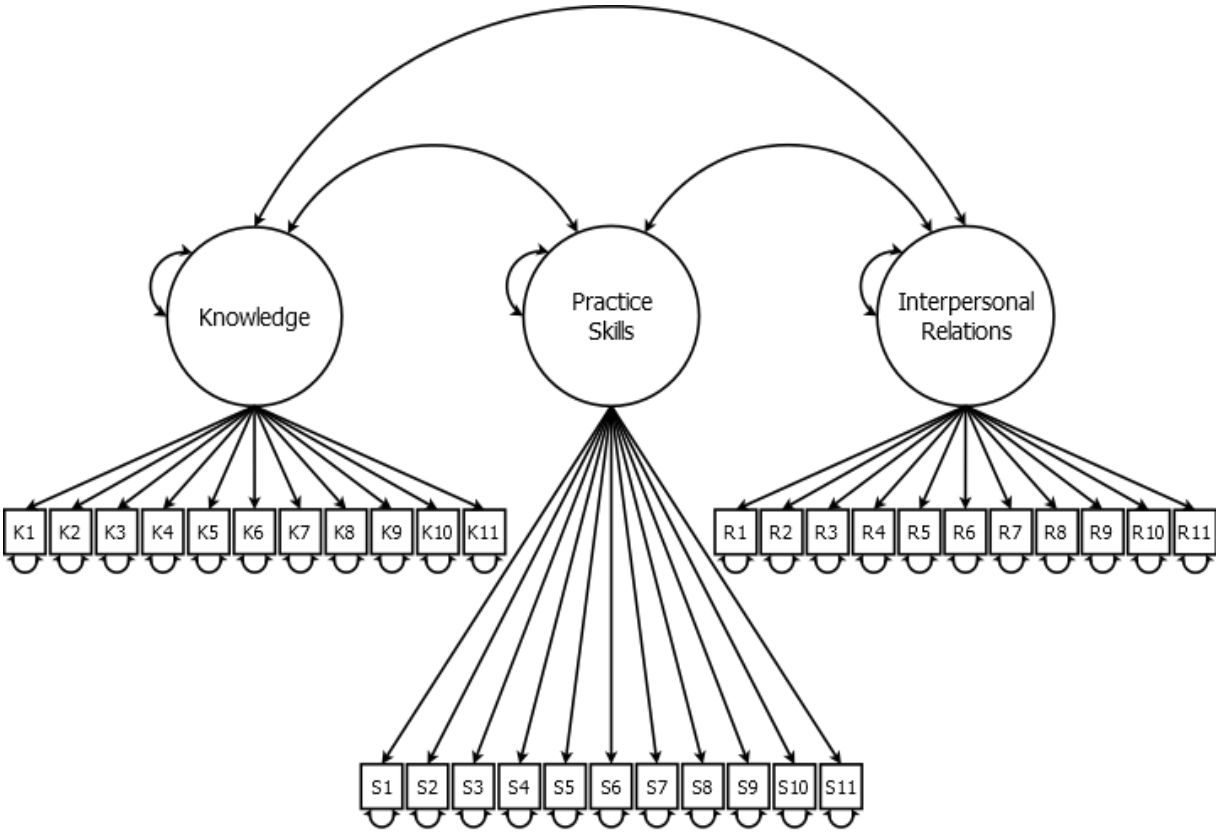
Survey completed in < 4 minutes	70

Data Analysis

R and the *lavaan* (Rosseel, 2012) package were used to estimate all CFA models in the analysis. No prior study data was available from which to estimate population parameters. Therefore, CFA was conducted in an exploratory framework. Latent variables were allowed to covary based on literature and theory that suggests relationships between the factors. Residual variances were presumed to be uncorrelated in the hypothesized three-factor model. The initial three-factor model path diagram was constructed using *Dia* (Larsson, 2007) and is shown in Figure 7.

Figure 7

Three-factor Model Path Diagram, Knowledge, Practice Skills, and Interpersonal Relations



Results

The sample was primarily White, held associate or baccalaureate degrees in nursing, were employed full-time as clinicians and from the Southeast. Complete demographic information is found in Table 9.

Table 9

Demographic Characteristics of Participants (N = 635)

	Women (*n* = 325) (51.1%)		Men (*n* = 310) (48.8%)		Total Sample (*n* = 635) (100.0%)	
	n	%	*n*	%	*n*	%
Years as a professional nurse						
Mean (SD)	15.8 (12.5)		12.7 (10.3)		14.3 (11.6)	
Min / Max	1 / 53.0		1 / 50		1 / 53.0	
Age						
Mean (SD)	41.1 (12.7)		39.6 (11.8)		40.4 (12.3)	
Min / Max	22 / 75		20 / 75		20 / 75	
Age (years)						
20-29	63	19.4	61	19.7	124	19.5
30-39	111	34.2	120	38.7	231	36.4
40-49	68	21.0	69	22.3	137	21.6
50-59	42	12.9	29	9.4	71	11.2
60-69	34	10.5	24	7.7	58	9.1
>70	6	1.8	6	1.9	12	1.9
Race						
Asian American	14	4.3	13	4.2	27	4.2
Black/African American	14	4.3	12	3.9	26	4.0
Native American/Alaskan Native	2	0.6	2	0.6	4	0.6
Pacific Islander	2	0.6	2	0.6	4	0.6
White/Caucasian	285	87.7	273	88.1	558	87.9

Other	8	2.5	8	2.6	16	2.5
Hispanic, Latina/o, Chicana/o heritage						
Yes	65	20	83	26.8	148	23.3
No	260	80	227	73.2	487	76.7
Highest education level						
Diploma	23	7.1	34	11.0	85	13.4
Associate degree	41	12.6	44	14.2	219	34.5
Baccalaureate degree	92	28.3	116	37.4	171	26.9
Master's degree	66	20.3	79	25.5	103	16.2
Doctoral degree	23	7.1	37	11.9	57	9.0
Work position						
Clinician	182	56.0	202	65.2	414	65.2
Faculty	89	27.4	54	17.4	146	23.0
Admin/Other	54	16.6	54	17.4	75	11.8
Employment status						
Full-time	269	82.8	286	92.2	555	87.4
Part-time	27	8.3	7	2.3	34	5.4
Per diem	25	7.7	15	4.8	40	6.3
Geographic region currently living						
New England	13	4.0	15	4.8	28	4.4
Mid-Atlantic	17	5.2	25	8.1	42	6.6
Southeast	230	70.8	170	54.8	400	63.0
Midwest	27	8.3	49	15.8	76	12.0
Rocky Mountain	11	3.4	10	3.2	21	3.3
Great Plains	6	1.8	1	0.3	7	1.1
Southwest	11	3.4	17	5.5	28	4.4
West Coast	8	2.5	20	6.5	28	4.4
Alaska or Hawaii	2	0.6	3	1.0	5	0.8

Model Fit

Determining goodness of model fit is widely debated. Recommended cutoff criteria for fit indices vary in the literature. Generally agreed upon guidelines exist for fit indices cutoff criteria but there is no unequivocal agreement. Brown (2015) suggested bearing in mind that fit indices are affected by multiple aspects of the analysis including sample size, model complexity, size of factor loadings, method of estimation, model misspecification, and normality and classification of data. Seminal literature (Hu et al., 1992; Hu & Bentler, 1995, 1998, 1999), which has been critiqued (Marsh et al., 2004), coupled with recommendations from other experts (Beauducel & Wittmann, 2005; Brown, 2015; Browne & Cudeck, 1992; Little, 2013; MacCallum et al., 1996) was considered when establishing cutoff criteria for fit indices for this analysis. Multiple indices were examined to ascertain information about model fit (absolute fit, fit relative to the null model, fit adjusting for model parsimony) and to compute a reliable evaluation of the model. Goodness of fit was evaluated by using absolute fit indices which indicate the degree to which the specified model is worse than the saturated model and relative fit indices which indicate the degree to which the specified model is a better fitting model compared to the null model. Specifically, the indices used in this study to estimate model fit included the root mean square error of approximation (RMSEA) and it's 90% confidence interval (90% CI), and the standardized root mean square residual (SRMR), comparative fit index (CFI), and the Tucker-Lewis-index (TLI). Acceptable model fit was defined by the following criteria: SRMR < .08, RMSEA ≤ .08, CFI ≥ .90, and TLI ≥ .90. Three data points were missing, which were handled by multiple imputation, m = 100. Leverage indices were examined using the *influence.SEM* package (Pastore & Altoe, 2018). No cases were determined to have a meaningful influence on the data.

As discussed previously, the initial model was a three-factor model. Maximum likelihood was used to estimate model parameters. The initial three-factor model fit the data poorly, χ^2 (492, N = 635) = 5265.16, *RMSEA* = .124. 90%*CI* [.121,.117], *SRMR* = .117, *CFI* = .643, *TLI* =

.617. Estimates of latent covariances, unstandardized residual variances, standard errors, and standardized factor loadings for the hypothesized three-factor model are shown in Table 10.

Table 10

Hypothesized Three-factor Model, Variances, Covariances, and Residual Error Variances

Factor Item	Unstandardized σ^2	*SE*	Standardized Loadings
Knowledge			
K1	.962	.055	.391
K2	.401	.024	.681
K3	.674	.039	.599
K4	.443	.026	.704
K5	.366	.022	.748
K6	.447	.027	.694
K7	1.764	.101	.505
K8	1.352	.078	.505
K9	1.775	.101	.458
K10	.574	.034	.633
K11	.597	.035	.640
Skills			
S1	.894	.051	.491
S2	.631	.037	.616
S3	.457	.027	.697
S4	.721	.042	.626
S5	.405	.024	.708
S6	.696	.041	.654
S7	.464	.027	.697
S8	.434	.026	.677
S9	1.483	.085	.516
S10	1.379	.080	.574
S11	.322	.020	.764
Interpersonal			

Relations			
R1	.951	.055	.542
R2	.545	.032	.643
R3	.545	.033	.708
R4	.475	.029	.689
R5	.436	.027	.724
R6	.542	.032	.670
R7	.390	.024	.762
R8	1.423	.083	.553
R9	1.408	.082	.569
R10	.390	.024	.743
R11	2.433	.137	-.034
Knowledge			
Covariances			
Skills	.997		
Interpersonal Relations	.949		
Skills			
Covariance			
Interpersonal Relations	.960		

Large latent covariances (Ψ_{21} = .997, Ψ_{31} = .949, Ψ_{32} = .960) were concerning and indicated better model fit by collapsing the model to fewer factors. Therefore, a nested model comparison was conducted by fitting a model with all latent covariances fixed to zero. A significant test of $\Delta\chi^2$ that is, $\Delta\chi^2(3) = 1808.9$, $p < .001$, $\chi^2_{crit} = 16.27$, indicated the parent model was a better fitting model. Modification indices, residual variances, latent and residual covariances, standard errors, and standardized factor loadings were examined iteratively, and models adjusted accordingly. Modification indices suggest allowing items K7 and K8 to covary. This modification was thought to be a theoretically sound modification and the model was

adjusted accordingly. However, allowing these items to covary resulted in a non-positive definite covariance matrix (Ψ_{21} = .1.003, Ψ_{31} = .949, Ψ_{32} = .958). Therefore, the supporting literature and theoretical underpinnings were reexamined. Subsequently, the three-factor model was collapsed into a one-factor model with all 33 items loading on a single factor. The single latent variable was hypothesized to reflect "men's nursing fitness."

Nineteen subsequent models were based on a one-factor solution (see Table 12). Models were adjusted in accordance with iterative examinations of modification indices, residual variances, latent and residual covariances, standard errors, and standardized factor loadings. Model revisions are explained in the following section. Models' fit indices are shown in Table 12.

One-factor Model Modifications

Model 1. The initial one-factor model fit the data poorly, χ^2 (495, *N* = 635) = 5314.05, *RMSEA* = .124. 90%*CI* [.121,.127], *SRMR* = .116, *CFI* = .640, *TLI* = .616. Modification indices and parameter estimates were examined, which suggested a better fitting model could be achieved by removing item R11 ("restrain themselves emotionally") from the model. The item was reexamined and determined to lack clarity. The unstandardized residual variance (σ^2 = 2.433), standardized factor loading (λ = -.034), and explained variance (R^2 = .001) supported removing the item from the model. Minimum variance explained by remaining indicators was ≥ R^2 = .151.

Model 2. A one-factor model with item R11 removed was an improved model but fit the data poorly. Modification indices and parameter estimates were examined, which suggested a better fitting model could be achieved by allowing items K7 ("address patients' health problems in a knowledgeable manner") and K8 ("think critically") to covary. This modification was thought to be a theoretically sound modification. The model was adjusted accordingly.

Model 3. A one-factor model allowing items K7 and K8 to covary ($\sigma_{K7, K8}$ = .80) was an improved model but fit the data poorly. Modification indices and parameter estimates were

examined, which suggested a better fitting model could be achieved by allowing items S10 ("incorporate teaching during patient care") and R9 ("include patients' families in communication"). This modification was determined to be intuitive and theoretically sound. The model was revised accordingly.

Model 4. A one-factor model allowing items S10 and R9 to covary ($\sigma_{S10, R9} = .72$) was an improved model but fit the data poorly. Modification indices and parameter estimates were examined, which suggested a better fitting model could be achieved by allowing items K9 ("pursue advanced educational degrees") and S9 ("function autonomously"). This modification was determined to be theoretically sound. The model was revised accordingly.

Model 5. A one-factor model allowing items K9 and S9 to covary ($\sigma_{K9, S9} = .661$) was an improved model but fit the data poorly. Modification indices and parameter estimates were examined, which suggested a better fitting model could be achieved by allowing items K6 ("know how to operate technical equipment") and S8 ("operate technical equipment skillfully") to covary. This modification was determined to be intuitive due to similarity of items and theoretically sound. The model was revised accordingly.

Model 6. A one-factor model allowing items K6 and S8 to covary ($\sigma_{K6, S8} = .386$) was an improved model but fit the data poorly. Modification indices and parameter estimates were examined which suggested a better fitting model could be achieved by removing item K9 ("pursue advanced educational degrees") from the model. This modification was based on a careful review of the item during which the item was determined to be poorly phrased, double barreled, and unobservable. Additionally, the unstandardized residual variance ($\sigma^2 = 1.895$), standardized factor loading ($\lambda = .395$), and explained variance ($R^2 = .156$) supported item removal

Model 7. A one-factor model with item K9 removed was a slightly improved model but fit the data poorly. Modification indices and parameter estimates were examined which suggested a better fitting model could be achieved by allowing items S9 ("function autonomously") and R8

("care for patients in a nonjudgmental manner") to covary. This modification was determined to be theoretically sound. The model was revised accordingly.

Model 8. A one-factor model allowing items S9 and R8 to covary ($\sigma_{S9, R8} = .658$) was an improved model but fit the data poorly. Modification indices and parameter estimates were examined which suggested a better fitting model could be achieved by allowing items R1 ("value professional knowledge") and R2 ("are knowledgeable about nursing care") to covary. This modification was considered intuitive and theoretically sound. The model was revised accordingly.

Model 9. A one-factor model allowing items R1 and R2 to covary ($\sigma_{S9, R8} = .277$) was an improved model but fit the data poorly. Modification indices and parameter estimates were examined which suggested a better fitting model could be achieved by removing item K7 ("address patients' health problems in a knowledgeable manner"). This item was examined and determined to be double barreled, requiring participants to indicate agreement about addressing patients' health problems and the way patients' health problems are addressed. Removal of item K7 was supported by an unstandardized residual variance ($\sigma^2 = 1.934$), standardized factor loading ($\lambda = .428$), and explained variance ($R^2 = .183$).

Model 10. A one-factor model with item K7 removed from the model was an improved model but fit the data poorly. Modification indices and parameter estimates were examined which suggested a better fitting model could be achieved by allowing items K8 ("think critically") and S9 ("function autonomously") to covary. This modification was considered intuitive and theoretically sound. The model was revised accordingly.

Model 11. A one-factor model allowing items K8 and S9 to covary ($\sigma_{S9, R8} = .555$) was an improved model but fit the data poorly. Modification indices and parameter estimates were examined which suggested a better fitting model could be achieved by allowing items K8 ("think critically") and R8 ("care for patients in a nonjudgmental manner") to covary. This modification was considered theoretically sound. The model was revised accordingly.

Model 12. A one-factor model allowing items K8 and R8 to covary ($\sigma_{S9,\,R8}$ = .707) was fit to the data. This modification increased covariance estimates between K8 and S9 ($\sigma_{S9,\,R8}$ = .717). Fit indices indicated the model was approaching good fit, χ^2 (399, *N* = 635) = 2027.80, *RMSEA* = .080. 90%*CI* [.077,.084], *SRMR* = .080, *CFI* = .858, *TLI* = .845. Modification indices and parameter estimates were examined. Items K8 ("think critically"), S9 ("function autonomously"), S10 ("incorporate teaching during patient care"), R8 ("care for patients in a nonjudgmental manner"), and R9 ("include patients' families in communication") were examined. Residual variances, factor loadings, and explained variances for these items were of particular interest and are shown in Table 11. Item K8 ("think critically") was determined to be vague and lacked clarity. This item was removed from the model. Item removal was supported by parameter estimates including large residual variance, standard error, factor loading and explained R^2 = .163.

Table 11

Residual Variance, Factor Loadings, and Explained Variance for Items K8, S9, S10, R8, and R9

Item	Unstandardized σ^2	*SE*	Standardized λ	Explained R^2
K8	1.520	.086	.404	.163
S9	1.665	.095	.420	.176
S10	1.569	.090	.487	.237
R8	1.618	.092	.460	.212
R9	1.595	.091	.483	.233

Model 13. A one-factor model with item K8 removed was an improved model but fit indices indicated the model fell short of good fit. Modification indices and parameter estimates were examined and suggested items S9, S10, R8, and R9 remained problematic for model fit. Specifically, residual variances and standard errors were large, and explained variance was R^2 < .250 for these items. Each item was again examined. Item S9 ("function autonomously") was determined to lack clarity due to using the term "autonomously" and was removed from the

model. Removal was supported by parameter estimates including large residual variance, standard error, factor loading and explained $R^2 = .176$.

Model 14. A one-factor model with item S9 removed was an improved model and fit indices indicated the model was approaching good fit. However, relative fit indices (*CFI* = .872, *TLI* = .860) indicated the model was not sufficiently improved from the null model. Modification indices and parameter estimates were reexamined. Item R8 ("care for patients in a nonjudgmental manner") contained ambiguity that may have affected responses. Specifically, the meaning of "nonjudgmental" may have been unclear for respondents. Item R8 was removed from the model. Removal was supported by reexamination of the item and parameter estimates including large residual variance, standard error, factor loading and explained $R^2 = .212$.

Model 15. A one-factor model with item R8 removed was a good fitting model, χ^2 (321, *N* = 635) = 1011.38, *RMSEA* = .058. 90%*CI* [.054,.062], *SRMR* = .043, *CFI* = .925, *TLI* = .918. Modification indices and parameter estimates were reexamined. Items S10 ("incorporate teaching during patient care") and R9 ("include patients' families in communication") remained concerning. Specifically, the covariance ($\sigma_{S9,\,R8} = .743$) between these items suggests they share a large proportion of the variance between them, which is conceptually unsurprising. Specifically, patients' families are often present during nurse-patient interactions and therefore may become involved in the teaching process. However, the residual variance and standard errors were concerning and suggested large disagreement between respondents. Reasons for the large residual variances was unclear. Subsequently, item R9 ("include patients' families in communication") was removed from the model. Item removal was supported intuitively because it seems less likely that respondents would have observed interactions between nurses and patients' families compared to observing interactions between nurses and patients. The latent variable explained 22% of the variance ($R^2 = .215$) in the item R9, but the residual variance and standard error were large enough to warrant removal from the model.

Model 16. A one-factor model with item R9 removed was not improved from model 15. Modification indices and parameter estimates were examined. Item S10 ("incorporate teaching during patient care") was determined to have a negative impact on model fit. This item explained 22% of the variance (R^2 = .218), but the residual variance and standard error were large enough to warrant removal from the model.

Model 17. A one-factor model with item S10 removed was a good fitting model and improved compared to the previous model. Fit indices indicated only ~ 4 – 5% misspecification compared to a saturate model and ~94% improvement compared to a null model, χ^2 (273, *N* = 635) = 964.55, *RMSEA* = .053. 90%*CI* [.049,.058], *SRMR* = .036, *CFI* = .940, *TLI* = .934. Modification indices and parameter estimates were examined.

Parameter estimates for items K1 ("value professional knowledge") and R1 ("make themselves emotionally available to patients") indicated a need for closer inspection. These items were examined closely. Specifically, phrasing of item K1 required respondents to make judgements about men's valuation of knowledge, which is something that cannot be known or estimated without defining "value" or establishing criteria by which to make a judgement. However, the item was theoretically sound and measured a facet of nursing fitness believed to be an important characteristic of nursing fitness. Item R1 showed a similar issue. Phrasing of R1 may not have been parsimonious. However, item R1 was also theoretically sound and measured a facet of nursing fitness believed to be a characteristic of nursing fitness for men. Similarly, parameter estimates may have reflected differences across response groups.

Since this CFA was being conducted within an exploratory framework, a determination was made to fit a model with item K1 removed (model 18) and a model with R1 removed (model 19) and compare each model to model 17. The first model comparison $\Delta\chi^2$ between model 17 and model 18, that is, $\Delta\chi^2(23) = 51.02$, $p < .05$, $\chi^2_{crit} = 35.17$, indicated that removing item K1 from the model was not a significant improvement in model fit. The second model comparison

$\Delta\chi^2$ between model 17 and model 19, that is, $\Delta\chi^2(44) = 110.38$, $p < .05$, $\chi^2_{crit} = 60.48$, indicated that removing item R1 from the model was not a significant improvement in model fit. Therefore, model 17 was selected as the final model. The final model is shown in Table 12.

Table 12

One-factor Model Modifications

Mod	# Free Parms	χ^2	χ^2 *df*	χ^2 *p-value*	CFI	TLI	RMSEA	RMSEA 90% CI	SRMR
M1	66	5314.05	495	<.001	.640	.616	.124	.121, .127	.116
M2	64	5198.51	464	<.001	.644	.619	.127	.124, .130	.117
M3	65	4572.21	463	<.001	.691	.669	.119	.115, .122	.116
M4	66	4121.61	462	<.001	.725	.705	.112	.109, .115	.115
M5	67	3763.18	461	<.001	.752	.733	.106	.103, .110	.114
M6	68	3666.79	460	<.001	.759	.740	.106	.102, .108	.114
M7	65	3468.94	431	<.001	.760	.741	.106	.102, .109	.105
M8	66	3115.58	430	<.001	.788	.771	.099	.096, .103	.103
M9	67	3067.17	429	<.001	.792	.774	.099	.095, .102	.103
M10	64	2615.09	401	<.001	.806	.790	.093	.090, .097	.088
M11	65	2460.96	400	<.001	.820	.804	.090	.087, .094	.085
M12	66	2027.80	399	<.001	.858	.845	.080	.077, .084	.080
M13	62	1874.04	373	<.001	.858	.846	.080	.076, .083	.071
M14	59	1617.12	347	<.001	.872	.860	.076	.072, .080	.060
M15	57	1011.38	321	<.001	.925	.918	.058	.054, .062	.043
M16	52	947.38	297	<.001	.923	.916	.059	.055, .063	.040
M17	52	964.55	273	<.001	.940	.934	.053	.049, .058	.036
M18	50	713.53	250	<.001	.942	.936	.054	.050, .059	.036
M19	47	654.167	229	<.001	.945	.939	.054	.049, .059	.034
Final Model	52	964.55	273	<.001	.940	.934	.053	.049, .058	.036

Final model. The final model was determined to have good fit to the data, χ^2 (273, *N* = 635) = 964.55, *RMSEA* = .053, 90%*CI* [.049,.058], *SRMR* = .036 *CFI* = .940, *TLI* = .934. The

final model is a one-factor model that loads nursing fitness on 25 items (K1, K2, K3, K4, K5, K6, K10, K11, S1, S2, S3, S4, S5, S6, S7, S8, S11, R1, R2, R3, R4, R5, R6, R7, and R10) and allows items K6 and S8 ($\sigma_{K6,\,S8} = .392$), and items R1 and R2 ($\sigma_{R1,\,R2} = .271$) to covary. Unstandardized residual variances, standard errors, and standardized factor loadings are shown in Table 13.

Table 13

Final One-factor Model, Factor Covariances, Residual Variances, and Factor Loadings

Factor Item	Unstandardized σ^2	*SE* σ^2	Standardized Loadings
Nursing Fitness			
K1	.975	.055	.376
K2	.412	.024	.670
K3	.636	.037	.628
K4	.459	.027	.691
K5	.356	.021	.756
K6	.483	.028	.663
K10	.568	.033	.638
K11	.611	.036	.629
S1	.861	.049	.519
S2	.594	.035	.645
S3	.455	.027	.698
S4	.694	.040	.644
S5	.384	.023	.726
S6	.658	.039	.678
S7	.421	.025	.731
S8	.457	.027	.655
S11	.317	.019	.769
R1	.956	.055	.538
R2	.585	.034	.609
R3	.490	.029	.743
R4	.496	.029	.672
R5	.456	.027	.709

R6	.574	.033	.644
R7	.403	.024	.753
R10	.415	.025	.724

Model Invariance

The model was examined for measurement and invariance between participants who identified as men, *n* = 309, and those who identified as women, *n* = 323. A configural invariance model was specified and estimated simultaneously within each group. Latent variances were fixed to 1 to identify the models within groups. As shown in Table 1, fit indices suggested acceptable model fit and latent variable invariance across groups. Modification indices did not indicate meaningful or substantive modifications. Next, model invariance testing was conducted by applying a series of model constraints in successive models to examine potential decreases in model fit resulting from measurement non-invariance.

A weak invariance model was fit in which factor loadings were constrained to be equal across groups. Latent variances were fixed to 1 in the men's group but were freely estimated in the women's group. All intercepts and residual variances were permitted to vary across groups. As shown in Table 1, model fit indices indicated the weak invariance model fit well. Likelihood ratio chi-square test was significant, which indicated weak invariance did not hold and the configural model was a better fitting model across groups, $\Delta\chi^2$ (23) = 66.25, p <.001. However, $\Delta\chi^2$ is sensitive to model complexity and sample size (Cheung & Rensvold, 2002). The significant $\Delta\chi^2$ was determined to be an effect of sample size, N = 635. A reasonableness test, Δ*CFI* (23) = -.005, was within the range (Δ*CFI* ≤ - 0.01) recommended by Cheung and Rensvold (2002). Therefore, Δ*CFI* indicated that weak invariance held. The fact that weak invariance held indicated that the items were related to the latent variable equivalently across groups, or more simply, that the same latent factor was being measured in each group.

Next, a strong invariance model was fit in which item intercepts were constrained to be equal across groups. Latent means were fixed to 0 and the latent variance was fixed to 1 in the men's group but were freely estimated in the women's group. All factor loadings and item intercepts were constrained to be equal across groups. As shown in Table 1, model fit indices indicated the strong invariance model fit well. A likelihood ratio chi-square test indicated a significant decrease in model fit relative to the weak invariance model, $\Delta\chi^2$ (23) = 45.45, p = .004. However, the significant $\Delta\chi^2$ was again determined to be an effect of sample size, N = 635. A reasonableness test, Δ*CFI* (23) = -.003, which was again within the range (Δ*CFI* ≤ - 0.01) recommended by Cheung and Rensvold (2002). These findings indicated that strong invariance held. The fact that strong invariance held indicated that observed differences in between group item means was due to differences in latent variable means only.

Finally, latent mean differences were computed. The latent variable intercept was estimated (M = -0.081, p = .335), which indicated that the latent mean for women's group was not significantly different from the men's group as demonstrated by a χ^2 difference test, such that $\Delta\chi^2$ (1) = 0.93, p = .335. The mean scores in the men's group (M = 5.99) were insignificantly higher than in the women's group (M = 5.94). Descriptive statistics for scale items are shown in Appendix K, including items' means, standard deviations, skewness, and kurtosis. However, the latent variable accounts for only a portion of the variance in each item (Brown, 2015). Meaningful interpretation of survey results depends on a summation of items' variances, which is reflected in latent variable means. Therefore, survey results are discussed as latent variable mean scores. Additionally, parameter estimates of standardized factor loadings (λ) have been included and discussed in this chapter and squaring standardized factor loadings (λ^2) yields the proportion of variance explained by the latent variable.

The 25-item FiNS-M© utilized a 7-point Likert response scale (strongly disagree = 1, disagree = 2, somewhat disagree = 3, neither agree nor disagree = 4, somewhat agree = 5,

agree = 6, and strongly agree = 7). Higher scores indicate higher levels of agreement, and lower scores indicate lower levels of agreement that men are fit for nursing. Mean scores for the men's group (*M* = 5.99) and women's group (*M* = 5.94) reflected an approximate score of 6/7 on the Likert response scale used, which suggests that men and women agree that men are fit for professional nursing.

Model Reliability and Validity

Traditional reliability estimates are based on coefficient alpha. However, the accuracy of coefficient alpha depends on meeting underlying assumptions that may not hold (Furr, 2015). Coefficient alpha's accuracy is affected by items' psychometric properties including the presence of residual covariances and Tau equivalence, which is an often violated assumption (Miller, 1995). When the assumption of Tau equivalence is met, coefficient alpha and McDonald's omega are identical. However, McDonald's omega is a robust measure of reliability in structural equation models and is not sensitive to residual covariances and violation of Tau equivalence. Tau equivalence was violated in this study. The *psych* package (Revelle, 2020) was used to estimate McDonald's omega. Reliability estimates for the final model was, $\omega_t = .95$.

Discussion

There are multiple points of discussion related to this study. First, most of the studies conducted on men in nursing are qualitative explorations of men's experiences. The existing literature suggests that men experience feeling socially disconnected, unwanted, and perceived by women colleague as unfit. However, studies have excluded women's voices in this field of inquiry (Smith et al., 2022). This study is novel in at least three ways. First, this study is the first developed quantitative instrument which measures perceptions of men working within professional nursing, which is a departure from other published studies on men in nursing. Secondly, this study was a beginning in exploring men's experiences of how they are perceived in the nursing workforce. Specifically, this study measured perceptions of men's fitness for nursing. Lastly, researchers conducting this study recognize the importance of including

women's voices in efforts that target improving diversity and inclusivity in nursing classrooms and the nursing workforce.

Prior studies on men in nursing have included only men in their sample pool (Al-Momani, 2017; Blackley et al., 2019; Buthelezi et al., 2015; Carnevale & Priode, 2018; Colby, 2012; DeVito, 2016; Evans, 2002, 2004; Jordal & Heggen, 2015; Meadus & Twomey, 2011; Milligan, 2001; O'Connor, 2015; Powers et al., 2018; Shin et al., 2017; Smith et al., 2020, 2022; Twomey & Meadus, 2016; C.-I. Yang et al., 2017). Continuing to exclude women from these discussions is counterproductive. Excluding women's voices from this type of research intuitively seems to marginalize women. Continuing to exclude women may send the message that their voices are unimportant or unheard. Furthermore, barriers for men in nursing have included marginalization and isolation (Gedzyk-Nieman & Svoboda, 2019; MacWilliams et al., 2013; Smith et al., 2020). Excluding women's voices from this research intuitively seems to marginalize women. This paradox should be considered in future research on men in nursing. Lastly, nurses of all genders, sexes, and ethnicities should be included in research informing diversity and inclusivity efforts and professional culture change.

This study aimed to identify perceptions of men's fitness for nursing. The primary driver for this aim was literature indicating men feel unwanted and perceived as unfit for nursing (Kane et al., 2021; Myklebust, 2020; Smith et al., 2020; Stanley, 2012; Stanley et al., 2016), not unlike Nightingale's vision of nursing. One method of identifying perceptions of men's fitness for nursing would have been to conduct a qualitative study to ascertain women's perceptions, but there is considerable risk of introducing unmanageable social bias in such a study. This study sought to minimize social bias by defining what it means for men to be fit for nursing and then measure perceptions related to those concepts. This aim was accomplished by administering the newly developed FiNS-M© to N = 635 participants. The FiNS-M© was developed in accordance with a systematized literature review that included international studies and was

aimed at identifying characteristics of nursing fitness for men. Participants were asked to rate their level of agreement with statements about these characteristics.

Confirmatory factor analysis was conducted in an exploratory fashion to analyze data. The hypothesized scale structure was a three-dimensional latent variable (knowledge, practice skills, and interpersonal relations) model with each latent variable loading on 11 items for a total of 33 items. CFA disconfirmed the hypothesized three-factor model in favor of a one-factor solution. Nineteen subsequent iterations yielded a one-factor solution loading on 25 items. Two residual covariances were allowed in the final model, which fit the data well.

In accordance with SRT (Eagly & Wood, 2012), women are predicted to be better suited for nursing and men better suited for roles where increased strength and physical fitness and less nurturing is required. This prediction is synonymous with the role divisions that Nightingale referred to as “natural divisions of labor” (Dunphy, 2015, p. 48). Men’s experiences in nursing suggest that men continue to be perceived within the framework of SRT and role expectations that deter men from nursing and create unfavorable conditions for men already involved in nursing practice. Therefore, a relevant hypothesis in this study was that women’s scale scores would be lower than men’s, which would indicate that women may perceive men as less fit for professional nursing compared to men’s perceptions of men.

A good fitting CFA model was fit to the data, which facilitated testing differences between men’s and women’s perceptions of men’s fitness for nursing. Multiple group CFA was conducted in R (Version 4.1.3; R Core Team, 2022) to test model invariance between men and women. Configural invariance for the measurement model held, which indicated the factor structure was invariant between groups. Next, weak invariance held, which indicated factor loadings were invariant across groups. Lastly, a strong invariance model held, which indicated item intercepts were invariant across groups. There are stricter tests of invariance, but there is general consensus that establishing configural, weak, and strong invariance is sufficient to establish measurement invariance (Bialosiewicz et al., n.d.; Brown, 2015; Milfont & Fischer,

2010). Establishing invariance is a critical procedure that supports validity and indicates the construct and indicators are interpreted similarly across groups. Establishing measurement invariance enables meaningful interpretation and comparison of data between groups.

In this study, scale scores across groups were not significantly different, $\Delta\chi^2(1) = 0.93$, $p = .335$, for women ($M = 5.94$) compared to men ($M = 5.99$). These statistics suggest that both women and men in the study "agree" that men are fit for nursing. These findings are inconsistent with SRT and men's reported experiences, which is interesting, unexpected, and warrants further study. One starting point for continued study is multiple group CFA to test differences between groups of clinicians and academic faculty or multi-level modeling to test for differences across levels of men and women, and clinicians and academic faculty. Another avenue worth pursuing is to investigate differences across levels of age and geography that may reflect cultural differences or similarities in perceptions of men's fitness for nursing.

In the final model, K6 ("know how to operate technical equipment") and S8 ("operate technical equipment skillfully") were allowed to covary, as were items R1 ("value professional knowledge") and R2 ("are knowledgeable about nursing care"). Interestingly, the covariance of these items differed across groups. Specifically, the covariance of items K6 and S8 for women ($\sigma_{K6, S8} = .591$) differed from men ($\sigma_{K6, S8} = .201$). This finding indicates that men see a clearer distinction between *knowing how to* operate technical equipment and operating technical equipment, whereas women may see these items as similar. These differences may support the finding that men have felt expected to gravitate toward more technical aspects and less emotive aspects of nursing. The covariance of items R1 and R2 for women ($\sigma_{R1, R2} = .451$) also differed from men ($\sigma_{R1, R2} = .118$). This finding indicates that men see a clearer distinction between *valuing* professional knowledge and being knowledgeable compared to women who perceive these items more similarly. Theoretical explanations for the difference in covariance ($\sigma_{R1, R2}$) is unclear.

A cardinal point of discussion relates to items removed from the models. There were no preexisting studies to guide model estimation. Thus, CFA was conducted in an exploratory manner. The final model resulted from an iterative model building process and was guided by the researchers' professional experience in nursing practice, SRT theoretical framework, parameter estimates, and model and modification indices. The final model included characteristics of nursing fitness that are foundational to nursing practice for both men and women. The model also included items noted in the literature to be specific strengths of men or more representative to men (Evans, 2002; Gilloran, 1995; Harding et al., 2008; Hollup, 2014; Milligan, 2001; O'Lynn, 2013; O'Lynn & Tranbarger, 2007, 2007; C. O'Lynn & Krautscheid, 2011; Sundus & Younas, 2020; Thompson, 2002; Younas & Sundus, 2018a, 2018b; Zhang & Liu, 2016). Interestingly, items removed from the models were items that represented men's strengths or were hypothesized to be more representative of men in nursing. These items included K7, K8, K9, S9, S10, R8, R9, and R11, and are shown in Table 14.

Table 14

Items Removed from the Final Model, K7, K8, K9, S9, S10, R8, R9, and R11

Variable	Item
K7	"Address patients' health problems in a knowledgeable manner"
K8	"Think critically"
K9	"Pursue advanced educational degrees"
S9	"Function autonomously"
S10	"Incorporate teaching during patient care"
R8	"Care for patients in a nonjudgmental manner"
R9	"Include patients' families in communication"
R11	"Restrain themselves emotionally"

Item R11 was removed due to parameter estimates that included a factor loading that approached zero and an unusually large residual variance and standard error. These findings indicate the item was interpreted differently by participants and was not predicted by the latent

construct. It is unknown whether difference in item interpretation was a function of group differences.

Items K7, K8, K9, S9, S10, R8, and R9 were removed due to large residual variances, and standard errors combined with smaller factor loadings ~ .400 - .500. These items' residual variances and standard errors indicated a large amount of disagreement in participants' perceptions of these characteristics in men in nursing, which negatively impacted model fit for the one-factor solution. One possibility is that these items comprise a second latent variable, "men's strengths," or "men's characteristics." Future research should investigate the possibility of a latent variable predicting characteristics specific to men. Nonetheless, the large residual variances and standard errors observed in these items suggest disagreement that is unexplained. Interestingly, residual variances and standard errors for these items were larger in the men's group compared to the women's group, reflecting less variation in women's responses than in men's responses. The implication of this finding suggests measurable differences in men and women's caring model. If true, there may be a substantive argument supporting the existence of a feminine and masculine model of nursing care, which is consistent with a divisions of labor framework or role expectations predicted by SRT. The prevailing model that is likely to emerge is that of the largest group, which is consistent with the "feminized" model of nursing care that has been postulated by some researchers and a failure to recognize the value of differences in caring seen in different groups. This hypothesis is also consistent with men's reported experiences in nursing. Investigating these hypotheses further may elucidate men's qualitative experiences in nursing and inform recommendations for cultural awareness and change within the classroom and workplace to improve diversity and inclusivity.

Lastly, this study spotlights Smith et al.'s (2022) suggestion that research aimed at improving diversity and inclusivity should extend beyond men. One area that has not been explored is intersection of men and race. Black men are one of the most underrepresented populations in nursing (Brathwaite et al., 2022; Hall & Stevens, 1997; Patterson & Daniel, 2021),

yet black men makeup approximately 14% of the U.S. population (Tamir et al., n.d.) and 63.5% of the U.S. civilian labor force (U.S. Bureau of Labor Statistics, 2021b). This study targeted deans and department chairs at the top 25 historically black colleges (*The Best Historically Black Colleges and Universities*, 2022) in an effort to include representation from African American nurses. However, black men (*n* = 12) represented only 1.9% of the total sample and only 3.9% of participating men. Suggestions for future research aimed at improving diversity and inclusivity in nursing should consider recruitment of black men into nursing during middle and high schools, predictors of success and attrition for black men in nursing programs, and experiences of black men in nursing programs and in the nursing workplace.

Limitations

Limitations included self-selection bias which may negatively impact generalization to the population. Responses may have been influenced by social desirability bias. The quantitative nature of this study was thought to lessen social desirability biases associated with a qualitative study aimed at discovering perceptions of men's fitness for nursing. However, social desirability bias may still affect findings. Chain referral sampling increases the likelihood that some views held by participants will be shared between them. Therefore, this study may not be generalizable. Additional psychometric testing is warranted to confirm model fit. The ethnic makeup of the sample mirrors that of the nursing workforce. White participants (*N* = 558) comprised 87.9% of the sample. A similar ethnic makeup was observed across groups of men and women, which may limit generalizability to non-White nurses. Participants from the southeastern U.S. (*N* = 400) comprised 63% of the sample. Cultural similarities among participants in the southeast may bias the model. Cultural differences outside the southeastern U.S. and internationally may affect model fit in other populations of nurses. Participants' primary area of nursing practice was not identified. Therefore, differences across practice areas cannot be tested. The FiNS-M© scale tested in this study was developed from a systematized review aimed at identifying characteristics of nursing fitness from both patients' and nurses' views. The

review included literature outside the U.S. However, this study limited initial psychometric testing to participants within the U.S. Additional psychometric testing is warranted to confirm model fit for nurses outside the U.S. This study was cross-sectional which excludes causal conclusions. Invariance across ages, ethnicities and work status was not established. Therefore, factor structures may not hold, and variances may not be invariant across these groups. Eligibility criteria required participants to have professional work experience with men in nursing. However, participants' responses were self-report. It was not possible to verify participants' work experience with men. Finally, there was a disproportionate number of men who participated in this survey compared to numbers of men in nursing, which suggests a selection bias. Selection bias may have skewed findings. CFA is robust to differences in sample sizes and the sample size was sufficient for analyses. Additionally, the model was invariant, which suggests scale scores accurately reflect the population. However, the disproportionate numbers of men may have influenced residuals and standard errors and thus affected the model fitting procedures. Therefore, future research should include testing this model in other samples.

Conclusion

In summary, this study was aimed at testing the psychometric properties of a newly developed FiNS-M© scale to quantitatively measure perceptions of men's fitness for professional nursing. The secondary aim of this study was to test for differences in perceptions of men's fitness for nursing across groups of men and women participants. Both aims were accomplished and contribute to the novelty of this study. The 25-item FiNS-M© can be used to measure perceptions of men's fitness for nursing, but we recommend additional testing to confirm measurement invariance and reliability in the intended population.

Funding

This study was grant funded by Sigma Theta Tau, Beta Nu chapter. The funding agency had no role in study design, data collection and analysis, decision to publish, or preparation of this manuscript.

REFERENCES

Abushaikha, L., Mahadeen, A., AbdelKader, R., & Nabolsi, M. (2014). Academic challenges and positive aspects: Perceptions of male nursing students. *International Nursing Review*, *61*(2), 263–269. https://doi.org/10.1111/inr.12098

Afaya, A., Hamza, S., Gross, J., Acquah, N. A., Aseku, P. A., & Doeyela, D. (2017). Assessing patient's perception of nursing care in medical- surgical ward in Ghana. *International Journal of Caring Sciences*, *10*(3), 1329–1340.

Alavi, A., Bahrami, M., Zargham-Boroujeni, A., & Yousefy, A. (2015). Characteristics of caring self-efficacy in pediatric nurses: A qualitative study. *Journal for Specialists in Pediatric Nursing*, *20*(3), 157–164. https://doi.org/10.1111/jspn.12110

Albert, B., Tullis, T., & Tedesco, D. (2010). *Beyond the usability lab: Conducting large-scale online user experience studies* (1st ed.). Morgan Kaufmann Publishers Inc.

Al-Momani, M. M. (2017). Difficulties encountered by final-year male nursing students in Their Internship Programmes. *Malaysian Journal of Medical Sciences*, *24*(4), 30–38. https://doi.org/10.21315/mjms2017.24.4.4

American Association of Colleges of Nursing [AACN]. (2006). *Advancing higher education in nursing*. http://www.aacn.nche.edu/publications/annual-reports/AR2006.pdf

American Mobile Nurses [AMN] Healthcare. (2015). Women in medicine: A review of changing physician demographics, female physicians by specialty, state and related data. Retrieved from https://www.amnhealthcare.com/uploadedFiles/MainSite/Content/Staffing_Recruitment/Staffcare-WP-Women%20in%20Med.pdf

American Nurses Association. (n.d.). *What is nursing?* https://www.nursingworld.org/practice-policy/workforce/what-is-nursing/

American Psychological Association. (n.d.). Fitness. In *APA dictionary of psychology*. https://dictionary.apa.org/fitness

American Psychological Association. (2020). *Publication manual of the American Psychological Association: The official guide to APA style.* (7th ed.). American Psychological Association.

Arigo, D., Pagoto, S., Carter-Harris, L., Lillie, S. E., & Nebeker, C. (2018). Using social media for health research: Methodological and ethical considerations for recruitment and intervention delivery. *Digital Health*, *4*, 2055207618771757. https://doi.org/10.1177/2055207618771757

Association of American Medical Colleges [AAMC]. (2012). Medical students, selected years, 1965-2012. Retrieved from https://www.aamc.org/download/305282/data/2012_table1.pdf

Auster, D. (1978). Occupational values of male and female nursing students. *Sociology of Work & Occupations*, *5*(2), 209–233. https://doi.org/10.1177/009392857852004

Aynaci, G., & Gulmez, H. (2019). Looking at male nurse discrimination among nursing students with o'connor's finger dexterity test: Future of gender discrimination. *Journal of Men's Health*, *15*(2), e30–e39. https://doi.org/10.22374/jomh.v15i2.131

Babbie, E. R. (2010). *The practice of social research*. Wadsworth, Cengage Learning.

Bahrami, M., Purfarzad, Z., Keshvari, M., Rafiei, M., & Sivertsen, N. (2018). Emotional competence: A core competence in gerontological nursing in Iran. *International Journal of Older People Nursing*, *13*(4), 1–10. https://doi.org/10.1111/opn.12210

Baldacchino, D. R., & Galea, P. (2012). Student nurses' personality traits and the nursing profession: Part 2. *British Journal of Nursing*, *21*(9), 530–535. https://doi.org/10.12968/bjon.2012.21.9.530

Barkley Jr, T. W., & Kohler, P. A. (1992). Is nursing's image a deterrent to recruiting men into the profession? Male high school students respond. *Nursing Forum*, *27*(2), 9–14.

Bartfay, W. J., Bartfay, E., Clow, K. A., & Wu, T. (2010). Attitudes and perceptions towards men in nursing education. *Internet Journal of Allied Health Sciences & Practice*, *8*(2), 7p–7p.

Başoğul, C., Arabacı, L. B., Büyükbayram, A., Aktaş, Y., & Uzunoğlu, G. (2019). Emotional intelligence and personality characteristics of psychiatric nurses and their situations of exposure to violence. *Perspectives in Psychiatric Care*, *55*(2), 255–261. https://doi.org/10.1111/ppc.12358

Beauducel, A., & Wittmann, W. W. (2005). Simulation study on fit indexes in cfa based on data with slightly distorted simple structure. *Structural Equation Modeling: A Multidisciplinary Journal*, *12*(1), 41–75. https://doi.org/10.1207/s15328007sem1201_3

Beck, D. M. (2005). At the millennium crossroads: Reigniting the flame of Nightingale's legacy. In B. M. Dossey (Ed.), *Florence Nightingale today: Healing, leadership, global action* (pp. 127–141). American Nurses Association.

Bell-Scriber, M. J. (2008). Warming the nursing education climate for traditional-age learners who are male. *Nursing Education Perspectives (National League for Nursing)*, *29*(3), 143–150.

Bendall, E. R. D., & Raybould, E. (1969). *A history of the general nursing council for england and wales, 1919-1969*. H. K. Lewis and Companhy.

Bernard, H. R. (2000). *Social reserach methods: Qualitative and quantitative approaches*. Sage Publications.

Bialosiewicz, S., Murphy, K., & Berry, T. (n.d.). Do our measures measure up? The critical role of measurement invariance. *Claremont Evaluation Center*, 37.

Blackley, L. S., Morda, R., & Gill, P. R. (2019). Stressors and rewards experienced by men in nursing: A qualitative study. *Nursing Forum*, *54*(4), 690–697. https://doi.org/10.1111/nuf.12397

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: A primer. *Frontiers in Public Health*, *6*. https://doi.org/10.3389/fpubh.2018.00149

Boniol, M., McIsaac, M., Xu, L., Wuliji, T., Diallo, K., & Campbell, J. (2019). Gender equity in the health workforce: Analysis of 104 countries. *Working Paper 1*, 8.

Brathwaite, A. C., Versailles, D., Juüdi-Hope, D. A., Coppin, M., Jefferies, K., Bradley, R., Campbell, R., Garraway, C. T., Obewu, O. A. T., LaRonde-Ogilvie, C., Sinclair, D., Groom, B., Punia, H., & Grinspun, D. (2022). Black nurses in action: A social movement to end racism and discrimination. *Nursing Inquiry*, *29*(1), e12482. https://doi.org/10.1111/nin.12482

Brown, T. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). The Guilford Press.

Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods & Research*, *21*(2), 230–258. https://doi.org/10.1177/0049124192021002005

Buerhaus, P. I., Donelan, K., Norman, L., & Dittus, R. (2005). Nursing students' perceptions of a career in nursing and impact of a national campaign designed to attract people into the nursing profession. *Journal of Professional Nursing*, *21*(2), 75–83. https://doi.org/10.1016/j.profnurs.2005.02.001

Buerhaus, P. I., Skinner, L. E., Auerbach, D. I., & Staiger, D. O. (2017). Four challenges facing the nursing workforce in the United States. *Journal of Nursing Regulation*, *8*(2), 40–46. https://doi.org/10.1016/S2155-8256(17)30097-2

Buthelezi, S. F., Fakude, L. P., Martin, P. D., Daniels, F. M., & Buthelezi, S. (2015). Clinical learning experiences of male nursing students in a bachelor of nursing programme: Strategies to overcome challenges. *Curationis*, *38*(2), 1–7. https://doi.org/10.4102/curationis.v38i2.1517

Carabez, R., Pellegrini, M., Mankovitz, A., Eliason, M., & Scott, M. (2015). Does your organization use gender inclusive forms? Nurses' confusion about trans* terminology. *Journal of Clinical Nursing*, *24*(21–22), 3306–3317. https://doi.org/10.1111/jocn.12942

Carnevale, T., & Priode, K. (2018). “The good ole’ girls’ nursing club”: The male student perspective. *Journal of Transcultural Nursing*, *29*(3), 285–291. https://doi.org/10.1177/1043659617703163

Carr, L. T. (1994). The strengths and weaknesses of quantitative and qualitative research: What method for nursing? *Journal of Advanced Nursing*, *20*(4), 716–721. https://doi.org/10.1046/j.1365-2648.1994.20040716.x

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, *9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Choemprayong, S., & Wildemuth, B. M. (2009). Developing new measures. In B. M. Wildemuth (Ed.), *Applications of social research methods to questions in information and library science* (pp. 278–293). Libraries Unlimited.

Christensen, M., & Knight, J. (2014). “Nursing is no place for men” — A thematic analysis of male nursing students experiences of undergraduate nursing education. *Journal of Nursing Education and Practice*, *4*(12), 95–104. https://doi.org/10.5430/jnep.v4n12p95

Clow, K. A., Ricciardelli, R., & Bartfay, W. J. (2015). Are you man enough to be a nurse? The impact of ambivalent sexism and role congruity on perceptions of men and women in nursing advertisements. *Sex Roles*, *72*(7–8), 363–376. https://doi.org/10.1007/s11199-014-0418-0

Codier, E., & MacNaughton, N. S. (2012). Are male nurses emotionally intelligent? *Nursing Management*, *43*(4), 1–4. https://doi.org/10.1097/01.NUMA.0000413355.36765.b1

Colby, N. (2012). Caring from the male perspective: A gender neutral concept. *International Journal of Human Caring*, *16*(4), 36–41. https://doi.org/10.20467/1091-5710.16.4.36

Committee on the Future of Nursing 2020–2030, National Academy of Medicine, & National Academies of Sciences, Engineering, and Medicine. (2021). *The future of nursing 2020-2030: Charting a path to achieve health equity* (M. Wakefield, D. R. Williams, S. L.

Menestrel, & J. L. Flaubert, Eds.; p. 25982). National Academies Press. https://doi.org/10.17226/25982

Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing, at the I. of M. & Institute of Medicine. (2011). *The future of nursing: Leading change, advancing health*. National Academies Press. https://www.nap.edu/catalog/12956

Costello, M. (2017). Nurses' self-identified characteristics and behaviors contributing to patients' positive perceptions of their nursing care: A qualitative study. *Journal of Holistic Nursing*, *35*(1), 62–66. https://doi.org/10.1177/0898010116643835

Cudé, G., & Winfrey, K. (2007). The hidden barrier: Gender bias: Fact or fiction? *Nursing for Women's Health*, *11*(3), 254–265. ccm.

da Silva, R. C., & Ferreira, M. de A. (2011). Technology in an intensive care unit: Delineation of a figure-type of the nurse. *Acta Paulista de Enfermagem*, *24*(5), 17–23. https://doi.org/10.1590/S0103-21002011000500004

Daley, B. (2017). *There is a serious staff crisis in nursing – and men are the solution*. The Conversation. http://theconversation.com/there-is-a-serious-staff-crisis-in-nursing-and-men-are-the-solution-84472

Darch, J., Baillie, L., & Gillison, F. (2017). Nurses as role models in health promotion: A concept analysis. *British Journal of Nursing*, *26*(17), 982–988. https://doi.org/10.12968/bjon.2017.26.17.982

DeVellis, R. F., & Thorpe, C. T. (2022). *Scale development: Theory and applications* (5th ed.). SAGE Publications, Inc.

DeVito, J. (2016). The experience of male nursing students: Male nursing students. *Nursing Forum*, *51*(4), 246–253. https://doi.org/10.1111/nuf.12149

Diño, M. J. S. (2021). Nomoethic exposition and intersectionality on the ideographic position of men in nursing: Domination, conflicts, oppression, and uncharted philosophies. *Journal*

of Psychosocial Nursing and Mental Health Services, *59*(2), 7–9. https://doi.org/10.3928/02793695-20210114-03

Dossey, B. M., Selanders, L. C., Beck, D. M., & Attewell, A. (Eds.). (2005). Nightingale's foundational philosophy for nursing. In *Florence Nightingale today: Healing, leadership, global action* (pp. 64–78). American Nurses Association.

Dunphy, L. (2015). Florence Nightingale's legacy of caring and its applications. In Smith & M. Parker (Eds.), *Nursing Theories and Nursing Practice* (pp. 37–54). F.A. Davis Company.

Eagly, A. H., & Wood, W. (2012). Social role theory. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (2011-21802-024; Vol. 2, pp. 458–476). Sage Publications Ltd; APA PsycInfo.

Eddy, D. M. (1989). *Men in nursing: Comparison & contrast of values & professional behaviors of male baccalaureate students & female faculty in Ohio*. http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,shib&db=sih&AN=SN087986&site=ehost-live&scope=site&custid=s5822723

Evans, J. A. (2002). Cautious caregivers: Gender stereotypes and the sexualization of men nurses' touch. *Journal of Advanced Nursing (Wiley-Blackwell)*, *40*(4), 441–448. https://doi.org/10.1046/j.1365-2648.2002.02392.x

Evans, J. A. (2004). Bodies matter: Men, masculinity, and the gendered division of labour in nursing. *Journal of Occupational Science*, *11*(1), 14–22.

Feo, R., Kitson, A., & Conroy, T. (2018). How fundamental aspects of nursing care are defined in the literature: A scoping review. *Journal of Clinical Nursing*, *27*(11–12), 2189–2229. https://doi.org/10.1111/jocn.14313

Finfgeld-Connett, D. (2008). Meta-synthesis of caring in nursing. *Journal of Clinical Nursing*, *17*(2), 196–204. https://doi.org/10.1111/j.1365-2702.2006.01824.x

Furr, M. R. (2015). *Scale construction and psychometrics for social and personality psychology* (3rd ed.). Sage Publications Ltd.

Garrett, B. (2013). *Science and modern thought in nursing: Pragmatism & praxis for evidence-based practice* (1st ed.). Northern Lights Media.

Garrett, B. M. (2016). New sophistry: Self-deception in the nursing academy. *Nursing Philosophy*, *17*(3), 182–193. https://doi.org/10.1111/nup.12128

Garrett, B. M., & Cutting, R. L. (2015). Ways of knowing: Realism, non-realism, nominalism and a typology revisited with a counter perspective for nursing science. *Nursing Inquiry*, *22*(2), 95–105. https://doi.org/10.1111/nin.12070

Garrett, B. M., & Cutting, R. L. (2017). Magical beliefs and discriminating science from pseudoscience in undergraduate professional students. *Heliyon*, *3*(11), e00433. https://doi.org/10.1016/j.heliyon.2017.e00433

Garvin, B. J. (1976). Values of male nursing students. *Nursing Research*, *25*, 352–357.

Gedzyk-Nieman, S. A., & Svoboda, G. (2019). Exploring attitudes of acceptance of males in nursing among registered nurses. *Journal of Nursing Management*, *27*(3), 647–654. https://doi.org/10.1111/jonm.12723

Gelinas, L., Pierce, R., Winkler, S., Cohen, I. G., Lynch, H. F., & Bierer, B. E. (2017). Using social media as a research recruitment tool: Ethical issues and recommendations. *The American Journal of Bioethics : AJOB*, *17*(3), 3–14. https://doi.org/10.1080/15265161.2016.1276644

Gilloran, A. (1995). Gender differences in care delivery and supervisory relationship: The case of psychogeriatric nursing. *Journal of Advanced Nursing*, *21*(4), 652–658. https://doi.org/10.1046/j.1365-2648.1995.21040652.x

Giménez-Espert, M. del C., & Prado-Gascó, V. J. (2017). Emotional intelligence in nurses: The trait meta-mood scale. *Acta Paul Enferm.*, *30*(2), 204–209. https://doi.org/10.1590/1982-0194201700031

Glass, G. V., Peckham, P. D., & Sanders, J. R. (1972). Consequences of failure to meet assumptions underlying the fixed effects analyses of variance and covariance. *Review of Educational Research*, *42*(3), 237–288. https://doi.org/10.3102/00346543042003237

Hajinezhad, M. E., Azodi, P., Rafii, F., Ramezanian, N., & Tarighat, M. (2012). Perspectives of patients and nurses on caring behaviors of nurses. *Hayat Journal*, *17*(4), 36–45.

Hall, J. M., & Stevens, P. E. (1997). African American men in nursing: A career opportunity that challenges structural racism. *Journal of African American Men*, *3*(2), 21–32.

Harding T. (2007). The construction of men who are nurses as gay. *Journal of Advanced Nursing*, *60*(6), 636–644. ccm. https://doi.org/10.1111/j.1365-2648.2007.04447.x

Harding, T., North, N., & Perkins, R. (2008). Sexualizing men's touch: Male nurses and the use of intimate touch in clinical practice. *Research and Theory for Nursing Practice: An International Journal*, *22*(2), 88–102. https://doi.org/10.1891/0889-7182.22.2.88

Hollup, O. (2014). The impact of gender, culture, and sexuality on Mauritian nursing: Nursing as a non-gendered occupational identity or masculine field? Qualitative study. *International Journal of Nursing Studies*, *51*(5), 752–760. https://doi.org/10.1016/j.ijnurstu.2013.09.013

Howell, D. C. (2013). *Statistical methods for psychology* (8th ed.). Wadsworth, Cengage Learning.

Hu, L., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and appplications* (pp. 76–99). SAGE Publications.

Hu, L., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, *3*(4), 424–453. https://doi.org/10.1037/1082-989X.3.4.424

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Hu, L., Bentler, P. M., & Kano, Y. (1992). Can test statistics in covariance structure analysis be trusted? *Psychological Bulletin*, *112*(2), 351–362. https://doi.org/10.1037/0033-2909.112.2.351

International Council of Nurses. (2021). *The COVID-19 effect: World's nurses facing mass trauma, an immediate danger to the profession and future of our health systems*. International Council of Nurses. https://www.icn.ch/news/covid-19-effect-worlds-nurses-facing-mass-trauma-immediate-danger-profession-and-future-our

Jamieson, I., Harding, T., Withington, J., & Hudson, D. (2019). Men entering nursing: Has anything changed? *Nursing Praxis in New Zealand*, *35*(2), 18–29. https://doi.org/10.36951/ngpxnz.2019.007

Jordal, K., & Heggen, K. (2015). Masculinity and nursing care: A narrative analysis of male students′ stories about care. *Nurse Education in Practice*, *15*(6), 409–414. https://doi.org/10.1016/j.nepr.2015.05.002

Jorgensen, T. D., Pornprasertmanit, S., Schoemann, A. M., & Rosseel, Y. (2021). *semTools: Useful tools for structural equation modeling*. (R package version 0.5-5) [Computer software]. https://CRAN.R-project.org/package=semTools

Joseph, C. B. (2014). A man's guide to a nursing career by Chad E. O'lynn. *Journal of Hospital Librarianship*, *14*(1), 99–101. ccm. https://doi.org/10.1080/15323269.2014.859999

Kane, D., Rajacich, D., & Andary, C. (2021). Exploring the contextual factors surrounding the recruitment and retention of men in a baccalaureate nursing program. *Nursing Forum*, *56*(1), 24–29. https://doi.org/10.1111/nuf.12504

Kargin, M., Aytop, S., Hazar, S., & Yüksekol, Ö. D. (2020). The relationship between gender role stress and self esteem in students of faculty of health sciences. *Perspectives in Psychiatric Care*. https://doi.org/10.1111/ppc.12605

Karlou, C., Papadopoulou, C., Papathanassoglou, E., Lemonidou, C., Vouzavali, F., Zafiropoulou-Koutroubas, A., Katsaragakis, S., & Patiraki, E. (2018). Nurses' caring

behaviors toward patients undergoing chemotherapy in Greece: A mixed-methods study. *Cancer Nursing*, *41*(5), 399–408. https://doi.org/10.1097/ncc.0000000000000562

Kellett, P., M. Gregory, D., & Evans, J. (2014). Patriarchal paradox: Gender performance and men's nursing careers. *Gender in Management: An International Journal*, *29*(2), 77–90. https://doi.org/10.1108/GM-06-2013-0063

Kouta, C., & Kaite, C. P. (2011). Gender discrimination and nursing: A literature review. *Journal of Professional Nursing*, *27*(1), 59–63. APA PsycInfo. https://doi.org/10.1016/j.profnurs.2010.10.006

Larsson, A. (2007). *Dia* (Version 0.97.2) [Computer software]. The Dia developers. http://dia-installer.de/doc/index.htm

Lasater, K. B., Aiken, L. H., Sloane, D. M., French, R., Martin, B., Reneau, K., Alexander, M., & McHugh, M. D. (2020). Chronic hospital nurse understaffing meets COVID-19: An observational study. *BMJ Quality & Safety*, *0*, 1–9. https://doi.org/10.1136/bmjqs-2020-011512

Lee, K., & Kim, S. H. (2020). Patients' and nurses' perceptions of what constitutes good nursing care: An integrative review. *Research and Theory for Nursing Practice*, *34*(2), 144–169. https://doi.org/10.1891/rtnp-d-19-00070

Lee, Y., & Seomun, G. (2016). Compassion competence in nurses. *Advances in Nursing Science*, *39*(2), E54–E66. https://doi.org/10.1097/ANS.0000000000000111

Leininger, M. M. (2002). *Transcultural nursing: Concepts, theories, research, and practice*. McGraw-Hill, Medical Pub. Division,.

Levelink, M., Voigt-Barbarowicz, M., & Brütt, A. L. (2020). Priorities of patients, caregivers and health-care professionals for health research – A systematic review. *Health Expectations*, *23*(5), 992–1006. https://doi.org/10.1111/hex.13090

Leyva, E. W. A., Peralta, A. B., Tejero, L. M. S., & Santos, M. A. (2015). Global perspectives of caring: An integrative review. *International Journal for Human Caring*, *19*(4), 7–29. https://doi.org/10.20467/1091-5710-19.4.7

Limiñana-Gras, R. M., Sánchez-López, M. P., Saavedra-San Román, A. I., & Corbalán-Berná, F. J. (2013). Health and gender in female-dominated occupations: The case of male nurses. *The Journal of Men's Studies*, *21*(2), 135–148. https://doi.org/10.3149/jms.2102.135

Little, T. D. (2013). *Longitudinal structural equation modeling*. The Guilford Press.

Liu, N. Y., Hsu, W. Y., Hung, C. A., Wu, P. L., & Pai, H. C. (2019). The effect of gender role orientation on student nurses' caring behaviour and critical thinking. *International Journal of Nursing Studies*, *89*, 18–23. https://doi.org/10.1016/j.ijnurstu.2018.09.005

Lubke, G. H., & Muthén, B. O. (2004). Applying multigroup confirmatory factor models for continuous outcomes to likert scale data complicates meaningful group comparisons. *Structural Equation Modeling: A Multidisciplinary Journal*, *11*(4), 514–534. https://doi.org/10.1207/s15328007sem1104_2

Ma, Y., Chen, S.-C., & Zeng, H. (2020). Male student nurses need more support: Understanding the determinants and consequences of career adaptability in nursing college students. *Nurse Education Today*, *91*, N.PAG-N.PAG. https://doi.org/10.1016/j.nedt.2020.104435

MacCallum, R. C., Browne, M. W., & Cai, L. (2006). Testing differences between nested covariance structure models: Power analysis and null hypotheses. *Psychological Methods*, *11*(1), 19–35. https://doi.org/10.1037/1082-989X.11.1.19

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, *1*(2), 130–149. https://doi.org/10.1037/1082-989X.1.2.130

Mackintosh, C. (1997). A historical study of men in nursing. *Journal of Advanced Nursing*, *26*(2), 232–236. https://doi.org/10.1046/j.1365-2648.1997.1997026232.x

MacWilliams, B. R., Schmidt, B., & Bleich, M. R. (2013). Men in nursing: Understanding the challenges men face working in this predominantly female profession. *The American Journal of Nursing*, *113*(1), 38–46.

Mahoney, C. B., Lea, J., Schumann, P. L., & Jillson, I. A. (2020). Turnover, burnout, and job satisfaction of certified registered nurse anesthetists in the United States: Role of job characteristics and personality. *AANA Journal*, *88*(1), 10.

Marsh, H. W., Hau, K.-T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling: A Multidisciplinary Journal*, *11*(3), 320–341. https://doi.org/10.1207/s15328007sem1103_2

McCance, T. V. (2003). Caring in nursing practice: The development of a conceptual framework. *Research and Theory for Nursing Practice*, *17*(2), 101–116. https://doi.org/10.1891/rtnp.17.2.101.53174

McCance, T. V., McKenna, H. P., & Boore, J. R. P. (1997). Caring: Dealing with a difficult concept. *International Journal of Nursing Studies*, *34*(4), 241–248. https://doi.org/10.1016/S0020-7489(97)00011-4

McCance, T. V., McKenna, H. P., & Boore, J. R. P. (1999). Caring: Theoretical perspectives of relevance to nursing. *Journal of Advanced Nursing*, *30*(6), 1388–1395. https://doi.org/10.1046/j.1365-2648.1999.01214.x

McDonald, S. M. (2012). Perception: A concept analysis. *International Journal of Nursing Knowledge*, *23*(1), 2–9. https://doi.org/10.1111/j.2047-3095.2011.01198.x

McEwen, M. (2019). Philosophy, science, and nursing. In M. McEwen & E. M. Wills (Eds.), *Theoretical basis for nursing* (5th ed., pp. 2–22). Wolters Kluwer.

McFarland, M. R., & Wehbe-Alamah, H. B. (2014). *Leininger's culture care diversity and universality: A worldwide nursing theory*. Jones & Bartlett Learning, LLC. http://ebookcentral.proquest.com/lib/eastcarolina/detail.action?docID=3319398

McLaughlin, K., Muldoon, O. T., & Moutray, M. (2010). Gender, gender roles and completion of nursing education: A longitudinal study. *Nurse Education Today*, *30*(4), 303–307. https://doi.org/10.1016/j.nedt.2009.08.005

Meadus, R. J., & Twomey, J. C. (2011). Men student nurses: The nursing education experience. *Nursing Forum*, *46*(4), 269–279. https://doi.org/10.1111/j.1744-6198.2011.00239.x

Milfont, T. L., & Fischer, R. (2010). Testing measurement invariance across groups: Applications in cross-cultural research. *International Journal of Psychological Research*, *3*(1), 111–130. https://doi.org/10.21500/20112084.857

Miller, M. B. (1995). Coefficient alpha: A basic introduction from the perspectives of classical test theory and structural equation modeling. *Structural Equation Modeling: A Multidisciplinary Journal*, *2*(3), 255–273. https://doi.org/10.1080/10705519509540013

Milligan, F. (2001). The concept of care in male nurse work: An ontological hermeneutic study in acute hospitals. *Journal of Advanced Nursing*, *35*(1), 7–16. https://doi.org/10.1046/j.1365-2648.2001.01818.x

Mudd, A., Feo, R., Conroy, T., & Kitson, A. (2020). Where and how does fundamental care fit within seminal nursing theories: A narrative review and synthesis of key nursing concepts. *Journal of Clinical Nursing*, *29*(19–20), 3652–3666. https://doi.org/10.1111/jocn.15420

Mundfrom, D. J., Shaw, D. G., & Ke, T. L. (2005). Minimum sample size recommendations for conducting factor analyses. *International Journal of Testing*, *5*(2), 159–168. https://doi.org/10.1207/s15327574ijt0502_4

Muthén, L. K., & Muthén, B. O. (2002). How to use a monte carlo study to decide on sample size and determine power. *Structural Equation Modeling: A Multidisciplinary Journal*, *9*(4), 599–620. https://doi.org/10.1207/S15328007SEM0904_8

Myklebust, R. B. (2020). Gendered repertoires in nursing: New conceptualizations of educational gender segregation. *Gender and Education*, 1–15. https://doi.org/10.1080/09540253.2020.1765993

Newcomb, P., Wilson, M., Baine, R., McCarthy, T., Nicholas, P., Nixon, C., & Orren, J. (2017). Influences on patient satisfaction among patients who use emergency departments frequently for pain-related complaints. *Journal of Emergency Nursing*, *43*(6), 553–559. https://doi.org/10.1016/j.jen.2017.03.022

NHS Careers. (2012). *Nursing*. http://www.nhscareers.nhs.uk/explore-bycareer/nursing/skills-required/

Nicholls, L., & Webb, C. (2006). What makes a good midwife? An integrative review of methodologically diverse research. *Journal of Advanced Nursing*, *56*(4), 414–429. https://doi.org/10.1111/j.1365-2648.2006.04026.x

Niederriter, J. E., Eyth, D., & Thoman, J. (2017). Nursing students' perceptions on characteristics of an effective clinical instructor. *SAGE Open Nursing*, *3*, 2377960816685571. https://doi.org/10.1177/2377960816685571

Nurseplus. (2021). *Male nurses are the untapped resource that nursing needs*. https://www.nurseplusuk.com/blog/2018/08/male-nurses-are-the-untapped-resource-that-nursing-needs

Nursing and Midwifery Council. (2010). *Standards for preregistration nursing education*. http://standards.nmc-uk.org/PreRegNursing/statutory/ Standards/Pages/Standards.aspx

O'Connor, T. (2015). Men choosing nursing: Negotiating a masculine identity in a feminine world. *The Journal of Men's Studies*, *23*(2), 194–211. https://doi.org/10.1177/1060826515582519

O'Lynn, C. E. (2013). *A man's guide to a nursing career*. Springer Publishing Company; nlebk. https://login.proxy006.nclive.org/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=500210&site=eds-live&scope=site

O'Lynn, C. E., & Tranbarger, R. E. (2007). *Men in nursing: History, challenges, and opportunities.* Springer Publishing Company.

O'Lynn, C., & Krautscheid, L. (2011). Original research: "How should I touch you?": A qualitative study of attitudes on intimate touch in nursing care. *The American Journal of Nursing*, *111*(3), 24–31; quiz 32–33. Medline.

O'Muircheartaigh, C., Krosnick, J. A., & Helic, A. (2000). Middle alternatives, acquiescence, and the quality of questionnaire data. In *Working Papers* (No. 0103; Working Papers). Harris School of Public Policy Studies, University of Chicago. https://ideas.repec.org/p/har/wpaper/0103.html

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, *372*(n71), 9. https://doi.org/10.1136/bmj.n71

Papastavrou, E., Efstathiou, G., Tsangari, H., Suhonen, R., Leino-Kilpi, H., Patiraki, E., Karlou, C., Balogh, Z., Palese, A., Tomietto, M., Jarosova, D., & Merkouris, A. (2012). A cross-cultural study of the concept of caring through behaviours: Patients' and nurses' perspectives in six different EU countries. *Journal of Advanced Nursing*, *68*(5), 1026–1037. https://doi.org/10.1111/j.1365-2648.2011.05807.x

Pastore, M & Altoe, G. (2018). *influence.SEM: Case Influence in structural equation models*. (R package version 2.2) [Computer software]. https://CRAN.R-project.org/package=influence.SEM

Patterson, L. D., & Daniel, G. A. (2021). Increasing diversity in nursing: A focus on black men. *Georgia Nursing*, 2.

Pavlish, C., & Ceronsky, L. (2009). Oncology nurses' perceptions of nursing roles and professional attributes in palliative care. *Clinical Journal of Oncology Nursing*, *13*(4), 404–413. https://doi.org/10.1188/09.CJON.404-412

Penrod, J., Preston, D. B., Cain, R. E., & Starks, M. T. (2003). A discussion of chain referral as a method of sampling hard-to-reach populations. *Journal of Transcultural Nursing: Official Journal of the Transcultural Nursing Society*, *14*(2), 100–107. https://doi.org/10.1177/1043659602250614

Petges, N., & Sabio, C. (2020). Perceptions of male students in a baccalaureate nursing program: A qualitative study. *Nurse Education in Practice*, *48*. http://dx.doi.org/10.1016/j.nepr.2020.102872

PlanIT plus. (2012). *Nurse—Registered*. http://www.planitplus.net/careerzone/areas/default.aspx?PID=nf&TOPL=14&SECL=14N&ID=530

Pornprasertmanit, S., Miller, P., Schoemann, A., & Jorgensen, T. D. (2021). *simsem: SIMulated structural equation modeling*. (R package version 0.5-16) [Computer software]. https://CRAN.R-project.org/package=simsem

Poole, M., & Isaacs, D. (1997). Caring: A gendered concept. *Women's Studies International Forum*, *4*, 529. edsgao.

Powers, K., Herron, E. K., Sheeler, C., & Sain, A. (2018). The lived experience of being a male nursing student: Implications for student retention and success. *Journal of Professional Nursing*, *34*(6), 475–482. https://doi.org/10.1016/j.profnurs.2018.04.002

Qualtrics. (2021). *Qualtrics* (October, 2021) [Computer software]. October, 2021. https://www.qualtrics.com

R Core Team (2022). *R: A Language and Environment for Statistical Computing* (Version 4.1.3) [Computer software]. R core team. http://www.R-project.org

Radwin, L. (2000). Oncology patients' perceptions of quality nursing care. *Research in Nursing & Health*, *23*(3), 179–190. https://doi.org/10.1002/1098-240x(200006)23:3<179::aid-nur2>3.0.co;2-t

Revelle, W. (2020). *psych: Procedures for Personality and Psychological Research* (Version 2.2.3) [Computer software]. Northwestern University. https://CRAN.R-project.org/package=psych

Rogers, M. E. (1970). *An introduction to the theoretical basis of nursing*. F.A. Davis Company.

Rogers, M. E. (1992). Nursing science and the space age. *Nursing Science Quarterly*, *5*(1), 27–34. https://doi.org/10.1177/089431849200500108

Romero-Martín, M., Gómez-Salgado, J., Robles-Romero, J. M., Jiménez-Picón, N., Gómez-Urquiza, J. L., & Ponce-Blandón, J. A. (2019). Systematic review of the nature of nursing care described by using the Caring Behaviours Inventory. *Journal of Clinical Nursing*, *28*(21–22), 3734–3746. https://doi.org/10.1111/jocn.15015

Rosseel, Y. (2012). *lavaan: An R package for structural equation modeling*. *Journal of Statistical Software, 48*(2), 1-36. http://www.jstatsoft.org/v48/i02/

Sargent, A. (2012). Reframing caring as discursive practice: A critical review of conceptual analyses of caring in nursing. *Nursing Inquiry*, *19*(2), 134–143. https://doi.org/10.1111/j.1440-1800.2011.00559.x

Sasa, R. I. (2019). Male nurse: A concept analysis. *Nursing Forum*, *54*(4), 593–600. https://doi.org/10.1111/nuf.12374

Satorra, A., & Saris, W. E. (1985). Power of the likelihood ratio test in covariance structure analysis. *Psychometrika*, *50*(1), 83–90. https://doi.org/10.1007/BF02294150

Sauro, J. (2017). Cleaning data from surveys & online research. *MeasuringU*. https://measuringu.com/cleaning-data/

Scheel, M. E., Pedersen, B. D., & Rosenkrands, V. (2008). Interactional nursing – A practice-theory in the dynamic field between the natural, human and social sciences.

Scandinavian Journal of Caring Sciences, *22*(4), 629–636. https://doi.org/10.1111/j.1471-6712.2007.00564.x

Schoemann, A. M., Miller, P., Pornprasertmanit, S., & Wu, W. (2014). Using Monte Carlo simulations to determine power and sample size for planned missing designs. *International Journal of Behavioral Development*, *38*(5), 471–479. https://doi.org/10.1177/0165025413515169

Sebrant, L., & Jong, M. (2021). What's the meaning of the concept of caring? A meta-synthesis. *Scandinavian Journal of Caring Sciences*, *35*(2), 353–365. https://doi.org/10.1111/scs.12850

Sedgwick, M. G., & Kellett, P. (2015). Exploring masculinity and marginalization of male undergraduate nursing students' experience of belonging during clinical experiences. *Journal of Nursing Education*, *54*(3), 121–129. https://doi.org/10.3928/01484834-20150218-15

Seymer, L. R. (1954). *Selected writings of Florence Nightingale*. The Macmillan Company.

Shin, G., Kim, S., & Lee, Y. K. (2017). Experiences of male nursing students in simulation training for maternal and child nursing care. *Clinical Simulation in Nursing*, *13*(3), 95–101. https://doi.org/10.1016/j.ecns.2016.11.003

Simpson, R. (2011). Men discussing women and women discussing men: Reflexivity, transformation and gendered practice in the context of nursing care. *Gender, Work & Organization*, *18*(4), 377–398. https://doi.org/10.1111/j.1468-0432.2008.00436.x

Smith, C. M., Lane, S. H., Brackney, D. E., & Horne, C. E. (2020). Role expectations and workplace relations experienced by men in nursing: A qualitative study through an interpretive description lens. *Journal of Advanced Nursing*, *76*(5), 1211–1220. https://doi.org/10.1111/jan.14330

Smith, C. M., Lane, S. H., Brackney, D. E., & Horne, C. E. (2022). Motivators and success strategies experienced by men in nursing: An interpretive description study. *The Journal of Men's Studies*, 10608265211066096. https://doi.org/10.1177/10608265211066096

Smith, M. (1999). Caring and the Science of Unitary Human Beings.pdf. *Advances in Nursing Science*, *21*(4), 14–28.

Smith, M. C., Turkel, M. C., & Wolf, Z. R. (2012). *Caring in nursing classics: An essential resource*. Springer Publishing Company. http://ebookcentral.proquest.com/lib/eastcarolina/detail.action?docID=1108385

Spector, P. E. (1992). *Summated rating scale construction: An introduction*. SAGE Publications.

Speer, J. D. (2020). Where the girls are: Examining and explaining the gender gap in the nursing major. *Scottish Journal of Political Economy*, *67*(3), 322–343. https://doi.org/10.1111/sjpe.12234

Stanley, D. (2012). Celluloid devils: A research study of male nurses in feature films. *Journal of Advanced Nursing (John Wiley & Sons, Inc.)*, *68*(11), 2526–2537. https://doi.org/10.1111/j.1365-2648.2012.05952.x

Stanley, D., Beament, T., Falconer, D., Haigh, M., Saunders, R., Stanley, K., Wall, P., & Nielson, S. (2016). The male of the species: A profile of men in nursing. *Journal of Advanced Nursing*, *72*(5), 1155–1168. https://doi.org/10.1111/jan.12905

Sullivan, E. (2002). In a woman's world. *Reflections on Nursing Leadership: Honor Society of Sigma Theta Tau International*, *3*, 10–16.

Summers, A. (1988). *Angels and citizens: British women as military nurses 1854-1914*. Routledge.

Sundus, A., & Younas, A. (2020). Caring behaviors of male nurses: A descriptive qualitative study of patients' perspectives. *Nursing Forum*, *55*(4), 575–581. https://doi.org/10.1111/nuf.12464

Takase, M., Yamamoto, M., & Sato, Y. (2018). Effects of nurses' personality traits and their environmental characteristics on their workplace learning and nursing competence. *Japan Journal of Nursing Science*, *15*(2), 167–180. https://doi.org/10.1111/jjns.12180

Tamir, C., Budiman, A., Noe-Bustamante, L., & Mora, L. (n.d.). Facts about the U.S. black population. *Pew Research Center's Social & Demographic Trends Project*. Retrieved March 30, 2022, from https://www.pewresearch.org/social-trends/fact-sheet/facts-about-the-us-black-population/

The best historically black colleges and universities. (2022). US News & World Report. https://www.usnews.com/best-colleges/rankings/hbcu

Thomas, D., Newcomb, P., & Fusco, P. (2019). Perception of caring among patients and nurses. *Journal of Patient Experience*, *6*(3), 194–200. https://doi.org/10.1177/2374373518795713

Thompson, E. H. (2002). What's unique about men's caregiving? In B. J. Kramer & B. H. Thompson (Eds.), *Men as caregivers: Theory, research, and service implications* (pp. 20–47). Springer Publishing Company.

Thorne, S. (2014). Science and modern thought in nursing: Pragmatism & praxis for evidence-based practice. *Nursing Philosophy*, *15*(3), 225–227. https://doi.org/10.1111/nup.12033

Trossman, S. (2003). Issues update. Caring knows no gender: Break the stereotype and boost the number of men in nursing. *AJN American Journal of Nursing*, *103*(5), 65–68. https://doi.org/10.1097/00000446-200305000-00024

Trueland, J. (2020). Weighing up the profession's gender balance problem. *Nursing Standard*, *35*(12), 26–29. https://doi.org/10.7748/ns.35.12.26.s14

Turnipseed, L. A. (1986). Female patients and male nursing students. *JOGNN: Journal of Obstetric, Gynecologic & Neonatal Nursing*, *15*(4), 345–348. https://doi.org/10.1111/j.1552-6909.1986.tb01406.x

Twomey, J. C., & Meadus, R. (2016). Men nurses in Atlantic Canada: Career choice, barriers, and satisfaction. *The Journal of Men's Studies*, *24*(1), 78–88. https://doi.org/10.1177/1060826515624414

U. S. Census Bureau. (2013). *Men in nursing occupations: American community survey highlight report*. https://www.census.gov/content/dam/Census/library/working-papers/2013/acs/2013_Landivar_02.pdf

U.S. Bureau of Labor Statistics. (2021a). *Labor force statistics from the current population survey: Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity.* United States Department of Labor. https://www.bls.gov/cps/cpsaat11.htm

U.S. Bureau of Labor Statistics. (2021b). *Labor force statistics from the current population survey: Employment status of the civilian noninstitutional population by age, sex, and race*. United States Department of Labor. https://www.bls.gov/cps/cpsaat03.htm

U.S. Census Bureau. (2021). *QuickFacts: United States*. United States Census Bureau. https://www.census.gov/quickfacts/fact/table/US/SEX255219

Veritas Health Innovation. (2021). *Covidence systematic review software*. www.covidence.org

Wan, Q., Jiang, L., Zeng, Y., & Wu, X. (2019). A big-five personality model-based study of empathy behaviors in clinical nurses. *Nurse Education in Practice*, *38*, 66–71. https://doi.org/10.1016/j.nepr.2019.06.005

Watson, J. (2012). *Human caring science: A theory of nursing* (2nd ed.). Jones & Bartlett Learning.

Watson, J. (2015). Jean Watson's theory of human caring. In *Nursing theories and nursing practice* (4th ed., pp. 321–340). F.A. Davis Company.

Watson, R., & Lea, A. (1997). The caring dimensions inventory (CDI): Content validity, reliability and scaling. *Journal of Advanced Nursing*, *25*(1), 87–94. https://doi.org/10.1046/j.1365-2648.1997.1997025087.x

Watson, R., & Lea, A. (1998). Perceptions of caring among nurses: The influence of age and sex. *Journal of Clinical Nursing (Wiley-Blackwell)*, *7*(1), 97–97. https://doi.org/10.1046/j.1365-2702.1998.00172.x

Waugh, A., Smith, D., Horsburgh, D., & Gray, M. (2014). Towards a values-based person specification for recruitment of compassionate nursing and midwifery candidates: A study of registered and student nurses' and midwives' perceptions of prerequisite attributes and key skills. *Nurse Education Today*, *34*(9), 1190–1195. https://doi.org/10.1016/j.nedt.2013.12.009

Wei, H., Corbett, R. W., Rose, M. A., & Wei, T. L. (2019). Parents' and healthcare professionals' perceptions of the quality of care: A PITSTOP model of caring. *Nursing Forum*, *54*(4), 661–668. https://doi.org/10.1111/nuf.12391

Wei, H., Roscigno, C. I., & Swanson, K. M. (2017). Healthcare providers' caring: Nothing is too small for parents and children hospitalized for heart surgery. *Heart & Lung*, *46*(3), 166–171. https://doi.org/10.1016/j.hrtlng.2017.01.007

Wei, H., & Watson, J. (2019). Healthcare interprofessional team members' perspectives on human caring: A directed content analysis study. *International Journal of Nursing Sciences*, *6*(1), 17–23. https://doi.org/10.1016/j.ijnss.2018.12.001

Wei, H., Wei, T., Brown, K. J., Buck, S. H., & Mill, M. R. (2018). Parents' perceptions of caring characteristics of physicians and nurses. *International Journal for Human Caring*, *22*(1), 1–7. https://doi.org/10.20467/1091-5710.22.1.pg47

Widiyaningsih, T., Yetti, K., & Kuntarti, K. (2019). The competency of clinical instructors as it relates to the caring behavior of new nurses. *Enfermeria Clinica*, *29*(S2), 815–819. https://doi.org/10.1016/j.enfcli.2019.04.122

Wiman, E., & Wikblad, K. (2004). Caring and uncaring encounters in nursing in an emergency department. *Journal of Clinical Nursing*, *13*(4), 422–429. https://doi.org/10.1111/j.1365-2702.2004.00902.x

Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*, *76*(6), 913–934. https://doi.org/10.1177/0013164413495237

Wolf, Z. R. (1986). The caring concept and nurse identified caring behaviors. *Topics in Clinical Nursing*, *8*(2), 84–93.

Wolf, Z. R. (2019). Caring behaviors inventory and caring behaviors inventory for elders. In K. Sitzman PhD, RN, CNE, ANEF & J. Watson PhD, RN, AHN-BC, FAAN (Eds.), *Assessing and measuring caring in nursing and health sciences: Watson's caring science guide* (3rd ed., pp. 45–81). Springer Publishing Company. http://ebookcentral.proquest.com/lib/eastcarolina/detail.action?docID=5719248

Wu, Y., Larrabee, J. H., & Putman, H. P. (2006). Caring behaviors inventory: A reduction of the 42-item instrument. *Nursing Research*, *55*(1), 18–25. https://doi.org/10.1097/00006199-200601000-00003

Yang, C., Yu, H., Chin, Y., & Lee, L. (2017). There is nothing wrong with being a nurse: The experiences of male nursing students in Taiwan. *Japan Journal of Nursing Science*, *14*(4), 332–340. https://doi.org/10.1111/jjns.12162

Yazdanian, A., Alavi, M., Irajpour, A., & Keshvari, M. (2016). Association between nurses' personality characteristics and their attitude toward the older adults. *Iranian Journal of Nursing and Midwifery Research*, *21*(1), 9. https://doi.org/10.4103/1735-9066.174758

Yi, M., & Keogh, B. (2016). What motivates men to choose nursing as a profession? A systematic review of qualitative studies. *Contemporary Nurse*, *52*(1), 95–105. https://doi.org/10.1080/10376178.2016.1192952

Younas, A., & Sundus, A. (2018a). Experiences of and satisfaction with care provided by male nurses: A convergent mixed-method study of patients in medical surgical units. *Journal of Advanced Nursing*, *74*(11), 2640–2653. https://doi.org/10.1111/jan.13785

Younas, A., & Sundus, A. (2018b). Patients' experiences and satisfaction about care provided by male nurses in medical surgical units in Islamabad, Pakistan: A pilot study. *Nursing Forum*, *53*(1), 12–19. https://doi.org/10.1111/nuf.12212

Zamanzadeh, V., Valizadeh, L., Negarandeh, R., Monadi, M., & Azadi, A. (2013). Factors influencing men entering the nursing profession, and understanding the challenges faced by them: Iranian and developed countries' perspectives. *Nursing and Midwifery Studies*, *2*(2), 49–56. https://doi.org/10.5812/nms.12583

Zhang, W., & Liu, Y.L. (2016). Demonstration of caring by males in clinical practice: A literature review. *International Journal of Nursing Sciences*, *3*(3), 323–327. https://doi.org/10.1016/j.ijnss.2016.07.006

Zhang, Y., Wei, L., Li, H., Pan, Y., Wang, J., Li, Q., Wu, Q., & Wei, H. (2020). The psychological change process of frontline nurses caring for patients with covid-19 during its outbreak. *Issues in Mental Health Nursing*, *41*(6), 525–530. https://doi.org/10.1080/01612840.2020.1752865

APPENDIX A: UCMIRB

Smith, Chris
From: umcirb@ecu.edu
Sent: Monday, January 24, 2022 6:41 AM
To: Smith, Chris
Subject: IRB: Study Correspondence Letter

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office 252-744-2914 · Fax 252-744-2284 · rede.ecu.edu/umcirb/

Notification of Exempt Certification

From: Social/Behavioral IRB
To: Christopher Smith
CC: Linda Bolin
Date: 1/24/2022
UMCIRB 21-000747
Re: Beyond Men's Experiences: Development and Psychometric Evaluation of the Fitness in Nursing Scale for Men (FiNS-M)

I am pleased to inform you that your research submission has been certified as exempt on 1/24/2022. This study is eligible for Exempt Certification under category # 2ab.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

Document	Description
dissertation proposal(0.01)	Study Protocol or Grant Application
dissertation proposal committee approval(0.01)	Study Protocol or Grant Application
smith_ mens fitness consent to participate.docx(0.01)	Consent Forms
smith_ mens fitness debriefing.docx(0.01)	Additional Items
smith_ mens fitness scale items and measures.docx(0.02)	Surveys and Questionnaires
smith_mens fitness demographic questionnaire.docx(0.01)	Surveys and Questionnaires
smith_mens fitness flyer.docx(0.02)	Recruitment Documents/Scripts
smith_mens fitness validity check.docx(0.01)	Additional Items
study email blast.docx(0.01)	Recruitment Documents/Scripts

For research studies where a waiver or alteration of HIPAA Authorization has been approved, the IRB states that each of the waiver criteria in 45 CFR 164.512(i)(1)(i)(A) and (2)(i) through (v) have been met. Additionally, the elements of PHI to be collected as described in items 1 and 2 of the Application for Waiver of Authorization have been determined to be the minimal necessary for the specified research.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

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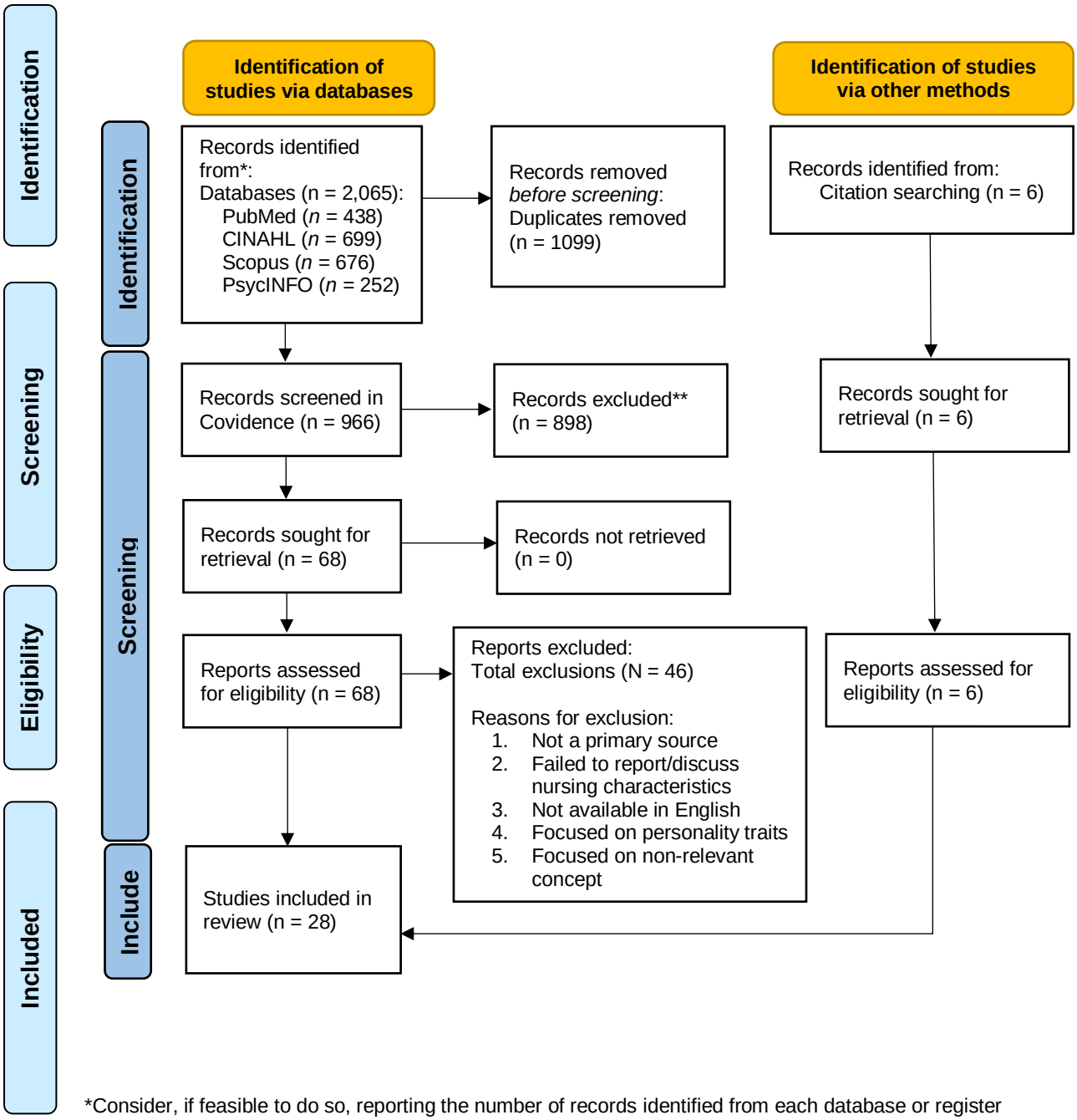
Study.PI Name:
Study.Co-Investigators:

APPENDIX B: PRISMA 2020 FLOW DIAGRAM



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.
For more information, visit: http://www.prisma-statement.org/

APPENDIX C: CHARACTERISTICS OF NURSES' PRACTICE FROM NURSES' AND PATIENTS' PERSPECTIVES

Study	Country or Area	Study Design	Study Population	Sample (*N*)	Age (y)	Instrument	Aim	Characteristics
Afaya et al., 2017	Kumbungu, Ghana	Qualitative, cross-sectional descriptive	Patients admitted to medical surgical ward, at Kings Medical Center.	183 patients	18-68	CBI-24	Explore patients' perceptions about nurses caring behaviors.	Listen to patients, teach patients, know how to give shots, respectful. Knowledge and skill rated most important subscale.
Alavi et al., 2015	Iran	Qualitative, content analysis	Pediatric nurses from pediatric wards and nursing school affiliated with Isfahan University of Medical Science.	27 nurses	27-49	Interview	Explore benchmark attributes of caring self-efficacy.	Professional communication, process-oriented care, family-oriented care, altruistic, empathetic, proficient in clinical skills, creativity in care, good interprofessional team skills.
Bahrami et al., 2018	Iran	Qualitative, descriptive exploratory	Nurses from teaching hospitals and nursing schools affiliated to Arak, Isfahan and Tehran Universities of Medical Sciences.	25 nurses	Not reported	Semi-structured interviews	Define components of emotional competence in caring for gerontological population.	Emotional competence, self-awareness, positive attitude, reduce suffering, good communication and interaction with families, compassionate, non-judgmental, actively listen to patients, adhere to professional ethics.
Costello, 2017	Boston, MA, USA	Qualitative, grounded theory	Nurses identified as "providing exceptional care" at a large urban academic medical center.	9 nurses	Not reported	Semi-structured interviews	Uncover the characteristics and behaviors of nurses identified by patients as providing exceptional nursing care.	Being emotionally and physically present, knowing the patient, human connection, empathy, connect with patient through shared commonalities, respectfulness and connectedness.

da Silva & Ferreira, 2011	Rio de Janeiro	Qualitative, descriptive	Nurses in a cardiointensive unit in a large federal hospital.	24 nurses	Not reported	Individual interviews	To describe the characteristics of the figure-type of a nurse to work in intensive care environments.	Interest and desire to seek knowledge related to healthcare, willingness to learn, emotional balance, communication/teamwork skills, leadership skills.
Darch et al., 2017	London	Qualitative, hybrid concept analysis	21 nurses and 18 third year nursing students working in NHS Trusts.	39 nurses	21-58	Analysis of literature	Provide theoretical clarity for the concept of role models in health promoting behavior for registered nurses and students.	Sensitive and empathetic, non-judgmental, trustworthy, honest, self-aware, fit and healthy, knowledgeable, professional, exemplar and advocate for healthy behaviors, patience, professional.
Evans, 2002	Nova Scotia, Canada	Qualitative, thematic analysis	Men nurses practicing in the province of Nova Scotia, Canada.	8	Late 20s – mid 50s	Semi-structured interviews	Explore experiences of men nurses and the ways in which gender relations structure different work experiences for women and men in the same profession	Compassion, empathy, honesty, humor, camaraderie, friendly demeanor, conscious attention to necessity of touch, trust building with patient, mindful of patient comfort, respectful of patients' dignity especially men nurses caring for women patients, teamwork.
Feo et al., 2018	Australia	Scoping review, Joanna Briggs method	CINAHL, Scopus, PubMed, ProQuest, 1/2010 – 10/2016	49 articles	---	Scoping review	Investigate how fundamental aspects of nursing care have been defined in the literature from 2010–2016.	Exhibit attributes of caring, understanding, respect, nonjudgement, concern, empathy, kindness, wisdom, and courteousness. Establish meaningful, empathic relationships with patients and families. Provide emotional comfort/support and reassurance. Actively listen.

								Offer clear explanations and explain procedures and interventions. Demonstrate professional knowledge and skill. Be attentive.
Finfgeld-Connett, 2008	Missouri, Columbia, MO, USA	Qualitative, meta-synthesis		49 qual reports & 6 concept analyses	---	Meta-synthesis	Enhance the understanding of the concept of caring.	Caring characterized by expert nursing practice, interpersonal sensitivity, and intimate professional relationships. Empathy, being physically and mindfully present, emotionally available, listening attentively, nonjudgmental care, respectful of cultural differences, honesty, knowledgeable and expert practice skills.
Harding et al., 2008	New Zealand	Qualitative, discourse analysis	Male nurses	18 male nurses		Semi-structured interviews	Explore experiences of male nurses in providing physically intimate care within a discourse that has sexualized men's touch.	Communication, providing explanations, humor, building trusting relationship with patient,
Karlou et al., 2018	Greece	Mixed methods, cross sectional	Oncology nurses caring for patients receiving chemo.	90 nurses	Not reported	CBI-24 and focus groups	Explore caring behaviors which nurses perceive as important in caring for patients receiving chemo.	Six categories included concept of care, respect, nurse-patient connection, empathy, and nurses' professional role. Providing emotional, informational, and practical support is central to care. Qualitative study confirmed most valued characteristics were related to professional knowledge, technical tasks, and procedures. Top 3 caring behaviors on CBI

								included knowing how to give shots, giving meds and treatments on time, and reducing patients' pain.
Kellett et al., 2014	Canada	Critical synthesis	Literature	Not reported	---	Critical synthesis	Situate existing scholarship about men in nursing within the broader gendered landscape of the profession and society.	Caring, compassion, empathy, honesty, appropriate use of humor, establishing trust, interacting in a professional manner, modifying procedures to minimize need for touching or exposing patient, adjusting expressions of masculinity to minimize patient discomfort,
Lee & Kim, 2020	Korea	Integrative review, mixed-methods appraisal tool	PubMed, CINAHL, and MEDLINE, 1/2000 – 6/2017	18 articles	---	Integrative review	Integrate the literature on patients' and nurses' perceptions of what constitutes "good nursing care" to identify similarities and differences in patients' and nurses' perceptions of good nursing care.	Patients' and nurses' perceptions – Being encouraging and providing reassurance, trusting relationships, physical and emotional presence, compassion, kindness, expert job performance, giving information, empowering the patient through decision making.
Lee & Seomun, 2016		Qualitative, hybrid concept analysis	Literature 1986 – 2013, and interviews	6 nurses, 23 studies	Not reported	Literature review and interviews	Identify the attributes of compassion competence in a nursing context.	Knowledge attributes = professional knowledge, continuous learning, 2. Skills = communication, sensitivity, insight, self-awareness, self-management, respect, 3. Attitudes = empathy, maintains professional distance.

Leyva et al., 2015	Includes 81 international studies	Integrative review	Literature, 2003 – 2014	86 studies	---	Integrative review	Includes resolving ambiguity in defining caring based on contemporary literature.	Caring defines a set of competencies necessary to produce positive patient outcomes. Includes listening attentively to the patient's needs and issues, effective communication, support, advocacy, informed participation, provision of comfort, kindness, compassion, empathy, nonjudgmental, emotional and physical connectedness between nurse and patient, honesty, competence in clinical skills, physiologic and psychological interventions.
McCance, 2003	Northern Ireland	Qualitative, hermeneutic phenomenology	Patients shortly after discharge from hospital.	24 patients		One to one interviews	Explore patient experiences of caring by qualified nurses.	Communicating, being attentive, being present or visible, timely responses, getting to know the patient, good time management, respecting privacy, ability to prioritize care, communicative interpersonal skills, professional competence.
Newcomb et al., 2017	Fort Worth, TX, Spokane, WA, Arlington, TX, Pikeville, KY, USA	Quantitative, retrospective cohort	Patient satisfaction surveys from 720 bed full service, private, nonprofit, urban medical center in southwestern US.	305 patients & 305 matched sample	Not reported	Patient satisfaction surveys	Assess relationships between opioid prescribing practices, patient and ED. attributes, and patient satisfaction ratings of nursing and physician care among patients with high utilization of the emergency department for pain relief.	Perceptions that nursing care was compassionate, feelings that the patient mattered personally, perceptions of safety precautions, and wait times. Four variables were highly intercorrelated ($r \geq 0.80$) so they reflect the same broad concept (satisfaction of nursing care).

Nicholls & Webb, 2006	UK	Qualitative, integrative review	Literature 1993 - 2006	33 articles	---	Literature review	Answer the question "What makes a good midwife?"	Having good communication skills made the greatest contribution to being 'a good midwife', while being compassionate, kind, supportive (affective dimension), knowledgeable (cognitive dimension) and skillful (psychomotor dimension) also made major contributions. Involvement in education and research were necessary requirements, adopting a caring approach, and 'be there' for women were essential. Involving patients' partners in their care.
Pavlish & Ceronsky, 2009	Midwestern U.S.	Qualitative, descriptive	Oncology nurses in 3 medical centers.	33 nurses	Not reported	Audio recorded focus group interviews	Explore oncology nurses' perspectives of palliative care.	Clinical experts, knowledgeable about nursing care, honest, collaborate with patient, family-oriented, attentive to patients' needs, good listeners, good communication skills, good interprofessional/team skills, deliberate and goal directed.
Radwin, 2000	Boston, MA, USA	Qualitative, grounded theory	Oncology patients treated at an urban medical center.	22 patients	27-82	Semi structured interviews	Analyze oncology patients' perceptions of the attributes and outcomes of quality nursing care.	Professional knowledge, continuity of nursing staff, physical and emotional attentiveness, interprofessional skills, being treated as a partner with nurse, individualized care, honesty/openness of nurse to build rapport.

Sundus & Younas, 2020	Islamabad, Pakistan	Qualitative, description	Patients from 14 med-surg units across 3 private hospitals in Islamabad, Pakistan	15 patients	25-63	Semi structured interviews	Explore caring behaviors of male nurses from patients' perspectives in med-surgical setting.	Respectful of feelings, considerate and thoughtful, good listeners, unbiased, non-judgmental, and supportive, attention to “little needs” like changing IV lines in a gentle manner, providing emotional and psychological support.
Waugh et al., 2014	UK	Quantitative, cross-sectional descriptive	Registered and student nurses' and midwives'	276 nurses & 226 students	Not reported	Survey	Identify perceptions of potential attributes and key skills to include in a person specification for nursing and midwifery candidates.	Honesty, good communication and listening skills, compassion, patience, teamwork, calm, knowledgeable, committed, numeracy, multi-tasking abilities, teaching abilities, reasoning/critical thinking skills.
Wei et al., 2018	Greenville & Chapel Hill, NC, USA	Qualitative, Description	Parents of patients with CHD undergoing heart surgery.	13 patients’ parents	Not reported	Face to face in depth interviews	Describe parents’ perceptions of the caring characteristics of physicians and nurses who take care of their children with CHD undergoing heart surgery.	Compassionate demeanor, physical and emotional presence, listening attentively, explaining healthcare information in layman’s terms, being knowledgeable, kindness, treating with dignity, honesty, empathy.
Widiyaningsih et al., 2019	Jakarta, Indonesia	Quantitative, correlational descriptive cross-sectional	New nurses in a South Jakarta, Indonesia, hospital	104 new nurses	Not reported	Survey	Identify the relation between clinical instructors and the caring behavior and commitment of new nurses in a hospital.	Knowledge, teaching skills, professional behavior, leadership, competent, right in communication, good interprofessional relations. Women perform highest scores on caring behaviors.

Wiman & Wikblad, 2004	Sweden	Qualitative, content analysis	ER nurses & ER patients	10 ER nurses & 5 ER patients	Not reported	Videotaping interactions between nurses and patients in the emergency room	Highlight encounters between injured patients and nurses in the trauma team and to explore whether the theory of caring and uncaring encounters in nursing and health care is applicable in emergency care.	Open attitude and communicate openly with patients, interpersonal skills that reflect genuine concern for patient, compassion, respect patients' dignity, physically and emotionally present, attentive listening, good communication skills, dedication to nursing responsibilities.
Younas & Sundus, 2018a	Islamabad, Pakistan	Convergent mixed methods	Patients from 14 medical surgical units of three private hospitals in Islamabad, Pakistan	262 patients		Newcastle Satisfaction with Nursing Scale & semi-structured interviews	Understand patients' experiences of and satisfaction with care provided by male nurses in medical surgical units.	Providing support and comfort, respecting privacy, providing information to patients and their families, spending time with patients, respect patients' autonomy, knowledge/capability in nursing care, caring attitude
Younas & Sundus, 2018b	Islamabad, Pakistan	Quantitative, cross-sectional descriptive	Patients admitted to medical-surgical units in a private hospital for at least 2 days and who had professional interactions with male nurses.	50 Patients	20 - >40	Newcastle Satisfaction with Nursing Scale	Determine patients' experiences and satisfaction from care provided by male nurses.	Explain healthcare-related information clearly, provide emotional and psychological support, knowledgeable in nursing care, attentive to patients needs/requests, open to discuss concerns related to patients' family/social life, smile, physical presence, good listening and communication skills
Zhang & Liu, 2016	Wuhan, China	Qualitative, literature review	Literature	---	---	Literature review	Investigate the role of male nurses in the use of intimate care, especially the application of touch.	Men apply more humor, caring is more restrained, focus on building mutual trust with patients, trend toward avoiding skin to skin touch, more likely to associate psychosocial tasks with caring.

APPENDIX D: INITIAL 39-ITEM POOL

Latent factors: knowledge, practice skills, and interpersonal relations

Knowledge

1. Men in nursing value professional knowledge.
2. Men in nursing are knowledgeable about fundamental aspects of nursing practice.
3. Men in nursing stay up to date with evidence-based nursing practice.
4. Men in nursing are knowledgeable about specialty specific (e.g., ER, ICU, med-surg, cardiac, peds, etc.) nursing care in which they work.
5. Men in nursing explain complex healthcare topics in an understandable way.
6. Men in nursing provide clear explanations to patients about the care process.
7. Men in nursing are competent in nursing practice
8. Men in nursing are knowledgeable about operating technical equipment.
9. Men in nursing are knowledgeable about patients' health problems
10. Men in nursing function autonomously.
11. Men in nursing pursue advanced educational degrees.
12. Men in nursing are knowledgeable about healthcare research.
13. Men in nursing promote healthy behaviors.

Practice Skills

1. Men in nursing perform IV insertions skillfully.
2. Men in nursing multi-task patient care.
3. Men in nursing are effective leaders.
4. Men in nursing are good role models in nursing.
5. Men in nursing reduce patients suffering.
6. Men in nursing operate technical equipment skillfully.
7. Men in nursing are self-aware.
8. Men in nursing communicate effectively.

9. Men in nursing are critical thinkers.
10. Men in nursing are effective teachers.
11. Men in nursing contribute well to team efforts (good team players).
12. Men in nursing are nonjudgmental.
13. Men in nursing are good problem solvers

Interpersonal Relations

1. Men in nursing are emotionally present with patients.
2. Men in nursing perform invasive nursing interventions (e.g., nasogastric tube, foley catheter) in a caring manner.
3. Men in nursing are empathetic toward patients.
4. Men in nursing listen attentively to patients.
5. Men in nursing are emotionally distant (RC)
6. Men in nursing develop meaningful relationships with patients.
7. Men in nursing are physically present with patients.
8. Men in nursing deliver nursing care compassionately.
9. Men in nursing are honest with patients
10. Men in nursing include patients' families in communication
11. Men in nursing are emotionally restrained.
12. Men in nursing meet patients' emotional needs
13. Men in nursing avoid skin to skin physical touch when caring for patients.

APPENDIX E: INITIAL 39-ITEM FINS-M© SCALE

Response Scale: Seven-point Likert with higher scores indicating higher levels of agreement and lower scores indicating lower levels of agreement that men are fit for nursing. Scale responses and scoring include, strongly disagree = 1, disagree = 2, somewhat disagree = 3, neither agree nor disagree = 4, somewhat agree = 5, agree = 6, and strongly agree = 7

Latent factors: K = knowledge, PS = practice skills, and IR = interpersonal relations

Coding: RC = reverse coded

Instructions: Please consider your work experience with men in nursing and indicate your level of agreement with the following statements:

1. Men in nursing value professional knowledge. (K)
2. Men in nursing perform IV insertions skillfully. (PS)
3. Men in nursing are emotionally present with patients. (IR)
4. Men in nursing perform invasive nursing interventions (e.g., nasogastric tube, foley catheter) in a caring manner. (IR)
5. Men in nursing are knowledgeable about fundamental aspects of nursing practice. (K)
6. Men in nursing multi-task patient care. (PS)
7. Men in nursing stay up to date with evidence-based nursing practice. (K)
8. Men in nursing are effective leaders. (PS)
9. Men in nursing are empathetic toward patients. (IR)
10. Men in nursing are good role models in nursing. (PS)
11. Men in nursing listen attentively to patients. (IR)
12. Men in nursing are knowledgeable about specialty specific (e.g., ER, ICU, med-surg, cardiac, peds, etc.) nursing care in which they work. (K)
13. Men in nursing are honest with patients. (IR)
14. Men in nursing explain complex healthcare topics in an understandable way. (K)
15. Men in nursing reduce patients suffering. (PS)

16. Men in nursing are emotionally distant (RC)
17. Men in nursing provide clear explanations to patients about the care process. (K)
18. Men in nursing develop meaningful relationships with patients. (IR)
19. Men in nursing are competent in nursing practice (K)
20. Men in nursing are self-aware. (PS)
21. Men in nursing are physically present with patients. (IR)
22. Men in nursing are knowledgeable about operating technical equipment. (K)
23. Men in nursing communicate effectively. (PS)
24. Men in nursing operate technical equipment skillfully. (PS)
25. Men in nursing deliver nursing care compassionately. (IR)
26. Men in nursing are knowledgeable about patients' health problems (K)
27. Men in nursing are critical thinkers. (PS)
28. Men in nursing function autonomously. (K)
29. Men in nursing are effective teachers. (PS)
30. Men in nursing are nonjudgmental. (PS)
31. Men in nursing include patients' families in communication (IR)
32. Men in nursing pursue advanced educational degrees. (K)
33. Men in nursing contribute well to team efforts (good team players). (PS)
34. Men in nursing are emotionally restrained. (IR)
35. Men in nursing are knowledgeable about healthcare research. (K)
36. Men in nursing meet patients' emotional needs. (IR)
37. Men in nursing promote healthy behaviors. (K)
38. Men in nursing are good problem solvers. (PS)
39. Men in nursing avoid skin to skin physical touch when caring for patients. (IR)

APPENDIX F: REVISED 39-ITEM FINS-M© SCALE BASED ON INTERNAL REVIEWERS FEEDBACK

The first revision of the 39-item FiNS-M© scale is shown below. The scale reflects revisions that were based on internal reviewers' feedback. Internal reviewers included three nurse scientists and a psychometrician who were part of the study team.

Response Scale: Seven-point Likert with higher scores indicating higher levels of agreement and lower scores indicating lower levels of agreement that men are fit for nursing. Scale responses and scoring include, strongly disagree = 1, disagree = 2, somewhat disagree = 3, neither agree nor disagree = 4, somewhat agree = 5, agree = 6, and strongly agree = 7

Latent factors: K = knowledge, PS = practice skills, and IR = interpersonal relations

Coding: RC = reverse coded

Instructions: Please consider your work experience with men in nursing and indicate your level of agreement with the following statements:

1. Men in nursing value professional knowledge. (K)
2. Men in nursing perform IV insertions skillfully. (PS)
3. Men in nursing display emotional presence with patients. (IR)
4. Men in nursing perform invasive nursing interventions (e.g., nasogastric tube, foley catheter) in a caring manner. (IR)
5. Men in nursing demonstrate proficiency in fundamental aspects of nursing practice. (K)
6. Men in nursing multi-task patient care. (PS)
7. Men in nursing stay up to date with evidence-based nursing practice. (K)
8. Men in nursing exhibit effective leadership. (PS)
9. Men in nursing show empathy toward patients. (IR)
10. Men in nursing exemplify "good role model" in nursing. (PS)
11. Men in nursing listen attentively to patients. (IR)

12. Men in nursing are knowledgeable about nursing care related to their specialty (e.g., ER, ICU, med-surg, cardiac, peds, etc.). (K)
13. Men in nursing employ honesty during patient interactions. (IR)
14. Men in nursing explain complex healthcare topics in an understandable way. (K)
15. Men in nursing reduce patients suffering. (PS)
16. Men in nursing are emotionally distant with their patients. (RC)
17. Men in nursing provide clear explanations to patients about the care process. (K)
18. Men in nursing develop meaningful relationships with patients. (IR)
19. Men in nursing practice nursing in a competent manner. (K)
20. Men in nursing display self-awareness. (PS)
21. Men in nursing maintain physical presence with patients. (IR)
22. Men in nursing operate technical equipment proficiently. (K)
23. Men in nursing communicate effectively. (PS)
24. Men in nursing operate technical equipment skillfully. (PS)
25. Men in nursing deliver nursing care compassionately. (IR)
26. Men in nursing address patients' health problems in a knowledgeable manner. (K)
27. Men in nursing think critically. (PS)
28. Men in nursing function autonomously. (K)
29. Men in nursing incorporate teaching during patient care. (PS)
30. Men in nursing care for patients in a nonjudgmental manner. (PS)
31. Men in nursing include patients' families in communication (IR)
32. Men in nursing pursue advanced educational degrees. (K)
33. Men in nursing contribute well to team efforts (good team players). (PS)
34. Men in nursing restrain themselves emotionally. (IR)
35. Men in nursing are knowledgeable about healthcare research. (K)
36. Men in nursing meet patients' emotional needs. (IR)

37. Men in nursing promote healthy behaviors. (K)

38. Men in nursing solve problems well. (PS)

39. Men in nursing avoid skin to skin physical touch when caring for patients. (IR)

APPENDIX G: REVISED 39-ITEM FINS-M© SCALE BASED ON EXTERNAL REVIEWERS' FEEDBACK

Response Scale: Seven-point Likert with higher scores indicating higher levels of agreement and lower scores indicating lower levels of agreement that men are fit for nursing. Scale responses and scoring include, strongly disagree = 1, disagree = 2, somewhat disagree = 3, neither agree nor disagree = 4, somewhat agree = 5, agree = 6, and strongly agree = 7

Latent factors: K = knowledge, PS = practice skills, and IR = interpersonal relations

Coding: RC = reverse coded

Instructions: Please consider your work experience with men in nursing and indicate your level of agreement with the following statements:

1. Men in nursing value professional knowledge. (K)
2. Men in nursing perform IV insertions skillfully. (PS)
3. Men in nursing display emotional presence with patients. (IR)
4. Men in nursing employ a caring manner when performing invasive nursing interventions. (IR)
5. Men in nursing are knowledgeable about nursing care. (K)
6. Men in nursing multi-task patient care. (PS)
7. Men in nursing stay up to date with evidence-based nursing practice. (K)
8. Men in nursing exhibit effective leadership. (PS)
9. Men in nursing show empathy toward patients. (IR)
10. Men in nursing exemplify a "good role model" in nursing. (PS)
11. Men in nursing listen attentively to patients. (IR)
12. Men in nursing are knowledgeable about nursing care related to their specialty (e.g., ER, ICU, med-surg, cardiac, peds, etc.). (K)
13. Men in nursing use honesty when interacting with patients. (IR)
14. Men in nursing explain complex healthcare topics in an understandable way. (K)

15. Men in nursing reduce patients suffering. (PS)
16. Men in nursing are emotionally distant with their patients. (RC)
17. Men in nursing provide clear explanations to patients. (K)
18. Men in nursing develop meaningful professional relationships with patients. (IR)
19. Men in nursing practice nursing with competence. (PS)
20. Men in nursing display self-awareness. (PS)
21. Men in nursing maintain physical presence with patients. (IR)
22. Men in nursing know how to operate technical equipment. (K)
23. Men in nursing communicate effectively. (PS)
24. Men in nursing operate technical equipment skillfully. (PS)
25. Men in nursing deliver nursing care compassionately. (IR)
26. Men in nursing address patients' health problems in a knowledgeable manner. (K)
27. Men in nursing think critically. (K)
28. Men in nursing function autonomously. (PS)
29. Men in nursing incorporate teaching during patient care. (PS)
30. Men in nursing care for patients in a nonjudgmental manner. (IR)
31. Men in nursing include patients' families in communication (IR)
32. Men in nursing pursue advanced educational degrees. (K)
33. Men in nursing contribute well to team efforts (good team players). (IR)
34. Men in nursing restrain themselves emotionally. (IR)
35. Men in nursing are knowledgeable about health-related research. (K)
36. Men in nursing meet patients' emotional needs. (IR)
37. Men in nursing encourage patients to adopt healthy behaviors. (K)
38. Men in nursing solve problems skillfully. (PS)
39. Men in nursing avoid skin to skin physical touch when caring for patients. (IR)

APPENDIX H: 33-ITEM FINS-M© SCALE FINAL REVISIONS

Response Scale: Seven-point Likert with higher scores indicating higher levels of agreement and lower scores indicating lower levels of agreement that men are fit for nursing. Scale responses and scoring include, strongly disagree = 1, disagree = 2, somewhat disagree = 3, neither agree nor disagree = 4, somewhat agree = 5, agree = 6, and strongly agree = 7

Latent factors: K = knowledge, PS = practice skills, and IR = interpersonal relations

Coding: RC = reverse coded

Instructions: For this survey, men are defined as persons who self-identify as men. Please consider your professional work experience with men in nursing and indicate your level of agreement with the following statements:

1. Men in nursing value professional knowledge. (K)
2. Men in nursing perform IV insertions skillfully. (PS)
3. Men in nursing make themselves emotionally available to patients. (IR)
4. Men in nursing employ a caring manner when performing invasive nursing interventions. (IR)
5. Men in nursing are knowledgeable about nursing care. (K)
6. Men in nursing multi-task patient care competently. (PS)
7. Men in nursing stay current with evidence-based nursing practice. (K)
8. Men in nursing exhibit effective leadership. (PS)
9. Men in nursing listen attentively to patients. (IR)
10. Men in nursing use honesty when interacting with patients. (IR)
11. Men in nursing explain complex healthcare topics in an understandable way. (K)
12. Men in nursing reduce patients suffering. (PS)
13. Men in nursing provide clear explanations to patients. (K)
14. Men in nursing develop meaningful professional relationships with patients. (IR)
15. Men in nursing practice nursing with competence. (PS)

16. Men in nursing display self-awareness. (PS)
17. Men in nursing maintain physical presence with patients. (IR)
18. Men in nursing know how to operate technical equipment. (K)
19. Men in nursing communicate effectively. (PS)
20. Men in nursing operate technical equipment skillfully. (PS)
21. Men in nursing deliver nursing care with compassion. (IR)
22. Men in nursing address patients' health problems in a knowledgeable manner. (K)
23. Men in nursing think critically. (K)
24. Men in nursing function autonomously. (PS)
25. Men in nursing incorporate teaching during patient care. (PS)
26. Men in nursing care for patients in a nonjudgmental manner. (IR)
27. Men in nursing include patients' families in communication (IR)
28. Men in nursing pursue advanced educational degrees. (K)
29. Men in nursing contribute well to team efforts (good team players). (IR)
30. Men in nursing restrain themselves emotionally. (IR)
31. Men in nursing are knowledgeable about health-related research. (K)
32. Men in nursing encourage patients to adopt healthy behaviors. (K)
33. Men in nursing solve problems skillfully. (PS)

APPENDIX I: PI DEVELOPED DEMOGRAPHIC QUESTIONNAIRE

Please answer the following:

1. How did you hear about this survey?
    - American Association for Men in Nursing (AAMN)
    - National League for Nursing (NLN)
    - Southern Nurses Research Society (SNRS)
    - Facebook
    - Twitter
    - Reddit
    - Instagram
    - University
    - Coworker
    - Friend
    - Other (please type response)
2. What is your age in years (please type response)
3. Which race best describes you?
    - Asian American
    - Black/African American
    - Native American/Alaskan Native
    - Pacific Islander
    - White/Caucasian
    - Other [open text box]
4. Are you of Hispanic, Latina/o, Chicana/o heritage?
    - Yes
    - No

5. Which gender best describes you?
    - Male
    - Female
    - Other (please type response)
6. What is your highest education level??
    - Diploma nurse
    - Associate degree
    - Baccalaureate degree
    - Master's degree
    - Doctoral degree
7. How many years have you been a nurse (please type response)
8. What is your current nursing position?
    - Clinician
    - Academic faculty
    - Other (please type response)
9. Which employment status best describes you?
    - Full-time
    - Part-time
    - Per diem (PRN)
10. In which U.S. geographic region are you currently living?
    - New England
    - Mid-Atlantic
    - Southeast
    - Midwest
    - Rocky Mountain

- Great Plains
- Southwest
- West Coast
- Alaska or Hawaii

APPENDIX J: R SYNTAX USED FOR ANALYSIS

```
#create covariance matrix

#create lambda matrix

lambda <- matrix(0, nrow = 30, ncol = 3)

lambda

lambda[1:10, 1] <- .7

lambda[11:20, 2] <- .7

lambda[21:30, 3] <- .7

lambda

#create psi matrix

psi <- matrix(1, nrow = 3, ncol = 3)

psi[2,1] <- psi[1,2] <- .5

psi[3,2] <- psi[2,3] <- .5

psi[3,1] <- psi[1,3] <- .5

psi

#create theta matrix

theta <- matrix(0, nrow = 30, ncol = 30)

diag(theta) <- .51

theta

#Based on LISREL model get covariance matrix

#Using matrix algebra formula lambda X psi X transpose of lambda + theta gives

#model implies covariance matrix

covMat <- lambda %*% psi %*% t(lambda) + theta

rownames(covMat) <- paste('v', 1:30, sep = "")

colnames(covMat) <- paste('v', 1:30, sep = "")

covMat
```

```
# Or use SSpower in semTools

#Specify population model and specify all fixed parameters in the model.

> PopMod <- 'F1 =~ .7*v1 + .7*v2 + .7*v3 + .7*v4 + .7*v5 + .7*v6 + .7*v7 + .7*v8 + .7*v9 +.7*v10

F2 =~ .7*v11 + .7*v12 + .7*v13 + .7*v14 + .7*v15 + .7*v16 + .7*v17 + .7*v18 + .7*v19 + .7*v20

F3 =~ .7*v21 + .7*v22 + .7*v23 + .7*v24 + .7*v25 + .7*v26 + .7*v27 + .7*v28 + .7*v29 + .7*v30

F1 ~~ 1*F1

F2 ~~ 1*F2

F3 ~~ 1*F3

F1 ~~ .3*F2

F2 ~~ .3*F3

F1 ~~ .3*F3

 v1 ~~ .51*v1

v2 ~~ .51*v2

v3 ~~ .51*v3

v4 ~~ .51*v4

v5 ~~ .51*v5

v6 ~~ .51*v6

v7 ~~ .51*v7

v8 ~~ .51*v8

v9 ~~ .51*v9

v10 ~~ .51*v10

v11 ~~ .51*v11

v12 ~~ .51*v12

v13 ~~ .51*v13

v14 ~~ .51*v14

v15 ~~ .51*v15
```

```
v16 ~~ .51*v16

v17 ~~ .51*v17

v18 ~~ .51*v18

v19 ~~ .51*v19

v20 ~~ .51*v20

v21 ~~ .51*v21

v22 ~~ .51*v22

v23 ~~ .51*v23

v24 ~~ .51*v24

v25 ~~ .51*v25

v26 ~~ .51*v26

v27 ~~ .51*v27

v28 ~~ .51*v28

v29 ~~ .51*v29

v30 ~~ .51*v30

'

#SSpower(model to fit, sample size of interest, # of parameters fixed to zero, and population

model specified above that the covariance matrix should be built from)

#3 parameters fixed to 0 - (latent covariances f1-f2, f2-f3, f1-f3)

SSpower(model, 95, 3, PopMod)

SSpower(model, 105, 3, PopMod)

SSpower(model, 150, 3, PopMod)

SSpower(model, 125, 3, PopMod)

SSpower(model, 120, 3, PopMod)

## Power: Monte Carlo method (using simsem package)

## use same model as above for population, but **NOT** constraining any parameters
```

```
## to 0, then specify the model.

##Specify population model. All fixed parameters

PopMod <- 'F1 =~ .7*v1 + .7*v2 + .7*v3 + .7*v4 + .7*v5 + .7*v6 + .7*v7 + .7*v8 + .7*v9 + .7*v10

F2 =~ .7*v11 + .7*v12 + .7*v13 + .7*v14 + .7*v15 + .7*v16 + .7*v17 + .7*v18 + .7*v19 + .7*v20

F3 =~ .7*v21 + .7*v22 + .7*v23 + .7*v24 + .7*v25 + .7*v26 + .7*v27 + .7*v28 + .7*v29 + .7*v30

F1 ~~ 1*F1

F2 ~~ 1*F2

F3 ~~ 1*F3

F1 ~~ .3*F2

F2 ~~ .3*F3

F1 ~~ .3*F3

v1 ~~ .51*v1

v2 ~~ .51*v2

v3 ~~ .51*v3

v4 ~~ .51*v4

v5 ~~ .51*v5

v6 ~~ .51*v6

v7 ~~ .51*v7

v8 ~~ .51*v8

v9 ~~ .51*v9

v10 ~~ .51*v10

v11 ~~ .51*v11

v12 ~~ .51*v12

v13 ~~ .51*v13

v14 ~~ .51*v14

v15 ~~ .51*v15
```

```
v16 ~~ .51*v16

v17 ~~ .51*v17

v18 ~~ .51*v18

v19 ~~ .51*v19

v20 ~~ .51*v20

v21 ~~ .51*v21

v22 ~~ .51*v22

v23 ~~ .51*v23

v24 ~~ .51*v24

v25 ~~ .51*v25

v26 ~~ .51*v26

v27 ~~ .51*v27

v28 ~~ .51*v28

v29 ~~ .51*v29

v30 ~~ .51*v30

'

##Specify analysis model being fitted

AnMod <- 'F1 =~ .7*v1 + .7*v2 + .7*v3 + .7*v4 + .7*v5 + .7*v6 + .7*v7 + .7*v8 + .7*v9 + .7*v10

F2 =~ .7*v11 + .7*v12 + .7*v13 + .7*v14 + .7*v15 + .7*v16 + .7*v17 + .7*v18 + .7*v19 + .7*v20

F3 =~ .7*v21 + .7*v22 + .7*v23 + .7*v24 + .7*v25 + .7*v26 + .7*v27 + .7*v28 + .7*v29 + .7*v30

'

#Run simulation with 1000 reps

out <- sim(nRep=1000, model=AnMod, n = 120,

        generate = PopMod, lavaanfun = "cfa", std.lv=TRUE)

summary(out)

fitindices <- sem(mod13f, data=dat)
```

```
FIindices <- fitinfluence(c("rmsea", "srmr", "cfi", "tli"),
                          fitindices, dat)
explore.influence(FIindices$Dind$rmsea)
explore.influence(FIindices$Dind$srmr)
explore.influence(FIindices$Dind$cfi)
explore.influence(FIindices$Dind$tli)
## mod 1 - a 3-factor model##
mod13f <- ' knowledge =~ k1 + k2 + k3 + k4 + k5 + k6 + k7 + k8 + k9 + k10 + k11
      skills =~ s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
      relations =~ r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10 +r11'
fit13f <- cfa(mod13f, data=dat, std.lv=TRUE)
summary(fit13f, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit13f, sort. = TRUE, minimum.value=100, maximum.number = (100))
#allow k7-k8
mod23f <- ' knowledge =~ k1 + k2 + k3 + k4 + k5 + k6 + k7 + k8 + k9 + k10 + k11
      skills =~ s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
      relations =~ r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10 + r11
k7~~k8'
fit23f <- cfa(mod23f, data=dat, std.lv=TRUE)
summary(fit23f, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit23f, sort. = TRUE, minimum.value=100, maximum.number = (100))
#inspect covariance matrix
lavInspect(fit1, "cov.lv")
#collapse into one-factor model
#model 1
mod1 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k7 + k8 + k9 + k10 + k11
```

```
    + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
    + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10 +r11'
fit1 <- cfa(mod1, data=dat, std.lv=TRUE)
summary(fit1, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit1, sort. = TRUE, minimum.value=100, maximum.number = (100))
#model 2
mod2 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k7 + k8 + k9 + k10 + k11
    + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
    + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10'
fit2 <- cfa(mod2, data=dat, std.lv=TRUE)
summary(fit2, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit1, sort. = TRUE, minimum.value=100, maximum.number = (100))
#model 3
mod3 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k7 + k8 + k9 + k10 + k11
    + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
    + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10
k7~~k8'
fit3 <- cfa(mod3, data=dat, std.lv=TRUE)
summary(fit3, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit3, sort. = TRUE, minimum.value=100, maximum.number = (100))
#model 4
mod4 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k7 + k8 + k9 + k10 + k11
    + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
    + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10
k7~~k8
s10 ~~ r9'
```

```
fit4 <- cfa(mod4, data=dat, std.lv=TRUE)
summary(fit4, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit4, sort. = TRUE, minimum.value=100, maximum.number = (100))
#model 5
mod5 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k7 + k8 + k9 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10
k7~~k8
s10 ~~ r9
k9 ~~ s9'
fit5 <- cfa(mod5, data=dat, std.lv=TRUE)
summary(fit5, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit5, sort. = TRUE, minimum.value=50, maximum.number = (100))
#model 6
mod6 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k7 + k8 + k9 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10
k7~~k8
s10 ~~ r9
k9 ~~ s9
k6 ~~ s8'
fit6 <- cfa(mod6, data=dat, std.lv=TRUE)
summary(fit6, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit6, sort. = TRUE, minimum.value=50, maximum.number = (100))
#model 7
mod7 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k7 + k8 + k10 + k11
```

```
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10
k7~~k8
s10 ~~ r9
k6 ~~ s8'
fit7 <- cfa(mod7, data=dat, std.lv=TRUE)
summary(fit7, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit7, sort. = TRUE, minimum.value=50, maximum.number = (100))
#model 8
mod8 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k7 + k8 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10
k7~~k8
s10 ~~ r9
k6 ~~ s8
s9 ~~ r8'
fit8 <- cfa(mod8, data=dat, std.lv=TRUE)
summary(fit8, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit8, sort. = TRUE, minimum.value=20, maximum.number = (100))
#model 9
mod9 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k7 + k8 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10
k7~~k8
s10 ~~ r9
k6 ~~ s8
```

```
s9 ~~ r8

r1 ~~ r2'

fit9 <- cfa(mod9, data=dat, std.lv=TRUE)

summary(fit9, fit.measures=TRUE, standardized=TRUE)

modificationindices(fit9, sort. = TRUE, minimum.value=20, maximum.number = (100))

#model 10

mod10 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k8 + k10 + k11

      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11

      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10

s10 ~~ r9

k6 ~~ s8

s9 ~~ r8

r1 ~~ r2'

fit10 <- cfa(mod10, data=dat, std.lv=TRUE)

summary(fit10, fit.measures=TRUE, standardized=TRUE)

modificationindices(fit10, sort. = TRUE, minimum.value=20, maximum.number = (100))

#model 11

mod11 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k8 + k10 + k11

      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11

      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10

s10 ~~ r9

k6 ~~ s8

s9 ~~ r8

r1 ~~ r2

k8 ~~ s9'

fit11 <- cfa(mod11, data=dat, std.lv=TRUE)
```

```
summary(fit11, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit11, sort. = TRUE, minimum.value=20, maximum.number = (100))
#model 12
mod12 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k8 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10
s10 ~~ r9
k6 ~~ s8
s9 ~~ r8
r1 ~~ r2
k8 ~~ s9
k8 ~~ r8'
fit12 <- cfa(mod12, data=dat, std.lv=TRUE)
summary(fit12, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit12, sort. = TRUE, minimum.value=20, maximum.number = (100))
#model 13
mod13 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s9 + s10 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10
s10 ~~ r9
k6 ~~ s8
s9 ~~ r8
r1 ~~ r2'
fit13 <- cfa(mod13, data=dat, std.lv=TRUE)
summary(fit13, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit13, sort. = TRUE, minimum.value=20, maximum.number = (100))
```

```
#model 14
mod14 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s10 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r8 + r9 + r10
s10 ~~ r9
k6 ~~ s8
r1 ~~ r2'
fit14 <- cfa(mod14, data=dat, std.lv=TRUE)
summary(fit14, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit14, sort. = TRUE, minimum.value=20, maximum.number = (100))
#model 15
mod15 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s10 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r9 + r10
s10 ~~ r9
k6 ~~ s8
r1 ~~ r2'
fit15 <- cfa(mod15, data=dat, std.lv=TRUE)
summary(fit15, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit15, sort. = TRUE, minimum.value=20, maximum.number = (100))
#model 16
mod16 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s10 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r10
k6 ~~ s8
r1 ~~ r2'
```

```
fit16 <- cfa(mod16, data=dat, std.lv=TRUE)
summary(fit16, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit16, sort. = TRUE, minimum.value=20, maximum.number = (100))
#model 17
mod17 <- ' fitness =~ k1 + k2 + k3 + k4 + k5 + k6 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r10
k6 ~~ s8
r1 ~~ r2'
fit17 <- cfa(mod17, data=dat, std.lv=TRUE)
summary(fit17, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit17, sort. = TRUE, minimum.value=20, maximum.number = (100))
#model 18
mod18 <- ' fitness =~ k2 + k3 + k4 + k5 + k6 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r10
k6 ~~ s8
r1 ~~ r2'
fit18 <- cfa(mod18, data=dat, std.lv=TRUE)
summary(fit18, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit18, sort. = TRUE, minimum.value=20, maximum.number = (100))
anova(fit17, fit18)

#model 19
mod19 <- ' fitness =~ k2 + k3 + k4 + k5 + k6 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s11
```

```
      + r2 + r3 + r4 + r5 + r6 + r7 + r10
k6 ~~ s8'
fit19 <- cfa(mod19, data=dat, std.lv=TRUE)
summary(fit19, fit.measures=TRUE, standardized=TRUE)
modificationindices(fit19, sort. = TRUE, minimum.value=20, maximum.number = (100))
anova(fit17, fit19)
#configural invariance model
modinvar1 <- ' fitness =~ k2 + k3 + k4 + k5 + k6 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r10
k6 ~~ s8
r1 ~~ r2'
fitinvar1 <- cfa(modinvar1, data=dat, std.lv=TRUE,
          group = "gender")
summary(fitinvar1, standardized=TRUE, fit.measures=TRUE)
modificationindices(fitinvar1, sort. = TRUE, minimum.value=20, maximum.number = (100))
modindices(fitinvar1, sort. = TRUE)
# weak invariance model
modweak1 <- ' fitness =~ k2 + k3 + k4 + k5 + k6 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r10
      k6 ~~ s8
      r1 ~~ r2
      fitness ~~ c(1, NA)*fitness'
fitweak1 <- cfa(modweak1, data=dat, std.lv=TRUE,
            group = "gender",
```

```
            group.equal="loadings")
summary(fitweak1, standardized=TRUE, fit.measures=TRUE)
modificationindices(fitweak1, sort. = TRUE, minimum.value=20, maximum.number = (100))
#Compare configural and weak invariance models. Non signficanct nested model test means
        weak invariance holds Significant nested model test (p<.05) means weak invariance
        model fits worse and need to investigate things further.
anova(fitinvar1, fitweak1)
#SemTools compareFit function that allows giving each model a name
#add show function to show results of compareFit function
#config = configural model, aweak = weak invariance model
#remember, if cfi < .01 in difference fit indices it's evidence for invariance (similarity)
configweakcompare <- compareFit(config = fitinvar1, weak = fitweak1)
summary(configweakcompare)
#strong invariance model
modstrong1 <- 'fitness =~ k2 + k3 + k4 + k5 + k6 + k10 + k11
      + s1 + s2 + s3 + s4 + s5 + s6 + s7 + s8 + s11
      + r1 + r2 + r3 + r4 + r5 + r6 + r7 + r10
      k6 ~~ s8
      r1 ~~ r2
      fitness ~~ c(1, NA)*fitness
            fitness ~ c(0, NA)*1'



fitstrong1 <- cfa(modstrong1, data=dat, std.lv=TRUE,
              group = "gender",
              group.equal=c("loadings","intercepts"))
```

```
summary(fitstrong1, standardized=TRUE, fit.measures=TRUE)
weakstrongcompare <- compareFit(weak = fitweak1, strong = fitstrong1)
summary(weakstrongcompare)
#estimate latent means between groups. Latent means by computing scale scores is same as
        effects coding
dat$fitness <- (dat$k2 + dat$k3 + dat$k4 + dat$k5 + dat$k6 + dat$k10 + dat$k11
            + dat$s1 + dat$s2 + dat$s3 + dat$s4 + dat$s5 + dat$s6 + dat$s7
            + dat$s8 + dat$s11 + dat$r1 + dat$r2 + dat$r3 + dat$r4 + dat$r5
            + dat$r6 + dat$r7 + dat$r10)/24
describeBy(dat[,c("fitness")], dat$gender)
inspect(fitstrong1, "mean.lv")
#  mean invariance model
## fixed factor method
fitmean1 <- cfa(modstrong1, data=dat, std.lv=TRUE,
            group = "gender",
            group.equal=c("loadings","intercepts", "means"))
summary(fitmean1, standardized=TRUE, fit.measures=TRUE)
#Test of mean invariance. Means do not differ across groups
anova(fitstrong1, fitmean1)
#reliabiltiy estimate via McDonald's omega
omegaFromSem(fit17)
## fixed factor mean invariance
fitMean1 <- cfa(modStrong1, data=large, std.lv=TRUE,
            group = "gender",
            group.equal=c("loadings","intercepts", "means"))
summary(fitMean1, standardized=TRUE, fit.measures=TRUE)
```

APPENDIX K: DESCRIPTIVE STATISTICS FOR SCALE ITEMS

	Women (n = 325) (51.1%)		Men (n = 310) (48.8%)		Total Sample (n = 635) (100.0%)	
	M (*SD*)	S_{KP}/K	*M* (*SD*)	S_{KP}/K	*M* (*SD*)	S_{KP}/K
Item						
K1	6.11 (1.08)	-2.54/8.22	6.14 (1.05)	-2.34/8.22	6.13 (1.07)	-2.44/8.50
K2	6.27 (0.81)	-1.82/6.75	6.23 (0.92)	-1.39/1.95	6.25 (0.86)	-1.58/3.86
K3	6.02 (0.97)	-1.09/1.28	5.97 (1.09)	-0.91/0.12	6.00 (1.03)	-1.00/0.62
K4	5.87 (0.94)	-1.19/2.36	5.99 (0.93)	-1.19/1.55	5.93 (0.94)	-1.13/1.94
K5	5.97 (0.90)	-1.37/3.01	5.98 (0.93)	-1.16/1.76	5.98 (0.91)	-1.26/2.34
K6	6.14 (0.90)	-1.39/2.89	6.12 (0.96)	-1.19/1.17	6.13 (0.93)	-1.28/1.93
K10	5.86 (0.93)	-0.84/0.76	5.80 (1.03)	-0.99/1.03	5.83 (0.98)	-0.93/0.97
K11	5.75 (0.98)	-0.87/1.07	5.82 (1.04)	-0.90/0.35	5.79 (1.01)	-0.88/0.66
S1	6.07 (1.01)	-1.39/2.41	5.98 (1.16)	-1.42/2.40	6.01 (1.09)	-1.43/2.53
S2	6.05 (1.02)	-1.51/2.67	6.18 (1.00)	-1.55/2.71	6.11 (1.01)	-1.52/2.66
S3	5.95 (0.97)	-1.21/1.98	6.01 (0.91)	-1.27/2.94	5.98 (0.94)	-1.24/2.39
S4	5.71 (1.16)	-1.12/1.20	5.76 (1.02)	-0.81/0.38	5.74 (1.09)	-1.01/0.98
S5	6.29 (0.85)	-2.05/7.14	6.29 (0.96)	-1.79/3.71	6.29 (0.90)	-1.91/5.11
S6	5.73 (1.15)	-1.28/1.69	5.94 (1.04)	-1.19/1.97	5.83 (1.10)	-1.26/1.87
S7	5.94 (0.93)	-1.27/2.94	5.98 (0.97)	-1.18/2.00	5.96 (0.95)	-1.21/2.41
S8	6.14 (0.85)	-1.25/2.40	6.04 (0.94)	-1.00/0.71	6.09 (0.90)	-1.12/1.43
S11	6.07 (0.84)	-1.39/3.40	6.13 (0.92)	-1.28/2.04	6.10 (0.88)	-1.32/2.60
R1	5.51 (1.17)	-0.94/0.95	5.59 (1.15)	-0.91/0.63	5.55 (1.16)	-0.92/0.79
R2	5.76 (1.00)	-1.30/2.83	5.95 (0.91)	-1.02/1.56	5.85 (0.96)	-1.19/2.41
R3	5.87 (1.06)	-1.61/4.23	6.00 (1.03)	-1.16/1.34	5.94 (1.04)	-1.39/2.92
R4	6.02 (0.93)	-1.54/3.95	6.07 (0.98)	-1.23/1.82	6.04 (0.95)	-1.37/2.77
R5	5.84 (0.95)	-1.17/2.01	5.87 (0.97)	-0.89/0.53	5.85 (0.96)	-1.02/1.25
R6	5.77 (1.04)	-1.21/1.56	5.88 (0.93)	-0.98/1.29	5.82 (1.00)	-1.14/1.55
R7	5.97 (0.97)	-1.42/3.48	6.07 (0.96)	-0.99/0.89	6.01 (0.96)	-1.21/2.24
R10	5.97 (1.03)	-1.59/3.76	6.13 (0.81)	-0.89/0.77	6.05 (0.93)	-1.44/3.44