Exploring Mental Health, Physical Health, and Affective Commitment in Acute Care Oncology Nurses in Ontario

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A thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree in Nursing
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Abstract

With reports of a steady increase in cancer risk as the present population ages (Canadian Cancer Society’s Advisory Committee on Cancer Statistics, 2017; Statistics Canada, 2017), and little knowledge of a definitive cure, ensuring cancer sufferers and their families are adequately supported is increasingly essential. Oncology nurses must therefore be the focus of current and future research, as their front-line presence in the lives of those afflicted, is quite substantial. Further, oncology nurses report the most physical symptoms and second highest levels of emotional distress among cancer care health professionals (Jones, Wells, Gao, Cassidy, & Davie, 2013; Kash et al., 2000).

In this study, a model integrating Avolio, Gardner, Walumbwa, Luthans, and May’s (2004a) authentic leadership theory; Milliman, Czaplewski, and Ferguson’s (2003) conception of workplace spirituality; and a learning-centered version of Kanter’s (1977) organizational empowerment theory, was tested in a sample of N=274 acute care oncology nurses in Ontario, Canada. Specifically, links between authentic leadership, workplace spirituality, structural empowerment (with a focus on learning at work), and nursing stress; and the subsequent mental health, physical health, and affective commitment of oncology nurses were examined. The moderating influence of individual spirituality on the workplace spirituality-nursing stress relationship was also explored.

A predictive, non-experimental, cross-sectional design was used following Dillman’s (2000) Method for survey-based studies. The initial model demonstrated poor fit, though adding structural empowerment-workplace spirituality and physical health-mental health paths; correlating two error terms associated with nursing stress; and removing one indicator associated with workplace spirituality resulted in improved fit:
$X^2(164, N=274)=384.254, p<.001$; RMSEA=.070; SRMR=.0743; CFI=.918; TLI=.905; $X^2/df=2.3$. All hypothesized direct relationships were significant, except for the authentic leadership-nursing stress, and structural empowerment-nursing stress paths. The indirect effect of authentic leadership on nursing stress via workplace spirituality was also supported, though the indirect effect via structural empowerment was not. The moderation hypothesis was also unsupported.

The study results offer a unique way for authentic leaders to impact the work environment of acute care oncology nurses; with a structurally empowering learning environment and workplace spirituality identified as pathways to impact nursing stress, and foster health and commitment in this priority group.

**Keywords**

Authentic leadership, structural empowerment, workplace spirituality, nursing stress, mental health, physical health, affective commitment, individual spirituality, oncology nurse
Summary for Lay Audience

With reports of a steady increase in cancer risk as the present population ages (Canadian Cancer Society’s Advisory Committee on Cancer Statistics, 2017; Statistics Canada, 2017), and little knowledge of a definitive cure, ensuring cancer sufferers and their families are adequately supported is increasingly essential. Oncology nurses must therefore be the focus of current and future research, as their front-line presence in the lives of those afflicted, is quite substantial. Further, oncology nurses report the most physical symptoms and second highest levels of emotional distress among cancer care health professionals (Jones et al., 2013; Kash et al., 2000).

In this study, a model integrating Avolio et al.’s (2004a) authentic leadership theory; Milliman et al.’s (2003) conceptions of workplace spirituality; and a learning-centered version of Kanter’s (1977) organizational empowerment theory, was tested in a group of 274 acute care oncology nurses in Ontario, Canada. Specifically, links between authentic leadership, workplace spirituality, structural empowerment (with a focus on learning at work), and nursing stress; and the subsequent mental health, physical health, and affective commitment of oncology nurses were examined. The potential for individual spirituality to strengthen or dampen the relationship between workplace spirituality and nursing stress was also explored.

A survey was mailed to potential study participants, to support measurement of the study variables. Study results demonstrated significant links between: authentic leadership and workplace spirituality; authentic leadership and structural empowerment; structural empowerment and workplace spirituality; workplace spirituality and nursing stress; physical health and mental health; nursing stress and physical health; nursing
stress and mental health; and nursing stress and affective commitment. Further analysis revealed that authentic leadership had an impact on nursing stress via workplace spirituality, though it did not have an impact via structural empowerment. Individual spirituality did not impact the strength of the workplace spirituality-nursing stress relationship.

The results of this study offer a unique way for authentic leaders to impact the work environment of acute care oncology nurses; with a structurally empowering learning environment and workplace spirituality identified as pathways to impact nursing stress, and foster health and commitment in this priority group.
Co-Authorship Statement

The research conducted within this dissertation is the original work of Lesley Marie Smith, including study design, data analysis, data interpretation, and written work. It was conducted under the supervision of Dr. Mary-Anne Andrusyszyn, and committee members Dr. Yolanda Babenko-Mould, Dr. Barbara Pesut, and Dr. Carol A. Wong. All individuals named here will be included in any publications arising from this work.
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CHAPTER 1: Introduction, Background, and Purpose of Study

An introduction and background to the study are presented in this chapter. Following this, the study purpose is discussed.

1.1 Introduction

Despite increased survivorship, cancer remains a devastating diagnosis, with more people expected to die from it than any other disease (Canadian Cancer Society, 2018). Patients and families face numerous challenges, relying heavily on health care workers to navigate their experience of treatment, remission, and/or palliation and death. In 2017 alone, the Canadian Cancer Society (2018) projected 206,200 new cases and 80,800 cancer related deaths.

With reports of a steady increase in cancer risk as the present population ages (Canadian Cancer Society’s Advisory Committee on Cancer Statistics, 2017; Statistics Canada, 2017), and little knowledge of a definitive cure, ensuring cancer sufferers and their families are adequately supported is increasingly essential. To do so, oncology nurses must be the focus of current and future research, as their front-line presence in the lives of those afflicted by the diagnosis is quite substantial. Further, oncology nurses often have the most direct contact with cancer patients across settings (Cancer Care Ontario, 2011). Presently, oncology nurses face numerous chronic stressors, reporting the most physical symptoms among various professions in response to work-related stress (Kash et al., 2000) and the second highest levels of emotional distress among cancer care health professionals (Jones et al., 2013). Persistent stressors faced by oncology nurses include: repeated exposure to moral and ethical dilemmas (Cohen & Erickson, 2006), patient suffering (De Carvalho, Muller, De Carvalho, & De Souza Melo, 2005), loss and
grief, complex treatment regimens (Altounji, Morgan, Grover, Daldumyan, & Secola, 2013), death and dying (Ko & Kiser-Larson, 2016), and professional boundary issues (Hartlage, 2012); with burnout, compassion fatigue (Wu, Singh-Carlson, Odell, Reynolds, & Su, 2016), and secondary traumatic stress (Quinal, Harford, & Rutledge, 2009) often reported. While these chronic costs of nurses’ caring may be the inevitable risk of such chosen work, knowledge of such costs and their potential threat to nurses’ well-being, paired with projected oncology nurse shortages (Berry, 2009), and recent trends in cancer epidemiology; have accelerated the need to explore innovative ways to attract, retain, and support these valued professionals further. Leadership is a particularly salient antecedent to support health and retention efforts, as links between leadership and health, as well as leadership.supervisor support and intent to leave the workplace/turnover intent, have recently been reported in the nurse and acute care oncology nurse literature (Gillet et al., 2018; Lagerlund, Sharp, Lindqvist, Runesdotter, & Tishelman, 2015; Laschinger, Borgogni, Consiglio, & Read, 2015).

Thus, to ensure today’s oncology nurses remain effective, healthy, and committed to the challenging and specialized areas in which they work, focusing on novel, context-specific leadership efforts, offers promising results for this cohort. In the study described herein, the influence of leader-supported workplace spirituality and a structurally empowering learning environment were examined as unique and encouraging support/retention strategies; given their links to several positive outcomes in alternate contexts, and their potential to influence oncology nurse health and affective organizational commitment (Babenko-Mould, 2010; Lethbridge, 2010; Laschinger et al., 2015; Meyer & Allen, 1991; Milliman et al., 2003). Such innovative strategies may
signal a new way to support oncology nurses, with far reaching impacts on both patients and families alike, hospital organizations, and the nurses themselves.

1.2 Background

Working with individuals suffering from cancer is not a new experience for nurses. Studies aimed at improving the working conditions and experiences of oncology nurses (e.g., grief resolution interventions, staff bereavement programs, art therapy, support groups, etc.) can be found throughout several decades of nursing literature (Amaral, Nehemkis, & Fox, 1981; Hildebrandt, 2012; Lewis, 1999; Nainis, 2005). However, despite evidence of such supports, though many nurses find the role rewarding, several also see the oncology setting as inherently stressful (Cohen, Ferrell, Vrabel, Visovsky, & Schaefer, 2010; Zander, Hutton, & King, 2010). According to the United States Department of Health and Human Services, National Institute of Mental Health (2016a), prolonged exposure to stressful circumstances can be detrimental to both physical (e.g., heart disease, decreased immune response, and digestive problems) and mental health (e.g., depression and anxiety). As well, Medland, Howard-Ruben, and Whitaker (2004) indicate that without appropriate supports in place, the psychological impact of caring for cancer patients and their families can become overwhelming. Elements of work stress have also been shown to decrease commitment in the general nursing population (Laschinger, Leiter, Day, & Gilin, 2009). However, while oncology nurses’ commitment to patients has been well established (Bakker, Fitch, Green, Butler, & Olson, 2006), few studies have empirically examined their affective commitment.

To date, studies aimed at reducing perceptions of work stress, fostering affective commitment, and promoting both the physical and mental health of oncology nurses in
the important work they do, have overlooked two fundamental elements: 1) workplace spirituality, and 2) structural empowerment, with a specific focus on the workplace learning environment. According to Dehler and Welsh (1994, 2010) organizations must address the physical, mental, emotional, and spiritual needs of their workers. Further, nurses in administrative roles must create an environment that encourages ongoing learning (College of Nurses of Ontario [CNO], 2018a). For this reason, examining the influence of authentic leadership on the spiritual domains of oncology nurses’ work life, as well as the conditions that support their learning effectiveness at work, is increasingly essential.

**Workplace Spirituality**

Though organizations have not attempted to constrain the individual spirituality of their employees in the past, support for a spiritual work setting has not been something leaders have traditionally encouraged (Laabs, 1995). Despite this, waning job security, downsizing, changing business and societal values, growing cultural diversity, frequent restructuring, and mounting interest in seeing work as more than ‘just a job’ or a place to ‘make a living’, have been strong catalysts for increased interest in spirituality at work (Cash & Gray, 2000; Giacalone & Jurkiewicz, 2003; Hong, 2011). In the 1990’s, numerous books exploring workplace spirituality were published in response to this interest (Garcia-Zamor, 2003). Further to this, the Academy of Management’s creation of the Management, Spirituality and Religion Interest Group in the late 1990’s marked a significant shift in affirming notions of workplace spirituality as a new and distinct field of study. Since then, the concept of workplace spirituality has gained increasing popularity as a new management paradigm (Dehler & Welsh, 1994; Hong, 2011), an
innovative approach to organizational success (Kazemipour, Amin, & Pourseidi, 2012), and an additive means to look beyond organizational structure and function. The term *workplace spirituality* reflects employees’ workplace-bound experiences (Pawar, 2017) and is defined as “the recognition that employees have an inner life that nourishes and is nourished by meaningful work that takes place in the context of community” (Ashmos & Duchon, 2000, p. 137). It includes the effort to find personal *meaning and purpose in one’s work*, a strong *connection to coworkers/colleagues* linked by a common purpose, and *consistency between one’s core beliefs and the values of the organization* (Milliman et al., 2003; Mitroff & Denton, 1999). Though the integration/consideration of such a concept in secular organizations may be met with inherent ethical concerns (fear of proselytizing; imposition of religious beliefs, activities, and perspectives; and concerns surrounding privacy; Canda & Furman, 1999), the construct noted in this dissertation addressed workplace spirituality from a more generic, universal, work-bound perspective, with the continued potential for several positive organizational outcomes (i.e., organization-based self-esteem, job involvement, work satisfaction; Milliman et al., 2003). Such broad, pluralistic conceptions are necessary in an institutional sense, though individual spirituality (reflecting an employee’s more personal experience) was explored as a separate concept, discussed later in the dissertation.

It is well known that the CNO (2018b) mandates the assessment of spiritual needs and the provision of spiritual support in nurse-patient interactions. Despite this, the struggle of leaders within many organizations, including hospitals, to be effective and efficient in their day-to-day work performance, often causes spiritual matters in the workplace to be eclipsed by the more concrete demands of the moment (Ashforth &
Pratt, 2010). Nevertheless, exploring spirituality at work remains a priority, with considerable relevance for oncology nurses, given their role in supporting clients who are frequently faced with clinical uncertainty. According to Webster (2002), the spiritual dimension needs to be developed for people to more effectively navigate their way in times of uncertainty. Such a work role may be difficult to carry out if spirituality is not supported at the organizational level. To date, no empirical studies on workplace spirituality could be found in the oncology nurse literature; though person-work value alignment (Caruso et al., 2012), value congruence (Gillet et al., 2018), and role-related meaning (Hinds et al., 2003) (broad aspects of workplace spirituality), were found to be important to oncology nurses in three separate studies. However, neither study looked at the workplace spirituality construct as a whole, nor were they consistent with Milliman et al.’s (2003) conceptualizations. In relation to work stress specifically, negative links between perceived work stress and meaningful work have been found in Taiwanese long-term care nurses (Li, Chen, & Kuo, 2008).

Authentic leaders are well-suited to support spirituality in the workplace, as Avolio and Gardner (2005) assert that elements of spiritual leadership are closely linked to their overall leadership style (e.g., hope, resilience, and integrity). The term authentic leadership describes leaders who are deeply mindful of their own thoughts and behaviours; keenly aware of the moral perspective, knowledge, and strengths of themselves and others; and are further described as confident, hopeful, optimistic, resilient, and high in moral character (Avolio, Luthans, & Walumbwa, 2004b). According to Klenke (2007), spirituality (self-transcendence, self-sacrifice, and a sense of meaning and purpose) can also be seen as an antecedent to becoming an authentic leader,
thus contributing to increased authenticity over time. This suggests that an authentic leader may be more likely to support spirituality in the workplace, given the link between his/her own spirituality and becoming an authentic leader. According to Reimer-Kirkham, Pesut, Sawatzky, Cochrane, and Redmond (2012), nurse leaders play a vital role in contributing to an organizational culture that supports the spirituality of its employees in a person-focused manner. For oncology nurses, endorsing an environment of workplace spirituality in those responsible for providing spiritual care to cancer patients, seems a natural, necessary, important, and pragmatic precursor that leaders must consider.

**Structural Empowerment and Learning**

Concerns surrounding the educational support of nursing staff have been identified in moderately recent cancer care research (Bakker et al., 2010; Booth, Luker, Costello, & Dows, 2003; Lagerlund et al., 2015). Though focusing on educational needs has been an ample part of supporting oncology nurses to date, various authors continue to identify both professional and continuing education as areas for development in present support efforts (Bakker et al., 2010). In a recent study by Lagerlund et al. (2015), the authors found only 19.7% of the general cancer care nurses, and 40.6% of the specialized cancer care nurses, reported their cancer care education as adequate ‘to [a] high degree’, with the remainder reporting it as adequate ‘partly or to [a] low degree’ (80.3%; 59.4%, respectively). Booth et al.’s (2003) study also found educational support to be a substantial practice development need among nurses working in cancer care areas.

Exploration of Kanter’s (1977) conception of a structurally empowering environment, with a specific focus on learning, has not been examined in an
employment/work setting. Though Van Grinsven and Visser’s (2011) work explored elements of empowerment (support not included) as an antecedent to organizational learning, the authors did not explore empowerment and learning as a single construct. As well, while Armstrong and Foley’s (2003) study included numerous broad indicators/mechanisms of organizational learning, their conceptions were not consistent with Kanter’s (1977) theoretical notions. According to Kanter (1993), power is defined as the ability to get things done, mobilize resources, and obtain and utilize whatever one needs to achieve their goals. This includes having access to the opportunity, information, support, and resources needed to accomplish one’s work in meaningful ways (i.e., conditions for work effectiveness; Kanter, 1977, 1993). Within this study, the tenets of structural empowerment were examined from a more micro perspective, with a specific focus on one’s learning needs at work (i.e., conditions for learning effectiveness or the opportunity, information, support, and resources needed to learn in more meaningful ways). Siu, Laschinger, and Vingilis (2005) and Spreitzer (1995) assert that structurally empowering environments can promote greater control over one’s choice of strategies to accomplish learning goals and an enhanced belief that individuals can affect their personal learning. Thus, it stands to reason that increased knowledge of how oncology nurses perceive their access to empowering learning conditions, could illuminate ways to reduce future perceptions that educational support is lacking, by enabling future staff to believe they can affect their personal learning and achieve their learning goals autonomously (i.e., by increasing access to these conditions). Kanter (1993) asserts that power is the ability to do, and having access to what is needed for the doing is essential.
In this case, having access to the conditions that specifically reflect learning effectiveness, are essential for oncology nurses to be able to learn at work.

Exploring the historical context of nursing education provides further support for examining the concept of structural empowerment and learning needs at work. While decades ago nursing education prevailed under a behaviourist philosophy, where educators held the power and students submitted to that power (Babenko-Mould, Iwasiw, Andrusyszyn, Laschinger, & Weston, 2012), nursing education has evolved. Nurses in that time were frequently educated in hospital-based programs, which often perpetuated their low status in comparison to other health professions with more advanced education (Manojlovich, 2007). The educator as content expert was common; implying the empowerment of learners (content receivers) may have been lacking (Babenko-Mould et al., 2012). To date, there is ample evidence of a more empowering landscape in the classroom (Babenko-Mould, 2010), with the concept of empowerment and the influence of education explored extensively in nursing work settings (Andrusyszyn, 2015; Laschinger, 2015). However, there is limited theoretically grounded, empirical research that examines staff nurses’ perceptions that the profession has truly transitioned from the behaviourist philosophy (educator as expert, positive reinforcement, and passive learning [Iwasiw, Goldenberg, & Andrusyszyn, 2005; Roblyer, 2003]) of learning at work, to a more structurally empowering approach. This approach may include: the chance to learn new skills (opportunity), having access to the formal knowledge needed to help solve patient care issues (information), encouragement to pursue individual learning needs (support), and the availability of others to help with learning goals (resources). Thus, while the search for specific educational interventions that can benefit oncology nurses in
supporting their practice continues to be important, it was predicted that increased benefit may be gained from ensuring their learning environments are first, structurally empowering.

Correlations between structural empowerment (with a focus on learning) and various educational concepts have been made throughout the nursing literature, including enhancements in the reflective thinking of students in practice-based learning environments, as well as increases in the psychological empowerment of students in both the classroom and clinical practice settings (Lethbridge, 2010; Siu et al., 2005). These studies offer promise for similar positive outcomes in the oncology work setting. In relation to work stress, negative relationships between job stressors and workplace learning climate have been reported (Ahmadi & Rakhsh, 2012). However, no known studies have examined the link between structural empowerment with a specific focus on learning, and work stress. Despite this, links between structural empowerment and elements of job stress (workplace incivility and workplace bullying; Laschinger et al., 2009; Laschinger, Grau, Finegan, & Wilk, 2010), as well as various work stressors (work environment, job content, interpersonal relationships, knowledge skills, and administrative management; Li et al., 2008), have been documented in the nursing literature.

Leaders must be cognizant of whether or not their staff perceive their work settings to be structurally empowering from a learning context, as it is troubling to note that educational support continues to be a cited area of concern for oncology nurses (Bakker et al., 2010; Booth et al., 2003). Authentic leaders are ideally positioned to support this need as the authentic leader-follower relationship includes an emphasis on
follower development, and guidance towards worthwhile objectives (Gardner, Avolio, Luthans, May, & Walumbwa, 2005). As well, leaders have the capacity to remove structural barriers to learning that may be present in an otherwise disempowering learning environment (Conger & Kanungo, 1988). Given that educational content in specialty areas like oncology is not typically emphasized at the baccalaureate level (Childress & Gorder, 2012), increased pressure is also placed on leaders to work with organizational partners, to provide a learning environment/learning culture that empowers oncology nurses to further develop and continuously maintain their competence. Kanter (1993) defines this as the ability to “get for the group” (p.168) and ensure a favourable share of resources and opportunities are available to followers.

**Summary**

Failure to address acute care oncology nurses needs surrounding workplace spirituality and structural empowerment (with a focus on the learning environment at work), may leave nurse leaders and organizations alike, ill-prepared to support this distinctive group of nurses with the many stressors unique to their specialty. As well, such omissions could risk the cultivation of poorly empowered, holistically deficient nursing care providers, who may unknowingly provide care that lacks aspects of these essential elements. While many organizational leaders believe a more humanistic and spiritually infused work environment, emphasizing meaning and community at work, is a win-win for the organization, as well as employees (Garcia-Zamor, 2003), empirical evidence that oncology nurse leaders have considered workplace spirituality as a staff support strategy is absent from the literature. Further, education remains a documented area of concern in cancer care settings (Bakker et al., 2010). With the incidence of
cancer on the rise, and a looming undersupply of nurses, understanding what keeps oncology nurses healthy and committed to the demanding areas in which they work, is critical to ensuring the supply of nurses needed to provide care to these patients is sufficient to meet future demands. The emergence of authentic leaders who support workplace spirituality and a structurally empowering environment with a focus on learning, as an innovative means to combat perceptions of work stress, and enhance the affective commitment and health of oncology nurses, may signal a potential retention strategy in this population. According to Bakker et al. (2013), in an aging population with an increased risk of developing cancer, the recruitment and retention of oncology nurses is and will continue to be a serious human resource problem in the future. For this reason, a holistic examination of the influence of both workplace spirituality and structural empowerment with a focus on learning in oncology nurses’ work life, were predicted to offer a unique way for authentic leaders to diffuse perceptions of stress, foster commitment, and promote health in this priority group.

1.3 Purpose of Study

The purpose of this study was to examine the links between authentic leadership, workplace spirituality, structural empowerment (with a focus on learning at work), and nursing stress; and the subsequent mental health, physical health, and affective commitment of acute care oncology nurses. The moderating influence of individual spirituality on the workplace spirituality-nursing stress relationship was also explored. The study was designed to enhance knowledge of authentic leadership theory (Avolio et al., 2004a) and workplace spirituality (Milliman et al., 2003), by examining the leader’s role in shifting the workplace away from traditional business mantras of ‘lean and mean’
to those centered on ‘lean and meaningful’ (HR Magazine, 1998). It also extends comprehension of Avolio et al.’s (2004a) theory and the concept of structural empowerment (Kanter, 1977) in a learning context, by exploring how leaders can support the specific conditions required for learning effectiveness. The results may provide evidence for re-designing work environments that promote leadership, spirituality, and empowered learning as a means to foster commitment and health in cancer care nurses, and diffuse perceptions of stress. This is the first study to unite these concepts.
CHAPTER 2: Theoretical Framework, Literature Review, and Hypothesized Model

The theoretical framework and literature review are discussed in this chapter. Following this, the hypothesized model is presented.

2.1 Theoretical Framework

The study involved testing a model integrating Avolio et al.’s (2004a) authentic leadership theory with two theoretical perspectives: 1) Milliman et al.’s (2003) conception of workplace spirituality, and 2) a learning-centered version of Kanter’s (1977) theory of organizational empowerment. The complement of each theoretical perspective was projected to influence important organizational outcomes.

To explore these linkages in detail, the tenets of authentic leadership theory will first be described. Second, the workplace spirituality construct will be presented, followed by a discussion of the links between authentic leadership theory and workplace spirituality. Third, the concept of a structurally empowering environment with a focus on learning will be defined, followed by a presentation of the links between authentic leadership theory and structural empowerment (within the aforementioned learning context). Fourth, each concept within the integrated model will be linked to nursing stress, as well as affective commitment, and health. Finally, a description of how individual spirituality can moderate the relationship between workplace spirituality and nursing stress will be presented.

Authentic Leadership

The concept of authenticity is rooted in the ancient Greek philosophy to know thyself (Avolio et al., 2004a; Harter, 2002). Various authors agree that authentic leaders have the capacity to nurture authenticity in both themselves and their constituents (Avolio...
Gardner, 2005; Wong & Laschinger, 2013). Rationale for this conviction lies within the definition of authentic leadership, as a process that draws on both positive psychological capacities and a supportive organizational context to achieve greater self-awareness and self-regulated positive behaviours on the part of leaders and associates; nurturing positive self-development (Luthans & Avolio, 2003). More specifically, Avolio et al. (2004a) and Wong, Laschinger and Cummings (2010) assert that authentic leaders have the capacity to enhance followers’ attitudes and behaviours (including both commitment and retention); though their personal and social identification, trust in the leader, and positive psychological capacities (i.e., hope, positive emotions, and optimism). Authentic leadership consists of four underlying components: self-awareness, relational transparency, internalized moral perspective, and balanced information processing (Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008). Self-awareness involves having an understanding of, and trust in one’s motives, feelings, desires, strengths, and weaknesses, as well as how they affect others. Relational transparency reflects the appropriate expression of one’s genuine self through open sharing of information and feelings to followers. Internalized moral perspective mirrors a form of self-regulation wherein one is guided by internal moral standards rather than external pressures from groups, organizations, or society. Finally, balanced information processing refers to the inclination or willingness to objectively analyze data and solicit others’ opinions (both positive and negative) prior to making a decision. According to Grossman and Valiga (2017), authentic leadership theory is considered a more contemporary leadership theory, as it moves beyond more classic views of leadership as merely trait, congenital, or situationally driven. It is further described as a root construct
of effective leadership; necessary to building a healthy work environment (Avolio & Gardner, 2005; Wong et al., 2010).

**Workplace Spirituality**

*Workplace Spirituality* is defined as the overall recognition that employees or constituents have an inner life, that nourishes and is nourished by work that has meaning and takes place in the context of community (Ashmos & Duchon, 2000). According to Milliman et al. (2003), workplace spirituality is described as encompassing three components or sub-concepts: *meaningful work, sense of community,* and *alignment with organizational values*. The sub-concepts are particularly well developed, as they represent an employees’ experience of spirituality in the workplace at three essential levels (individual, group, and organizational; Neal & Bennett, 2000; Oswick, 2009). *Meaningful work (individual level)* is described as the deep sense of meaning and purpose one has in day-to-day work activities. This sub-concept recognizes the fact that each person has his/her own internal motivations, truths, and desires to be involved in activities that give increased meaning to the lives of others, as well as themselves (Ashmos & Duchon, 2000; Hawley, 1993). According to Moore (1992), work in this sense, is largely considered vocational and a call to create meaning and identity within one’s job setting. *Sense of community (group level)* is described as having a connection to, or relationship with others, conveyed through support, freedom of expression, and caring (Milliman et al., 2003). This sub-concept is centered within the notion that individuals view themselves as being interconnected with others and value the relationship between their inner self and the inner selves of their coworkers (Maynard, 1992; Miller, 1992). According to Neal and Bennett (2000) community includes the
notion of *esprit de corps* or team spirit, which is a well-researched phenomenon by organizational psychologists (Campion, Medsker, & Higgs, 1993). It further reflects the belief that community can permeate the organization as a whole, not just one’s work group; akin to the notion of an organizational family (Milliman et al., 2003). *Alignment with organizational values (organizational level)* reflects an individual’s alignment with an organization’s mission and goals, and their personal values (Milliman et al., 2003). This sub-concept reflects the employees’ association with the larger purpose of the overall organization (Mitroff & Denton, 1999). Individuals believe that the organization as a whole has a conscience, and cares about the welfare of workers and the community (Ashmos & Duchon, 2000; Milliman et al., 2003). Part of living by one’s inner truth includes working in an institution with integrity, a purpose that benefits others, and goes beyond profit-making (Hawley, 1993). It involves a desire to work in an organization whose aim goes beyond being a good corporate citizen, but seeks an elevated sense of ethics or integrity, and a desire to make a larger contribution than the average business to employee, customer, and societal welfare (Milliman et al., 2003).

**Authentic leadership and workplace spirituality.** The link between authentic leadership and workplace spirituality is expected as authentic leaders are conceptualized as those who act in accordance with what they believe, establishing open, transparent, trusting, and genuine relationships with others (Avolio et al., 2004a; Luthans & Avolio, 2003). These leadership qualities have close ties to the community aspect of workplace spirituality, and the notion of living by one’s inner truth (Ashmos & Duchon, 2000; Hawley, 1993). Avolio and Gardner (2005) also proposed that authentic leaders can energize followers in the business world, by enabling employees to find meaning and
connection at work. Knowledge of these connections offers marked insight into the value of an integrated model. As well, Klenke (2007) asserts that spirituality, which includes a sense of meaning and purpose, is at the core of authentic leadership.

**Structural Empowerment**

According to Kanter (1977, 1993), a structurally empowering work setting is conceptualized as one that is largely dependent on the presence of three distinctive social structures: the *structure of opportunity*, the *structure of power*, and the *structure of proportions*. These structures enable employees to accomplish their work in meaningful ways. First, the *structure of opportunity* affords employees the possibility of advancement within an organization, as well as the prospect of developing his/her knowledge and skills. Individuals with high access to opportunity have been found to exhibit ambition towards professional growth, high levels of self-esteem, and increased commitment to their organizations (Kanter, 1993; Lethbridge, 2010). In contrast, those with low levels of opportunity tend to exhibit “stuck behaviour” (Kanter, 1977, p. 136) resulting in low ambition, self-esteem, motivation, and commitment; thereby “setting in motion a self-perpetuating cycle of disadvantage” (Kanter, 1993, p. 293). Second, the *structure of power* encompasses access to three essential sources: information, support, and resources (Kanter, 1979). Access to information refers to the expertise, knowledge, and data needed to work effectively in an organization, while support includes feedback, guidance, and helpfulness gained from supervisors, colleagues, and subordinates. Finally, access to resources encompasses the time, finances, and materials needed to accomplish ones work efficiently and effectively (Kanter, 1977, 1993). The last structure, the *structure of proportions*, refers to the social composition of people in
approximately the same situation (i.e., gender, ethnicity, etc.; Kanter, 1993). While the structure of proportions is clearly included in Kanter’s theory, it was not explored in this study given that the large proportion of nurses in Ontario continues to be female (93%; CNO, 2015).

It should be noted that the application of Kanter’s (1977, 1993) theory with a specific focus on the learning environment has yet to be developed in a workplace context. However, exploration of structural empowerment in reference to learning has been noted in educational contexts; within both the clinical environment and the classroom (Babenko-Mould, 2010; Lethbridge, 2010; Siu et al., 2005). In this study, each dimension of Kanter’s theory was related to the learning environment in the workplace (i.e., opportunities to learn and grow; information required to work effectively; support from supervisors, peers, and subordinates; and resources to accomplish organizational goals). This offers a refined view of structural empowerment at work, as the individual items that comprise each indicator (with a focus on learning) are unique to the traditional latent construct. In this sense, the study was projected to offer an enhanced view of the construct, with a specific focus on learning at work.

**Authentic leadership and structural empowerment.** The integration of authentic leadership and organizational empowerment theory is also supported, as authentic leaders have been identified as being well-suited to enable learning in their constituents. This is accomplished through the authentic leader’s strategic facilitation of follower development (Wong & Laschinger, 2013). Follower development in this sense relates to the influence that leaders have in ensuring that the structural conditions necessary to foster learning in their constituents, are present in the workplace (conditions
for learning effectiveness). For this reason an integrated model that pairs authentic leadership and the concept of structural empowerment with a focus on learning seems increasingly beneficial. Recent studies have supported a link between authentic leadership and Kanter’s (1977) conception of structural empowerment (Laschinger, Wong, & Grau, 2013; Regan, Laschinger, & Wong, 2016; Wong & Laschinger, 2013), though no known studies have examined authentic leadership and structural empowerment in a learning context at work; as the latter concept is being introduced in this study.

**Integrated Model, Nursing Stress, Affective Commitment, and Health**

Support for the links between authentic leadership theory and nursing stress, as well as the commitment and health of oncology nurses are included in what follows. The methods through which these links are further amplified, were hypothesized to occur through workplace spirituality and a structurally empowering learning environment at work.

**Authentic leadership links.** According to Avolio and Gardner (2005), authentic leaders can foster the development of authenticity within followers. Rahimnia and Sharifirad (2015) further indicate that an elevation in authenticity within followers can in turn alleviate perceptions of work stress. In this study, nursing stress is defined as the frequency with which specific factors (nursing situations) are perceived as stressful by nurses at work (Gray-Toft & Anderson, 1981). This is in keeping with Rahimnia and Sharifirad’s (2015) conceptualization of stress, and thus supports the link between authentic leadership and nursing stress. Accordingly, Avolio et al. (2004a) indicate that the role modeling mechanisms of authentic leadership can enhance follower work
attitudes, such as engagement, meaningfulness, job satisfaction, and commitment. In relation to health, Macik-Frey, Quick, and Cooper (2009) asserted that enhanced understanding of what constitutes positive health among followers, can lead to heightened understanding of how leaders can be effective in meeting their needs. Further, a definitive focus on the psychological health and well-being of leaders and followers has been cited as a novel feature of authentic leadership theory (Banks, McCauley, Gardner, & Guler, 2016).

**Workplace spirituality links.** The link between workplace spirituality and nursing stress is expected, as Zellars, Perrewé, and Brees (2010) assert that a sense of spirituality can alter one’s view of an event and may reduce the likelihood that a particular work situation is perceived as stressful. Such a link is closely related to the notion of meaningful work, wherein one is better able to cope with a stressful situation when he/she perceives their work as vocational (Treagold, 1999). As well, a strong connection to one’s coworkers/colleagues, and a sense that the larger organization cares about its constituents is also likely to mitigate perceptions of stress; through recognition of both group and organizational levels of support. A link between workplace spirituality and affective commitment is also supported, as the aforementioned sub-concepts are likely to influence one’s desire to continue organizational membership; particularly when perceptions of stress are decreased. According to Malphurs (1996), an individual should not work for an organization (sacred or secular) if they lack predominantly similar institutional values. Such a notion relates to the idea of ‘person-environment fit’ (Vandenberghe, 2011). In terms of health, a relationship with workplace spirituality is also supported given its association to reduced perceptions of work stress; leading to a
decreased potential to affect one’s health (e.g., headaches, sleeplessness, gastrointestinal problems, heart disease, immune dysfunction, psychological disorders, etc.; Health Canada, 2008; Zellars et al., 2010).

**Structural empowerment links.** The link between a structurally empowering learning environment at work and nursing stress is also supported, as it is likely that when the aforementioned structural conditions for learning effectiveness (opportunity, information, support, and resources) are present within ones work setting, oncology nurses may perceive their associated work situations to be less stressful. In reference to commitment, while numerous studies have demonstrated a relationship to structural empowerment (DeCicco, Laschinger, & Kerr, 2006; Smith, Andrusyszyn, & Laschinger, 2010; Wilson & Laschinger, 1994), the specific focus on learning described here has yet to be explored. Nevertheless, it is likely that a similar link will be found, as one’s intent to stay in an area requiring specialized knowledge, is likely to be influenced by the structures that support their learning; particularly when perceptions of stress are reduced. In reference to health, links between structural empowerment and increased physical and mental health have also been reported (Laschinger, Almost, Purdy, & Kim, 2004). As such, it is reasonable to assume that specific access to the learning structures required to accomplish one’s work in an effective manner, are also likely to contribute to enhancements in health; especially when stress perceptions are diminished.

**Individual Spirituality**

Within the integrated model, rationale for the previously supported link between workplace spirituality and nursing stress may be enhanced, if the nurse reports a higher level of individual spirituality. According to Benson, Roehlkepartain, and Rude (2003)
and Pawar (2009), high levels of individual spirituality may result in a stronger desire for connectedness and meaning (aspects of workplace spirituality). For this reason, the connection between workplace spirituality and nursing stress may be stronger, when workplace spirituality as a whole, is inherently more valued.

**Summary of Integrated Model**

The complement of Avolio et al.’s (2004a) theory, paired with Milliman et al.’s (2003) conception of workplace spirituality, and Kanter’s (1977) theoretical notions provides a solid foundation for creating a positive work environment for today’s oncology nurses (Figure 1). The integrated model provides a powerful framework to examine the combined effects of authentic leadership, workplace spirituality, and structural empowerment (with a focus on learning at work) on nursing stress; and the potential impact of these variables, on oncology nurses’ affective commitment, physical health, and mental health. The model also supports investigation of the potential protective effect of individual spirituality on the relationship between workplace spirituality and nursing stress.

**2.2 Literature Review**

In this literature review the current state of knowledge on affective commitment, physical health, and mental health in oncology nurses, and the projected antecedents: authentic leadership, workplace spirituality, a structurally empowering learning environment at work, and nursing stress is explored. In addition, the potential moderating effect of individual spirituality on the workplace spirituality-nursing stress relationship is examined. In the following paragraphs, the aforementioned constructs are presented.
Figure 1. Theoretical model linking authentic leadership, workplace spirituality, and structural empowerment.

**Authentic Leadership**

(Avolio, Gardner, Walumbwa, Luthans, & May, 2004a)
- Self-awareness
- Relational transparency
- Internalized moral perspective
- Balanced information processing

**Structural Empowerment**

(Kanter, 1977)
- Opportunities to learn and grow
- Information required to work effectively
- Support from supervisors, peers, and subordinates
- Resources to accomplish organizational goals

**Workplace Spirituality**

(Milliman, Czaplewski, & Ferguson, 2003)
- Meaningful work
- Sense of community
- Alignment with organizational values

**Authentic Leadership**

Several studies across diverse fields have revealed a significant link between authentic leadership and positive organizational outcomes such as: increased organizational citizenship behaviour, work engagement (Walumbwa, Wang, Wang, Schaubroeck, & Avolio, 2010), performance, trust in management (Clapp-Smith, Vogelgesang, & Avey, 2009), job satisfaction, and decreased attachment insecurity (Rahimnia & Sharifirad, 2015). In nursing specifically, the exploration of authentic leadership has gained popularity in recent years, with numerous studies supporting its
relationship to key work outcomes. In Ontario acute care nurses (N=280), Wong et al. (2010) found authentic leadership had a positive influence on staff nurses’ trust in their manager and work engagement, which in turn predicted voice behaviour (speaking up) and perceived unit care quality. In Giallonardo, Wong, and Iwasiw’s (2010) study of new graduate nurses (N=170) in Ontario, preceptor authentic leadership was significantly correlated with both job satisfaction and work engagement. In addition, work engagement partially mediated the relationship between preceptor authentic leadership and job satisfaction. (Giallonardo et al., 2010). Wong and Laschinger’s (2013) study of acute care nurses (N=280) in Ontario also revealed links between authentic leadership and job satisfaction.

In relation to commitment, Banks et al.’s (2016) meta-analysis revealed a strong link between authentic leadership and organizational commitment (k=17, N=4,077). More specifically, studies of diverse employees in Germany (N=157) and of students with full-time jobs in the United States (N=178) have shown a strong connection between authentic leadership and organizational commitment (Peus, Wesche, Streicher, Braun, & Frey, 2012; Walumbwa et al., 2008). In reference to physical health, an American study of university faculty and staff (N=261) revealed significant relationships between various physical health behaviours and specific components of authentic leadership (i.e., self-awareness, balanced information processing, and internalized moral perspective; Bess, 2015). In terms of mental health, a study of Canadian new graduate nurses (N=1,009) by Laschinger et al. (2015) demonstrated authentic leadership to have a positive effect on areas of worklife, which in turn had a positive effect on occupational coping self-efficacy; resulting in decreased burnout, which was associated with poor mental health.
In reference to burnout specifically, emotional exhaustion (frequency of feeling emotionally depleted and worn out by one’s work [Maslach & Jackson, 1981]) and interpersonal strain (frequency of feeling uncomfortable and disengaged in relationships with others in the workplace, caused by excessive social requests and pressures [Borgogni, Consiglio, Alessandri, & Schaufeli, 2012]) were further found to be negatively related to authentic leadership (Laschinger et al., 2015). Similarly, in a smaller study, Laschinger, Wong, and Grau (2012a) also reported authentic leadership to have a significant negative direct effect on workplace bullying, which in turn had a significant positive effect on emotional exhaustion in a sample of newly graduated nurses (N=342) across Ontario. It should be noted that the aforementioned emotional exhaustion and interpersonal strain constructs do not reflect the frequency with which certain factors/nursing situations are perceived as stressful (i.e., nursing stress). For this reason, they are conceptually distinct from nursing stress, and more clearly reflect aspects of burnout/a psychological syndrome (Maslach & Jackson, 1981); (i.e., products of stress – outcomes, vs. predictors/producers of stress – stressors [Selye, 1976]).

Within the oncology nursing literature, only one study was found which explored authentic leadership behaviours in both clinical and non-clinical workers (N=335) across a number of cancer treatment facilities in Western Canada (Wong & Cummings, 2009). Members of the clinical group (N=147) perceived authentic leadership to be related to enhanced voice behaviour; trust in management; trustworthy, supportive, and empowering leader behaviours; and the notion of being in a supportive group (Wong & Cummings, 2009). In relation to leadership in general, Lagerlund et al.’s (2015) study of Swedish acute care nurses who cared for cancer patients (N=7,412), found intent to leave
was more prevalent among nurses reporting less favourable perceptions of leadership. In Bakker et al.’s (2010) qualitative study of cancer nurses across Canada (N=91), the authors revealed a strong desire for nursing leaders to be more active in oncology work settings. Participants in their study highlighted leadership as being critical to organizational commitment (Bakker et al., 2010).

**Workplace Spirituality**

Workplace spirituality is a relatively new concept to organizational nurse researchers (Pirkola, Rantakokko, & Suhonen, 2016). In spite of this, interest in its organizational benefits has grown in recent years, with some theoretical development, and several studies exploring the concept; though a lack of abundant annual research output has been highlighted (Vasconcelos, 2018). With the existence of some varied conceptualizations noted, and affirmed in a recent health care focused integrated review (Pirkola et al., 2016; Vasconcelos, 2018), it is important to consider context, as well as how the construct is defined across studies, to avoid potentially vague interpretations of the results discussed (included below). While Vasconcelos (2018) asserted that a standard definition of workplace spirituality may be unfeasible, Pirkola et al.’s (2016) integrated review identified meaningful work and sense of community as the most important components of workplace spirituality in health care. These sub-concepts represent two of the three sub-concepts examined in this dissertation (among various alternative sub-conceptualizations identified throughout the literature).

While empirically documented direct antecedents of workplace spirituality remain somewhat minimal to date, leadership has begun to emerge as a considerable predictor (described below). Aside from leadership, only a small number of quantitative
antecedents were otherwise found. First, Chinomona’s (2012) study conducted in the business sector of Zimbabwe, found a positive link between perceived organizational support and workplace spirituality among employees (N=320). Conceptions of workplace spirituality in Chinomona’s (2012) study aligned with Milliman et al.’s (2003) conceptualization described earlier. Second, Wagner, Warren, Cummings, Smith, and Olson’s (2013) study found aspects of psychological empowerment led to components of spirit at work (meaning linked to engaging work and spiritual connection; impact linked to sense of community) in registered nurses (RNs; N=147) across Alberta. Third, Wagner, Warren, Cummings, Smith, and Olson (2014) noted links between elements of structural and psychological empowerment and aspects of spirit at work (engaging work, spiritual connection, sense of community, and mystical experience) in Albertan physiotherapists (N=169) and occupational therapists (N=101). Fourth, Kinjerski and Skrypnek (2008)’s quasi-experimental study revealed support for the influence of a spirit at work program (one day workshop; eight weekly booster sessions) on spirit at work (engaging work, spiritual connection, sense of community, and mystical experience) among long-term care employees working in Western Canada (N=24 [intervention group]; N=34 [comparison group]). Despite these results however, Wagner et al.’s (2013, 2014) and Kinjerski and Skrypnek’s (2008) conceptions of workplace spirituality were not fully in line with Milliman et al.’s (2003) notions. In the qualitative literature, a study of employees across diverse professions (N=15) was also found which revealed: strong organizational foundation; organizational integrity; positive workplace culture and space; sense of community among members; opportunities for personal fulfilment, continuous learning, and development; and appreciation and regard for employees and their
contribution, as being essential to fostering spirit at work (work is perceived as meaningful, feeling of making a contribution, a sense that work was important; Kinjerski & Skrypnek, 2006).

In contrast to antecedents, documented outcomes of workplace spirituality are certainly increasing in the literature. In Duchon and Plowman’s (2005) study of United States hospital workers ($N=108$) across six hospital units, a positive relationship between work unit performance and notions of workplace unit spirituality (inner life, meaningful work, individual sense of community, work unit community, and work unit meaning) was found. Kolodinsky, Giacalone, and Jurkiewicz (2008) also found correlations between organizational spirituality (perception of the spiritual values exhibited by one’s organization) and important organizational outcomes, spanning five separate studies of working graduate students. The authors found links between organizational spirituality and job involvement, organizational identification, work rewards satisfaction, and decreased organizational frustration. More recently, Altaf and Awan (2011) found workplace spirituality to be a strong predictor of job satisfaction in a sample of diverse employees ($N=76$) across Islamabad. Workplace spirituality was conceptualized in their study as including: basic beliefs and values; self-awareness; responding to others; team building and goal identification; interpersonal skills; cooperation for common purposes; level of participation; data sharing and human relationships; and organizational responsiveness (Altaf & Awan, 2011). In nursing specifically, a recent qualitative study of nurses, public health nurses, and nurse managers working in primary health care and in one hospital ($N=14$), revealed that a managers’ promotion of workplace spirituality (enjoyment at work and alignment with organizational values) is important to overall
project success (Suhonen & Paasivaara, 2011). Additionally, a sense of impact and meaning has previously been shown to be important in Ontario nurses’ work, in both the new graduate and general nurse populations (Laschinger, Finegan, Shamian, & Wilk, 2001a; Smith et al., 2010).

In reference to commitment, Milliman et al. (2003) found aspects of workplace spirituality to determine increased organizational commitment, job involvement, organization-based self-esteem, and a reduced intention to quit in United States MBA students ($N=200$). Rego and Cunha’s (2008) study ($N=361$) further revealed correlations between dimensions of workplace spirituality (alignment between organizational and individual values, opportunities for inner life, team’s sense of community, sense of contribution to the community, and enjoyment at work) and increased affective and normative commitment across numerous organizations. A decrease in continuance commitment was also noted, though the correlations were quite weak and the ‘team’s sense of community’ item was non-significant (Rego & Cunha, 2008). An additional study by Rego, Cunha, and Souto (2007) of 465 Portuguese and Brazilian employees using the same measure of workplace spirituality, revealed similar relationships to commitment; and an increase in self-reported individual performance. More recently, Pawar’s (2009) study of employees ($N=156$) enrolled in various management programs in India, found strong positive correlations between workplace spirituality (meaning in work, community at work, and positive organizational purpose) and organizational commitment, as well as job satisfaction and job involvement. Nasina and Doris (2011) also found significant positive correlations to affective commitment in Malaysian auditors ($N=153$), where workplace spirituality was conceptualized as sense of
community, alignment with organizational values, sense of contribution to the community, and enjoyment at work. As well, Kazemipour et al.’s (2012) study of Iranian nurses (N=305) reported affective commitment to mediate the relationship between workplace spirituality (Milliman et al., 2003) and organizational citizenship behaviour. Hinds et al. (2003) also found organizational commitment to be positively correlated with role-related meaning (an aspect of workplace spirituality) in a sample of 89 pediatric oncology nurses in the United States. In Wagner et al.’s (2013) study, a link between an aspect of spirit at work (spiritual connection) and organizational commitment was found in RNs (N=147) across Alberta. Wagner and Gregory (2015) also noted a link between an element of spirit at work (sense of community) and organizational commitment in both surgical (N=217) and home care (N=158) RNs in Western Canada. An additional aspect of spirit at work (mystical experience) was also found to be linked to organizational commitment in Albertan physiotherapists (N=169; Wagner et al., 2014).

Jaichitra and Srinivasan (2017) also noted individual spirit at work to significantly contribute to commitment at work in Indian service sector employees (N=551). In reference to health, relationships to workplace spirituality have received little attention to date, though two studies explored links between workplace spirituality and aspects of health. Kumar and Kumar’s (2014) study of bank managers (N=150) in India revealed workplace spirituality (engaging work, sense of community, spiritual connection, and mystical experience) to moderate the negative relationship between stress (role overload, role ambiguity, role conflict, unreasonable group and political pressure, responsibility, under participation, powerlessness, poor peer relations, intrinsic impoverishment, low status, strenuous working conditions, and unprofitability) and health (somatic symptoms,
anxiety/insomnia, social dysfunction, and severe depression). As well, Caruso et al.’s (2012) study of both nurses (N=102) and physicians (N=80) working in Italian oncology settings, revealed that significant levels of burnout (exhaustion and cynicism) were associated with worker-management value misalignment (an aspect of workplace spirituality).

No studies were found exploring the concept of workplace spirituality in oncology nurses, with the exception of the aforementioned studies by Caruso et al. (2012) and Hinds et al.’s (2003), which explored aspects of workplace spirituality in this population. An aspect of workplace spirituality (value congruence) was also linked to supervisor support, staffing, need satisfaction, job satisfaction, quality of care, and turnover intentions in a sample of oncology nurses (N=83) and certified nursing assistants (N=61; Gillet et al., 2018) in France. Nevertheless, in Grant, O’Neil and Stephens’s (2004) study of staff nurses (N=299) working in a hospital that had taken several steps to include spirituality in its organizational culture, 72% of the oncology ward nurses indicated that their job provided them with opportunities to put their spiritual beliefs into practice. This placed them in the position of fourth highest practice area to hold this belief, out of 17 diverse hospital units (operating room lowest [38%], pediatric intensive care unit highest [77%]). While this may reflect the fact that these nurses are often more likely to encounter issues of death and dying, and thus, may be more likely to engage in spiritual conversations with patients, the results offers favourable support for endorsing workplace spirituality in similar work settings. Research in religion, spirituality, and health has also suggested that people who are spiritually healthier will be more resilient to the negative effects of work stress (Tusaie & Dyer, 2004). In considering this notion
in oncology nurses and the difficult circumstances in which they often work (Cummings et al., 2008), it seems essential for leaders to use every possible means to endorse workplace spirituality as a means to foster commitment within this group. Furthermore, the benefit of such an endorsement stands to influence not only these nurses, but the organization as a whole.

With respect to authentic leadership, Jianglin, Lujian, and Dongxue’s (2017) study revealed a link between authentic leadership and workplace spirituality (meaning at work, sense of community, and alignment with organizational values), though sample characteristics and size were not clearly reported. In a study of service workers \( (N=123) \), an aspect of workplace spirituality (meaningfulness of work) was also shown to be predicted by authentic leadership (Cassar & Buttigieg, 2013). Studies linking alternative types of leadership to aspects of workplace spirituality have also been conducted. In a recent study of Canadian health care workers \( (N=178) \), McKee, Driscoll, Kelloway, and Kelley (2011) revealed a component of workplace spirituality (sense of community) to fully mediate the effects of transformational leadership (idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration) on both mental and spiritual well-being. Additionally, Arnold, Turner, Barling, Kelloway, and McKee (2007) conducted two studies which further explored aspects of workplace spirituality and transformational leadership. In their first study, the authors found a sense of meaningful work to partially mediate the relationship between transformational leadership and positive affective well-being in Canadian health care workers \( (N=319) \). Their second study focused on service workers \( (N=146) \) and found that the meaning these individuals ascribed to their work, fully mediated the relationship between
transformational leadership and psychological well-being (controlling for humanistic work beliefs). It can be argued that connections between transformational leadership and workplace spirituality offer enhanced promise for a similar relationship between authentic leadership and workplace spirituality as a whole, given the documented similarities between the two leadership approaches (Walumbwa et al., 2008). According to Avolio and Gardner (2005), authentic leaders have the capacity to incorporate transformational forms of leadership into their practice. Further, a recent meta-analysis ($k=23, N=5,414$) revealed that the relationship between authentic and transformational leadership was strong; suggesting some degree of conceptual overlap (Banks et al., 2016). Aspects of spiritual leadership (vision, altruistic love, and hope/faith), though distinct from authentic leadership, have also been found to have moderate to strong links to meaning in work in Texan army soldiers ($N=369$; Fry, Vitucci, & Cedillo, 2005). More recently, Wagner et al. (2013) explored links between resonant leadership and spirit at work (engaging work, sense of community, mystical experience, and spiritual connection) in Albertan RNs ($N=147$). Resonant leadership and individual empowerment were found to have a significant causal influence on spirit at work. Wagner et al. (2014) also noted links between resonant leadership and two spirit at work elements (sense of community and spiritual connection) in physiotherapists ($N=169$), as well as one spirit at work element (sense of community) in occupational therapists ($N=101$) in Alberta. As well, in Duchon and Plowman’s (2005) study of hospital workers ($N=108$) in the United States, the authors proposed work unit leaders to have a likely impact on the degree to which work units acknowledge and encourage issues of the spirit. It should be noted however, that this proposition was not empirically supported. Finally,
a qualitative study of employees across diverse professions \((N=15)\) was also found, which revealed inspiring leadership and mentorship to be essential in fostering spirit at work (work is perceived as meaningful, feeling of making a contribution, a sense that work was important; Kinjerski & Skrypnek, 2006).

**Structural Empowerment and the Learning Environment**

The positive organizational outcomes of a structurally empowering work setting are well documented (Laschinger, 2015). Empirical support for Kanter’s (1977) theory is vast, spanning a wide variety of organizational contexts. In nursing specifically, structural empowerment has been linked to: increased job satisfaction (Casier, 2000), trust (Laschinger, Leiter, Day, Gilin-Oore, & Mackinnon, 2012b), respect (Faulkner & Laschinger, 2008), intent to stay (Nedd, 2006), decreased burnout (Laschinger et al., 2013), decreased negative mental health symptoms (Wing, Regan, & Laschinger, 2013), and decreased perceptions of workplace incivility (Smith et al., 2010), to name a few.

No known studies have been conducted exploring the individual level concept of a structurally empowering environment as described by Kanter (1977), with a specific focus on learning at work. In nursing education however, studies have been conducted examining structural empowerment from a learning perspective, though they are sparse in number. Specifically, Siu et al.’s (2005) study explored nursing students’ perceptions of structural empowerment (with a focus on learning) and psychological empowerment when engaged in both conventional lecture learning \((N=67)\) and problem-based learning \((N=41)\) pedagogies in Ontario. The authors reported a moderate positive relationship between the variables using both approaches, though a stronger relationship was found in the problem-based learning environment. In both Sinclair’s (2000) and Ledwell,
Andrusyszyn, and Iwasiw’s (2006) qualitative studies, nursing students described their learning experiences as being consistent with aspects of Kanter’s theory \((N=10; N=7,\) respectively). Evidence from these studies offer support for examining Kanter’s theory, with a specific focus on the conditions for learning effectiveness in the workplace. In a nursing education clinical practice context, Babenko-Mould’s (2010) Ontario study revealed a link between learning-focused structural empowerment, and nursing students’ \((N=352)\) perceptions of their teachers’ use of empowering behaviours. As well, Lethbridge (2010) found direct positive relationships between both learning-centered structural empowerment and psychological empowerment in third year nursing students \((N=510)\) in Ontario; within the classroom and clinical setting. While these studies spearheaded the movement to explore structural empowerment in relation to learning needs in a nursing practice context, exploration of a similar unified concept in nursing employees is likely to be unique, given the autonomy of a practicing nurses’ role, and the contrasting contexts of a paying job versus an educational clinical placement.

As depicted in this dissertation, the concept of a structurally empowering environment, with a focus on learning at work, is clearly in its infancy. As such, no studies were found linking the concept to affective commitment or health specifically. However, in terms of commitment, general structural empowerment has been linked to organizational commitment in acute care staff nurses in numerous studies \((N=112; N=92,\) respectively; McDermott, Laschinger, & Shamian, 1996; Wilson & Laschinger, 1994). Links between structural empowerment and affective commitment have also been made in Ontario nursing home samples of RNs \((N=79)\) and registered practical nurses (RPNs; \(N=75;\) DeCicco et al., 2006); as well as hospital-based nurses \((N=412;\) Laschinger,
Finegan, & Shamian, 2001b). Relationships to structural empowerment and health have also been noted. In a 2004 Ontario study, total structural empowerment of first-line nurse managers (N=202) and middle nurse managers (N=84) was positively related to energy level and negatively related to depressive symptoms (Laschinger et al., 2004). Significant negative links to physical symptoms were also found, though this was only noted in middle managers (Laschinger et al., 2004). Wing et al.’s (2013) study of 394 new nursing graduates in Ontario also revealed a significant negative relationship between structural empowerment and negative mental health symptoms.

Exploration of the concept of a structurally empowering environment, with a focus on learning at work is missing from the oncology nurse literature. While numerous studies were found exploring patient empowerment (i.e., health care providers capacity to nurture patients’ self-management abilities, or the ability of patients to influence their health), and many collected demographics which highlighted members of their sample as working in oncology settings, only one quantitative study was found exploring structural empowerment alone in this cohort. Özbaş and Tel’s (2016) study of Turkish oncology nurses (N=82) noted a decrease in burnout, and an increase in psychological and workplace empowerment scores, following participation in a psychodrama-based psychological empowerment program. One qualitative study examining oncology nurses (N=7) perceptions of structural empowerment was also found, revealing several aspects of structural empowerment were deemed present in the oncology work setting (Mota, 2015). Apart from this, no other studies could be located exploring structural empowerment in this group. As well, in a recent integrative review of the current context of oncology nurse practice, the concept of empowerment was unaccounted for (Bakker et
al., 2013). It should be noted that an additional qualitative study was located which described support (organizational context, evidence-based practice [EBP] structures and processes, EBP work group context) and empowerment (challenging the status quo, making a difference in patient care) as reflecting aspects of oncology nurses’ \( N=12 \) personal and professional growth, and the creation of a culture of EBP (Fridman & Frederickson, 2014). The conceptualization of empowerment described within the study however, was not consistent with Kanter’s (1977) theoretical notions.

As noted previously, the concept of a learning focused, structurally empowering work environment based on Kanter’s theory (1977), is being introduced in the current study. As such, the concept’s connection to authentic leadership has not yet been explored. In sole relation to structural empowerment however, Wong and Laschinger (2013) demonstrated that authentic leadership significantly and positively influenced Ontario staff nurses’ \( N=280 \) structural empowerment, which in turn increased their satisfaction with their jobs and self-rated performance. Laschinger and Smith’s (2013) Ontario study also explored leadership and empowerment, demonstrating a significant, positive correlation among authentic leadership and structural empowerment in new-nursing graduates \( N=194 \).

**Nursing Stress**

The term stress has numerous conceptualizations in terms of public, professional, and scholarly usage (Beehr, 1995). According to Newton and Keenan (1985), work is a major source of stress and has been linked to increased absenteeism, lost productivity, illness, and immense financial loss (Makie, 2006).
In the current study, *stress* is defined as an internal signal in one’s physical, psychological, or social environment that threatens their equilibrium (Appley & Trumbull, 1967; Lazarus, 1966). As previously noted, this definition was specifically refined to encompass the *frequency* (as opposed to intensity) with which specific *factors* (nursing situations) are perceived as stressful by nurses at work; and aptly termed *nursing stress* (i.e., focused on stressors; Gray-Toft, & Anderson, 1981). The nursing stress construct consists of work-related stressors encountered within a nurses’ practice setting including: workload, death and dying, inadequate preparation, lack of support, uncertainty concerning treatment, conflict with physicians, and conflict with other nurses (Gray-Toft & Anderson, 1981). Numerous studies have conceptualized the latent construct nursing stress, using these indicators (Escot, Artero, Gandubert, Boulenger, & Ritchie, 2001; Hayes, Douglas, & Bonner, 2015; Ko & Kiser-Larson, 2016). It should be noted that this conceptualization is in direct contrast to some alternative conceptions of stress, where general life situations, or one’s overall feeling of being stressed at work is the primary focus (e.g., Cohen, Kamarck, and Mermelstein, 1983; Motowidlo, Packard, & Manning, 1986).

In the nursing profession, stress can often be seen as a prevalent, endemic, occupational hazard, and an inherent feature of a nurse’s work life (Makie, 2006). Nurses’ high level of job stress is well documented. Heavy workloads, poor staffing, dealing with death, bullying, shift work, and a lack of resources have been identified as considerable sources of job stress among nurses (Laschinger et al., 2012a; Lee, 2003). Studies in Ontario by Laschinger, Grau, Finegan, & Wilk (2012c) and Smith et al. (2010) have shown elements of work stress (bullying and incivility) to increase burnout.
(emotional exhaustion) and turnover intentions, and decrease commitment in acute care new nurse members ($N=420; N=117$, respectively). Further, a recent study of newly licensed nurses ($N=414$) in Florida hospitals also found a negative link between commitment and aspects of stress (frequency of job difficulties [working conditions that impede good performance] and frequency of job demands [time pressure and heavy workload]; Unruh & Zhang, 2013). While the indicators included in Unruh and Zhang’s (2013) study were broadly applicable to any work setting, the current study described in this dissertation, aims to focus directly on indicators of stress, that are specifically related to nursing situations. In relation to health, Politsky (2013) indicated that caring for patients who frequently require psychological support, in addition to complex technological interventions with prolonged hospital stay, often results in both physiological and psychological impacts on nurses.

In oncology nursing, numerous sources of stress have been identified. According to Hooper, Craig, Janvrin, Wetsel, and Reimels (2010), the oncology work setting is considered a high-risk area for nurses. In De Carvalho et al.’s (2005) study, Brazilian cancer care nurses ($N=35$) who participated in a specialized course in oncology, identified the following among the highest ranked, work-related stressors they faced: making mistakes, an administrator’s failure to improve a situation, equipment and supply shortages, inability to complete work, being unable to alleviate patient suffering, lack of time to help a patient, inadequate staffing, insufficient managerial planning for staffing, inability to get caught up, dealing with untrusting parents, poor patient care communication among nurses and doctors, as well as a lack of comfort with one’s skills. Similarly, in Mukherjee, Beresford, Glaser, and Sloper’s (2009) literature review of
burnout, psychiatric morbidity, and work-related sources of stress in pediatric oncology staff, the authors also identified numerous sources of stress. The following were noted in nurses specifically: observing a child’s pain and suffering, caring for a dying child, death, working with and supporting parents, being involved in delivering inadequate or inappropriate care, workload, lack of resources, inadequate managerial support, and poor collegial relationships (Mukherjee et al., 2009). As well, in Ko and Kiser-Larson’s (2016) study of RNs (N=40) working in outpatient oncology units, the authors found workload and patient death and dying, to be among the highest sources of stress. Thus, given the numerous sources of stress noted here, the potential for a significant impact on oncology nurses’ commitment and health is possible.

With respect to workplace spirituality, Daniel’s (2015) study of employees and business students (N=304) across Mexico and the United States demonstrated a significant negative link between meaningful work and work stress, though the relationship was much stronger in the United States. Work stress in their study, however, was operationalized according to one’s overall perception of stress (i.e., my job is extremely stressful, very few stressful things happen to me at work, I feel a great deal of stress because of my job, I almost never feel stressed because of my job; Daniel, 2015; Motowidlo et al., 1986). Meaningful work was also found to be negatively correlated with work stress in long-term care nurses (N=178) in Taiwan; with stress measured according to the level of distress associated with one’s work environment, job content, interpersonal relationships, knowledge skills, and administrative management (Hsu, 2004; Li et al., 2008). According to Dodd (2007), nurses must be understood, nurtured, and cared for, to retain protection from the negative impacts of workplace stress, and to
use themselves as an instrument of care. Jackson (2004) furthered these claims stating that nurses must be supported to attain health of body, mind, and spirit, to be able to engage in a caring relationship. The relationships noted offer ample support for the pragmatic importance of considering workplace spirituality as an important mitigator of work stress.

No studies were found linking the concept of a structurally empowering environment, with a focus on learning at work, to the frequency and factor-based concept of nursing stress noted here. This study is the first to explore these variables together. However, links between structural empowerment and elements of stress have been documented. Laschinger et al.’s (2009) study revealed significant negative relationships between structural empowerment and aspects of stress (both coworker and supervisor workplace incivility) in Canadian staff nurses (N=612). Laschinger et al. (2010) also found a significant negative relationship between structural empowerment and workplace bullying in acute care new-graduate nurses (N=415) in Ontario. Additionally, negative links to the work stress components in Li et al.’s (2008) study (noted above), have also been made, in relation to the opportunity, information, support, and resource aspects of structural empowerment, in Taiwanese nurses (N=178) working in long-term care.

The support of authentic leaders will be essential to ensure stress inducing factors in the workplace are amply managed. In the literature to date, Rahimnia and Sharifirad’s (2015) study of 212 health care providers across five hospitals in Iran supported an inverse relationship between authentic leadership and perceived work stress. Work stress was conceptualized in their study using 2 items supported through previous research; though only one was reported (i.e., I usually feel that I am under a lot of pressure;
Rahimnia & Sharifirad, 2015; Siu, Lu, & Spector, 2007; Siu, Spector, & Cooper, 2006). Thus, while meaningful, the conceptualization of work stress in their study was inconsistent with the nursing stress construct noted in the current study. Authentic leadership has however been linked to a decrease in workplace bullying in Ontario new graduate nurses ($N=342$; Laschinger et al., 2012a). Aspects of leadership in other forms (transactional and transformational) have also been linked to decreased nursing stress in Belgian RNs ($N=625$; Stordeur, D’Hoore, & Vandenberghe, 2001).

**Affective Commitment**

The concept of *organizational commitment* is defined as an employee’s attachment to his/her affiliate organization (Buchanan, 1974), or a stabilizing mechanism that acts to maintain a certain behavioural direction when the expected/desired conditions of one’s work fail to be met (Decotiis & Summers, 1987; Scholl, 1981). According to Meyer, Allen, and Smith (1993), the concept can influence a worker’s decision to continue or discontinue membership in an organization. Meyer and Allen (1991) identified three distinct forms of organizational commitment including: *affective* (want to stay), *continuance* (need to stay), and *normative* (ought to stay). For the purposes of the current study, only *affective commitment* was explored, as affirmation that oncology nurses are staying in their work environments because they want to, was anticipated to be considerably more significant from organizational as well as professional perspectives. A recent study of staff nurses ($N=366$) offered support for this decision revealing the affective dimension to have a stronger positive relationship to both intent to remain on unit and intent to remain in organization, as compared to both continuance and normative commitment (Gellatly, Cowden, & Cummings, 2014). The three-component model has
also been criticized for grouping attitudes towards a target (affective), with attitudes
toward a behaviour (normative and continuance), resulting in threats to construct validity
(Solinger, van Olffen, & Roe, 2008). In further support of this decision, the majority of
studies that report data on organizational commitment typically refer to the affective
domain. Meyer, Stanley, Herscovitch, and Topolnytsky’s (2002) meta-analysis of the
three-component model also found affective commitment had the strongest and most
favourable links to absence ($k=10, N=3,543$), job performance ($k=25, N=5,938$), and
organizational citizenship behaviour ($k=22, N=6,277$).

As noted in the literature reviewed above, specific links between commitment and
the related antecedents explored in this study are numerous. However, as previously
stated, the unique connection between structural empowerment with a focus on learning
at work and affective commitment has yet to be explored. With regard to the cancer care
setting, Hughes et al.’s (2001) study of oncology nurses who were both non-On
cology Nursing Society (ONS) certified ($N=514$) as well as ONS certified ($N=703$) in the United
States, showed moderate levels of organizational commitment ($M=3.73, SD=0.76$, on a 5-
point scale), with higher scores indicating greater commitment, and little variation among
the groups. In their study, organizational commitment was strongly related to job
satisfaction and group cohesion. In an additional study of pediatric oncology nurses
($N=89$) in the United States by Hinds et al. (2003), the authors revealed stress, coping
effectiveness, role-related meaning, job satisfaction, and decreased intent to leave to be
linked with organizational commitment. Levels of organizational commitment were
reported at $M=81.2, SD=20.6$, with a possible maximum score of 105 indicating high
levels of commitment. More recently in Canada, Bakker et al.’s (2010) national
a qualitative study \((N=91)\) highlighted leadership, recognition, and professional and continuing education opportunities as being critical to organizational commitment in oncology nurses. In an additional longitudinal study by Bakker et al. (2012), which followed a group of Canadian oncology nurses \((N=615\) initial study; \(N=397\) follow-up study, respectively), the proportion of nurses asserting an intent to leave their current job increased from 6.4% to 26% over a two-year time period. In light of these results, the authors emphasized a strong need to consider workplace strategies that explore oncology nurses’ organizational commitment in the future.

**Mental Health and Physical Health**

*Mental health* is defined as the frequency of negative psychological states, as well as general positive affect (Ware, Snow, Kosinski, & Gandek, 1993). In this study, mental health is operationalized to include psychological distress (i.e., anxiety, depression, and loss of behavioural/emotional control) and psychological well-being (i.e., positive affect; McHorney & Ware, 1995). According to Ware and Sherbourne (1992), operationalizing the concept in this manner reflects a parsimonious approach to examining general mental health status, as the indicators concisely reflect four key dimensions of mental health identified in previous studies. As well, the operationalization noted here has been identified as effective in screening for psychiatric disorders (Ware & Gandek, 1998).

Alternatively, *physical health* is defined as the absence of somatic symptom burden, including pain, fatigue, gastrointestinal, and cardiopulmonary symptom clusters (Gierk et al., 2014). According to Gijsbers Van Wijk and Kolk (1997) and Mumford (1993), somatic symptoms are defined as perceived physical symptoms or sensations, not clearly connected to objective pathology. Kohlmann, Gierk, Hümmelgen, Blankenberg,
and Löwe (2013) and Kroenke et al. (2010) further assert, that they are present in a variety of medical conditions. According to Gierk and colleagues (2015), the presence of somatic symptoms are associated with impaired functioning, an increase in health care service use, decreased health related quality of life, and psychological distress. As such, assessment of the burden associated with one’s somatic symptom experience is essential (Gierk et al., 2015).

As depicted in the literature reviewed above, associations between both physical and mental health, and the forecasted predictors described in this study are clear. In reference to oncology nurses specifically, while it is well recognized that oncology nurse’s work can offer both personal fulfillment and intellectual stimulation, the role they take on as specialized care providers is also considered both physically and emotionally demanding (Medland et al., 2004). In a study of Turkish oncology nurses (N=89) participating in a basic course on chemotherapy, nurses were asked how providing care for patients with cancer affected their quality of life (Ergün, Oran, & Bender, 2005). Overall, perceived physical health (M=14.03, SD=1.81) and psychologic health (M=13.67, SD=3.04) levels were moderate (possible ranges from 4-20; higher scores indicating better quality of life). In the same study, responses to open ended questions revealed 9% felt their quality of life was positively impacted, while 75.3% felt it was negative (primarily due to chemotherapy exposure during drug handling). As well, in Kash et al.’s (2000) study of 261 nurses, house staff, and medical oncologists in a cancer research hospital, nurses reported more physical symptoms than their colleagues, as a result of work-related stress. In a more recent study by Quinal et al. (2009) of 42 hospital oncology staff (N=33 RNs) in Southern California, participants were found to suffer from
secondary traumatic stress, with the most common symptoms being difficulty sleeping, intrusive thoughts about patients, and irritability. Secondary traumatic stress was defined in their study as traumatization experienced by others (patients) that becomes problematic to a caring person over time (Figley, 1995; Quinal et al., 2009). In Quattrin et al.’s (2006) study, substantial levels of emotional exhaustion were also found among oncology nurses (N=100) in Italy. An additional study in Australia of 101 RNs working in oncology, revealed emotional exhaustion levels to be moderate in both frequency and intensity (Barnard, Street, & Love, 2006). In Wu et al.’s (2016) study of practicing oncology nurses affiliated with the Canadian Association of Nursing Oncology and the ONS, compassion fatigue and burnout were also noted in both American (N=486) and Canadian (N=63) nurses. As well, in Jones et al.’s (2013) study of Scottish cancer care staff as a whole (N=85), nurses (N=44) reported the second highest levels of emotional distress among numerous diverse professions. Caruso et al.’s (2012) study also revealed significant levels of burnout (exhaustion and cynicism) to be associated with worker-management value misalignment (an aspect of workplace spirituality) in both nurses (N=102) and physicians (N=80) working in Italian oncology settings. According to Ayock and Boyle (2009), the intimate interpersonal contact that oncology nurses often have with both patients and families can result in physical, emotional, and spiritual consequences. This is of utmost concern as the overall health of oncology nurses may in turn influence the health of oncology patients (Politsky, 2013). For oncology patients, nurses can represent a potentially stable factor in their otherwise uncertain care paths.
**Individual Spirituality**

Individual spirituality is recognized as a complex concept as it involves one’s personal beliefs and experiences. Though various interpretations exist (Burnard, 1990; Cawley, 1997; Walter, 1997), numerous texts present spirituality and religion as being inextricably linked. Nevertheless, in Angeli (2001), and Daaleman’s (2004) work, the authors indicate that a person can be spiritual without having explicit religious practices and beliefs. Bessinger and Kuhne’s (2002) work supports this notion, conceptualizing spirituality as an element of individuality that is not necessarily defined by association with a specific custom/tradition or organizational affiliation. Despite this, while the concepts may differ within many diverse contexts, they also share commonalities in many cultures (Bibby, 2006; Paley, 2007; Pesut, Fowler, Taylor, Reimer-Kirkham, & Sawatzky, 2008). Pesut et al. (2008) asserted that definitions of spirituality and/or religion should match the purpose for which they are being used; particularly from an international perspective. As such, relevant literature that enhances our understanding of the individual spirituality concept noted in this review, was not excluded on the basis of religious reference. According to Underwood (2006), when one attempts to remove spirituality from its religious context, the concept can become so ambiguous that it eventually becomes meaningless.

The term *individual spirituality* is defined in this study as an individual’s perception of, and interaction with the divine or transcendent (e.g., God, Higher Power, etc.) in daily life (Underwood, 2006; Underwood & Teresi, 2002). Underwood and Teresi’s (2002) conceptualization is further described as an ordinary person’s experience of spirituality, as opposed to an inherent set of particular behaviours or beliefs. This is
highly valuable as it offers a means to explore individual spirituality in a way that cuts across the boundaries of various religions in both a comprehensive and parsimonious manner (Underwood & Teresi, 2002). Furthermore, it offers a conceptual definition of individual spirituality that avoids conflation with alternative concepts (i.e., religious coping, spiritual well-being, mystical experience, etc.; Ellison, 1983; Paloutzian & Ellison, 1982; Pargament, 1997; Underwood & Teresi, 2002). Specifically, the construct noted here includes aspects of six important elements: strength and comfort with one’s religion (or spirituality), as well as indicators associated with presence, inner harmony, desire to be closer to or in union, feeling spiritually touched, and feeling love (Underwood & Teresi, 2002). In the current study, individual spirituality is considered an intrapersonal resource. As the concept is intended to examine one’s ordinary spiritual experience in day-to-day life (Underwood & Teresi, 2002), it is well aligned with the intent of the present study, which is to explore its impact on certain aspects of an oncology nurses’ work life (i.e., workplace spirituality and nursing stress). Specifically, individual spirituality is hypothesized to moderate the relationship between workplace spirituality and perceptions of nursing stress. According to Pesut (2013), it is important to recognize the power that spirituality brings nurses.

Numerous studies have supported the positive relationship between aspects of individual spirituality and both workplace spirituality and nursing stress. In relation to workplace spirituality specifically, Pawar (2009) asserts that components of workplace spirituality are likely to be more valued by employees with higher levels of individual spirituality. In Pawar’s (2009) study of 156 employees enrolled in various management programs in India, a positive correlation was found between the meaning in work aspect
of workplace spirituality and Underwood (2006)’s 16-item conception of daily spiritual experience (i.e., awe, gratitude, mercy, sense of connectedness with the transcendent, compassionate love, desire for closeness to God, awareness of discernment/inspiration, and transcendent sense of self). Kolodinsky et al. (2008) conducted a series of studies linking personal spirituality and organizational spirituality as well. In their first study of graduate students who were concurrently working full-time (N=74), personal spirituality (individual attributes constituting one’s spiritual values) was positively correlated with organizational spirituality (perceived spiritual values exhibited by one’s organization). In their second study of 89 working students enrolled in business and public administration programs at the masters level (using the same organizational spirituality scale), a positive correlation to personal spirituality (meaning and purpose in life) was also found (Kolodinsky et al., 2008). A third study of 124 working business and public administration graduate students used the same organizational spirituality measure and found a positive correlation with personal spirituality (attributes constituting one’s spiritual values). In reference to work stress, Neal (2000) asserted that individual spirituality is an important factor in dealing with job stress, reflecting an integral component of wellness. In Csiernik and Adams’ (2002) study of various individuals in helping professions (N=154), the authors found that employees who indicated a greater sense of spiritual well-being, were more likely to perceive their workplace as being less stressful (level of workplace stress) and having a positive emotional climate. Tuck, Alleyne, and Thinganjana’s (2006) longitudinal study of 27 adults from local church congregations also demonstrated significant negative correlations between perceived stress (degree to which one appraises situations in life as stressful) and spiritual well-
being. In their study, participants were asked to attend a 90-minute session exploring various spiritual topics, once a week for six weeks. Levels of stress declined and spiritual perspective levels increased from pretest to follow-up (Tuck et al., 2006). As well, in Maton’s (1989) study, spiritual support was negatively related to depression and positively related to self-esteem among parents experiencing high levels of life stress (recently bereaved).

In reference to moderation analyses specifically, the value in exploring individual spirituality as an intrapersonal resource in the workplace spirituality-nursing stress relationship, has been somewhat supported. In Pawar’s (2009) study, the effect of the positive organizational purpose aspect of workplace spirituality on job satisfaction, was significantly moderated by individual spirituality (i.e., awe, gratitude, mercy, sense of connectedness with the transcendent, compassionate love, desire for closeness to God, awareness of discernment/inspiration, and transcendent sense of self) among employees (N=156) enrolled in various management programs in India. While the link was not made to stress specifically, negative correlations between nursing stress and job satisfaction have been made within the nursing literature (Hayes, Bonner, & Douglas, 2015). As well, in a literature review of personal resilience, achieving life balance and spirituality were identified as essential protective factors for nurses, in relation to adverse work climates (Jackson, Firtko, & Edenborough, 2007).

In oncology, Ekedahl and Wengström’s (2010) qualitative study of 15 Swedish nurses working in hospices, oncology wards, and outpatient services for patients with advanced cancer, religious orientation was revealed to have a protective function that facilitated coping in nurses’ work. The participants felt it provided something to turn to
as a source of support. The study also revealed different forms of prayer to be the most frequently used coping strategy. In Davis, Lind, and Sorensen’s (2013) study of oncology nurses in the United States (N=74), spirituality was the most often used coping strategy among participants in relation to general work stress. The notion of innate life force (Grafton, Gillespie, & Henderson, 2010) has also been useful for oncology nurses in contending with the stresses of their work environment.

**Summary of Research Problem**

There is initial evidence to support authentic leadership, workplace spirituality, and structurally empowering environments with a focus on learning at work, as constructs that together, may predict important organizational outcomes in cancer care nursing settings. Given the links noted above, oncology nurses may benefit from exploration of these constructs as a means to dampen perceptions of nursing stress, and increase their affective commitment, and both physical and mental health. As well, addressing individual spirituality as a means to further amplify the influence of workplace spirituality on nursing stress requires considerable attention in this priority group. Ensuring these nurses, who are valuable health human resources, are supported in their work settings is critical to the future of oncology nursing, as the incidence of cancer continues to rise and afflict families across the globe. Ignoring this call to action could leave nurse leaders ill-prepared to support oncology nurses with the wide array of stressors they face in their day-to-day work life.

**2.3 Hypothesized Model**

Based on Avolio et al.’s (2004a) model, Milliman et al.’s (2003) work, Kanter’s (1977) theoretical notions, and the literature reviewed above, the current study is
designed to provide a comprehensive examination of oncology nurses’ affective commitment and both physical and mental health. Specifically, it was hypothesized that higher acute care oncology nurse ratings of their immediate manager’s authentic leadership style, would be related to higher levels of workplace spirituality, and structural empowerment (with a focus on learning at work); and subsequently lower levels of perceived nursing stress. This would in turn, contribute to higher levels of affective commitment, good mental health, and lower levels of physical health problems. Oncology nurses’ individual spirituality was also hypothesized to moderate the relationship between workplace spirituality and nursing stress (Figure 2).

**Specific Hypotheses**

1. Authentic leadership is positively related to workplace spirituality
2. Authentic leadership is positively related to structural empowerment
3. Authentic leadership is negatively related to nursing stress
4. Workplace spirituality is negatively related to nursing stress
5. Structural empowerment is negatively related to nursing stress
6. Workplace spirituality will mediate the relationship between authentic leadership and nursing stress
7. Structural empowerment will mediate the relationship between authentic leadership and nursing stress
8. Individual spirituality will positively moderate the relationship between workplace spirituality and nursing stress
9. Nursing stress is negatively correlated with affective commitment
10. Nursing stress is positively correlated with physical health problems
Figure 2. Hypothesized model.
11. Nursing stress is negatively correlated with good mental health

**Rationale**

**Hypothesis 1: authentic leadership is positively related to workplace spirituality.** Avolio and Gardner (2005) maintain that authentic leaders can make a difference in the workplace by assisting people to find meaning in their work; building values such as optimism and commitment among followers; promoting transparent interactions that foster trust; and by supporting inclusive and positive work climates. With this in mind, links to the tenets of workplace spirituality, which include a sense of meaning, community, and value alignment within one’s work setting (Milliman et al., 2003), are clearly evident. According to Fry and Slocum (2008) organizations perform better when they emphasize workplace spirituality via people-centered values and a level of commitment between the organization and its employees. This notion is linked to the authentic leader-follower relationship described in Avolio et al.’s (2004a) theory (leader-nurse in this context) and relates well to the workplace spirituality concept. Moore (1992) asserts that work seen as vocational and as a calling, offers employees a way to experience a greater sense of meaning and identity at work. With this in mind, it should also be noted that personal and social identification are core tenets of the authentic leadership model (Avolio et al., 2004a). The noted relationships between authentic leadership, transformational leadership, and elements of workplace spirituality (Arnold et al., 2007; Cassar & Buttigieg, 2013; McKee et al., 2011) also support the possibility of a similar relationship between authentic leadership and workplace spirituality as a whole. As well, Jianglin et al.’s (2017) study supported a link between the variables.
Hypothesis 2: authentic leadership is positively related to structural empowerment. According to Kanter (1977), structural empowerment includes access to opportunity (structure of opportunity), information, support, and resources (structure of power). Kanter (1993) maintains that it is important to address these sub-concepts, as powerlessness can occur within highly routinized and rules-bound jobs, which can in-turn be exacerbated by a lack of support from those above (i.e., leaders; Kanter, 1993). In a structurally empowering learning environment, as depicted in the current study, the influence of a leader in reducing the powerlessness of nurse learners is clearly supported. Given that a staff nurses’ role in an acute care oncology unit is likely to include elements of routine and continued reference to policies and procedures, it is conceivable that leaders would play an important part in reducing the structural elements in the workplace that may be blocking learning effectiveness. Links between authentic leadership and structural empowerment have also been made within the nursing literature (Laschinger et al., 2013); though correlations to structural empowerment, with a focus on learning at work, have not been specifically tested. In spite of this, structurally empowering learning climates are likely to be supported by authentic leaders, given the leaders’ strong affinity for follower development.

Hypothesis 3: authentic leadership is negatively related to nursing stress.

Authentic leaders are described as those who encourage open sharing of information, while accepting input from constituents or followers (Avolio, Walumbwa, & Weber, 2009). This is accomplished through a pattern of transparent and ethical leader behaviour (Avolio et al., 2009). Given ample evidence that the oncology nurse work setting is inherently stressful, should nurses bring issues of stress forward, the authentic leader in
listening to followers through balanced information processing and relational transparency, is well placed to assist in reducing perceptions of stress (i.e., by enacting his/her internalized moral perspective). According to Banks et al. (2016), the internalized moral perspective component of authentic leadership, infers a distinct moral responsibility to respect the interests of the group.

**Hypotheses 4 and 6: workplace spirituality is negatively related to nursing stress; and workplace spirituality will mediate the relationship between authentic leadership and nursing stress.** In the presence of workplace stress, it is logical to assume that employees who feels a strong connection to their coworkers/colleagues, alignment with the values of their organization, and a sense of meaning in their work (Milliman et al., 2003), may be less likely to perceive their work as stressful. The relationship between meaningful work and decreased stress has also been empirically supported in long-term care nurses (Li et al., 2008). Studies have also supported links between authentic leadership and work stress (Rahimnia & Sharifirad, 2015), as well as decreased elements of work stress (Laschinger et al., 2012a). The current study predicts that workplace spirituality occurs in between this relationship. This is suggested given the clear influence that a leader can have in supporting elements of workplace spirituality; as well as the projected link between workplace spirituality and stress noted above.

**Hypotheses 5 and 7: structural empowerment is negatively related to nursing stress; and structural empowerment will mediate the relationship between authentic leadership and nursing stress.** Gilbreath (2004) asserts that supervisors often have the power to ameliorate negative work factors and therefore play a significant role in creating
healthy work environments. A traditional command and control management style is in direct opposition to the notion of an empowering work setting (Ackoff, 1999; Argyris, 1998; Laschinger & Finegan, 2005; Mills & Ungson, 2003). Thus, given the links between structural empowerment and numerous positive organizational outcomes (including decreased work stress; Laschinger, 2015; Lautizi, Laschinger, & Ravazzolo, 2009), it is logical to assume that authentic leaders are ideally positioned to reduce perceptions of stress by ensuring that the cancer care learning environment is structurally empowering. This is of particular importance for acute care oncology nurses given the continuous specialized learning requirements (i.e., variable treatment protocols, clinical trials, etc.) within their work settings, and the immense levels of stress they can encounter in their day-to-day work life; particularly when such support is lacking.

**Hypothesis 8: individual spirituality will positively moderate the relationship between workplace spirituality and nursing stress.** As a potential intrapersonal resource, individual spirituality is conceptualized to moderate the effects of workplace spirituality on nursing stress. According to Ekedahl and Wengström (2010), a religious orientation can be an important source of coping in a nurses’ stressful work with cancer patients. It also stands to reason that some individuals may be drawn to emotional work, such as cancer care, for reasons that are linked to their individual spirituality; hence its presence and potential influence in this population may be stronger. According to Milliman et al. (2003), workplace spirituality includes meaningful work, a sense of community, and alignment with organizational values. It is expected that these aspects are likely to be more valued by employees/constituents with high levels of individual spirituality. With this in mind, it is predicted that the relationship between workplace
spirituality and decreased perceptions of nursing stress is likely to be stronger for those with high levels of individual spirituality versus those with low levels of individual spirituality. It should be noted that the majority of working adults are likely to have a well-ingrained sense of personally defined spirituality by the time they reach the professional stage of their life. For this reason, individual spirituality is likely to be less fluid when measured, particularly if it is associated with specific religious beliefs. However, in the cancer care setting where life and death issues are often prevalent, and thus spiritual discussion may be more likely, it is also possible that these specialized nurses may have encountered spiritual questions in their work, thus contributing to its development within themselves over time.

**Hypothesis 9: nursing stress is negatively correlated with affective commitment.** It is logical to assume that a stressful work environment can have a significant impact on an oncology nurses’ attitude towards remaining in an organization. Elements of work stress have also been shown to decrease commitment in newly-graduated nurses (Smith et al., 2010). Given the wide array of stress inducing factors present in cancer care settings (i.e., complex treatments, watching patients suffer, feeling overwhelmed by work, caring for dying patients, supporting families, etc.; Altounji et al., 2013; De Carvalho et al., 2005; Mukherjee et al., 2009), it is not surprising that researchers continue to emphasize a need to focus on ways to maintain organizational commitment in this nursing group (Bakker et al., 2012).

**Hypothesis 10: nursing stress is positively correlated with physical health problems.** Nursing stress is hypothesized to have a positive relationship with physical health problems. According to Politsky (2013), caring for those suffering from cancer
can induce physiological stress on nurses’ bodies. According to the United States Department of Health and Human Services, National Institute of Mental Health (2016b), people under chronic stress are also more prone to frequent and severe viral infections. The United States Department of Health and Human Services, National Cancer Institute (2015) also asserts that stress can cause a number of physical health problems. Given these links, the potential for work related stress to affect cancer care nurses’ physical health are evident.

**Hypothesis 11: nursing stress is negatively correlated with good mental health.**

Nursing stress is predicted to have a negative relationship with good mental health. In Quinal et al.’s (2009) study, hospital oncology staff were found to suffer from secondary traumatic stress, exhibiting symptoms of sleep disturbance, intrusive thoughts about patients, and irritability. Emotional exhaustion has also been found among cancer care nurses (Quattrin et al., 2006). In Shields’s (2006) Statistics Canada study, male and female workers who considered most days to be *quite a bit* or *extremely stressful* were found to be over 3 times more likely to have suffered a major depressive episode versus those who reported general stress as *low*. According to the Canadian Mental Health Association (2015), stress can also exacerbate mental illness.
CHAPTER 3: Methods

Research methods are described in this chapter. Specifically, the study design, setting and sample, data collection procedures, instruments, data management procedures, data analysis procedures, and ethical considerations are presented.

3.1 Study Design

A predictive, non-experimental, cross-sectional design was used to test the hypothesized model. Causality cannot be inferred due to lack of control over the independent variables.

3.2 Setting and Sample

Setting and Sample Description

The study was conducted in the province of Ontario, Canada. The CNO Mailing Address and Data Request Services (2017a) was used to obtain a random sample of acute care oncology RNs within the province. This included nurses’ names and home addresses.

Participation was not restricted by the RN’s level of tenure in their affiliate organization or length of time in nursing. This contributed to the potential for increased generalizability of findings to all acute care oncology RNs in Ontario (target population). However, only those listed as practicing RNs in a staff nurse position were included, as the aim was to focus on nurses in direct care roles specifically. As such, RNs in alternate roles (i.e., educators, managers, etc.) were not included. RNs working in the community were excluded from the study as their work experience was predicted to be quite different from the acute interactions a nurse may have in a hospital setting. As well, RPNs were
excluded, as their experience in the practice setting was expected to substantially differ from that of an RN.

**Sample Size Calculation and Response**

The sample size required for the study was calculated based on the use of the structural equation modeling (SEM) technique. Based on use of a sample size heuristic, this type of analysis requires a minimum of 5-10 cases per measured variable or indicator (5:1-10:1), to provide a reliable estimate of the parameters explored (Bentler & Chou, 1987; Kline, 2016). Jackson (2003) refers to this as the *N:q rule*, where *N* represents the number of cases, and *q* represents the number of model parameters that require statistical estimates (i.e., free parameters). For this reason, a minimum sample size of 255 was required, as there were 51 parameters to be estimated in the structural model. This was also in line with Kline’s (2011) recommendation for a typical minimum sample size of at least 200 for SEM analyses. A power analysis was also conducted using Soper’s (2018) A-Priori Sample Size Calculator for Structural Equation Models. The calculation revealed a minimum sample size for model structure of 88 and minimum sample size to detect an effect of 150, was required. This was based on having five latent variables, 23 observed/indicator variables, a probability level of .05, a medium effect size (.30), and a desired statistical power of .80. However, based on an anticipated low response rate typically associated with mailed surveys (Polit & Beck, 2008) and probable loss of subjects due to CNO database errors, a sample of 1,000 nurses was requested from the CNO. Given an anticipated response rate of 43% using the mailed survey technique (Mellahi & Harris, 2016), this ensured a sufficient number of participants were available, to support the proposed analyses (i.e., 430 minimum). Despite this, while the CNO
Membership Statistics Report 2017 indicated 1,993 RNs were working in cancer care hospital settings in Ontario, the CNO sampling frame only contained 749 potential participants. As such, the entire mailing list of 749 participants was sent to the researcher. It was predicted that some nurses may not have consented to third party release of their home addresses to support research in nursing when renewing their annual memberships. Those who check ‘yes’ to third party release as noted above, represent the pool of subjects available to researchers (CNO, 2017a).

From the list of 749 participants supplied by the CNO, one was eliminated from the survey distribution list due to an out of continent mailing address. Of the 748 questionnaires distributed, 17 were marked as “return to sender”, 22 were returned blank, and three declined to participate. A total of 308 participants (response rate 42.13% [308/731]) responded with completed surveys. However, 15 were excluded as respondents were not employed in the acute care sector or left the ‘workplace type’ question blank (cases [ID]: 21[29], 85[631], 94[653], 123[475], 134[668], 135[739], 178[427], 189[485], 192[205], 230[70], 264[160], 281[619], 295[437], 304[264], and 308[400]). An additional four were excluded as participants indicated they were retired (cases [ID]: 251[436], 305[425], 306[424], and 307[418]; with 308[400] deleted previously as noted above). Finally, six were excluded as respondents indicated they did not work in oncology or left the ‘what is the specialty area of your current unit’ question blank (cases [ID]: 186[247], 205[363], 243[373], 260[228], 269[331], and 303[224]; with 230[70], 304[264], and 308[400] deleted previously as noted above). The final sample included N=283 (response rate 40.08% [283/706]) useable questionnaires.
3.3 Data Collection Procedures

For data collection purposes, a self-report questionnaire was used. Specifically, questionnaire packages were mailed to participants’ home addresses. It was deemed prudent to collect data in this manner, as it was considered reasonable to expect that given the demands of the work setting, it may not be possible or appropriate for nurses to complete these surveys at work. Dillman’s (2000) Tailored Design Method was used to maximize response rates. Dillman’s (2000) method involved three rounds of mailing, described as follows (Appendix A [letters of information] and B [instruments]):

1. All participants were sent a personalized letter highlighting the study purpose, a copy of the questionnaire, and prepaid postage for its return (February 8, 2018).

2. Approximately two weeks later, non-respondents (participants whose surveys had not been received by the researcher, excluding those who declined to participate) received a letter with instructions, the study questionnaire, and again, prepaid postage for its return (February 23, 2018).

3. Finally, approximately four weeks later, a third and final letter and questionnaire was sent to non-respondents, with prepaid postage for its return (March 22, 2018).

It should be noted that this was a small deviation from Dillman’s (2000) method, which includes a three-week period between the second and third mailing.

Nurses also received a seed pod to plant at their leisure, in appreciation of their time. The seed pod was included in the initial mailing only, regardless of choice to participate. Additionally, participants were given the option to be entered into a draw to win one 6th generation 32GB Apple iPod touch valued at $298.00 Canadian. All participants were given the option of being entered in the draw, regardless of choice to
participate in the study. The choice to be entered into the draw was included in all three mailings. The iPod was mailed to the winner upon completion of data entry. Finally, participants were also given the option of receiving a copy of the study results upon study completion. Once again, all participants were given this option in all three mailings, regardless of their choice to participate in the actual study. Study results will be mailed to interested participants via plain language brief, upon study completion. Returning the questionnaire inferred implied consent.

3.4 Instruments

Eight instruments were used to measure the major study variables, including a researcher-developed demographic questionnaire (Appendix B). Permission to use each of the tools was obtained from the original authors and/or copyright holders as required (Appendix C). For copyright purposes within the written dissertation however, only a few sample items and/or survey completion instructions have been provided in Appendix B. As well, some information regarding item revisions, survey completion instructions, personal signatures, and/or contact information have been redacted (highlighted in black) as required.

Authentic Leadership Questionnaire

Authentic leadership was measured using the Authentic Leadership Questionnaire (ALQ; Avolio, Gardner, & Walumbwa, 2007). The ALQ includes 16 items comprising four subscales: relational transparency, internalized moral perspective, balanced processing, and self-awareness. Each item is rated on a 5-point Likert scale ranging from 0 (not at all) to 4 (frequently, if not always). Participants were asked to reflect on their leader’s (immediate manager) leadership style when completing the survey. Each
subscale is averaged to produce a score between 0 and 4, with total ALQ scores produced through summing and averaging the subscales. Higher scores reflect higher levels of authentic leadership (Giallonardo et al., 2010; Regan et al., 2016). Previous research has supported the reliability of this scale with subscale alphas ranging from .69 to .93, and total scale alphas ranging from .91 to .95 (Giallonardo et al., 2010; Laschinger et al., 2012a; Walumbwa et al., 2008). Walumbwa et al. (2008) established content validity by connecting with faculty members and doctoral students to analyze the items’ adequacy in representing the four categories of authentic leadership. Confirmatory factor analyses (CFAs) have also been conducted in support of construct validity; with evidence to affirm a four factor structure (Clapp-Smith et al., 2009; Peus et al., 2012; Walumbwa et al., 2008).

**Workplace Spirituality Scale**

Milliman et al.’s (2003) three factor *Workplace Spirituality Scale* (WSS) was chosen to represent workplace spirituality in this study. The tool was largely based on Ashmos and Duchon’s (2000) work and includes: individual (*meaningful work*), group (*sense of community*), and organizational (*alignment of organizational values*) levels of interaction. In this study, empirical assessment was conducted at the individual level, which aligns with Milliman et al.’s (2003) approach when designing the tool. The original measure contains 21 Likert scale items ranging from 1 (*disagree strongly*) to 7 (*agree strongly*). Acceptable internal consistency of the subscales and total scale have been demonstrated (.81-.94; .95, respectively; Kazemipour et al., 2012; Milliman et al., 2003). Milliman et al. (2003) performed a CFA to support the three factor WSS, with item loadings above .33. Using a conservative strategy, no factor or covariance path was
modified. Additionally, no error terms were permitted to co-vary, and each item was connected to a single latent variable. In terms of scoring, average scores were computed for each of the WSS subscales. This method of scoring was confirmed through literature review and consultation with one of the original authors prior to analysis (J. Milliman, personal communication, December 18, 2018). A total WSS score was also computed in this study, by summing and averaging the subscale scores. Higher scores indicated a higher level of workplace spirituality. In the current study, a 20-item version of the WSS was used, with one of the meaningful work items omitted; as per Milliman (‘understand what gives my work personal meaning’; J. Milliman, personal communication, September 28, 2017). According to Milliman, there was some uncertainty as to whether the item fit well with the other questions in the scale. As such, the 20-item version was used.

**Conditions for Learning Effectiveness Questionnaire-Education Revised**

A researcher-adapted staff nurse version of the *Conditions for Learning Effectiveness Questionnaire-Education Revised* (CLEQ-EDR; Siu et al., 2005) was used to measure structurally empowering learning environments at work. The instrument was originally modified from the Conditions for Work Effectiveness Questionnaire-II (Laschinger et al., 2001a), using the tenets of Kanter’s (1993) theory and Sinclair’s (2000) qualitative study of empowerment in nursing students. The tool was adapted for use in a nursing education environment to capture students’ perceptions of empowerment within those environments (Siu et al., 2005). In this study, it was further adapted to capture employees’ perceptions of empowerment within their organizational learning environments. Permission to include the revisions noted here was obtained from Siu in
2017 (H. Siu, personal communication, September 28, 2017). The tool was designed to measure perceptions of access to four subcomponents (opportunity, information, support, and resources); which were explored in this study. The two informal and formal power subscales were not examined in this study, as the intent was to focus on participants’ access to the structural aspects of their workplace learning environments. In each subscale of the adapted version used for this study, the term ‘teacher’ was replaced with ‘educator’. In the information subscale specifically, the phrases: ‘teaching/learning values of (faculty)’ was slightly modified to ‘your unit’; and ‘goals of the nursing (curriculum)’ was adapted to ‘educational’ goals of the nursing ‘unit’. In the resources subscale, two items were added given their direct relation to the acute care learning environment. The items included: ‘availability of in-services related to your educational needs’ and ‘availability of continuing education opportunities related to your educational needs’. The adapted scale consists of 26 items measured on a 5-point Likert scale ranging from 1 (none) to 5 (a lot). Scoring of the subscales is achieved by summing and averaging the items to obtain mean scores. A total score is obtained by summing the means of each subscale (Siu et al., 2005). The higher the total score, the more access an individual has to the empowerment structures. Siu et al. (2005) found excellent total scale Cronbach’s alpha reliabilities in her study of baccalaureate nursing students in Ontario, in both problem-based learning and conventional lecture learning contexts (.90; .91, respectively). Reliabilities for the four subscales were also acceptable (.60-.76; .68-.76, respectively; Siu et al., 2005). Siu et al. (2005) also established construct validity of the CLEQ through exploratory factor analysis (EFA). Items that were retained loaded
meaningfully on each empowerment dimension (factor loadings >.40). The final version contained six subscales (Siu et al., 2005).

**Nursing Stress Scale Revised**

Work stress was measured using a researcher-adapted version of the *Nursing Stress Scale Revised* (NSSR; Gray-Toft & Anderson, 1981). Permission was obtained to adapt the scale from Anderson in 2017 (J. Anderson, personal communication, October 27, 2017). The original instrument consists of 34 items reflecting potentially stressful situations that nurses may encounter in their work and asks respondents to rate the frequency with which these stressors are experienced as stressful. The items were identified based on interviews with nurses, physicians, and chaplains; and supported through literature review (Gray-Toft & Anderson, 1981). While the original tool cites Likert scale responses ranging from 0 (*never*) to 3 (*very frequently*; Gray-Toft & Anderson, 1981), response options were modified to 1 (*never*) to 4 (*very frequently*) as per Anderson (J. Anderson, personal communication, October 2, 2017). According to Gray-Toft and Anderson (1981), seven subscales are included in the measure, which encompass specific stressors associated with three aspects of a nurse’s work setting. These include: the physical (*workload*), psychological (*death and dying, lack of staff support, inadequate preparation to deal with the emotional needs of patients and their families, and uncertainty concerning treatment*), and social environment (*conflict with physicians, and conflict with other nurses*). In the present study, all three environments were represented. However, two subscales (6 items) were omitted from the psychological environment aspect of a nurse’s work: *lack of staff support* and *inadequate preparation to deal with the emotional needs of patients and their families*. This resulted
in five subscales remaining (28 items). Rationale for these omissions was supported in a recent study by Ko and Kiser-Larson (2016), where the subscales excluded here, were perceived as causing the least amount of stress for oncology nurses in their work. While Ko and Kiser-Larson’s (2016) study was specific to the outpatient setting, rationale for the omission of these items was further supported by the following. First, it is logical to assume that oncology nurses in an inpatient setting may be unlikely to feel they cannot share their problems, experiences, and feelings regarding their work with other personnel; as nursing work often requires practitioners to work closely with one another (lack of staff support). Second, it is unlikely that these nurses would feel unprepared to help with a patient or family’s emotional needs, given the persistent need to provide this level of care on an oncology unit (inadequate preparation to deal with the emotional needs of patients and their families). Third, being asked a question by a patient for which one does not have a satisfactory answer, may be less likely to be perceived as stressful, given that a general lack of definitiveness is a common feature of many acute care oncology settings (inadequate preparation to deal with the emotional needs of patients and their families).

In addition to the omissions noted above, the following modifications were made to the remaining items. Three items in the workload subscale were altered including: ‘breakdown of (the computer)’ which was slightly modified to ‘technology’; ‘not enough time to provide emotional support to a (patient)’ which was modified to include ‘patient and/or family’; and ‘not enough time to complete all my (nursing tasks)’ which was modified to ‘work’. These modifications were included to reflect the fact that technology is not exclusive to one’s computer, family-centered care is a hallmark of many nursing practice settings as a whole, and the term nursing tasks does not clearly reflect the scope
of a nurses work in contemporary practice. Additionally, the titles of the subscales conflict with physicians and conflict with other nurses were also altered, wherein the broader term ‘problems’ was substituted for the word ‘conflict’. This was done given the clear difference between conflict and criticism as noted by the original authors, in their discrete item construction within these subscales (Gray-Toft & Anderson, 1981). Finally, two items in the conflict with other nurses subscale were also altered including: ‘conflict with a (supervisor)’ which was modified to ‘nursing supervisor’; and ‘criticism by a (supervisor)’ which was modified to ‘nursing supervisor’. Rationale for these modifications reflect the fact that not all supervisors are nurses, and the subscale itself, is intended to reflect nurse focused conflict only.

Gray-Toft and Anderson (1981) reported total scale internal consistency coefficients ranging from .79 (Spearman-Brown coefficient and Guttman split-half coefficient) to .89 (coefficient alpha and standardized item alpha). Reliabilities for the five subscales were also reported, ranging from .71-.78 (Spearman-Brown coefficient), .68-.77 (Guttman split-half coefficient), and .68-.80 (coefficient alpha and standardized item alpha; Gray-Toft & Anderson, 1981). Construct validity of the scale was established through EFA, revealing a seven factor structure (Gray-Toft & Anderson, 1981). Concurrent validity of the scale was also established by correlating total nursing stress to measures of trait anxiety and state anxiety. Correlations between the measures were significant and moderate ($r=.39, p\leq.01; r=.35, p\leq.01$, respectively; Gray-Toft & Anderson, 1981). Face validity has also been supported through expert review (Makie, 2006). As well, content validity has been supported, as the scale was designed using Appley and Trumbull’s (1967) and Lazarus’ (1966) notions of psychological stress as a
guide. Lastly, in terms of scoring, Gray-Toft and Anderson (1981) stipulate that individual item responses are added together for each grouping of items, as well as for all items, in order to obtain both subscale scores and total scores, respectively. Higher scores on the NSSR indicate more frequently experienced stress. While this method of scoring was used for univariate descriptive reporting, average scores were computed for each of the NSSR subscales and the total scale, to support the correlation, moderation, and structural model analyses conducted in this study. This was done as a means of standardizing these scores, to support these analyses.

It should be noted that French, Lenton, Walters, and Eyles’ (2000) study presented an extensive review of the nursing stress sale and it’s use from 1981 to 2000, and developed an expanded version (57 items), which was supported through CFA. The expanded version included a number of minor revisions, as well as the addition of the *discrimination* and *patients and their families* subscales. However, as previously noted, given that Ko and Kiser-Larson’s (2016) study was specific to the oncology nurse context, as well as recent, the adapted scale used in the current study provides a solid basis for a comprehensive, current, and parsimonious examination of oncology nurse stress. As well, the expanded *discrimination* subscale (sex, age, and ethnicity) noted in French et al.’s (2000) study was not included, as its examination is beyond the scope of the present study, and unlikely to be unique to oncology nursing specifically. Consideration of families is however incorporated in the study (two items), in keeping with French et al.’s (2000) addition of the *patients and their families* subscale.
Affective Commitment Scale

Affective commitment was assessed using the Affective Commitment Scale (ACS), which is a subscale of the Three-Component Model Employee Commitment Survey (Meyer & Allen, 2004; Meyer et al., 1993). The subscale consists of six items measured on a 7-point Likert scale, with scores ranging from 1 (strongly disagree) to 7 (strongly agree). Mean scores are obtained by averaging the items within the subscale. The higher one’s score, the higher their affective commitment is considered to be. Three items within the subscale are negatively worded and were reverse coded prior to analysis. Acceptable reliability coefficients for the subscale have been reported (.82-.87; Meyer et al., 1993). Confirmatory factor analysis has also been conducted to establish construct validity of the overall tool (Meyer et al., 1993). In Meyer et al.’s (1993) study, a six factor solution, which included affective organizational commitment as an individual factor, provided the best fit for the data.

Mental Health Inventory-5

Mental health was measured using the Mental Health Inventory-5 (MHI-5; Veit & Ware, 1983). The scale was developed through selection of the five items that best predicted the full-length 38-item Mental Health Inventory (MHI) summary score (Ware et al., 1993). According to McHorney and Ware (1995) the five-item measure represents a more practical measure of general mental health. The original scale was designed to measure the affective components of psychological distress and well-being in participants involved in a health insurance study (Ware, Johnston, Davies-Avery, & Brook, 1979). The shorter version includes items reflecting each of the four major mental health dimensions (i.e., anxiety, depression, loss of behavioural/emotional control, and
psychological well-being) confirmed in factor analytic studies of the full MHI (Veit & Ware, 1983). Criterion related validity has been confirmed through correlational (r=.95) analysis of the full-length 38-item MHI with the five-item version (Ware et al., 1993). Construct validity of the MHI-5 has also been supported via EFA of a Portuguese version of the tool (one component solution; Marques, Pais-Ribeiro, & Lopez, 2011), and both EFA and CFA of a Brazilian version of the tool (single factor solution; Damásio, Borsa, & Koller, 2014). Each item within the scale is measured on a 6-point Likert scale ranging from 1 (all of the time) to 6 (none of the time). Three items in the scale reflect psychological distress (anxiety, depression, and behavioural/emotional control), and two items reflect psychological well-being (positive affect; McHorney & Ware, 1995).

Participants are asked to consider how they have been feeling within the past four weeks when filling out the questionnaire. Prior to computing a total score, the two positively worded items were reversed. Following this, a total score is calculated by transforming each item so that the lowest and highest possible scores are set at 0 and 100 (RAND Corporation, 2018). From there, the values are averaged to compute a total score, wherein higher scores indicate a more favorable health state (RAND Corporation, 2018).

Acceptable coefficient alphas for the MHI-5 have previously been reported .85-.89 (Gilin Oore et al., 2010; McHorney & Ware, 1995).

**Somatic Symptom Scale-8 Revised**

Physical health was measured using the *Somatic Symptom Scale-8 Revised* (SSS-8R; Gierk et al., 2014; Kroenke, Spitzer, & Williams, 2002). The eight-item scale was developed as an abbreviated version of the *Patient-Health Questionnaire-15* (PHQ-15), which measures the presence and severity of common somatic symptoms (Kroenke et al.,
2002). The tool assesses somatic symptom burden as a subjective, patient-reported phenomenon, whilst avoiding assumptions related to potential cause (Gierk et al., 2014). In the current study, oncology nurses were invited to examine aspects of their physical health (somatic symptoms), making them the ‘patient’ in this context. The four somatic symptoms clusters explored within the scale include: gastrointestinal, cardiopulmonary, fatigue, and pain (Gierk et al., 2014). The items within the questionnaire are measured on a 5-point Likert scale from 0 (not at all) to 4 (very much). In the original scale, participants are asked how much in the ‘past (seven days)’ they have been bothered by a series of potential somatic problems (Gierk et al., 2014). For the purposes of this study however, permission was obtained from Gierk to extend the timeframe to ‘30 days’ (B. Gierk, personal communication, October 26, 2017). Rationale for this decision reflected an intent to explore these items over a similar timeframe to the MHI-5; thereby creating an element of standardization across both health-based study measures. As well, consideration of an extended timeframe was considered optimal, in reflecting a less transient context for participants to consider. Construct validity of the scale was determined via CFA supporting a four factor structure (Gierk et al., 2014). As well, criterion related validity was demonstrated through correlational analysis, examining the relationship between the SSS-8 and the PHQ-15; revealing a strong positive correlation between the two (r=.83; Gierk et al., 2015). Possible total summed scores range from 0 to 32, with higher scores reflecting increased severity of overall somatic symptom burden (i.e., no to minimal [0-3], low [4-7], medium [8-11], high [12-15], very high [16-32]; Gierk et al., 2014). Further, given Gierk et al.’s (2014) support for a four factor structure, the research team computed average scores for each subscale (symptom cluster) as well.
However, while this method of scoring was used for univariate descriptive reporting, average scores were computed for both the subscales (as noted above), and the total scale during correlational and structural model analyses. This was done to as a means of standardizing the scores for theses analyses specifically. Reports of internal consistency of the total SSS-8 have ranged from .76 to .81, thereby supporting the reliability of the measure (Gierk et al., 2014, 2015). No symptom cluster alphas could be located.

**Brief Daily Spiritual Experience Scale Revised**

Individual spirituality was measured using a revised version of the *Brief Daily Spiritual Experience Scale Revised* (BDSESR; Idler et al., 2003; Underwood, 2006). The original scale consists of 16 items, with the first 15 items measured on a 6-point Likert scale from 1 (*many times a day*) to 6 (*never or almost never*; Underwood & Teresi, 2002). The last item in the original scale is measured on a 4-point Likert scale from (*not close at all*) to (*as close as possible*); asking respondents ‘in general, how close do you feel to God?’ (Underwood & Teresi, 2002). Content validity of the overall scale was established through in-depth interviews and focus groups with individuals from a wide array of diverse religious perspectives; as well as a review of theoretical, spiritual and religious writings, and alternate measures of spiritual experience (Underwood & Teresi, 2002). Construct validity was established through CFA of the 16-item tool, offering support for a single factor solution (Kim, Martin, & Nolty, 2016). Reliability coefficients for the full 16-item scale have ranged from $\alpha=\cdot94-\cdot95$ (Underwood & Teresi, 2002). According to Underwood (2006) a total score is often calculated by computing a mean score for the entire scale, with lower scores reflecting more frequent daily spiritual experiences (Underwood & Teresi, 2002). Alternatively, a transformative algorithm can
be used wherein higher scores reflect more frequent daily spiritual experiences
(Underwood, 2011). In the present study, a brief six-item version of the original scale
was used, which incorporated the same 6-point Likert scale anchors noted in original
scale (for the first 15 items). According to Underwood (2013), researchers can choose to
omit the anchoring numbers if desired, hence, they were not included in the actual
survey. The six-item version was developed for ease of incorporation into surveys
(Davis, Smith, & Marsden, 2001; Underwood & Teresi, 2002). Items were selected by
identifying key aspects of one’s daily spiritual experience from the 16-item version
(Underwood & Teresi, 2002). The measure provides a basic measure of spiritual
experience (Underwood & Teresi, 2002). A total score was calculated in the same
manner as the 16-item version, with lower scores reflecting more frequent daily spiritual
experiences. Previous research has shown the six-item and 16-item scales to be highly
correlated (Underwood, 2016). Idler et al. (2003) found support for a single factor
structure of the six-item scale, with Cronbach’s alpha reported at .91. In the present
study, permission was obtained from Underwood to make small modifications to five of
the six items (L. Underwood, personal communication, October 26, 2017).
Additionally, the instructions noted at the end of the survey were slightly modified from 'please substitute another word that calls to mind the divine or holy for you' to 'please substitute another word that calls to mind the divine or holy for you, such as God, Ultimate Reality, Higher Power, Goddess, Supreme Consciousness, Tao, Wholly Other, Allah, God, Transcendent, Great Spirit, etc.' (L. Underwood, personal communication, October 26, 2017).

Providing an unrestricted list of options for respondents to choose from fits well with the definition of individual spirituality noted in the current study: an individual's perception of, and interaction with the divine or transcendent (e.g., God, Higher Power, etc.) in daily life (Underwood, 2006; Underwood & Teresi 2002). Substitution of the word nature for creation was also made (as noted above), to avoid possible conflation with special creationism (the belief that God created the universe and living things as we see them today; Scott, 2009).

Demographic Questionnaire

Demographic data were also obtained from participants using a researcher-developed questionnaire. The questionnaire was designed to better understand the context within which oncology nurses work.

3.5 Data Management Procedures

The IBM SPSS statistics program (Version 25.0; IBM Corp., 2017) was used to enter data from each consenting respondent. All collected data were directly inputted into the system to facilitate data management (i.e., value cleaning, addressing missing values, managing outliers, assessing normality, and assessing for multicollinearity). The
order in which these steps were taken was informed by Meyers, Gamst, and Guarino’s (2013) general recommendations.

**Value Cleaning**

First, the data were audited to ensure responses were entered correctly. All responses were accurately transcribed, with the exception of case 87 (identification number [ID] 82). A value of 115 as opposed to 15, was incorrectly entered under ‘*how long have you worked as an RN at your current organization*’. The data entry error was corrected accordingly.

Next, the data were examined for response set bias (RSB). According to Loiselle, Profetto-McGrath, Polit, and Beck (2011), RSB reflects the tendency of some participants to respond to items in characteristic ways, independent of item content. No evidence of RSB was objectively apparent. However, it should be noted that some RSBs (i.e., acquiescence, extreme, and social desirability; Woo, 2019) are difficult to ascertain, without the ability to confer with each participant directly. Still, researchers can reduce these biases by ensuring items are worded sensitively and that confidentiality of responses is assured (Woo, 2019). Both RSB reduction approaches were upheld in this study.

**Missing Values**

Second, missing value analyses (i.e., amount [variable, case, item] and pattern) were conducted to further facilitate the data management process. According to Tabachnick and Fidell (2013), while the amount of missing data is an important assessment criterion, the associated pattern of missingness is more important. Meyers and colleagues (2013) assert that missing value pattern assessments are critical to
understanding whether the absence of certain values relates to a random or systematic process. As such, a description of how missing data were managed is also included. According to Fox-Wasylyshyn and El-Masri (2005), the validity of research findings can be affected by missing data.

**Amount at variable level.** To begin, the data were analyzed to determine the amount of missing values at the variable level. Fox-Wasylyshyn and El-Masri (2005) note that variable level missingness occurs when all items on a multi-item instrument are missing. The missing value analysis feature within the IBM SPSS statistics program (Version 25.0; IBM Corp., 2017) was used to conduct the analysis. The output showed the amount and percent of missing values for each variable (0-4; 0%-1.4%, respectively). According to Kline (2011) variables containing <5% missing data are likely of little concern. As such, the extent of missingness was deemed negligible.

**Amount by case.** The study variables were also analyzed for missing values by case identification number. This was done to identify any cases with large amounts of missing data. Apart from six cases, the percentage of missing data was ≤ 4.3%. However, case 74 (ID 47) contained 17.4% missing values; cases 203 (ID 660) and 208 (ID 687) contained 13.0% missing values; and cases 48 (ID 159), 226 (ID 576), and 247 (ID 414) contained 8.7% missing data. All six cases were deleted from the analysis as the percentages were greater than 5% (Tabachnick & Fidell, 2013).

**Amount at item level.** Next, the data were analyzed to determine the amount of missing values at the item level. Fox-Wasylyshyn and El-Masri (2005) note that item level missingness occurs when respondents omit ≥ 1 item(s) within a multi-item instrument measuring a specific variable (e.g., authentic leadership). Once again, the
missing value analysis feature within the IBM SPSS statistics program (Version 25.0; IBM Corp., 2017) was used to conduct the analysis. The output showed the amount and percent of missing values for each item (0-30; 0%-10.8%, respectively). Upon closer assessment however, the amount and percent of missing values when item 12 from the NSSR was removed (Gray-Toft & Anderson, 1981), were much lower (0-8; 0%-2.9%, respectively). Item 12 asks respondents: how often on their present unit, they have found a ‘physician not being present when a patient dies’ to be stressful. The tool itself contains 28 items in total. It is likely that in many cases a physician is not present when a patient dies, hence it is plausible that respondents may have felt this question was irrelevant. Alternatively, some areas may not face death in this context, and some may have felt the question was too sensitive to answer. Nevertheless, a decision was made to retain this item, as 10.8% represents a fairly small amount of missing data at the discrete item level (i.e., close to the more conservative 10% cutoff recommended by Bennett [2001]). As such, no deletions were made based on missing data from this single item.

Pattern. Next, the data were analyzed to determine the pattern of missing data. Little’s (1988) MCAR (missing completely at random) test was run to assess for the ‘mechanism of missingness’ (Graham, 2009). According to Tabachnick and Fidell (2013), when missing data are categorized as MCAR, this means that the data are missing in a way that does not follow any discernable pattern (ideal situation). Further, the data observed on average in cases with complete data, are said to be comparable to the data observed in cases with missing values (Meyers et al., 2013). The null hypothesis is that the missing data are MCAR if the alpha is equal to .05 or greater (Meyers et al., 2013). Little’s (1988) MCAR test was run on all study variables using the IBM SPSS statistics
program (Version 25.0; IBM Corp., 2017) missing value analysis function and including the expectation maximization (EM) option in the estimation panel (Meyers et al., 2013). The results were not statistically significant (chi-square=65.886, df=66, sig.=.481). We concluded that the missing data were likely MCAR. As such, we can assume the data are likely missing in a random way; thus, constituting an ignorable missingness situation (Meyers et al., 2013).

Managing missing data. To manage missing data, Meyers et al. (2013) suggests either (1) removing cases with missing data or (2) replacing missing data through an imputation process. For cases with missing demographic data, no action was taken as it allowed the research team to retain a more accurate representation of the sample characteristics and was deemed unnecessary to subsequent analyses.

Case deletion and full-information maximum likelihood. To manage missing data in this study, some cases were excluded as noted above. For cases with non-demographic missing data that were retained, a modern imputation method was used. According to Enders (2010) and Graham (2009), modern imputation methods are preferred over traditional approaches like listwise deletion, as they avoid the issues that can be created by removing a significant amount of cases with missing values. Further, they preserve some of the parameter variability in the data that might otherwise be lost when choosing alternative approaches like mean substitution (Meyers et al., 2013). In this study specifically, the modern imputation method of full-information maximum likelihood (FIML) estimation was used; with the regression imputation option. This was completed using the IBM SPSS AMOS statistical software program (Version 25.0; IBM Corp., 2017). According to Meyers et al. (2013), FIML imputation represents a state-of-
the-art imputation procedure as it handles missing data effectively, and estimates parameters and standard errors, all in one step (Graham, 2009). The FIML approach was deemed appropriate for SEM, as a means to generate a complete data set with no missing values.

**Outliers**

Third, assessments for outliers were made, to further support the process of data management. Meyers et al. (2013) asserts that outliers can adversely affect the results of an analysis for several reasons. One specific caution relates to measures of central tendency. According to Meyers et al. (2013), the mean of a distribution of scores may be considerably distorted when an outlier is present.

**Data entry problems.** To assess the data for outliers, the data were audited for data entry problems (previously noted under value cleaning). No further data entry issues were noted. In addition, an assessment of the minimum and maximum values for each variable were made. This was done to determine if the values for each variable fell within the range of possible total scores. No out of range values were noted when examining continuous variables. However, when examining categorical variables, one question in the demographic questionnaire contained two out of range values. Under ‘present age’, one respondent (case 171 [ID 667]) wrote 10 years old, and one (case 155 [ID 18]) wrote 17 years old. As it was confirmed that these values were accurately transcribed, a decision was made to delete these cases, given that it is implausible that an RN in Ontario would be ≤17 years old. Further, it could not be confirmed whether these respondents truly represented the target population under study.
Univariate outliers. To identify univariate outliers more specifically, the data were examined for extreme values using z-tests. First, the values for the study variables were converted to standardized scores. Following this, the new standardized scores were explored to assess for extreme values, using a critical value of $z=3.29$ (3 standard deviations from the mean; Tabachnick & Fidell, 2013). According to Kline (2011), scores $> 3$ standard deviations beyond the mean may be outliers. While Tabachnick and Fidell’s (2013) cutoff was used in this study, Hair, Black, Babin, and Anderson (2014) recommend considering cases with $z$ scores exceeding +/- 2.5 to be outliers, and if so, to carefully consider them for removal. A more liberal approach was taken here, given that some outliers are expected in large data sets and important data can often be found in the tails of a distribution (Schat, 2004).

In this study, extreme values in the continuous data were noted in cases 99 (ID 547) ‘total nursing stress scale revised’ (3.68187); and 23 (ID 430) ‘how long have your worked as an RN on your current unit’ (3.54595). A decision was made to delete case 99 in keeping with Tabachnick and Fidell’s (2013) recommendations, while case 23 was retained. Upon closer inspection of case 23, 39 years had been entered as a response. It was felt that this was a realistic timeframe for employment on a nursing unit, as opposed to a truly anomalous outlier. Several cases with extreme values were also noted within the categorical data (i.e., ‘sex’, ‘specialty of current unit’, ‘level of education’, ‘supervisor profession’, and ‘desire to be entered into the iPod draw’). Despite this, no further cases were deleted. Rationale for this decision was as follows: with only forced response options (fixed alternatives) for all categorical data (i.e., demographic information only), as well as new categories added when participants chose ‘other’ as
their response, it was deemed inappropriate to delete these cases. Deletion of these cases would result in important information about sample characteristics being lost.

**Multivariate outliers.** To assess the data for multivariate outliers, Mahalanobis distance was calculated for each case (Meyers et al., 2013). This allowed us to determine how much a case’s values on a specific variable differed from the average of all cases (Meyers et al., 2013). According to Meyers et al. (2013), a large distance indicates that a case has extreme values on ≥ 1 of those variables. The magnitude of each Mahalanobis distance value was assessed by consulting a table of critical values for chi-square, at 8 degrees of freedom (equal to the number of variables clicked into the independent area), and an alpha level of \( p < .001 \) (Meyers, et al., 2013). In this study, any case with a distance value equal to or greater than 26.125 was considered a multivariate outlier. As noted through the results, there were no multivariate outliers (highest extreme value 25.62607) for case 141 [ID 372].

**Normality**

Next, following deletion of the cases noted above, the data were examined for both univariate and multivariate normality.

**Univariate normality.** To assess for univariate normality, the data were examined for skewness (describes the symmetry of the distribution) and kurtosis (describes the clustering of scores toward the center of the distribution; Meyers et al., 2013). None of the main study variables had values +/-1.0 (George & Mallery, 2016), hence a large departure from normality was not considered problematic (skewness [-.099 to -.771]; kurtosis [.024 to -.813], respectively). The distribution of scores were also inspected using histograms. However, while several of the variables appeared to be
normally distributed, Kolmogorov-Smirnov and Shapiro-Wilk tests were run to confirm. With the exception of the ‘total nursing stress scale revised’, all of the main study variables revealed a significance level of $\leq 0.05$ on one or both of the aforementioned tests. As such, seven of the eight main study variables were considered significantly different from normal distribution. However, according to Meyers et al. (2013), both tests are very sensitive to minor departures from normality, particularly with sample sizes >50. According to Tabachnick and Fidell (2013), the null hypothesis is commonly rejected with larger sample sizes, even when there are only minor deviations from normality. Thus, while one might consider transforming the data based on these findings (e.g., square root, logarithm transformations, etc.), Tabachnick and Fidell (2013) assert that a variable with statistically significant skewness/kurtosis often does not deviate enough from normality to make a substantial difference in the analysis. As such, transformations were not completed.

**Multivariate normality.** Next, to assess for multivariate normality, the shapes of bivariate scatterplots were examined for each combination of variables. According to Meyers et al. (2013), the use of bivariate scatterplots is the most common way of assessing linearity among two variables. Further, variables that are linearly related and normally distributed to one another, are said to demonstrate scatterplots with an oval or elliptical shape (Meyers et al., 2013). According to Meyers et al. (2013), if one of the variables is not normally distributed, linearity will not be achieved. Upon visual inspection, the results appear to demonstrate largely linear relationships overall. As such, a decision was made to proceed with the analysis.
Multicollinearity

Last multicollinearity was examined. Multicollinearity exists when more than two predictors are very strongly correlated (Meyers et al., 2013). According to Meyers et al. (2013) the issue concerns predictor variables only, not predictors and outcome variables. When variables are extremely correlated, it suggests they may be measuring the same thing, making it difficult to determine which of them is more relevant (Kline, 2011; Meyers et al., 2013). According to Kline (2011), when this happens, either one of them can be included in the analysis, but not both. Multicollinearity is problematic in SEM as it can result in inaccurate path coefficients and inflated standard errors (Grewal, Cote, & Baumgartner, 2004).

To test for multicollinearity, the hypothesized model was examined using linear multiple regression methods, as a means to examine both tolerance and variance inflation factors (VIF). Tolerance reflects the amount of total standardized variance that is not explained by all of the other variables (Kline, 2011). Tolerance values < 0.10 indicate extreme multicollinearity (corresponds to a multiple correlation of .95 with the other independent variables; Hair et al., 2014); though some suggest a cutoff of < 0.20 (Read, 2016). VIF reflects the ratio of total standardized variance, over unique variance (i.e., tolerance; Kline, 2011). A VIF cutoff of > 10 is considered problematic (corresponds to a multiple correlation of .95 with the other independent variables; Hair et al., 2014). Hair et al. (2014) assert that a VIF value of as low as 3.0 may also be problematic, as it can result in interpretation or estimation problems; particularly when relationships with the dependent measure are weak. As shown in Table 1, multicollinearity was not a problem in the hypothesized model.
Table 1: Tolerance Values and Variance Inflation Factors for Independent Variables in the Hypothesized Model

<table>
<thead>
<tr>
<th>Model (Dependent Variable)</th>
<th>Collinearity Statistics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tolerance (&lt; .20 problematic)</td>
<td>Variance Inflation Factor (&gt; 3 problematic)</td>
</tr>
<tr>
<td>(Authentic Leadership)</td>
<td>.638</td>
<td>1.568</td>
</tr>
<tr>
<td>Structural Empowerment</td>
<td>.576</td>
<td>1.735</td>
</tr>
<tr>
<td>Workplace Spirituality</td>
<td>.866</td>
<td>1.155</td>
</tr>
<tr>
<td>Nursing Stress</td>
<td>.640</td>
<td>1.562</td>
</tr>
<tr>
<td>(Structural Empowerment)</td>
<td>.701</td>
<td>1.427</td>
</tr>
<tr>
<td>Authentic Leadership</td>
<td>.640</td>
<td>1.562</td>
</tr>
<tr>
<td>Workplace Spirituality</td>
<td>.865</td>
<td>1.156</td>
</tr>
<tr>
<td>Nursing Stress</td>
<td>.754</td>
<td>1.327</td>
</tr>
<tr>
<td>(Workplace Spirituality)</td>
<td>.745</td>
<td>1.342</td>
</tr>
<tr>
<td>Authentic Leadership</td>
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<td>Structural Empowerment</td>
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<tr>
<td>Nursing Stress</td>
<td>.662</td>
<td>1.511</td>
</tr>
<tr>
<td>(Nursing Stress)</td>
<td>.602</td>
<td>1.661</td>
</tr>
<tr>
<td>Authentic Leadership</td>
<td>.554</td>
<td>1.805</td>
</tr>
<tr>
<td>Structural Empowerment</td>
<td>.602</td>
<td>1.661</td>
</tr>
<tr>
<td>Workplace Spirituality</td>
<td>.554</td>
<td>1.805</td>
</tr>
</tbody>
</table>

Final Sample

After examining all of the data through the aforementioned data management procedures, the final sample was determined. The remaining sample for analysis contained 274 cases.

3.6 Data Analysis Procedures

Data Analysis Software

The IBM SPSS statistics program (Version 25.0; IBM Corp., 2017) and IBM SPSS AMOS statistical software program (Version 25.0; IBM Corp., 2017) were used to analyze the study data.
Descriptive Statistics

Univariate descriptive statistics were calculated for all study variables (demographics and main study variables) including frequency distributions, measures of central tendency (mean), and indexes of variability (standard deviation and range).

Correlational analyses were also conducted to examine the bivariate relationships among the main study variables. An alpha level of .05 was used to determine significance levels.

Measurement Statistics

To evaluate internal consistency reliability, Cronbach’s alpha coefficients were computed for all study instruments as applicable.

To inform validity assessments, EFAs were solely conducted on two of the study instruments (CLEQ-EDR and NSSR), while CFAs were conducted on all eight of the study instruments (i.e., three standard CFAs and five hierarchical CFAs; Kline, 2011). This provided a means to evaluate the construct validity of each study questionnaire.

According to Meyers et al. (2013), EFAs are more appropriately conducted in an atheoretical environment/for theory development purposes; while CFAs are for theory testing (Tabachnick & Fidell, 2013).

Confirmatory factor analyses only. Because six of the eight questionnaires (ALQ, WSS, ACS, MHI-5, SSS-8R, and the BDSES R) used in this study were well established, with prespecified latent variable structures (based on theory and previous empirical research), and largely minor-to-no modifications made, it was deemed appropriate to solely report CFAs on these tools (Byrne, 2010). According to Meyers et al. (2013), CFA involves determining whether the relationships between the variables in
the theoretically-developed hypothesized model, resemble the relationships between the variables in the observed data set (note that the analysis process is described under SEM procedures).

**Exploratory factor analyses and confirmatory factor analyses.** Rationale for solely conducting EFAs on the CLEQ-EDR and the NSSR (prior to CFAs) is as follows. Two subscales were omitted from both the CLEQ-EDR and NSSR (in addition to modifying a number of existing items) though a total score was computed. As well, for the CLEQ-EDR, the research team developed two new items that did not exist prior to this study. Additionally, the context in which the questions were being asked was also new. For the NSSR, given that the tool was originally developed in 1981, exploring the factor structure was supported, as it is theoretically possible that the frequency with which certain situations are perceived as stressful by a nurse, may have changed over the past nearly four decades. The analysis process involved assessments of factorability, determining the number of factors to extract, and conducting principal axis factoring (PAF) with oblique promax rotation. It should be noted that while there is some controversy in conducting EFAs and CFAs using the same data set (Fokkema & Greiff, 2017), the above rationale supports the decision to conduct two EFAs in this study.

**Inferential Statistics: Structural Equation Modeling and Moderation**

Structural equation modeling was used to test the fit of the hypothesized multivariate model, with the data obtained from the study sample. It should be noted however, that prior to inclusion/testing within the hypothesized model, the moderating influence of individual spirituality on the workplace spirituality-nursing stress relationship was examined in isolation.
Moderation. To conduct the analysis, the IBM SPSS statistics program (Version 25.0; IBM Corp., 2017) was used. First, an interaction term was computed between workplace spirituality and individual spirituality. Second, a hierarchical regression analysis was conducted to predict nursing stress, and the interaction term was entered in step 2. Next, the R Square change when the interaction variable was added to the predictor and moderator variables was then examined. In the event of a non-significant change, further examination within the full hypothesized model was deemed futile.

Structural equation modeling procedures. According to Hair et al. (2014) and Ullman (2013), SEM is a family of statistical techniques that allow a set of relationships between one or more independent variable(s) (IVs) and one or more dependent variable(s) (DV s) to be examined. In this study specifically, a structural regression (SR) model was analyzed. According to Kline (2011), an SR model is the most general kind of structural equation model; representing a synthesis of both: (1) a measurement model and (2) a structural model. Kline (2011) further asserts that SR models allow researchers to test hypotheses about direct and indirect effects; and unlike path models, can involve latent variables. More specifically, this study involves analysis of a partially latent SR model (Kline, 2011). Kline (2011) indicates that while analysis of a fully latent SR model is desirable, it is possible to represent an observed variable that is a single indicator of a construct, in an SR model. This reflects the fact that sometimes, there is only a single measure of a construct of interest (Kline, 2011). As such these models can be called partially latent SR models because at least one variable in the structural model is a single indicator (Kline, 2011). Kline (2011) cautions researchers’ use of this approach in stating that unless measurement error in a single indicator is taken into account, partially latent
SR models have the same limitations as path models. However, in partially latent SR models, the assumption that measurement error cannot be accounted for is not a concern for observed endogenous variables, as it is appreciably manifested through their disturbances (i.e., accounts for measurement error and omitted causes; Kline, 2011, 2016). Observed exogenous variables however, are assumed to have no measurement error (Kline, 2016). In the present study, five of the variables were latent (authentic leadership, workplace spirituality, structural empowerment, nursing stress, and physical health), while three were observed (affective commitment [endogenous], mental health [endogenous], and individual spirituality [exogenous]).

In specifying and identifying SR models, Kline (2011) asserts that it is common that a valid measurement model is needed, before it makes sense to evaluate the structural part of the model. As such Kline (2011) endorses a two-step modeling approach (Anderson & Gerbing, 1988) where the measurement and structural model are analyzed separately. A one-step approach can make it difficult to precisely locate sources of poor fit (Kline, 2011). In this study specifically, a two-phase approach was pursued (informed by the two-step modeling approach) wherein eight individual CFAs (phase 1) were conducted on all study instruments (as noted above), prior to analysis of the structural model (phase 2). According to Meyers et al. (2013), it is important to have a strong measurement model prior to evaluating the structural model, as without it, the latent variables may not have acceptable construct validity to support further structural testing. These analyses were conducted using a model-fitting approach, determined through exploration of fit indices (Kline, 2011; Meyers et al., 2013).
(1) In the first phase, separate CFAs were conducted on all study instruments. Conducting separate CFAs enables the researcher to demonstrate the extent to which the indicator (measured) variables, capture the essence of their associated latent (unmeasured) factor (Meyers et al., 2013). This involved five steps which encompassed both the development and evaluation of each individual CFA (Bollen & Long, 1993). The five steps included: model specification, model identification, selection of a model estimation technique, model evaluation, and model respecification as needed (full descriptions included below).

(2) In the second phase (once all CFAs were conducted and good fit achieved), the structural portion of the partially latent SR model (with modifications based on the CFAs) was evaluated. This involved an examination of the hypothesized relationships among the latent variables, as well as those between measured variables and their respective latent variables, in relation to how well they were supported by the data (Meyers et al., 2013). Once again five steps were included in developing and evaluating the structural model: model specification, model identification, selection of a model estimation technique, model evaluation, and model respecification as needed (full descriptions included below).

**Step 1: Model specification.** In phase 1, separate representations of the hypothesized/EFA informed relationships for each CFA were developed. This was also completed in phase 2 when examining the structural model. For each CFA all second-order factors, first-order factors, disturbances, indicators, and error terms were distinguished; as applicable. For the structural model, all latent variables, observed variables, disturbances, and errors terms were also distinguished, as applicable.
Step 2: Model identification. In the next step, assessments for model identification were conducted for each CFA in phase 1 and the structural model in phase 2. According to Bollen (1989), to assess whether a proposed model fits the data, an essential but not sufficient condition to be met is that the model must be identified. To determine this, the degrees of freedom for each analysis were established. To accomplish this, the following formula was used: \( df = \text{number of known elements} - \text{number of unknown parameters} \) (Meyers et al., 2013). According to Meyers et al. (2013), only when the degrees of freedom are found to be positive, can a meaningful analysis be performed (i.e., the model is identified).

Knowns. First, to determine the number of known/nonredundant elements in each analysis, the following formula was used (where \( V \) represented the number of measured variables in the analysis; Raykov & Marcoulides, 2000): \( \text{number of nonredundant elements} = \frac{V(V+1)}{2} \). Next, Meyers et al. (2013) recommended scaling the latent variable(s). Thus, for each analysis, one of the paths from each latent variable was constrained to one of its indicator (reference item) variables (i.e., a value of 1.0 was assigned to the pattern/structure/path coefficient for the respective path; Meyers et al., 2013). This allowed the remaining paths to be estimated in each analysis. According to Meyers et al. (2013), it is important to note that due to the use of maximum likelihood in SEM, the statistical procedure will eventually produce its own estimate, despite our choice of 1.0 as the coefficient value. Finally, both the errors terms and disturbances were scaled (constrained to values of 1.0), as applicable.
Unknowns. Second, the number of unknown elements were then determined. According to Meyers et al. (2013), the unknown elements are the parameters estimated by the statistical procedure.

**Step 3: Estimation technique.** Next, to estimate the relationships between the variables in each of the CFA models in phase 1 and the structural model in phase 2, the maximum likelihood estimation procedure was used. According to Meyers et al. (2013), maximum likelihood attempts to estimate the values of the parameters that would result in the highest likelihood of the data matching the proposed model.

**Step 4: Model evaluation.** In the next step, all CFA models in phase 1 were individually evaluated. Similarly, in phase 2, the structural model was also assessed. According the Stevens (2009) model assessment includes the following: 1) assessments of model fit; and 2) individual model parameter assessments.

First, assessments of model fit were conducted. According to Meyers et al. (2013), these assessments allow the researcher to determine if the hypothesized model and observed data (model derived from the actual data) resemble each other. If so, the model is said to fit the data (Meyers et al., 2013). To assess overall fit, a number of indicators were used including: the chi-square statistic ($X^2$), chi-square divided by degrees of freedom ($X^2/df$) test, root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), comparative fit index (CFI), and the Tucker-Lewis index (TLI). The choice of these indices was in line with Jaccard and Wan’s (1996) recommendations to report one absolute, one relative, and one parsimonious index (at minimum), to ensure diverse evaluation criteria are included.
Chi-square statistic and chi-square divided by degrees of freedom test. The $X^2$ is a measure of absolute fit which indicates how well the proposed interrelationships between the variables (hypothesized model) match the interrelationships between the actual or observed interrelationships (the data; Meyers et al., 2013). According to Meyers et al. (2013) a non-significant $X^2$ is desired. Despite this cutoff, Meyers et al. (2013) further asserts that as sample size increases, power increases; hence the $X^2$ can return to a statistically significant value, even when the model fits the data fairly well. As such, researchers may inadvertently reject a fairly good fitting model when analyzing data from a large sample, due to small discrepancies between the observed and predicted values (Meyers et al., 2013). Meyers et al. (2013) recommends dividing the $X^2$ by the df in the analysis; wherein a value of less than 2 would suggest a good fit (Byrne, 1989), and a value between 2 and 5 would suggest acceptable fit (Marsh & Hocevar, 1985). According to Cangur and Ercan (2015), use of this formula constitutes an index of parsimonious fit.

Root mean square error of approximation. The RMSEA is an additional measure of absolute fit, defined as the average of the residuals between the observed correlation/covariance from the sample, and the expected model estimated for the population (Meyers et al., 2013). Values $\leq .08$ are determined to be acceptable, while values $>.10$ are typically indicative of poor fit. Values between .08 and .10 are generally judged as being borderline acceptable (Meyers et al., 2013).

Standardized root mean square residual. The SRMR is an additional index of absolute fit, that represents the average difference between the sample variances and covariances, and the estimated population variances and covariances (Ullman, 2013). Values range from 0-1.0, with values of $\leq .08$ indicating acceptable fit (Ullman, 2013).
**Comparative fit index.** The CFI is a measure of relative fit. Relative fit indices represent a measure of fit relative to the independence model (assumes poor fit or no relationships in the data) and the saturated model (assumes perfect fit). When evaluating the CFI, good fit is indicated by values ≥.90 (Knight, Virdin, Ocampo, & Roosa, 1994). Adequate fit is indicated by values ranging from .80-.89, with poor fit ranging from .60-.79, and very poor fit illustrated by values <.60 (Knight et al., 1994). According to Byrne (1998, 2010) the CFI should be the fit statistic of choice in SEM research.

**Tucker-Lewis index.** The TLI is an additional measure of relative fit (Tucker & Lewis, 1973), also known as the non-normed fit index (NNFI). A value >.90 is indicative of acceptable model fit, with values closer to .95 indicating good fit (Bentler, 1990; Hu & Bentler, 1999).

Second, individual model parameter assessments were conducted. For the CFAs in phase 1 specifically, the models were assessed to determine if the factor pattern/structure coefficients were statistically significant ($p<.05$) and meaningful ($\geq .50$; Hair et al., 2014). It is worth noting that while Meyers et al. (2013) reports $\geq .30$ as being indicative of a meaningful pattern/structure coefficient worth retaining, Hair et al.’s (2014) more conservative cutoff was used in this study; though coefficients ranging from .45-.49 (maximum) were considered for retention, only when theoretically justified. For the structural model in phase 2, the model was assessed to determine if the path coefficients were statistically significant ($p<.05$). The meaningfulness of each coefficient was reported and determined based on its size. For phase 2, these values were only reported once good fit was achieved.
Step 5: Model respecification. In the final step noted here, all CFAs in phase 1 and the structural model in phase 2 were subject to model respecification (as needed). However, prior to model respecification, Meyers et al. (2013) indicates a necessity to consider if respecification is theoretically justifiable. Thus, if deletions or additions lacked theoretical justification, we did not attempt to improve model fit.

Mediation. To evaluate specific indirect effects in phase 2 of this study, a user defined Estimand was created in the IBM SPSS AMOS statistical software program (Version 25.0; IBM Corp., 2017) as suggested by Crowson (2018). The Estimand allowed the product of the unstandardized regression weights between the independent and mediating variable, and the mediating and outcome variable, for each mediated path to be computed. The outcome of this computation provided the indirect effects for each path in the form of an unstandardized parameter estimate. The lower and upper bound confidence intervals and p values were also reported, through requesting the bootstrapping option (number of samples set at 2000), and the bias-corrected confidence interval (CI; set at 95%). According to Byrne (2010) and Kline (2016), bootstrapping allows for comparison of parametric values over repeatedly generated samples/data sets (with replacement) from the original sample; thereby simulating random sampling with replacement. As such, it allows the researcher to assess the stability of parameter estimates and report their values with greater accuracy (Byrne, 2010). Bias-corrected CIs are also considered to generate more accurate values over the percentile method (Efron & Tibshirani, 1998). To obtain the standardized specific indirect effects for each mediated path, the product of the standardized regression weights between the independent and mediating variable, and the mediating and outcome variable, for each mediated path were
computed. According to Kline (2011), indirect effects can be estimated statistically, as the product of the standardized coefficients for the constituent paths.

Total indirect effects were also examined in this study, as a means to evaluate the overall influence of authentic leadership on the dependent variables: physical health problems, good mental health, and affective commitment; through all possible pathways in the model. This analysis was conducted using the IBM SPSS AMOS statistical software program (Version 25.0; IBM Corp., 2017). Specifically, unstandardized and standardized indirect effects were examined, along with lower and upper bound CIs and p values. Once again, the bootstrapping option was requested (number of samples set at 2000), and the bias-corrected CI (set at 95%).

3.7 Ethical Considerations

Ethics approval to conduct this study was obtained from the Western University Health Sciences Research Ethics Board (HSREB; Appendix D). In accordance with the HSREB, the researcher ensured that the basic principles of conducting ethical research were adhered to during the study. The three primary ethical principles are beneficence, respect for human dignity, and justice (Polit & Beck, 2008). First, beneficence was upheld by protecting participants’ rights to freedom from harm and exploitation during the course of, or as a result of, being in the study. Second, respect for human dignity was upheld by protecting participants’ rights to self-determination and self-disclosure by obtaining voluntary, informed consent. Third, the principle of justice was upheld by protecting people’s right to fair treatment and privacy.

All questionnaires were kept in a locked file cabinet, in a locked office; both of which were only accessible to the researcher. Questionnaires did not contain any
identifying information. Only unique, non-identifying codes were applied to questionnaires. The coding system involved application of a specific code to each questionnaire matching respondents contact information. This was based on a researcher-developed tracking list. Codes were applied to the upper right corner of each questionnaire. The tracking list was kept in a separate locked file cabinet, in a locked office; only accessible to the researcher. This ensured that all questionnaire data remained confidential and that names were never attached to actual questionnaires. Codes were only linked to participants’ contact information to facilitate the following:

1. Mailing of reminder letters to participants who had not yet responded
2. Mailing of the Apple iPod touch to the winner of the draw
3. Future mailing of the study results to interested participants

To facilitate analysis, questionnaire data were transferred to an electronic file, which was stored on a secure USB that was both password-protected and encrypted. The encryption software that was used was called BitLocker. The USB was stored in a locked cabinet, only accessible to the researcher. Access to the data was restricted to members of the research team only. Study data were entered according to code numbers only.

While the research team did not anticipate any adverse and/or unexpected experiences or events to occur during the study, the risk of privacy breach was acknowledged in the event that the study data were somehow stolen or hacked. Participants were made aware that there was a risk of privacy breach, though they were further assured that this was not an anticipated occurrence; due to the secure measures put in place to protect their data. There was no privacy breach throughout the course of this study. In addition, given the potential risk of emotional distress in recalling incidents of
workplace stress, resources and referrals were available to participants, as needed. Participants were invited to contact the *Occupational Health Clinics for Ontario Workers* (OHCOW) should they experience any emotional distress in filling out the questionnaire. This information was included in the letter of information that accompanied each questionnaire, with an invitation for research participants to call, should they experience any emotional distress in filling out the questionnaire. Participants were notified that they may not personally benefit from participation in the study. They were also notified that despite this, findings from the study would be important to nurse leaders and health care administrators at all levels of the health care hierarchy, in identifying potential ways to support oncology nurses in their work. Finally, contact information for the *Office of Research Ethics, Western University*, was included in the first letter of information to study participants, in the event that respondents had questions or concerns about the conduct of the research study or their rights as research subjects. As well, contact information for members of the research team was included in each letter of information, should participants have had questions about the research study in general.

All data and source documentation related to this study will be maintained for five years. Rationale for the five-year timeframe is to ensure that that research team can confirm the validity of the study results if needed. Following this period, all identifying information and hard copy surveys will be shredded and disposed of in a secure container. All electronic data will be destroyed by means of secure file overwriting and deletion software methods. Only grouped data will be communicated in all study related communications and reports. No individuals will be identified by name.
CHAPTER 4: Results

The findings from this research study are presented in this chapter, including descriptive results (demographics and main study variables), as well as measurement, and inferential results.

4.1 Descriptive Results

Demographics

Demographic characteristics are presented in Tables 2 and 3. The majority of respondents were female (96.0%), with baccalaureate degrees (48.2%) or diplomas (41.2%) in nursing. The average age was 45.38 years (range: 25.00-74.00), with 20.93 years’ experience as an RN, 16.32 years’ experience at their current organization, and 10.43 years of experience on their current unit. A large portion of the sample worked full time (64.6%), with 61.5% reporting 20-39 hours worked, per week. The majority identified their immediate supervisor as an RN (89.0%), 6.2% listed an alternate profession, and 4.8% did not specify. The majority also reported that nursing was their first career choice (75.2%), and most identified oncology as their first choice of specialty (56.6%). All respondents reported working in acute care oncology settings (100.0%).

Table 2: Means (M), Standard Deviations (SD), and Ranges for Acute Care Oncology Nurses’ Demographic Characteristics (N=274)

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Response Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present Age</td>
<td>272</td>
<td>45.38</td>
<td>11.69</td>
<td>25.00-74.00</td>
</tr>
<tr>
<td>Years Worked as an RN</td>
<td>273</td>
<td>20.93</td>
<td>12.03</td>
<td>2.33-50.00</td>
</tr>
<tr>
<td>Years Worked as an RN at Current Organization</td>
<td>274</td>
<td>16.32</td>
<td>10.63</td>
<td>1.00-44.00</td>
</tr>
<tr>
<td>Years Worked as an RN on Current Unit</td>
<td>274</td>
<td>10.43</td>
<td>7.97</td>
<td>0.42-39.00</td>
</tr>
</tbody>
</table>
Table 3: Frequency Distributions for Acute Care Oncology Nurses’ Demographic Characteristics (N=274)

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
<th>Valid %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11</td>
<td>4.0</td>
</tr>
<tr>
<td>Female</td>
<td>263</td>
<td>96.0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Work Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casual</td>
<td>23</td>
<td>8.4</td>
</tr>
<tr>
<td>Part time</td>
<td>74</td>
<td>27.0</td>
</tr>
<tr>
<td>Full time</td>
<td>177</td>
<td>64.6</td>
</tr>
<tr>
<td><strong>Hours Typically Worked Within a Week</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 20</td>
<td>28</td>
<td>10.3</td>
</tr>
<tr>
<td>20-39</td>
<td>168</td>
<td>61.5</td>
</tr>
<tr>
<td>Over 40</td>
<td>77</td>
<td>28.2</td>
</tr>
<tr>
<td><strong>Workplace Type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute care</td>
<td>274</td>
<td>100.0</td>
</tr>
<tr>
<td>Community</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Long-term</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Specialty Area of Your Current Unit</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oncology</td>
<td>274</td>
<td>100.0</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Highest Level of Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>113</td>
<td>41.2</td>
</tr>
<tr>
<td>BScN/BN</td>
<td>132</td>
<td>48.2</td>
</tr>
<tr>
<td>MScN/MN</td>
<td>16</td>
<td>5.8</td>
</tr>
<tr>
<td>PhD</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>4.1</td>
</tr>
<tr>
<td><strong>Immediate Supervisor Is</strong>&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>An RN</td>
<td>242</td>
<td>89.0</td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
<td>6.2</td>
</tr>
<tr>
<td>Unspecified</td>
<td>13</td>
<td>4.8</td>
</tr>
<tr>
<td><strong>Nursing Was My First Choice as a Career</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>206</td>
<td>75.2</td>
</tr>
<tr>
<td>No</td>
<td>68</td>
<td>24.8</td>
</tr>
<tr>
<td><strong>Oncology Was My First Choice of Nursing Specialty</strong>&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>154</td>
<td>56.6</td>
</tr>
<tr>
<td>No</td>
<td>118</td>
<td>43.4</td>
</tr>
</tbody>
</table>

<sup>a</sup> Due to missing data for this variable, n=273.

<sup>b</sup> Due to missing data for this variable, n=272.

**Main Study Variables**

*Univariate.* The means, standard deviations, and ranges for the main study variables are summarized in Table 4. On average, acute care oncology nurses rated their
Table 4: Cronbach’s Alphas (α), Number (#) of Items, Means (M), Standard Deviations (SD), and Ranges for Main Study Variables (N=274)

<table>
<thead>
<tr>
<th>Variable (Possible Range)</th>
<th>α</th>
<th># Items</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Response Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total ALQ (0-4)</td>
<td>.97</td>
<td>16</td>
<td>274</td>
<td>2.41</td>
<td>0.97</td>
<td>0.00-4.00</td>
</tr>
<tr>
<td>Relational transparency (0-4)</td>
<td>.90</td>
<td>5</td>
<td>274</td>
<td>2.58</td>
<td>0.97</td>
<td>0.00-4.00</td>
</tr>
<tr>
<td>Internalized moral perspective (0-4)</td>
<td>.92</td>
<td>4</td>
<td>274</td>
<td>2.56</td>
<td>1.01</td>
<td>0.00-4.00</td>
</tr>
<tr>
<td>Balanced processing (0-4)</td>
<td>.86</td>
<td>3</td>
<td>274</td>
<td>2.33</td>
<td>1.04</td>
<td>0.00-4.00</td>
</tr>
<tr>
<td>Self-awareness (0-4)</td>
<td>.93</td>
<td>4</td>
<td>274</td>
<td>2.17</td>
<td>1.15</td>
<td>0.00-4.00</td>
</tr>
<tr>
<td>Total WSS (1-7)</td>
<td>.96</td>
<td>20</td>
<td>274</td>
<td>4.73</td>
<td>1.07</td>
<td>1.73-6.87</td>
</tr>
<tr>
<td>Meaningful work (1-7)</td>
<td>.87</td>
<td>5</td>
<td>274</td>
<td>5.41</td>
<td>1.05</td>
<td>1.80-7.00</td>
</tr>
<tr>
<td>Sense of community (1-7)</td>
<td>.93</td>
<td>7</td>
<td>274</td>
<td>4.88</td>
<td>1.27</td>
<td>1.00-7.00</td>
</tr>
<tr>
<td>Alignment of organizational values (1-7)</td>
<td>.95</td>
<td>8</td>
<td>274</td>
<td>3.90</td>
<td>1.41</td>
<td>1.00-6.88</td>
</tr>
<tr>
<td>Total CLEQ-EDR (4-20)+</td>
<td>.93</td>
<td>17</td>
<td>274</td>
<td>13.18</td>
<td>3.04</td>
<td>4.00-19.25</td>
</tr>
<tr>
<td>Support (1-5) +</td>
<td>.89</td>
<td>6</td>
<td>274</td>
<td>3.22</td>
<td>0.87</td>
<td>1.00-5.00</td>
</tr>
<tr>
<td>Opportunity (1-5) +</td>
<td>.86</td>
<td>4</td>
<td>274</td>
<td>3.58</td>
<td>0.87</td>
<td>1.00-5.00</td>
</tr>
<tr>
<td>Information (1-5) +</td>
<td>.92</td>
<td>4</td>
<td>274</td>
<td>3.03</td>
<td>1.17</td>
<td>1.00-5.00</td>
</tr>
<tr>
<td>Resources (1-5) +</td>
<td>.82</td>
<td>3</td>
<td>274</td>
<td>3.34</td>
<td>0.87</td>
<td>1.00-5.00</td>
</tr>
<tr>
<td>Total NSSR (18-72)+</td>
<td>.86</td>
<td>18</td>
<td>274</td>
<td>41.99</td>
<td>7.77</td>
<td>23.00-69.00</td>
</tr>
<tr>
<td>Workload (5-20) +</td>
<td>.83</td>
<td>5</td>
<td>274</td>
<td>14.79</td>
<td>3.27</td>
<td>7.00-20.00</td>
</tr>
<tr>
<td>Death and dying (4-16) +</td>
<td>.83</td>
<td>4</td>
<td>274</td>
<td>10.04</td>
<td>2.59</td>
<td>4.00-16.00</td>
</tr>
<tr>
<td>Uncertainty concerning treatment (5-20) +</td>
<td>.82</td>
<td>5</td>
<td>274</td>
<td>10.05</td>
<td>2.86</td>
<td>5.00-19.00</td>
</tr>
<tr>
<td>Problems with physicians and other nurses (4-16) +</td>
<td>.82</td>
<td>4</td>
<td>274</td>
<td>7.11</td>
<td>2.50</td>
<td>4.00-16.00</td>
</tr>
<tr>
<td>Total ACS (1-7)+</td>
<td>.85</td>
<td>5</td>
<td>274</td>
<td>4.73</td>
<td>1.35</td>
<td>1.00-7.00</td>
</tr>
<tr>
<td>Total MHI-5 (0-100)</td>
<td>.84</td>
<td>5</td>
<td>274</td>
<td>70.51</td>
<td>17.17</td>
<td>16.00-100.00</td>
</tr>
<tr>
<td>Total SSS-8R (0-32)</td>
<td>.80</td>
<td>8</td>
<td>274</td>
<td>10.82</td>
<td>6.14</td>
<td>0.00-27.00</td>
</tr>
<tr>
<td>Gastrointestinal (0-4)</td>
<td>N/A</td>
<td>1</td>
<td>274</td>
<td>1.32</td>
<td>1.26</td>
<td>0.00-4.00</td>
</tr>
<tr>
<td>Pain (0-4)</td>
<td>.59</td>
<td>3</td>
<td>274</td>
<td>1.58</td>
<td>0.98</td>
<td>0.00-4.00</td>
</tr>
<tr>
<td>Cardiopulmonary (0-4)</td>
<td>.54</td>
<td>2</td>
<td>274</td>
<td>0.36</td>
<td>0.65</td>
<td>0.00-3.00</td>
</tr>
<tr>
<td>Fatigue (0-4)</td>
<td>.69</td>
<td>2</td>
<td>274</td>
<td>2.03</td>
<td>1.11</td>
<td>0.00-4.00</td>
</tr>
<tr>
<td>Total BDSESR (1-6)</td>
<td>.91</td>
<td>6</td>
<td>274</td>
<td>3.54</td>
<td>1.20</td>
<td>1.00-6.00</td>
</tr>
</tbody>
</table>

+ Trimmed result following phase 1.
immediate managers’ authentic leadership behaviour as moderate (M=2.41, SD=0.97). Specifically, relational transparency (M=2.58, SD=0.97) was rated as highest, while perceived self-awareness (M=2.17, SD=1.15) was rated as lowest.

Perceptions of workplace spirituality were also moderate (M=4.73, SD=1.07), with participants reporting a sense of meaning in their work (M=5.41, SD=1.05) as being the most present. Conversely, alignment with organizational values (M=3.90, SD=1.41) was perceived as the least present.

For structural empowerment, respondents found their workplace learning environments to be moderately structurally empowering (M=13.18, SD=3.04). They felt the greatest overall access to opportunities (M=3.58, SD=0.87), and the least access to information (M=3.03, SD=1.17).

The frequency with which acute care oncology nurses perceived their work settings to be stressful was rated as fairly moderate (M=41.99, SD=7.77). Workload (M=14.79, SD=3.27) was perceived as the most frequently stressful aspect of their work, while problems with physicians and other nurses (M=7.11, SD=2.50) was reported as the least stressful.

Overall, respondents’ affective commitment to their work (M=4.73, SD=1.35) and daily spiritual experiences (M=3.54, SD=1.20) were reported as moderate. Conversely, perceived mental health (M=70.51, SD=17.17) was appreciably above moderate (i.e., closer to good mental health), while physical health (M=10.82, SD=6.14) was below moderate (i.e., closer to better physical health; severity category=medium). In relation to physical health specifically, participants reported being the most bothered by fatigue
(M=2.03, SD=1.11) and the least bothered by cardiopulmonary problems (M=0.36, SD=0.65).

**Bivariate.** Correlational analyses were conducted to examine the bivariate relationships under study (see Table 5).

1. Authentic leadership was: positively related to workplace spirituality (r=.55, p<.01) and structural empowerment (r=.47, p<.01); and negatively related to nursing stress (r=−.27, p<.01).
2. Workplace spirituality was: negatively related to nursing stress (r=−.39, p<.01).
3. Structural empowerment was: negatively related to nursing stress (r=−.19, p<.01).
4. Nursing stress was: negatively correlated with affective commitment (r=−.29, p<.01) and good mental health (r=−.30, p<.01); and positively correlated with physical health problems (r=+.34, p<.01).

### 4.2 Measurement Results

**Reliability**

Cronbach’s alpha reliability coefficients for the main study variables and their affiliate subscales are presented in Table 4. According to Meyers et al. (2013) coefficient alpha is an index of internal consistency. Interpretation guidelines are as follows: ~.90=excellent, ~.80=very good, ~.70=adequate, <.50=unacceptable (Kline, 2011).

In this study, Cronbach’s alpha of the ALQ was .97, with subscale reliabilities ranging from .86-.93. Similarly, for workplace spirituality, Cronbach’s alpha was .96, with subscale reliabilities ranging from .87-.95. The CLEQ-EDR reliability score was excellent (α=.93), with subscale scores between .82 and .92. As well, the NSSR demonstrated reliability in the very good range (α=.86), with subscale scores between .82
Table 5: Correlations between Main Study Variables (N=274)

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** Correlation is significant at the 0.01 level (1-tailed). * Correlation is significant at the 0.05 level (1-tailed).
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**Correlation is significant at the 0.01 level (1-tailed). * Correlation is significant at the 0.05 level (1-tailed). 
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</tr>
<tr>
<td>13. Information+</td>
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<tr>
<td>14. Resources+</td>
<td></td>
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<tr>
<td>15. Total NSSR+</td>
<td></td>
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<tr>
<td>16. Workload+</td>
<td></td>
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<tr>
<td>17. Death and dying+</td>
<td></td>
<td></td>
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<tr>
<td>18. Uncertainty concerning treatment+</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Problems with physicians and other nurses+</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Total ACS+</td>
<td>-0.22**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Total MHI-5</td>
<td>-0.14*</td>
<td>0.25**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Total SSS-8R</td>
<td>0.16**</td>
<td>-0.22**</td>
<td>-0.56**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Gastrointestinal</td>
<td>0.07</td>
<td>-0.08</td>
<td>-0.36**</td>
<td>-0.79**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Pain</td>
<td>0.15**</td>
<td>-0.21**</td>
<td>-0.47**</td>
<td>-0.79**</td>
<td>0.43**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Cardiopulmonary</td>
<td>0.14*</td>
<td>-0.14**</td>
<td>-0.34**</td>
<td>-0.63**</td>
<td>0.36**</td>
<td>0.40**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Fatigue</td>
<td>0.15**</td>
<td>-0.26**</td>
<td>-0.56**</td>
<td>-0.84**</td>
<td>0.51**</td>
<td>0.61**</td>
<td>0.43**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>27. Total BDSESR</td>
<td>-0.01</td>
<td>-0.23**</td>
<td>-0.20*</td>
<td>0.03</td>
<td>0.06</td>
<td>-0.02</td>
<td>-0.10*</td>
<td>0.09</td>
<td>1.00</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (1-tailed). * Correlation is significant at the 0.05 level (1-tailed).
+ Trimmed result following phase 1.
and .83. In addition, the SSS-8R demonstrated very good reliability (α=.80), though the subscale scores were somewhat low (.54-.69). According to Little, Lindenberger, and Nesselroade (1999) somewhat lower levels of reliability can be tolerated when using latent variable methods (as opposed to observed), if the sample size is sufficiently large. As well, Cronbach’s alpha can be low when a scale has a small number of items (Field, 2009). Finally, the ACS, MHI-5, and the BDSES also demonstrated adequate reliability (α=.85; .84; .91, respectively).

**Validity**

EFAs were conducted on 2 of the main study variables (CLEQ-EDR and NSSR), with CFAs conducted on all of the main study variables. These analyses were conducted as a means to support construct validity (see below).

### 4.3 Inferential Results

**Structural Equation Modeling**

Phase 1: exploratory and confirmatory factor analyses. As noted above, EFAs were conducted on two of the main study variables (CLEQ-EDR and NSSR), with CFAs conducted on all of the main study variables. The results of these analyses are presented here.

**Authentic Leadership Questionnaire.** In keeping with Avolio et al.’s (2007) theoretical propositions of authentic leadership, a hierarchical CFA was performed. To specify the ALQ (Avolio et al., 2007) model, a structural representation of the hypothesized relationships was developed. This included: one second-order factor with no indicators (authentic leadership); four first-order factors (relational transparency, internalized moral perspective, balanced processing, and self-awareness) with associated
disturbances; and 16 indicator variables (5; 4; 3; 4, respectively) with associated error terms (Kline, 2016).

The model was determined to be identified. Using the recommended formula to determine the number of knowns (Raykov & Marcoulides, 2000), the model contained 136 nonredundant elements. By then subtracting the number of unknowns (36) from this value, the degrees of freedom were determined to be 100.

The initial four factor model demonstrated poor fit: \(X^2(100, N=274)=424.805, p<.001;\) RMSEA=.109 (poor fit); SRMR=.0395; CFI=.924; TLI=.909. While the \(X^2\) was significant, the \(X^2/df\) test revealed a value of 4.3. While this was in the acceptable range, the overall model still demonstrated poor fit.

The raw score regression weights were then explored. Each of the coefficients for the unconstrained paths were significant with \(p\) values <.001. In this respect, each of the estimated coefficients reached statistical significance. The standardized regression weights were then examined. The rel1-rel5 variables correlated with relational transparency at .755-.875; mora1-mora4 correlated with internalized moral perspective at .825-.876; bal1-bal3 correlated with balanced processing at .812-.845; and self1-self4 correlated with self-awareness at .819-.927. In addition, RTcfa, IMPcfa, BIPcfa, and SELFAcfa were correlated with authentic leadership (.952; .948; 1.001; .935, respectively). This demonstrated that the pattern coefficients achieved meaningful significance with coefficients greater than .50 (Hair et al., 2014), though one coefficient exceeded a value of 1.0.

In terms of model respecification, as all the pattern coefficients achieved both statistical and practical significance, deleting any of the coefficients was deemed
counterproductive (Meyers et al., 2013). However, the fact that BIP correlated with authentic leadership at a value greater than 1, was a potential concern. While a variety of recommendations are offered to remedy the situation (Gaskin, 2015), it was deemed necessary to first examine the modification indices in the covariances table. Several changes were indicated as a means to improve model fit. Specifically, adding a correlation between $e_{13}$ and $d_3$ was suggested, though this lacked theoretical justification. As well, adding a correlation between $e_{12}$ and $e_{13}$ was suggested ($X^2=26.893$ [second largest]). This was theoretically supported as the error terms were affiliated with $b_{al3}$ ‘listens carefully to different points of view before coming to conclusions’ and $s_{elf1}$ ‘seeks feedback to improve interactions with others’. It is possible that acute care oncology nurse would perceive their immediate manager’s likelihood of listening to different points of view and seeking feedback to reflect similar constructs.

Examination of the regression weights table also indicated a number of potential changes to improve model fit. Specifically, a path was suggested between $mora_1$ and $rel_1$ ($X^2=11.545$ [largest]). However, given that addition of this path lacked theoretical grounding (as per the hypothesized relationships in the model), no modifications were made. Thus, given the theoretical and empirical rationale noted above, a correlation between $e_{12}$ and $e_{13}$ was added as a first step. This second iteration improved model fit, though the overall fit remained poor: $X^2(99, N=274)=396.404, p<.001$; RMSEA=.105 (poor fit); SRMR=.0384; CFI=.931; TLI=.916. In this case $X^2$ remained significant, hence the $X^2/df$ test was conducted. The results of this test revealed a value of 4.0. While this demonstrated acceptable fit, the overall fit of the re-specified model remained poor. Once again, when examining the raw score regression weights, each of the coefficients
for the unconstrained paths were significant with \( p \) values <.001. The standardized regression weights were then examined. The rel1-rel5 variables correlated with \textit{relational transparency} at .757-.875; mora1-mora4 correlated with \textit{internalized moral perspective} at .825-.875; bal1-bal3 correlated with \textit{balanced processing} at .809-.834; and self1-self4 correlated with \textit{self-awareness} at .809-.929. In addition, RTcfa, IMPcfa, BIPcfa, and SELFAcfa were correlated with \textit{authentic leadership} (.951; .951; .1.005; .934, respectively). This again demonstrated that the pattern coefficients achieved meaningful significance, though one coefficient exceeded a value of 1.0.

Model respecification was again conducted. Once again, as all the pattern coefficients achieved both statistical and practical significance, deleting any of the coefficients was deemed counterproductive (Meyers et al., 2013). In looking at the modification indices in the covariances table, adding a correlation between e10 and e13 was suggested (\( X^2=26.157 \) [largest]). This was theoretically supported as the error terms are affiliated with bal1 ‘\textit{solicits views that challenge his or her deeply held positions}’ and self1 ‘\textit{seeks feedback to improve interactions with others}’. It is conceivable that acute care oncology nurses might perceive their immediate manager’s propensity to solicit potentially challenging views, and feedback to improve their interactions with others, as reflective of similar behaviours. Examination of the regression weights table also indicated a number of potential changes to improve model fit, though none of the suggestions had theoretical grounding. Thus, given the theoretical and empirical rationale noted above, a correlation between e10 and e13 was added. This third iteration improved model fit: \( X^2(98, N=274)=366.413, p<.001; \) RMSEA=.100; SRMR=.0378; CFI=.937; TLI=.923. While \( X^2 \) again remained significant, the results of the \( X^2/df \) test revealed a
value of 3.7. This indicated acceptable fit. Once again examination of the raw score regression weights revealed the coefficients for the unconstrained paths were significant with \( p \) values <.001. As well, the standardized regression weights revealed the following:

- rel1-rel5 variables correlated with \textit{relational transparency} at .760-.875;
- mora1-mora4 correlated with \textit{internalized moral perspective} at .825-.873;
- bal1-bal3 correlated with \textit{balanced processing} at .808-.843; and
- self1-self4 correlated with \textit{self-awareness} at .798-.932.

In addition, RTcfa, IMPcfa, BIPcfa, and SELFAcfa were correlated with \textit{authentic leadership} (.951; .954; .994; .930, respectively). This demonstrated that the pattern coefficients achieved meaningful significance with coefficients greater than .50 (Hair et al., 2014). As well, the concern associated with the pattern coefficient >1.0 was resolved (Figure 3).

\textbf{Workplace Spirituality Scale.} Based on Milliman et al.’s (2003) theoretical propositions of workplace spirituality, a hierarchical CFA was conducted. To specify the WSS (Milliman et al., 2003) model, a structural representation of the hypothesized relationships was developed. This included: one second-order factor with no indicators \textit{(workplace spirituality)}; three first-order factors \textit{(meaningful work, sense of community, and alignment of organizational values)} with associated disturbances; and 20 indicator variables (5; 7; 8, respectively) with associated error terms.

The model was determined to be identified. Using the recommended formula to determine the number of knowns (Raykov & Marcoulides, 2000), the model contained 210 nonredundant elements. By then subtracting the number of unknowns (43) from this value, the degrees of freedom were determined to be 167.
Figure 3. ALQ final confirmatory factor analysis.
ALQtotal=authentic leadership; RTcfa=relational transparency; IMPcfa=internalized moral perspective; BIPcfa=balanced processing; SELFAcfa=self-awareness.
Model fit: $X^2(98, N=274)=366.413, p<.001$; RMSEA=.100; SRMR=.0378; CFI=.937; TLI=.923; $X^2/df=3.7$. 
The model provided acceptable fit to the data: $X^2(167, N=274)=600.337, p<.001$; RMSEA=.097; SRMR=.0559; CFI=.912; TLI=.900. While the $X^2$ was significant, the $X^2/df$ test revealed a value of 3.6. This indicated acceptable fit.

The raw score regression weights were then explored. Each of the coefficients for the unconstrained paths were significant with $p$ values <.001. The standardized regression weights were then examined. The meani1-meani5 variables correlated with meaningful work at .572-.900; sen1-sen7 correlated with sense of community at .716-.878; and alig1-alig8 correlated with alignment of organizational values at .614-.927. As well, MEANIcfa, SENcfa, and ALIGcfa were correlated with workplace spirituality (.589; .881; .901, respectively). The results demonstrated that all pattern coefficients achieved meaningful significance with coefficients greater than .50 (Hair et al., 2014).

In terms of model respecification, as all the pattern coefficients achieved both statistical and practical significance, deletion of coefficients was unwarranted (Meyers et al., 2013). In looking at the modification indices in the covariances table and regression weights table, a number of changes were indicated to possibly improve model fit. However, none of the potential correlations or path additions, indicated by the modification indices made theoretical sense. For this reason, no modifications were made. Furthermore, given that adequate fit was achieved, this was deemed unnecessary (Figure 4).

**Conditions for Learning Effectiveness Questionnaire-Education Revised.** To support theory development, a first-generation EFA was conducted on the CLEQ-EDR (Siu et al., 2005); prior to conducting a CFA. As previously noted, rationale for conducting the EFA first reflects the following: two subscales were omitted from the
Figure 4. WSS final confirmatory factor analysis.
WSStotal=workplace spirituality; MEANcfa=meaningful work; SENcfa=sense of community; ALIGcfa=alignment of organizational values.
Model fit: $X^2(167, N=274)=600.337, p<.001$; RMSEA=.097; SRMR=.0559; CFI=.912; TLI=.900; $X^2/df=3.6$. 
original tool, a number of items were modified, two entirely new items were included that did not exist prior to this study, and the context in which the questions were being asked was also new (focus on learning at work).

Exploratory factor analysis. Initially, the factorability of the 26-item CLEQ-EDR (Siu et al., 2005) was examined. First, it was observed that all of the 26 items were correlated at a level of .47 with at least one other item; suggesting reasonable factorability. According to Tabachnick and Fidell (2013), the correlation matrix should reveal several sizable correlations >.30. Second, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was revealed to be .94, and as such, was considered adequate (≥.60=required; Tabachnick & Fidell, 2013). The Bartlett’s Test of Sphericity was also statistically significant ($\chi^2(325)=5308.822$, $p<.01$) enabling us to reject the null hypothesis of a lack of sufficient correlation between the variables (Meyers et al., 2013).

The analysis continued with an examination of the scree plot, which revealed a leveling off of the eigenvalues after four factors. Meyers et al. (2013) indicated that the scree plot begins to straighten out at a point when no gains can be made in choosing additional factors. This was consistent with an examination of the initial eigenvalues, of which only four were ≥1.0 (12.4; 1.8; 1.5; 1.4, respectively). Parallel analysis (Pallant, 2010; Patil, Singh, Mishra, & Donavan, 2017) also supported a four factor structure. For this reason, a four factor solution for the construct was deemed to be the most likely and viable possibility, which was consistent with Siu et al.’s (2005) propositions. The solution also accounted for 65.7% of the total variance.

PAF was conducted using a four factor structure with oblique promax rotation. According to Schat (2013), PAF is the preferred method in seeking theoretical solutions
and in aiming to use factors as subscales. Tabachnick and Fidell (2013) further assert that it is widely used and conforms to a model in which common variance is analyzed with unique and error variance removed. The choice of an oblique rotation is supported as it allows the factors to be correlated (Tabachnick & Fidell, 2013). Analysis of the factor correlation matrix revealed that all six correlations were above the absolute value of +/- .20, thus it was assumed that there was some correlation among the factors (range .60 to .72).

The communalities (i.e., the estimate of a variable’s common variance with the other variables in the analysis; Hair et al., 2014) were then explored; of which twenty of the extracted variables were above .50. According to Meyers et al. (2013), variables with communalities of less than .50 (low) are considered possible candidates for removal. This left six variables as possible candidates for deletion. At this point in the analysis however, only those below .35 (very low) were considered for removal (though none of the variables fell below this threshold). As such, the analysis continued.

The pattern matrix was then examined. Within the analysis, four factors were extracted that cumulatively explained 60.2% of the common item variance. Analysis of the pattern matrix revealed the following: sup1, sup2, sup3, sup4, sup5, and sup6 loaded highly on factor 1 (support); inf3, inf5, res2, and supp7 loaded highly on factor 2 (information); opp1, opp2, opp3, and opp4 loaded highly on factor 3 (opportunity); and res3, res4, and res5 loaded highly on factor 4 (resources). Inf1, inf2, inf4, inf6, opp5, opp6, res1, res6, and res7 were deleted due to loadings below .45 (i.e., fair; Comrey & Lee, 1992; Tabachnick & Fidell, 2013) and/or cross loadings. It is not surprising that res2 ‘educator availability for help with your learning needs’ and supp7 ‘open discussion of
learning concerns with your educator’ loaded on information, as both inf3 ‘educator expectations of you’ and inf5 ‘educator expertise relevant to your learning experiences’ also loaded on information; and all four items are reflective of oncology nurses’ interactions/perceptions of their educator.

Ultimately, a total of nine items were deleted, wherein all items with cross loading and/or low loadings were removed. In relation to the communalities, a decision was made to retain the remaining two items (supp2 and opp1) with somewhat low communalities (.36; .40, respectively). Deletion of these items seemed to lack theoretical justification, and as such, they were retained for further examination through confirmatory means. In total, seventeen items were retained, with two items moved to alternate factors. The four factors noted here adequately represented the support, information, opportunity, and resources aspects of the CLEQ-EDR overall, explaining 46.22%; 5.73%; 4.34%; and 3.88% of the common item variance, respectively; following oblique promax rotation (see Table 6).

**Confirmatory factor analysis.** Based on Siu et al.’s (2005) theoretical propositions of structural empowerment and the EFA results, a hierarchical CFA was conducted. To specify the CLEQ-EDR (Siu et al., 2005) model, a structural representation of the hypothesized relationships was developed. This included: one second-order factor with no indicators (structural empowerment); four first-order factors (support, information, opportunity, and resources) with associated disturbances; and seventeen indicator variables (6; 4; 4; 3, respectively) with associated error terms.

The model was determined to be identified. Using the recommended formula to determine the number of knowns (Raykov & Marcoulides, 2000), the model contained
Table 6: Factor Loadings, Communalities, and Proportions of Variance for Principal Axis Extraction with Oblique Promax Rotation for the Conditions for Learning Effectiveness Questionnaire-Education Revised Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Item Code</th>
<th>1 Support</th>
<th>2 Information</th>
<th>3 Opportunity</th>
<th>4 Resources</th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Specific information about the things you do well</td>
<td>sup 1</td>
<td>.87</td>
<td></td>
<td></td>
<td></td>
<td>.57</td>
</tr>
<tr>
<td>2. Specific comments about things you could improve</td>
<td>sup 2</td>
<td>.71</td>
<td></td>
<td></td>
<td></td>
<td>.36</td>
</tr>
<tr>
<td>3. Helpful hints or problem solving advice</td>
<td>sup 3</td>
<td>.88</td>
<td></td>
<td></td>
<td></td>
<td>.67</td>
</tr>
<tr>
<td>4. Encouragement to pursue your own learning needs</td>
<td>sup 4</td>
<td>.76</td>
<td></td>
<td></td>
<td></td>
<td>.62</td>
</tr>
<tr>
<td>5. Encouragement to challenge ideas</td>
<td>sup 5</td>
<td>.92</td>
<td></td>
<td></td>
<td></td>
<td>.67</td>
</tr>
<tr>
<td>6. Active engagement in learning activities</td>
<td>sup 6</td>
<td>.63</td>
<td></td>
<td></td>
<td></td>
<td>.61</td>
</tr>
<tr>
<td>7. Open discussion of learning concerns with your educator</td>
<td>sup 7</td>
<td></td>
<td></td>
<td>.73</td>
<td></td>
<td>.65</td>
</tr>
<tr>
<td>8. Tasks that use all of your skills and knowledge</td>
<td>opp 1</td>
<td></td>
<td>.65</td>
<td></td>
<td></td>
<td>.40</td>
</tr>
<tr>
<td>9. Challenging learning opportunities</td>
<td>opp 2</td>
<td></td>
<td>1.06</td>
<td></td>
<td></td>
<td>.77</td>
</tr>
<tr>
<td>10. Chance to learn new skills</td>
<td>opp 3</td>
<td></td>
<td>1.06</td>
<td></td>
<td></td>
<td>.80</td>
</tr>
<tr>
<td>11. Design learning experiences according to individual learning needs</td>
<td>opp 4</td>
<td></td>
<td>.51</td>
<td></td>
<td></td>
<td>.61</td>
</tr>
<tr>
<td>12. Accomplish learning goals in your own way</td>
<td>opp 5</td>
<td>.36</td>
<td></td>
<td>.40</td>
<td></td>
<td>.54</td>
</tr>
<tr>
<td>13. Share with others what you have learned</td>
<td>opp 6</td>
<td>.35</td>
<td></td>
<td>.41</td>
<td></td>
<td>.49</td>
</tr>
<tr>
<td>14. Teaching/learning values of your unit</td>
<td>inf 1</td>
<td>.42</td>
<td>.38</td>
<td></td>
<td></td>
<td>.65</td>
</tr>
<tr>
<td>15. Educational goals of the nursing unit</td>
<td>inf 2</td>
<td>.41</td>
<td>.52</td>
<td></td>
<td></td>
<td>.71</td>
</tr>
<tr>
<td>16. Educator expectations of you</td>
<td>inf 3</td>
<td></td>
<td></td>
<td>1.0</td>
<td></td>
<td>.85</td>
</tr>
<tr>
<td>17. Expertise of your peers gained from their learning experiences</td>
<td>inf 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.40</td>
</tr>
<tr>
<td>18. Educator expertise relevant to your learning experiences</td>
<td>inf 5</td>
<td></td>
<td></td>
<td>1.04</td>
<td></td>
<td>.86</td>
</tr>
<tr>
<td>19. Formal knowledge that helps you to solve patient care problems</td>
<td>inf 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.60</td>
</tr>
<tr>
<td>20. Time available to accomplish learning goals</td>
<td>res 1</td>
<td></td>
<td>.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Educator availability for help with your learning needs</td>
<td>res 2</td>
<td></td>
<td></td>
<td>.86</td>
<td></td>
<td>.64</td>
</tr>
<tr>
<td>22. Availability of peers for sharing information about their learning experiences</td>
<td>res 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.69</td>
</tr>
<tr>
<td>23. Availability of health care professionals (i.e. nurses, doctors, and other members of health care team) for consultation on learning needs</td>
<td>res 4</td>
<td></td>
<td></td>
<td>.94</td>
<td></td>
<td>.64</td>
</tr>
<tr>
<td>24. Availability of other people to help with your learning goals</td>
<td>res 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.82</td>
</tr>
<tr>
<td>25. Availability of in-services related to your educational needs</td>
<td>res 6</td>
<td>.32</td>
<td></td>
<td>.34</td>
<td></td>
<td>.43</td>
</tr>
<tr>
<td>26. Availability of continuing education opportunities related to your educational needs</td>
<td>res 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.54</td>
</tr>
</tbody>
</table>

**Percentage of variance (following rotation)**

46.22%  5.73%  4.34%  3.88%

Note: Only factor loadings above .30 are reported. Factor loadings exceeding .45 are presented in boldface. Communalities below .35 are presented in italics.
153 nonredundant elements. By then subtracting the number of unknowns (38) from this value, the degrees of freedom were determined to be 115.

The newly-trimmed model provided acceptable fit to the data: $X^2(115, N=274)=338.638, p<.001$; RMSEA=.084; SRMR=.0677; CFI=.928; TLI=.914. While the $X^2$ was significant, the $X^2/df$ test revealed a value of 2.9. This indicated acceptable fit.

The raw score regression weights were then explored. Each of the coefficients for the unconstrained paths were significant with $p$ values <.001. The standardized regression weights were then examined. The sup1-sup6 variables correlated with support at .556-.830; opp1-opp4 correlated with opportunity at .643-.907; inf3, inf5, sup7, and res2 correlated with information at .805-.939; and res3-res5 correlated with resources at .693-.838. As well, SUPcfaf, OPPcfaf, INFcfaf, and REScfaf were correlated with structural empowerment (.824; .740; .708; .729, respectively). The results demonstrated that all pattern coefficients achieved meaningful significance with coefficients greater than .50 (Hair et al., 2014).

In terms of model respecification, as all the pattern coefficients achieved both statistical and practical significance, deletion of coefficients was unwarranted (Meyers et al., 2013). In looking at the modification indices in the covariances table and regression weights table, a number of changes were indicated to possibly improve model fit. However, none of the potential correlations or path additions, indicated by the modification indices made theoretical sense. For this reason, no modifications were made. Furthermore, given that adequate fit was achieved, this was deemed unnecessary. It should be noted that the trimmed model presented here, was used to inform structural model analysis in phase 2 (Figure 5).
Figure 5. CLEQ-EDR final confirmatory factor analysis.
CLEQtotal=structural empowerment; SUPcfa=suppport; OPPcfa=opportunity; INFcfa=information; REScfa=resources.
Model fit: $X^2(115, N=274)=338.638, p<.001$; RMSEA=.084; SRMR=.0677; CFI=.928; TLI=.914; $X^2/df=2.9$. 

CLEQtotal $\rightarrow$ SUPcfa $\rightarrow$ opp1, opp2, opp3, opp4, opp5, opp6
CLEQtotal $\rightarrow$ OPPcfa $\rightarrow$ opp7, opp8, opp9, opp10
CLEQtotal $\rightarrow$ INFcfa $\rightarrow$ inf1, inf2, inf3, inf4, inf5
CLEQtotal $\rightarrow$ REScfa $\rightarrow$ res1, res2, res3, res4, res5, res6, res7, res8, res9, res10
Nursing Stress Scale Revised. In support of theory development, a first-generation EFA was also conducted on the NSSR (Gray-Toft & Anderson, 1981); prior to conducting a CFA. As previously discussed, rationale for conducting the EFA as a first step reflects the following: two subscales were omitted from the original scale, several items were modified, and it was thought that the frequency with which certain situations are perceived as stressful by a nurse, may have changed over the past 4 decades.

Exploratory factor analysis. Initially, the factorability of the 28-item NSSR (Gray-Toft & Anderson, 1981) was explored. First, it was observed that all of the 28 items were correlated at a level of .30 with at least one other item (with the exception of work1 at .29); suggesting reasonable factorability overall (> .30 = adequate; Tabachnick & Fidell, 2013). Second, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was considered adequate at a value of .847 According to Tabachnick and Fidell (2013), values of ≥ .60 are required. Finally, the Bartlett’s Test of Sphericity was also statistically significant ($\chi^2$(378) = 3180.168, $p$ < .01), indicating factor analysis was an appropriate choice (Meyers et al., 2013).

Next the eigenvalues were examined, of which seven were ≥ 1.0 (7.2; 2.9; 2.1; 2.0; 1.3; 1.1; 1.0, respectively). However, upon visual inspection of the scree plot, a levelling off of eigenvalues was evident by the fourth factor. Rationale for retaining only four factors was further supported through the use of parallel analysis software (Pallant, 2010; Patil et al., 2017). As such, a more parsimonious four factor solution for the construct was deemed to be the most appropriate choice; though not consistent with Gray-Toft and Anderson’s (1981) original propositions. As well, Tabachnick and Fidell (2013) assert that the goal of factor analysis is to summarize a pattern of correlations with as few
factors as possible. According to Schat (2013) it is important to avoid over-factoring. The four factor solution accounted for 50.6% of the total variance.

PAF was conducted using a fixed four factor structure with oblique promax rotation. Analysis of the factor correlation matrix revealed that all six correlations were above the absolute value of +/- .20, thus it was assumed that there was some correlation among the factors (range .23 to .45).

Next the communalities were examined. Eleven of the extracted variables were above .50, leaving the remaining seventeen variables below .50 (low) as possible candidates for deletion (Meyers et al., 2013). However, at this point in the analysis, only those below .35 (very low) were considered for removal (nine variables).

The pattern matrix was then reviewed. Within the analysis, four factors were extracted that cumulatively explained 43.4% of the total item variance. Analysis of the pattern matrix demonstrated the following: pron1, pron3, pron4, pron5, prop1, and prop2 loaded highly on factor 1 (*problems with physicians and other nurses* [newly combined]), uncer1, uncer2, uncer3, uncer4, and prop4 loaded highly on factor 2 (*uncertainty concerning treatment*), work2, work3, work4, work5, and work6 loaded highly on factor 3 (*workload*), and finally dead2, dead3, dead4, and dead5 loaded highly on factor 4 (*death and dying*). Prop3, prop5, pron2, uncer5, dead1, dead6, dead7, and work1 were deleted due to loadings below .45 (Comrey & Lee, 1992; Tabachnick & Fidell, 2013) and/or cross loadings. It is not surprising that items reflecting *problems with physicians* and *problems with other nurses* clustered together in this analysis, as it is likely that these elements of a nurses’ work life may be quite similar in today’s acute care oncology settings; compared to nearly 40 years ago. As well, it is logical that prop4 ‘disagreement
concerning the treatment of a patient’ loaded on uncertainty concerning treatment, as the item itself, is clearly reflective of the affiliate factor.

Ultimately, a total of ten items were deleted, wherein all items with low loadings and cross loadings were deleted. In relation to communalities, this left two items with very low communalities (pron3 [.32], pron5 [.34], respectively), and seven items (work2, work3, dead2, uncer3, prop1, prop4, and pron1) with somewhat low communalities (range: .37-.48). A decision was made to delete the items with very low communalities (neither reflected criticism or conflict explicitly); while retaining the items with somewhat low communalities (deletion of these items seemed to lack theoretical justification). Further, those with very low communalities were deemed to have little common variance with the other items in the analysis (Field, 2009; Hair et al., 2014; Kline, 2016). In total, eighteen items were retained, with one item moved to an alternate factor; and two previously separate factors combined into one (as noted above). The four factors noted here adequately represented the problems with physicians and other nurses (newly created), uncertainty concerning treatment, workload, and death and dying aspects of the NSSR, explaining 23.64%; 8.60%; 5.82%; and 5.35% of the common item variance, respectively; following oblique promax rotation (see Table 7).

 Confirmatory factor analysis. Based on Gray-Toft and Anderson’s (1981) theoretical propositions of nursing stress and the EFA results, a hierarchical CFA was conducted. To specify the NSSR (Gray-Toft & Anderson, 1981) model, a structural representation of the hypothesized relationships was developed. This included: one second-order factor with no indicators (nursing stress); four first-order factors (problems with physicians and other nurses, uncertainty concerning treatment, workload, and death
Table 7: Factor Loadings, Communalities, and Proportions of Variance for Principal Axis Extraction with Oblique Promax Rotation for the Nursing Stress Scale Revised Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Item Code</th>
<th>Factor Loadings</th>
<th>Communalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Breakdown of technology</td>
<td>work1</td>
<td>.35</td>
<td>.18</td>
</tr>
<tr>
<td>2. Unpredictable staffing and scheduling</td>
<td>work2</td>
<td>.67</td>
<td>.48</td>
</tr>
<tr>
<td>3. Too many non-nursing tasks required, such as clerical work</td>
<td>work3</td>
<td>.53</td>
<td>.40</td>
</tr>
<tr>
<td>4. Not enough time to provide emotional support to a patient and/or family</td>
<td>work4</td>
<td>.73</td>
<td>.53</td>
</tr>
<tr>
<td>5. Not enough time to complete all my work</td>
<td>work5</td>
<td>.71</td>
<td>.50</td>
</tr>
<tr>
<td>6. Not enough staff to adequately cover the unit</td>
<td>work6</td>
<td>.80</td>
<td>.63</td>
</tr>
<tr>
<td>7. Performing procedures that patients experience as painful</td>
<td>dead1</td>
<td>.31</td>
<td>.25</td>
</tr>
<tr>
<td>8. Feeling helpless in the case of a patient who fails to improve</td>
<td>dead2</td>
<td>.50</td>
<td>.37</td>
</tr>
<tr>
<td>9. Listening or talking to a patient about his/her approaching death</td>
<td>dead3</td>
<td>.82</td>
<td>.63</td>
</tr>
<tr>
<td>10. The death of a patient</td>
<td>dead4</td>
<td>.87</td>
<td>.71</td>
</tr>
<tr>
<td>11. The death of a patient with whom you developed a close relationship</td>
<td>dead5</td>
<td>.82</td>
<td>.64</td>
</tr>
<tr>
<td>12. Physician not being present when a patient dies</td>
<td>dead6</td>
<td>.44</td>
<td>.32</td>
</tr>
<tr>
<td>13. Watching a patient suffer</td>
<td>dead7</td>
<td>.33</td>
<td>.44</td>
</tr>
<tr>
<td>14. Inadequate information from a physician regarding the medical condition of a patient</td>
<td>uncer1</td>
<td>.77</td>
<td>.51</td>
</tr>
<tr>
<td>15. A physician ordering what appears to be inappropriate treatment for a patient</td>
<td>uncer2</td>
<td>.83</td>
<td>.58</td>
</tr>
<tr>
<td>16. A physician not being present in a medical emergency</td>
<td>uncer3</td>
<td>.66</td>
<td>.47</td>
</tr>
<tr>
<td>17. Not knowing what a patient or a patient's family ought to be told about the patient's medical condition and its treatment</td>
<td>uncer4</td>
<td>.69</td>
<td>.53</td>
</tr>
<tr>
<td>18. Uncertainty regarding the operation and functioning of specialized equipment</td>
<td>uncer5</td>
<td></td>
<td>.21</td>
</tr>
<tr>
<td>19. Criticism by a physician</td>
<td>prop1</td>
<td>.67</td>
<td>.47</td>
</tr>
<tr>
<td>20. Conflict with a physician</td>
<td>prop2</td>
<td>.73</td>
<td>.58</td>
</tr>
<tr>
<td>21. Fear of making a mistake in treating a patient</td>
<td>prop3</td>
<td>.30</td>
<td>.20</td>
</tr>
<tr>
<td>22. Disagreement concerning the treatment of a patient</td>
<td>prop4</td>
<td>.50</td>
<td>.40</td>
</tr>
<tr>
<td>23. Making a decision concerning a patient when the physician is unavailable</td>
<td>prop5</td>
<td>.32</td>
<td>.30</td>
</tr>
<tr>
<td>24. Conflict with a nursing supervisor</td>
<td>pron1</td>
<td>.67</td>
<td>.44</td>
</tr>
<tr>
<td>25. Floating to other units that are short-staffed</td>
<td>pron2</td>
<td></td>
<td>.16</td>
</tr>
<tr>
<td>26. Difficulty in working with a particular nurse (or nurses) outside the unit</td>
<td>pron3</td>
<td>.56</td>
<td>.32</td>
</tr>
<tr>
<td>27. Criticism by a nursing supervisor</td>
<td>pron4</td>
<td>.80</td>
<td>.56</td>
</tr>
<tr>
<td>28. Difficulty in working with a particular nurse (or nurses) on the unit</td>
<td>pron5</td>
<td>.61</td>
<td>.34</td>
</tr>
</tbody>
</table>

**Percentage of variance (following rotation)**

|                      | 23.64% | 8.60% | 5.82% | 5.35% |

Note: Only factor loadings above .30 are reported. Factor loadings exceeding .45 are presented in boldface. Communalities below .35 are presented in italics.
and dying) with associated disturbances; and eighteen indicator variables (4; 5; 5; 4, respectively) with associated error terms.

The model was determined to be identified. Using the recommended formula to determine the number of knowns (Raykov & Marcoulides, 2000), the model contained 171 nonredundant elements. By then subtracting the number of unknowns (40) from this value, the degrees of freedom were determined to be 131.

The newly-trimmed model provided poor fit to the data: $X^2(131, N=274) = 389.109, p<.001; \text{RMSEA}=.085; \text{SRMR}=.0741; \text{CFI}=.877; \text{TLI}=.857$ (poor fit). As the $X^2$ was significant, the $X^2/df$ test revealed a value of 3.0. While this indicated acceptable fit, the overall model was poor.

The raw score regression weights were then examined. Each of the coefficients for the unconstrained paths were significant with $p$ values <.001. In this respect, each of the estimated coefficients reached statistical significance. The standardized regression weights were then examined. The dead2-dead5 variables correlated with death and dying at .527-.853; uncer1-uncer4 and prop4 correlated with uncertainty concerning treatment at .622-.798; work2-work6 correlated with workload at .637-.814; and pron1, pron4, prop1, prop2 correlated with problem with physicians and other nurses at .516-.911. As well, DEADcfa, UNCERCfa, PROPNCfa, and WORKcfa were correlated with nursing stress (.475; .714; .491; .640, respectively). The results demonstrated that the pattern coefficients achieved meaningful significance with coefficients close to .50 (Hair et al., 2014) and above the prespecified maximum cutoff of .45.

In terms of model respecification, as all the pattern coefficients achieved both statistical and practical significance, deleting any of the coefficients was deemed
unnecessary (Meyers et al., 2013). In looking at the modification indices in the covariances table, adding a correlation between e1 and e2 was suggested ($X^2=87.518$ [largest]). This was theoretically supported as the error terms associated with pron1 ‘conflict with a nursing supervisor’ and pron4 ‘criticism by a nursing supervisor’ are clearly linked. It is likely that acute care oncology nurses are likely to perceive conflict and criticism with or by a nursing supervisor as being similar. As such, it is likely that they may share some error. Thus, given this theoretical and empirical rationale, a correlation between e1 and e2 was added. This second iteration revealed adequate model fit: $X^2(130, N=274)=287.335, p<.001$; RMSEA=.067; SRMR=.0692; CFI=.925; TLI=.912. As the $X^2$ was significant, the $X^2/df$ test was conducted, which revealed a value of 2.2. This indicated acceptable model fit. The raw score regression weights were again examined revealing that the coefficients for the unconstrained paths were significant ($p<.001$). The standardized regression weights were then examined. The dead2-dead5 variables correlated with death and dying at .527-.854; uncer1-uncer4 and prop4 correlated with uncertainty concerning treatment at .621-.797; work2-work6 correlated with workload at .637-.815; and pron1, pron4, prop1, prop2 correlated with problem with physicians and other nurses at .468-.935. As well, DEADcfa, UNCERcfa, PROPcfa, and WORKcfa were correlated with nursing stress (.472; .723; .479; .633, respectively). The results demonstrated that the pattern coefficients achieved meaningful significance with coefficients close to .50 (Hair et al., 2014) and above the prespecified maximum cutoff of .45. It should be noted that trimmed/re-specified model noted here was used to inform structural model analysis in phase 2 (Figure 6).
Figure 6. NSSR final confirmatory factor analysis.
NSSRtotal=nursing stress; PROPNcfa=problems with physicians and other nurses; UNCERcfa=uncertainty concerning treatment; WORKcfa=workload; DEADcfa=death and dying.
Model fit: $X^2(130, N=274)=287.335, p<.001$; RMSEA=.067; SRMR=.0692; CFI=.925; TLI=.912; $X^2/df=2.2$. 
**Affective Commitment Scale.** Based on Meyer and Allen (2004) and Meyer et al.’s (1993) theoretical propositions of affective commitment, a standard CFA was conducted. To specify the ACS (Meyer & Allen, 2004; Meyer et al., 1993) model, a structural representation of the hypothesized relationships was developed. This included one latent factor, and six indicator variables with associated error terms.

The one factor model was determined to be identified. Using the recommended formula to determine the number of knowns (Raykov & Marcoulides, 2000), the model contained 21 nonredundant elements. By then subtracting the number of unknowns (12) from this value, the degrees of freedom were determined to be 9.

The initial one factor model provided poor fit to the data: $X^2(9, N=274)=46.450, p<.001$; RMSEA=.123 (poor fit); SRMR=.0541; CFI=.944; TLI=.906. While the $X^2$ was significant, the $X^2/df$ test revealed a value of 5.2 (poor fit). This however indicated poor model fit.

The raw score regression weights were then explored. Each of the coefficients for the unconstrained paths were significant with $p$ values <.001. The standardized regression weights were then examined. Each of the Rac3-AC6 variables correlated with affective commitment at .640-.876, with the exception of AC1 (.459) and AC2 (.299). As such, all but two of the pattern coefficients achieved meaningful significance (≥.50; Hair et al., 2014).

In terms of model respecification, though AC1 ‘*I would be very happy to spend the rest of my career with this organization*’ did not achieve practical significance (.459), removal of AC1 lacked theoretical justification. As the overall affective commitment construct reflects one’s desire to stay in his/her organization (Meyer & Allen, 1991),
retention of AC1 seemed justified in that the item appears to clearly reflect the variable. Further, the standardized regression weight was close to .50 (Hair et al., 2014) and above the prespecified maximum cutoff of .45. Conversely, in looking at AC2 ‘I really feel as if this organization’s problems are my own’, this coefficient also failed to achieve practical significance (.299), though in this case, deletion was theoretically supported. It stands to reason that acute care oncology nurses’ desire to stay in their organizations may not be influenced by organizational-level problems. While perceptions of problems at the unit-level might have been more likely, in this context, the impact of organizational problems may be beyond the scope of their day-to-day work life, and/or they may not even be aware of them. Thus, given the theoretical and empirical rationale noted above, only AC2 was deleted. This improved model fit significantly: $X^2(5, N=274)=15.263, p=.009$; RMSEA=.087; SRMR=.0322; CFI=.983; TLI=.967. While the $X^2$ was again significant, the $X^2/df$ test revealed a value of 3.1. This indicated that the re-specified model was a superior fit to the data over the original model. Once again, when examining the raw score regression weights, each of the coefficients for the unconstrained paths were significant with $p$ values <.001. The standardized regression weights for the AC1-AC6 variables (minus AC2) correlated with affective commitment at .455-.887. As such, all of the pattern coefficients achieved largely meaningful significance. It should be noted that re-specified model noted here was used to inform computation of the total affective commitment score, in phase 2 of the analysis (Figure 7).

**Mental Health Inventory-5.** Based on Veit and Ware’s (1983) theoretical propositions of mental health, a standard CFA was conducted. To specify the MHI-5 (Veit & Ware, 1983) model, a structural representation of the hypothesized relationships
Figure 7. ACS final confirmatory factor analysis.
AcCFA=affective commitment.
Model fit: $X^2(5, N=274)=15.263$, $p=.009$; RMSEA=.087; SRMR=.0322; CFI=.983; TLI=.967; $X^2/df=3.1$. 

AcCFA  \rightarrow  AC1, e1
\downarrow 45
AcCFA  \rightarrow  Rac3, e3
\downarrow 82
AcCFA  \rightarrow  Rac4, e4
\downarrow 82
AcCFA  \rightarrow  Rac5, e5
\downarrow .89
\downarrow .63
AcCFA  \rightarrow  ACS, e6
was developed. This included one latent factor, and five indicator variables with associated error terms.

The one factor model was determined to be identified. Using the recommended formula to determine the number of knowns (Raykov & Marcoulides, 2000), the model contained 15 nonredundant elements. By the subtracting the number of unknowns (10) from this value, the degrees of freedom were determined to be 5.

The initial one factor model provided poor fit to the data: $X^2(5, N=274)=67.512, p<.001$; RMSEA=.214 (poor fit); SRMR=.0625; CFI=.899; TLI=.797 (poor fit). While the $X^2$ was significant, the $X^2/df$ test revealed a value of 13.5 (poor fit). This indicated poor fit.

The raw score regression weights were then explored. Each of the coefficients for the unconstrained paths were significant with $p$ values <.001. The standardized regression weights were then examined. The SMH1-SRmh5 variables correlated with mental health at .506-.863. The pattern coefficients achieved meaningful significance with coefficients greater than .50 (Hair et al., 2014).

In terms of model respecification, as all the pattern coefficients achieved both statistical and practical significance, deleting any of the coefficients was deemed counterproductive (Meyers et al., 2013). In looking at the modification indices in the covariances table, a number of changes were indicated to possibly improve model fit. Specifically, adding a correlation between e3 and e5 was suggested ($X^2=52.181$ [largest]). Rationale for adding a correlation between e3 and e5 was theoretically supported, as the error terms are associated with SRmh3 ‘have you felt calm and peaceful’ and SRmh5 ‘have you been a happy person’. Not only are these the only two reverse scored items in
the measure; but it stands to reason that feeling calm and peaceful is likely to be related to feeling like a happy person. In looking at the modification indices in the regression weights table, adding a path between SRmh5 and SRmh3 ($X^2=28.893$ [largest]) was suggested as a means to improve model fit. However, this path was not added as it lacked theoretical justification, as per the hypothesized relationships within the model. Thus, given the theoretical and empirical rationale noted above, a correlation between e3 and e5 was added. This improved model fit significantly: $X^2(4, N=274)=8.877$, $p=.064$; RMSEA=.067; SRMR=.0239; CFI=.992; TLI=.980. In this case $X^2$ was non-significant, thus further supporting the adequate fit of the model. Nevertheless, the $X^2/df$ test was computed, which revealed a value of 2.2. This again indicated that the re-specified model was a superior fit to the data over the original model. Once again, when examining the raw score regression weights, each of the coefficients for the unconstrained paths were significant with $p$ values <.001. The standardized regression weights for the SMH1-SRmh5 correlated with mental health at .503-.890. As such, all of the pattern coefficients achieved meaningful significance ($\geq .50$; Hair et al., 2014) (Figure 8).

**Somatic Symptom Scale-8 Revised.** Based on Gierk et al. (2014) and Kroenke et al.’s (2002) theoretical propositions of physical health, a hierarchical CFA was conducted. To specify the SSS-8R (Gierk et al., 2014; Kroenke et al., 2002) model, a structural representation of the hypothesized relationships was developed. This included: one second-order factor with no indicators (*physical health*); four first-order factors (*gastrointestinal*, *pain*, *cardiopulmonary*, and *fatigue*) with associated disturbances; and eight indicator variables (1; 3; 2; 2, respectively) with associated error terms.
Figure 8. MHI-5 final confirmatory factor analysis. 
MHCFA=mental health. 
Model fit: $X^2(4, N=274)=8.877, p=.064$; RMSEA=.067; SRMR=.0239; CFI=.992; TLI=.980; $X^2/df=2.2$. 
According to Kline (2011) two indicators per factor is the technical minimum. As such, given that the *gastrointestinal* factor only contained one indicator (ph1) this was deemed problematic. However, this structure was in line with the authors’ theoretical propositions. As well, the operational definition ‘*stomach or bowel problems*’ of the indicator, is clearly linked with the conceptual definition (*gastrointestinal symptoms*). Further, Hair et al. (2014) indicates that some highly simplistic concepts, that lack the nuance and complexity present in the majority of psychological constructs, can be sufficiently represented by a single item. To run the analysis, the variance of the error term associated with the indicator was fixed to a specific value (.633, further explained below) as recommended by Bauer (2014). Hayduk and Littvay (2012) endorsed this approach; and assert that single indicators can contribute to theory/model precision. According to Kline (2011) using this approach requires an a priori estimate, of the proportion of variance in the single indicator that reflects measurement error. Kline (2011) asserts that this is often based on the results of previous research studies or the researcher’s personal experience (i.e., 10%, 20%, etc.). However, given that *I minus the reliability coefficient* estimates the proportion of observed variance that is due to random error (Kline, 2011), and in this case, the reliability of ph1 was determined to be .367, the selection of .633 was deemed a safe/appropriate choice. Further, fixing the error variance to a constant allowed the model to be identified (Kline, 2011). To determine the reliability of the single item (noted above), the Correction for Attenuation formula was used (Christophersen & Konradt, 2011; Nunnally & Bernstein, 1994; Wanous, Reichers, & Hudy, 1997): \[ \hat{r_{xy}} = \frac{r_{xy}}{\sqrt{r_{xx} \cdot r_{yy}}} \]. The corrected item-total correlation for ph1 was found to be \( r_{xy} = .533 \). For the reliability of the multi-item measure (ph2-ph8) \( r_{xx} \); Cronbach’s Alpha
was calculated without including ph1 in the scale ($\alpha=.774$). From there we assumed the most conservative value for the true correlation between measures x and y, under the presumption of no measurement error $\hat{r}_{xy}=1.0$. According to Wanous and Hudy (2001) choosing lower values will lead to higher estimates for the minimum reliability of the single item. This resulted in a minimum reliability estimate of the ph1 $r_{yy}$ of .367 (i.e., $1.0=.533/\sqrt{.774 r_{yy}}$).

The model was determined to be identified. Using the recommended formula to determine the number of knowns (Raykov & Marcoulides, 2000), the model contained 36 nonredundant elements. By then subtracting the number of unknowns (19) from this value, the degrees of freedom were determined to be 17.

The four factor model provided good fit to the data: $X^2(17, N=274)=21.144$, $p=.220$; RMSEA=.030; SRMR=.0311; CFI=.992; TLI=.986. While the $X^2$ was non-significant, it was prudent to run the $X^2/df$ test. This revealed a value of 1.2 indicating good model fit.

The raw score regression weights were then explored. Each of the coefficients for the unconstrained paths were significant with $p$ values <.001. The standardized regression weights were then examined. The ph1 variable correlated gastrointestinal at .774; ph2-ph4 correlated with pain at .534-.612; ph5-ph6 correlated with cardiopulmonary at .570-.640; and ph7-ph8 correlated with fatigue at .682-.783. As well, GI, PAIN, CARDIO, and FATIGUE were correlated with physical health (.799; .952; .732; .994, respectively). The results demonstrated that all pattern coefficients achieved meaningful significance with coefficients greater than .50 (Hair et al., 2014).
In terms of model respecification, as all the pattern coefficients achieved both statistical and practical significance, deletion of coefficients was unwarranted (Meyers et al., 2013). In looking at the modification indices in the covariances table and regression weights table, a small number of changes were indicated to possibly improve model fit. However, none of the potential correlations or path additions, indicated by the modification indices made theoretical sense. For this reason, no modifications were made. Furthermore, given that adequate fit was achieved, this was deemed unnecessary (Figure 9).

**Brief Daily Spiritual Experience Scale Revised.** According to Idler et al. (2003) and Underwood’s (2006) theoretical propositions of individual spirituality, a standard CFA was conducted. To specify the BDSESR (Idler et al., 2003; Underwood, 2006) model, a structural representation of the hypothesized relationships was developed. This included one latent factor, and six indicator variables with associated error terms.

The one factor model was determined to be identified. Using the recommended formula to determine the number of knowns (Raykov & Marcoulides, 2000), the model contained 21 nonredundant elements. By then subtracting the number of unknowns (12) from this value, the degrees of freedom were determined to be 9.

The initial one factor model provided poor fit to the data: $X^2(9, N=274)=53.660$, $p<.001$; RMSEA=.135 (*poor fit*); SRMR=.0417; CFI=.959; TLI=.932. As the $X^2$ was significant, the $X^2/df$ test was conducted, revealing a value of 6.0 (*poor fit*). This again indicated poor fit.

The raw score regression weights were then explored. Each of the coefficients for the unconstrained paths were significant with $p$ values <.001. The standardized
Figure 9. SSS-8R final confirmatory factor analysis.
PHCFA=physical health; GI=gastrointestinal; PAIN=pain; CARDIO=cardiopulmonary; FATIGUE=fatigue.
Model fit: $X^2(17, N=274)=21.144, p=.220; \text{RMSEA}=.030; \text{SRMR}=.0311; \text{CFI}=.992; \text{TLI}=.986; \frac{X^2}{df}=1.2.
regression weights were then examined, which demonstrated the Spir1-Spir6 variables correlated with individual spirituality at .580-.920. The pattern coefficients achieved meaningful significance with coefficients greater than .50 (Hair et al., 2014).

As all the pattern coefficients achieved both statistical and practical significance, deleting any of the coefficients in the re-specified model was considered counterproductive (Meyers et al., 2013). In looking at the modification indices in the covariances table, a number of changes were indicated to possibly improve model fit. Specifically, adding a correlation between e3 and e6 was suggested ($X^2=14.867$ [largest]).

Rationale for adding a correlation between e3 and e6 was theoretically supported, as the error terms are associated with Spir3 ‘I feel deep inner peace or harmony’ and Spir6 ‘I desire to be closer to or in union with the divine’. It is possible that the frequency with which acute care oncology nurses might be directly related to the source of the inner peace in which they feel. In looking at the modification indices in the regression weights table, adding a path between Spir6 and Spir3 ($X^2=6.787$ [largest]) was suggested as a means to improve model fit. However, this path was not added as it lacked theoretical justification, as per the hypothesized relationships within the model. As such, given the theoretical and empirical rationale noted above, a correlation between e3 and e6 was added. While model fit was improved, the overall fit of the alternate model remained poor: $X^2(8, N=274)=35.913, p<.001$; RMSEA=.113 (poor fit); SRMR=.0326; CFI=.974; TLI=.952. In this case $X^2$ was again significant, as such the $X^2/df$ test was computed. This revealed a value of 4.5. While this value was deemed acceptable, the overall model still demonstrated poor fit. Once again, when examining the raw score regression weights, each of the coefficients for the
unconstrained paths were significant ($p<.001$). The standardized regression weights for the Spir1-Spir6 correlated with individual spirituality at $0.586-.913$. As such, all of the pattern coefficients achieved meaningful significance ($≥.50$; Hair et al., 2014).

Model respecification was again examined. Once again, as all of the pattern coefficients achieved both statistical and practical significance, deleting any of the coefficients was unnecessary. In looking at the modification indices in the covariances table, a number of changes were indicated to possibly improve model fit. Specifically, adding a correlation between e1 and e3 was suggested ($X^2=9.006$ [largest]). Rationale for adding a correlation between e1 and e3 was theoretically supported, as the error terms are associated with Spir1 ‘I feel a divine presence’ and Spir3 ‘I feel deep inner peace or harmony’. It is logical that the frequency with which one feels peace or may in fact be related. In looking at the modification indices in the regression weights table, adding a path between Spir4 and Spir5 ($X^2=4.529$ [largest]) was suggested as a means to improve model fit. However, this path was not added as it lacked theoretical justification, as per the hypothesized relationships within the model. Thus, given the theoretical and empirical rationale noted above, an additional correlation between e1 and e3 was added. Model fit in the re-specified model was significantly improved: $X^2(7, N=274)=20.920, p=.004$; RMSEA=.085; SRMR=.0271; CFI=.987; TLI=.973. In this case $X^2$ was again significant, as such the $X^2/df$ test was computed. This revealed a value of 3.0. This demonstrated that the third iteration of the model was indeed a superior fit to the data. Once again, when examining the raw score regression weights, each of the coefficients for the unconstrained paths were significant with $p$ values <.001. The standardized regression weights for the Spir1-Spir6 correlated with individual spirituality.
at .581-.902. As such, all of the pattern coefficients achieved meaningful significance (≥.50) in the re-specified model (Hair et al., 2014) (Figure 10).

Phase 2: structural model analysis and moderation. Evaluation of the structural portion of the partially latent SR model is presented here. This evaluation was informed by the results of the EFAs and CFAs from phase 2. However, prior to testing the fully hypothesized model, the moderating influence of individual spirituality on the workplace spirituality-nursing stress relationship was examined in isolation.

**Moderation.** The moderating influence of individual spirituality on the relationship between workplace spirituality and nursing stress was examined. First, an interaction term was computed between workplace spirituality and individual spirituality. Second, a hierarchical regression analysis was conducted to predict nursing stress, with the interaction term entered in step 2. In the model summary, the R Square Change was 0.004 when the interaction variable was added to the predictor and moderator variables. This change was non-significant, $F(1, 270)=1.4, p=.238$. The non-significant interaction tells us that our presumed moderator (individual spirituality) did not positively moderate the effects of workplace spirituality on nursing stress (hypothesis 8 not supported). Given this result, it was deemed unnecessary to explore this relationship further within the full hypothesized model.

**Structural model analysis.** To specify the structural portion of the model, a structural representation of the hypothesized relationships was developed.

**Hypothesized model 1 (without moderation).** The model was determined to be identified. Using the recommended formula to determine the number of knowns (Raykov & Marcoulides, 2000), the model contained 231 nonredundant elements. By then
Figure 10. BDSESR final confirmatory factor analysis.
ISCFA=individual spirituality.
Model fit: $X^2(7, N=274)=20.920, p=.004$; RMSEA=.085; SRMR=.0271; CFI=.987; TLI=.973; $X^2/df=3.0$. 
subtracting the number of unknowns (47) from this value, the degrees of freedom were
determined to be 184.

The results demonstrated that the hypothesized model (with individual spirituality
removed) was not a good fit with the observed data: $X^2(184, N=274) = 565.065, p < .001$;
RMSEA = .087; SRMR = .0970 (poor fit); CFI = .874; TLI = .856 (poor fit). While the $X^2$ was
significant, the $X^2/df$ test was acceptable at a value of 3.1. Nevertheless, the overall fit of
the model remained poor (Figure 11).

In looking at the modification indices a number of modifications were suggested
to possibly improve model fit. Byrne (2010) suggests focusing on the regression weights
at this stage in the analysis; and more specifically, the structural paths. She further asserts
that modification indices reflecting: cross-loadings of an indicator variable on a factor
(other than the one it was designed to measure), and those representing regressions of one
indicator variable on another; are essentially meaningless (Byrne, 2010). Thus, in looking
at the suggested structural paths within the regression weights table, adding a regression
path from PHsem (physical health problems) to TotMH (good mental health) was
suggested ($X^2 = 44.765$ [second largest]). Addition of this path was considered
theoretically plausible in that it is highly likely that perceived physical health could
influence one’s overall perceptions of personal mental health. Prior to moving on, it
should be noted that adding a path from Fatigue1 (fatigue) to TotMH (good mental
health) was also suggested within the regression weights table ($X^2 = 45.576$ [largest]).
However, as per Byrne (2010; noted above), addition of this path was not considered
appropriate.
Post hoc model 2. The second iteration of the model demonstrated improved fit, though the overall fit remained poor: $X^2(183, N=274)=491.118, p<.001$; RMSEA=.079; SRMR=.0894 (poor fit); CFI=.898; TLI=.883 (poor fit). While the $X^2$ was significant, the $X^2/df$ test was acceptable at a value of 2.7. Nevertheless, the overall fit of the model remained poor.

In looking at the modification indices a number of modifications were suggested to possibly improve model fit. In once again looking at the suggested structural paths within the regression weights table as per Byrne (2010), adding a regression path from CLEQsem (structural empowerment) to WSSsem (workplace spirituality) was suggested ($X^2=30.084$ [largest]). Addition of this path was considered theoretically sound, as one’s perceptions of a structurally empowering learning environment is likely to influence their perceptions of workplace spirituality (the overall recognition that employees have an inner life that nourishes and is nourished by work [Ashmos & Duchon, 2000]).

Post hoc model 3. The third iteration of the model demonstrated acceptable fit: $X^2(182, N=274)=431.267, p<.001$; RMSEA=.071; SRMR=.0728; CFI=.918; TLI=.905. However, while the $X^2$ was significant, the $X^2/df$ test was acceptable at a value of 2.4. This indicated acceptable fit. Given this result, it was deemed appropriate to retain this model and move on to analysis of the parameter estimates among the study variables (Figure 12).

Examination of the raw score regression weights revealed that all of the path coefficients were significant with $p$ values <.02; with the exception of: ALQsem (authentic leadership) to NSSsem (nursing stress), and CLEQsem (structural empowerment) to NSSsem (nursing stress) ($p=.086; p=.529$, respectively). Examination
of the standardized regression weights revealed a range of values for each of the path coefficients; however, the relationship between WSSsem (*workplace spirituality*) and NSSsem (*nursing stress*) ($\beta=-1.053$) was both unexpected and concerning.

According to Byrne (2010) and Hair et al. (2014), a standardized estimate $>1.0$ is problematic; with identification problems, extremely low reliability, construct validity issues, violations of statistical assumptions, and multicollinearity cited as potential causes of such values. However, prior assessments (documented above) confirmed no identification issues, very good to excellent reliability coefficients for the indicators in question ($\alpha=.82-.95$; Kline, 2011), acceptable CFA results in support of construct validity, and a lack of strong evidence to suggest violations of statistical assumptions or the presence of multicollinearity. Prior to moving forward however, it was deemed prudent to conduct additional assessments for statistical assumption violations and multicollinearity, given that these assessments had been conducted during the data management phase only, and the *nursing stress* construct had been trimmed during phase 1. As such, it was deemed wise to perform these assessments once again, at both the latent and observed/indicator variable level.

Consistent with previous findings, univariate normality assessments of *nursing stress* revealed skewness and kurtosis were not a substantive issue at the latent variable level (skewness [.345]; kurtosis [.260], respectively). Histogram assessment also revealed *nursing stress* to be normally distributed. Kolmogorov-Smirnov and Shapiro-Wilk tests were run to confirm, with significance levels of $>.05$. As such, *nursing stress* was not considered significantly different from normal distribution. This again was consistent with previous findings. As *workplace spirituality* was not trimmed, an additional
univariate assessment was deemed trivial. An assessment for multivariate normality was conducted for the two latent variables using a bivariate scatterplot. Upon visual inspection, the variables appeared to demonstrate a largely linear relationship overall. Assessments of univariate and multivariate normality were also conducted at the observed variable level, for these constructs specifically. Univariate normality assessments revealed skewness and kurtosis were somewhat concerning at the observed variable level (skewness [-.167 to 1.190]; kurtosis [-.026 to 1.994], respectively). Specifically, inspection of histograms revealed that the newly-created problems with physicians and other nurses variable alone, was mildly non-normally distributed. Kolmogorov-Smirnov and Shapiro-Wilk tests were then run, with significance levels of <.01 for all observed variables in question, suggesting a significant difference from normal distribution (see Table 8). However, in keeping with Tabachnick and Fidell (2013), a variable with statistically significant skewness/kurtosis often does not deviate enough from normality to make a substantive difference in the analysis. As such, transformations were not completed based on this rationale specifically. Transformation of the problems with physicians and other nurses observed variable based on the histogram and skewness/kurtosis results was considered, however, given that the values did not demonstrate extreme deviations (only mild) from 1.0 (considered excellent; George & Mallery, 2016), and the sample size was fairly large (Tabachnick & Fidell, 2013), it was determined to be unnecessary. Moreover, according to George and Mallery (2016), skewness and kurtosis values of +/-2.0 are considered acceptable. Assessments for multivariate normality were also conducted using bivariate scatterplots. Upon visual inspection, the variables appeared to demonstrate largely linear relationships overall.
Table 8: Skewness and Kurtosis Values for Workplace Spirituality and Nursing Stress at the Observed Variable Level in the Trimmed Hypothesized Model

<table>
<thead>
<tr>
<th>Observed Variable</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Kolmogorov-Smirnov</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meaningful work</td>
<td>-.661</td>
<td>-.026</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Sense of community</td>
<td>-.646</td>
<td>.166</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Alignment of organizational values</td>
<td>-.248</td>
<td>-.803</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Workload+</td>
<td>-.167</td>
<td>-.887</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Death and dying+</td>
<td>.524</td>
<td>-.159</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Uncertainty concerning treatment+</td>
<td>.820</td>
<td>.905</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Problems with physicians and other nurses+</td>
<td>1.190</td>
<td>1.994</td>
<td>&lt;.001</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

+ Trimmed following phase 1.

Multicollinearity assessments were then conducted. As shown in Table 9, multicollinearity was not an issue at the latent variable level, which was consistent with our previous findings. However, given the relationship found between workplace spirituality and nursing stress noted above, it was considered prudent to zero in on this relationship at the observed variable level as well. As shown in Table 10, multicollinearity was somewhat apparent/unexpected at the observed variable level among alignment of organizational values and several observed variables (two with VIF’s very close to 3 [range: 2.893-2.901]). It is plausible that many perceived aspects of one’s work life, may also be reflective of one’s perception of alignment with the overall organization’s values. Given this result, Tabachnick and Fidell (2013) recommend deleting the variable with the highest variance proportion or combining the collinear variables. As it did not make theoretical sense to combine the variables, a decision was made to delete the alignment of organizational values observed variable.
Table 9: Tolerance Values and Variance Inflation Factors for Independent Variables at the Latent Variable Level in the Trimmed Hypothesized Model

<table>
<thead>
<tr>
<th>Model (Dependent Variable)</th>
<th>Collinearity Statistics</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Authentic Leadership)</td>
<td>Tolerance (&lt; .20</td>
<td>Variance Inflation Factor (&gt; 3</td>
<td></td>
</tr>
<tr>
<td>Workplace Spirituality</td>
<td>problematc)</td>
<td>problematc)</td>
<td></td>
</tr>
<tr>
<td>Structural Empowerment+</td>
<td>.583</td>
<td>1.716</td>
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<tr>
<td>Nursing Stress+</td>
<td>.660</td>
<td>1.515</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.848</td>
<td>1.179</td>
<td></td>
</tr>
<tr>
<td>(Workplace Spirituality)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structural Empowerment+</td>
<td>.776</td>
<td>1.289</td>
<td></td>
</tr>
<tr>
<td>Nursing Stress+</td>
<td>.921</td>
<td>1.085</td>
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<tr>
<td>Authentic Leadership</td>
<td>.747</td>
<td>1.339</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Structural Empowerment)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing Stress+</td>
<td>.845</td>
<td>1.184</td>
<td></td>
</tr>
<tr>
<td>Authentic Leadership</td>
<td>.698</td>
<td>1.434</td>
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</tr>
<tr>
<td>Workplace Spirituality</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Nursing Stress) +</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authentic Leadership</td>
<td>.667</td>
<td>1.499</td>
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</tr>
<tr>
<td>Workplace Spirituality</td>
<td>.565</td>
<td>1.769</td>
<td></td>
</tr>
<tr>
<td>Structural Empowerment+</td>
<td>.629</td>
<td>1.590</td>
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</tbody>
</table>

+ Trimmed following phase 1.

Post hoc model 4. The fourth iteration of the model demonstrated poor fit: $X^2(163, N=274)=400.397, p<.001$; RMSEA=.073; SRMR=.0749; CFI=.911; TLI=.897 (poor fit).

While the $X^2$ was significant, the $X^2/df$ test was acceptable at a value of 2.5. Nevertheless, the overall fit of the model remained poor.

In looking at the modification indices a number of modifications were suggested to possibly improve model fit. As per Byrne’s (2010) suggestions, the regression weights associated with the structural paths were first examined, though no suggested modifications were reported. From there the covariances were examined wherein adding a correlation between $e_{14}$ and $e_{15}$ was suggested ($X^2=16.669$ [third largest]). This was theoretically supported as the error terms are associated with UncerAvgSEM (uncertainty
Table 10: Tolerance Values and Variance Inflation Factors for Workplace Spirituality
and Nursing Stress at the Observed Variable Level in the Trimmed Hypothesized Model

<table>
<thead>
<tr>
<th>Model (Dependent Variable)</th>
<th>Collinearity Statistics</th>
<th></th>
<th>Tolerance Statistics</th>
<th>Variance Inflation Factor</th>
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<tbody>
<tr>
<td>Independent Variable</td>
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<td></td>
<td>Tolerance (&lt; .20</td>
<td>Factor (&gt; 3</td>
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<tr>
<td></td>
<td></td>
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<td>problematic)</td>
<td>problematic)</td>
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<td>(Meaningful Work)</td>
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<tr>
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<td>.801</td>
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<tr>
<td>Death and Dying+</td>
<td></td>
<td></td>
<td>.777</td>
<td>1.288</td>
</tr>
<tr>
<td>Uncertainty Concerning Treatment+</td>
<td></td>
<td></td>
<td>.808</td>
<td>1.237</td>
</tr>
<tr>
<td>Problems with Physicians and other Nurses+</td>
<td></td>
<td>.389</td>
<td>2.573</td>
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<tr>
<td>Sense of Community</td>
<td></td>
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<td>.349</td>
<td>2.863</td>
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<tr>
<td>Alignment of Organizational Values</td>
<td></td>
<td></td>
<td>.632</td>
<td>1.581</td>
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<tr>
<td>(Sense of Community)</td>
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<td>.846</td>
<td>1.182</td>
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<tr>
<td>Workload+</td>
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<td>.752</td>
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<tr>
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<td>.798</td>
<td>1.254</td>
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+ Trimmed following phase 1.
Table 10 Continued: Tolerance Values and Variance Inflation Factors for Workplace Spirituality and Nursing Stress at the Observed Variable Level in the Trimmed Hypothesized Model

<table>
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<tr>
<th>Model (Dependent Variable)</th>
<th>Collinearity Statistics</th>
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<tr>
<td></td>
<td>Tolerance</td>
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<tr>
<td></td>
<td>(&lt; .20 problematic)</td>
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</tr>
<tr>
<td>(Uncertainty Concerning Treatment) +</td>
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<tr>
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<td>Meaningful Work</td>
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<td>Death and Dying+</td>
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</tr>
<tr>
<td>Uncertainty Concerning Treatment+</td>
<td>.809</td>
<td>1.236</td>
</tr>
</tbody>
</table>

+ Trimmed following phase 1.

concerning treatment) and ProPNAvgSEM (problems with physicians and other nurses); which may evoke similar feelings of stress for oncology nurses. Furthermore, both elements are largely reflective of professional collaboration/communication concerns (particularly with physicians); lending further support to the possibility that there may be shared elements of error here. It should be noted that adding correlations between e12
and e13, as well as e12 and e14 were also suggested \( X^2=32.664 \) [largest]; \( X^2=21.743 \) [second largest], respectively; though correlating these error terms lacked theoretical justification.

*Post hoc model 5 (final: non-significant paths retained).* The fifth iteration of the model demonstrated acceptable fit: \( X^2(162, N=274)=382.527, p<.001; \) RMSEA=.071; SRMR=.0744; CFI=.918; TLI=.903. However, while the \( X^2 \) was significant, the \( X^2/df \) test was acceptable at a value of 2.4. This indicated acceptable fit. Given this result, it was deemed appropriate to retain this final model and move on to analysis of the parameter estimates among the study variables (Figure 13).

Examination of the raw score regression weights revealed that all of the path coefficients were significant with \( p \) values \( \leq .029 \); with the exception of: ALQsem (*authentic leadership*) to NSSsem (*nursing stress*) and CLEQsem (*structural empowerment*) to NSSsem (*nursing stress*) \( (p=.224; p=.756, \) respectively). In addition, each of the non-significant paths were found to have small effect sizes \( (\beta=.115; \beta=-.039, \) respectively). Of the statistically significant primary relationships examined in this study a range of effect sizes were apparent, with three positive relationships: ALQsem (*authentic leadership*) to WSSsem (*workplace spirituality*) \( (\beta=.330), \) NSSsem (*nursing stress*) to PHsem (*physical health problems*) \( (\beta=.421), \) and ALQsem (*authentic leadership*) to CLEQsem (*structural empowerment*) \( (\beta=.571); \) and three negative relationships: NSSsem (*nursing stress*) to TotMH (*good mental health*) \( (\beta=-.164), \) NSSsem (*nursing stress*) to TotACSEM (*affective commitment*) \( (\beta=-.767), \) and WSSsem (*workplace spirituality*) to NSSsem (*nursing stress*) \( (\beta=-.955) \) revealed. Of the new paths that were added, both were statistically significant (as noted above), with one positive
relationship: CLEQsem (structural empowerment) to WSSsem (workplace spirituality) ($\beta=.514$); and one negative relationship: PHsem (physical health problems) to TotMH (good mental health) ($\beta=-.563$) revealed. The unstandardized and standardized direct effects are presented in Table 11.

Table 11: Post Hoc Model 5 (Final: Non-Significant Paths Retained) Unstandardized and Standardized Direct Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Target</th>
<th>Unstandardized Estimate</th>
<th>Standard Error</th>
<th>$p$</th>
<th>Standardized Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLEQsem</td>
<td>ALQsem</td>
<td>.401</td>
<td>.045</td>
<td>***</td>
<td>.571</td>
</tr>
<tr>
<td>WSSsem</td>
<td>ALQsem</td>
<td>.202</td>
<td>.048</td>
<td>***</td>
<td>.330</td>
</tr>
<tr>
<td>WSSsem</td>
<td>CLEQsem</td>
<td>.448</td>
<td>.079</td>
<td>***</td>
<td>.514</td>
</tr>
<tr>
<td>NSSsem</td>
<td>ALQsem</td>
<td>.037</td>
<td>.031</td>
<td>.224</td>
<td>.115</td>
</tr>
<tr>
<td>NSSsem</td>
<td>WSSsem</td>
<td>-.505</td>
<td>.107</td>
<td>***</td>
<td>-.955</td>
</tr>
<tr>
<td>NSSsem</td>
<td>CLEQsem</td>
<td>-.018</td>
<td>.057</td>
<td>.756</td>
<td>-.039</td>
</tr>
<tr>
<td>PHsem</td>
<td>NSSsem</td>
<td>1.040</td>
<td>.217</td>
<td>***</td>
<td>.421</td>
</tr>
<tr>
<td>Self</td>
<td>ALQsem</td>
<td>1.000</td>
<td></td>
<td>***+</td>
<td>.904</td>
</tr>
<tr>
<td>Bal</td>
<td>ALQsem</td>
<td>.930</td>
<td>.036</td>
<td>***</td>
<td>.933</td>
</tr>
<tr>
<td>Mora</td>
<td>ALQsem</td>
<td>.887</td>
<td>.036</td>
<td>***</td>
<td>.913</td>
</tr>
<tr>
<td>Rel</td>
<td>ALQsem</td>
<td>.836</td>
<td>.036</td>
<td>***</td>
<td>.900</td>
</tr>
<tr>
<td>ResSEM</td>
<td>CLEQsem</td>
<td>.781</td>
<td>.072</td>
<td>***</td>
<td>.655</td>
</tr>
<tr>
<td>InfSEM</td>
<td>CLEQsem</td>
<td>1.076</td>
<td>.096</td>
<td>***</td>
<td>.672</td>
</tr>
<tr>
<td>OppSEM</td>
<td>CLEQsem</td>
<td>.869</td>
<td>.071</td>
<td>***</td>
<td>.726</td>
</tr>
<tr>
<td>SupSEM</td>
<td>CLEQsem</td>
<td>1.000</td>
<td></td>
<td>***+</td>
<td>.838</td>
</tr>
<tr>
<td>ProPNAvgSEM</td>
<td>NSSsem</td>
<td>.650</td>
<td>.140</td>
<td>***</td>
<td>.350</td>
</tr>
<tr>
<td>UncerAvgSEM</td>
<td>NSSsem</td>
<td>.497</td>
<td>.124</td>
<td>***</td>
<td>.293</td>
</tr>
<tr>
<td>DeadAvgSEM</td>
<td>NSSsem</td>
<td>.289</td>
<td>.132</td>
<td>.029</td>
<td>.150</td>
</tr>
<tr>
<td>WorkAvgSEM</td>
<td>NSSsem</td>
<td>1.000</td>
<td></td>
<td>****</td>
<td>.514</td>
</tr>
<tr>
<td>Gastrol</td>
<td>PHsem</td>
<td>1.000</td>
<td></td>
<td>****</td>
<td>.723</td>
</tr>
<tr>
<td>Pain1</td>
<td>PHsem</td>
<td>.848</td>
<td>.077</td>
<td>***</td>
<td>.722</td>
</tr>
<tr>
<td>Cardio1</td>
<td>PHsem</td>
<td>.421</td>
<td>.051</td>
<td>***</td>
<td>.537</td>
</tr>
<tr>
<td>Fatigue1</td>
<td>PHsem</td>
<td>1.105</td>
<td>.090</td>
<td>***</td>
<td>.827</td>
</tr>
<tr>
<td>Meani</td>
<td>WSSsem</td>
<td>1.000</td>
<td></td>
<td>****</td>
<td>.605</td>
</tr>
<tr>
<td>Sen</td>
<td>WSSsem</td>
<td>1.695</td>
<td>.176</td>
<td>***</td>
<td>.848</td>
</tr>
<tr>
<td>TotMH</td>
<td>NSSsem</td>
<td>-8.363</td>
<td>3.330</td>
<td>.012</td>
<td>-.164</td>
</tr>
<tr>
<td>TotACSEM</td>
<td>NSSsem</td>
<td>-3.063</td>
<td>.405</td>
<td>***</td>
<td>-.767</td>
</tr>
<tr>
<td>TotMH</td>
<td>PHsem</td>
<td>-11.602</td>
<td>1.434</td>
<td>***</td>
<td>-.563</td>
</tr>
</tbody>
</table>

*** $p < .001$. 
* New path.
+ $p$ reported post paths unconstrained.
Prior to moving forward and in the interest of model parsimony, Byrne (2010) and Ullman (2013) suggest that a final model is estimated, with all non-significant paths dropped. Byrne (2010) elaborated in stating that some initially hypothesized paths may become irrelevant to the model, as evidence by their lack of statistical significance. In following this suggestion, one final model was run with all non-significant paths dropped.

Post hoc model 6 (final: non-significant paths dropped). The sixth and final model demonstrated acceptable fit: $X^2(164, N=274)=384.254, p<.001; \text{RMSEA}=0.070; \text{SRMR}=0.074; \text{CFI}=0.918; \text{TLI}=0.905$. However, while the $X^2$ was significant, the $X^2/df$ test was acceptable at a value of 2.3. This indicated acceptable fit. Given this result, it was once again deemed appropriate to retain this final model and move on to analysis of the parameter estimates among the study variables (Figure 14).

As expected, examination of the raw score regression weights confirmed that all of the path coefficients were significant with $p$ values $\leq0.023$. Of the primary relationships examined in this study a range of effect sizes were apparent, with three positive relationships: ALQsem (authentic leadership) to WSSsem (workplace spirituality) ($\beta=0.302$), NSSsem (nursing stress) to PHsem (physical health problems) ($\beta=0.422$), and ALQsem (authentic leadership) to CLEQsem (structural empowerment) ($\beta=0.570$); and three negative relationships: NSSsem (nursing stress) to TotMH (good mental health) ($\beta=-0.161$), NSSsem (nursing stress) to TotACSEM (affective commitment) ($\beta=-0.760$), and WSSsem (workplace spirituality) to NSSsem (nursing stress) ($\beta=-0.896$) revealed. Of the new paths that were added, one positive relationship: CLEQsem (structural empowerment) to WSSsem (workplace spirituality) ($\beta=0.530$); and one negative relationship: PHsem (physical health problems) to TotMH (good mental health) ($\beta=$-
.564) were revealed. The unstandardized and standardized direct effects are presented in Table 12.

Table 12: Post Hoc Model 6 (Final: Non-Significant Paths Dropped) Unstandardized and Standardized Direct Effects

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Unstandardized Estimate</th>
<th>Standard Error</th>
<th>p</th>
<th>Standardized Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLEQsem &lt;--- ALQsem</td>
<td>.399</td>
<td>.045</td>
<td>***</td>
<td>.570</td>
</tr>
<tr>
<td>WSSsem &lt;--- ALQsem</td>
<td>.186</td>
<td>.045</td>
<td>***</td>
<td>.302</td>
</tr>
<tr>
<td>WSSsem &lt;--- CLEQsem #</td>
<td>.466</td>
<td>.078</td>
<td>***</td>
<td>.530</td>
</tr>
<tr>
<td>NSSsem &lt;--- WSSsem</td>
<td>-.478</td>
<td>.072</td>
<td>***</td>
<td>-.896</td>
</tr>
<tr>
<td>PHsem &lt;--- NSSsem</td>
<td>1.031</td>
<td>.214</td>
<td>***</td>
<td>.422</td>
</tr>
<tr>
<td>Self &lt;--- ALQsem</td>
<td>1.000</td>
<td></td>
<td><strong>+</strong></td>
<td>.904</td>
</tr>
<tr>
<td>Bal &lt;--- ALQsem</td>
<td>.930</td>
<td>.036</td>
<td>***</td>
<td>.933</td>
</tr>
<tr>
<td>Mora &lt;--- ALQsem</td>
<td>.887</td>
<td>.036</td>
<td>***</td>
<td>.913</td>
</tr>
<tr>
<td>Rel &lt;--- ALQsem</td>
<td>.835</td>
<td>.036</td>
<td>***</td>
<td>.900</td>
</tr>
<tr>
<td>ResSEM &lt;--- CLEQsem</td>
<td>.783</td>
<td>.072</td>
<td>***</td>
<td>.656</td>
</tr>
<tr>
<td>InfSEM &lt;--- CLEQsem</td>
<td>1.081</td>
<td>.097</td>
<td>***</td>
<td>.673</td>
</tr>
<tr>
<td>OppSEM &lt;--- CLEQsem</td>
<td>.874</td>
<td>.071</td>
<td>***</td>
<td>.728</td>
</tr>
<tr>
<td>SupSEM &lt;--- CLEQsem</td>
<td>1.000</td>
<td></td>
<td><strong>+</strong></td>
<td>.836</td>
</tr>
<tr>
<td>ProPNAvgSEM &lt;--- NSSsem</td>
<td>.665</td>
<td>.139</td>
<td>***</td>
<td>.362</td>
</tr>
<tr>
<td>UncerAvgSEM &lt;--- NSSsem</td>
<td>.496</td>
<td>.123</td>
<td>***</td>
<td>.296</td>
</tr>
<tr>
<td>DeadAvgSEM &lt;--- NSSsem</td>
<td>.298</td>
<td>.131</td>
<td>.023</td>
<td>.157</td>
</tr>
<tr>
<td>WorkAvgSEM &lt;--- NSSsem</td>
<td>1.000</td>
<td></td>
<td><strong>+</strong></td>
<td>.521</td>
</tr>
<tr>
<td>Gastro1 &lt;--- PHsem</td>
<td>1.000</td>
<td></td>
<td><strong>+</strong></td>
<td>.722</td>
</tr>
<tr>
<td>Pain1 &lt;--- PHsem</td>
<td>.848</td>
<td>.077</td>
<td>***</td>
<td>.722</td>
</tr>
<tr>
<td>Cardio1 &lt;--- PHsem</td>
<td>.421</td>
<td>.051</td>
<td>***</td>
<td>.537</td>
</tr>
<tr>
<td>Fatigue1 &lt;--- PHsem</td>
<td>1.105</td>
<td>.090</td>
<td>***</td>
<td>.827</td>
</tr>
<tr>
<td>Meani &lt;--- WSSsem</td>
<td>1.000</td>
<td></td>
<td><strong>+</strong></td>
<td>.608</td>
</tr>
<tr>
<td>Sen &lt;--- WSSsem</td>
<td>1.701</td>
<td>.174</td>
<td>***</td>
<td>.855</td>
</tr>
<tr>
<td>TotMH &lt;--- NSSsem</td>
<td>-8.084</td>
<td>3.295</td>
<td>.014</td>
<td>-.161</td>
</tr>
<tr>
<td>TotACSEM &lt;--- NSSsem</td>
<td>-2.998</td>
<td>.395</td>
<td>***</td>
<td>-.760</td>
</tr>
<tr>
<td>TotMH &lt;--- PHsem #</td>
<td>-11.629</td>
<td>1.437</td>
<td>***</td>
<td>-.564</td>
</tr>
</tbody>
</table>

*** p < .001. * New path.
+ p reported post paths unconstrained.

Of the primary specific indirect relationships hypothesized in this study, the indirect effect of ALQsem (authentic leadership) on NSSsem (nursing stress) through CLEQsem (structural empowerment) was unable to be computed, as the path from
CLEQsem to NSSsem was dropped due to non-significance (as noted above).

Conversely, ALQsem (authentic leadership) was found to have an indirect effect on NSSsem (nursing stress) via WSSsem (workplace spirituality) ($B=-.089$, $95\% CI -.147$ to $-.044$, $p=.001$; $\beta=-.271$, respectively). It should be noted that this result is valid despite the fact that the direct relationship between ALQsem (authentic leadership) and NSSsem (nursing stress) was non-significant. According to Hayes and Rockwood (2017), evidence of a direct association between the independent variable (X) and dependent variable (Y) is no longer required to determine indirect (M) effects. Several additional specific indirect effects were examined/revealed in this study, including those resulting from the path additions already discussed. The unstandardized and standardized specific indirect effects for all three-variable mediated paths within this study are presented in Table 13.

Table 13: Post Hoc Model 6 (Final: Non-Significant Paths Dropped) Unstandardized and Standardized Specific Indirect Effects

<table>
<thead>
<tr>
<th>Path</th>
<th>Unstandardized Estimate</th>
<th>95% Lower Bound</th>
<th>95% Upper Bound</th>
<th>$p$</th>
<th>Standardized Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ALQsem$\rightarrow$WSSsem$\rightarrow$NSSsem</td>
<td>-.089</td>
<td>-.147</td>
<td>-.044</td>
<td>.001</td>
<td>-.271</td>
</tr>
<tr>
<td>2 ALQsem$\rightarrow$CLEQsem$\rightarrow$WSSsem *</td>
<td>.186</td>
<td>.117</td>
<td>.277</td>
<td>.001</td>
<td>.302</td>
</tr>
<tr>
<td>3 WSSsem$\rightarrow$NSSsem$\rightarrow$PHsem</td>
<td>-.493</td>
<td>-.695</td>
<td>-.328</td>
<td>.001</td>
<td>-.378</td>
</tr>
<tr>
<td>4 WSSsem$\rightarrow$NSSsem$\rightarrow$Total MH</td>
<td>3.863</td>
<td>.445</td>
<td>7.053</td>
<td>.031</td>
<td>.144</td>
</tr>
<tr>
<td>5 WSSsem$\rightarrow$NSSsem$\rightarrow$Total AC SEM</td>
<td>1.432</td>
<td>.719</td>
<td>1.984</td>
<td>.001</td>
<td>.681</td>
</tr>
<tr>
<td>6 CLEQsem$\rightarrow$WSSsem$\rightarrow$NSSsem *</td>
<td>-.222</td>
<td>-.324</td>
<td>-.147</td>
<td>.000</td>
<td>-.475</td>
</tr>
<tr>
<td>7 NSSsem$\rightarrow$PHsem$\rightarrow$Total MH *</td>
<td>-11.993</td>
<td>-18.287</td>
<td>-7.272</td>
<td>.001</td>
<td>-.238</td>
</tr>
</tbody>
</table>

* New path.
The total indirect effects of authentic leadership on the dependent variables: physical health problems, good mental health, and affective commitment were also examined. The results demonstrated that the total indirect effects of ALQsem (authentic leadership) on PHsem (physical health problems) ($\beta=-.229$, 95% CI $-.322$ to $-.141$, $p=.001$, respectively), TotMH (good mental health) ($\beta=.216$, 95% CI $-.301$, $p<.001$, respectively), and TotACSEM (affective commitment) ($\beta=.412$, 95% CI $-.512$ to $-.512$, $p=.001$, respectively), through all possible pathways in the model were statistically significant (see Table 14).

Table 14: Post Hoc Model 6 (Final: Non-Significant Paths Dropped) Unstandardized and Standardized Total Indirect Effects

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Estimate</th>
<th>95% Lower Bound Confidence Interval</th>
<th>95% Upper Bound Confidence Interval</th>
<th>$p$</th>
<th>Standardized Estimate</th>
<th>95% Lower Bound Confidence Interval</th>
<th>95% Upper Bound Confidence Interval</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ALQsem $\rightarrow$ PHsem</td>
<td>-.183</td>
<td>-.256</td>
<td>-.188</td>
<td>&lt;.001</td>
<td>-229</td>
<td>-322</td>
<td>-141</td>
</tr>
<tr>
<td>2</td>
<td>ALQsem $\rightarrow$ TotMH</td>
<td>3.567</td>
<td>2.202</td>
<td>5.107</td>
<td>&lt;.001</td>
<td>.216</td>
<td>.133</td>
<td>.301</td>
</tr>
<tr>
<td>3</td>
<td>ALQsem $\rightarrow$ TotACSEM</td>
<td>.533</td>
<td>.266</td>
<td>.690</td>
<td>.001</td>
<td>.412</td>
<td>.214</td>
<td>.512</td>
</tr>
</tbody>
</table>

**Summary.** In summary, the results of phase 2 of this study are as follows. Prior to hypothesized model testing, the moderating influence of individual spirituality on the workplace spirituality-nursing stress relationship was unsupported. Additionally, assessment of the hypothesized partially latent SR model did not provide support for the overall/original study hypothesis (minus moderation). However, by adding a path from structural empowerment to workplace spirituality, physical health problems to good mental health, correlating two error terms associated with nursing stress, and dropping
one indicator associated with workplace spirituality, the overall fit of the post hoc (final) model was improved. The final model provided support for the majority of specific hypotheses explored in this study. A summary of phase 2 (final structural model and moderation analyses) hypotheses testing results are provided in Table 15.

Table 15: Phase 2 Summary of Hypotheses Testing

<table>
<thead>
<tr>
<th>Study Hypothesis</th>
<th>Supported or Unsupported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific 1 Authentic leadership is positively related to workplace spirituality</td>
<td>Supported</td>
</tr>
<tr>
<td>Specific 2 Authentic leadership is positively related to structural empowerment</td>
<td>Supported</td>
</tr>
<tr>
<td>Specific 3 Authentic leadership is negatively related to nursing stress</td>
<td>Unsupported</td>
</tr>
<tr>
<td>Specific 4 Workplace spirituality is negatively related to nursing stress</td>
<td>Supported</td>
</tr>
<tr>
<td>Specific 5 Structural empowerment is negatively related to nursing stress</td>
<td>Unsupported</td>
</tr>
<tr>
<td>Specific 6 Workplace spirituality will mediate the relationship between authentic leadership and nursing stress</td>
<td>Supported</td>
</tr>
<tr>
<td>Specific 7 Structural empowerment will mediate the relationship between authentic leadership and nursing stress</td>
<td>Unsupported</td>
</tr>
<tr>
<td>Specific 8 Individual spirituality will positively moderate the relationship between workplace spirituality and nursing stress</td>
<td>Unsupported</td>
</tr>
<tr>
<td>Specific 9 Nursing stress is negatively correlated with affective commitment</td>
<td>Supported</td>
</tr>
<tr>
<td>Specific 10 Nursing stress is positively correlated with physical health problems</td>
<td>Supported</td>
</tr>
<tr>
<td>Specific 11 Nursing stress is negatively correlated with good mental health</td>
<td>Supported</td>
</tr>
</tbody>
</table>
Figure 11. Hypothesized model 1 (without moderation).
ALQsem=authentic leadership; WSSsem=workplace spirituality; CLEQsem=structural empowerment; NSSsem=nursing stress; PHsem=physical health; Total MH=mental health; Total AC SEM=affective commitment.
Model fit: $X^2(184, N=274)=565.065, p<.001$; RMSEA=.087; SRMR=.097; CFI=.874; TLI=.856; $X^2/df=3.1$. 
Figure 12. Post hoc model 3.
ALQsem=authentic leadership; WSSsem=workplace spirituality; CLEQsem=structural empowerment; NSSsem=nursing stress; PHsem=physical health; Total MH=mental health; Total AC SEM=affective commitment.
Model fit: $X^2(182, N=274)=431.267, p<.001$; RMSEA=.071; SRMR=.0728; CFI=.918; TLI=.905; $X^2/df=2.4$. 
Figure 13. Post hoc model 5 (final: non-significant paths retained).
ALQsem=authentic leadership; WSSsem=workplace spirituality; CLEQsem=structural empowerment; NSSsem=nursing stress; PHsem=physical health; Total MH=mental health; Total AC SEM=affective commitment.
Model fit: $X^2(162, N=274)=382.527, p<.001; \text{RMSEA}=.071; \text{SRMR}=.0744; \text{CFI}=.918; \text{TLI}=.903; X^2/df=2.4.$
Figure 14. Post hoc model 6 (final: non-significant paths dropped).
ALQsem=authentic leadership; WSSsem=workplace spirituality; CLEQsem=structural empowerment; NSSsem=nursing stress; PHsem=physical health; Total MH=mental health; Total AC SEM=affective commitment.
Model fit: $X^2(164, N=274)=384.254, p<.001$; RMSEA=.070; SRMR=.0743; CFI=.918; TLI=.905; $X^2/df=2.3$. 
CHAPTER 5: Discussion

A discussion of the study results is included in this chapter. This is presented in the following sections: the study overview, key research findings, implications, limitations, dissemination and knowledge transfer, opportunities for future research, and conclusion.

5.1 Study Overview

In this study Avolio et al.’s (2004a) model, Milliman et al.’s (2003) work, and Kanter’s (1977) theoretical notions were tested in a sample of acute care oncology nurses. Specifically, it was hypothesized that higher acute care oncology nurse ratings of their immediate manager’s authentic leadership style would be related to higher levels of workplace spirituality and structural empowerment (with a focus on learning at work); and subsequently lower levels of perceived nursing stress. These relationships, in turn, were predicted to contribute to higher levels of affective commitment, and better physical and mental health. Oncology nurses’ individual spirituality was also hypothesized to moderate the relationship between workplace spirituality and nursing stress. Prior to testing within the hypothesized model, the moderating influence of individual spirituality on the workplace spirituality-nursing stress relationship was examined in isolation. SEM was then used to test the fit of the hypothesized model (minus moderation) with the data obtained from the study sample. More specifically, a partially latent SR model was analyzed using a two-phase approach: 1) CFAs of all study instruments (with prior EFAs conducted on two questionnaires); and 2) full analysis of the structural model.
5.2 Key Research Findings

The research findings and their significance are discussed as follows: 1) newly-trimmed EFA-informed questionnaires; 2) moderating effect of individual spirituality; 3) final model - overall discussion; 4) final model - direct effects of authentic leadership; 5) final model - direct and indirect effects of structural empowerment and workplace spirituality; and 6) final model - outcomes of nursing stress and physical health.

Newly-Trimmed EFA-Informed Questionnaires

Conditions for Learning Effectiveness Questionnaire-Education Revised. In this study, the results offered support for a revised hierarchical factor structure of the CLEQ-EDR (Siu et al., 2005). The final measurement model included: one second-order factor with no indicators (structural empowerment); four first-order factors (support, information, opportunity, and resources); and seventeen indicator variables (6; 4; 4; 3, respectively).

All first-order factors were trimmed based on strong empirical and theoretical rationale. 1) The newly-trimmed support factor, representing support from supervisors, peers and subordinates (Kanter, 1977) included all hypothesized indicators, though one was moved to the information factor (discussed below). 2) The newly-trimmed/revised information factor included two indicators from the original subscale (educator expectations of you and educator expertise relevant to your learning experiences), as well as one indicator each, from the support (open discussion of learning concerns with your educator) and resources (educator availability for help with your learning needs) subscales. It is notable that each of the indicators representing information noted here, were distinctly reflective of the overall structure of power (i.e., information, support, and
resources), as per Kanter’s theory (1979). According to Kanter (1977, 1993), information reflects the data, expertise, and knowledge needed to work effectively. Further, it refers to being “in the know” (Kanter, 1979) within the larger organization. It is clear that within the acute care oncology workplace learning environment, one’s educator was perceived to represent an important source of informational structural empowerment. It also suggests that conceptually, the information factor may warrant renaming within this workplace learning context. According to Coffey and White (2019), the hospital-based nurse educator (HBNE) role is essential for the provision of safe, quality, and excellent patient care. Further, the HBNE bears an important responsibility to facilitate educational initiatives, support ongoing staff knowledge development, foster a culture of learning, and maintain subject matter expertise to support nurses’ exceptional care efforts (Coffey & White, 2019). As such, it is not surprising that one’s educator was revealed as a unique informational resource, associated with a structurally empowering learning environment at work. It should be noted that four indicators were deleted from the original information factor including teaching/learning values of your unit, educational goals of the nursing unit, expertise of your peers gained from their learning experiences, and formal knowledge that helps you to solve patient care problems. Clearly, oncology nurses did not see information related to unit-specific learning values/goals and knowledge of their peers’ expertise as being uniquely or strongly reflective of information required to work effectively. Further, while it was somewhat surprising that information related to formal knowledge to solve patient care problems was not found to be strongly reflective of the information factor, it is possible that ‘solving’ patient care problems may not have been seen as fully realistic in the oncology context; and as such, not a strong reflection of
something required for learning effectiveness. 3) The newly-trimmed opportunity factor, reflecting opportunities to learn and grow (Kanter, 1977), encompassed all hypothesized indicators, though two were removed. These included share with others what you have learned and accomplish learning goals in your own way. In relation to the first indicator, it was considered plausible that while students may have deemed this item more relevant to the classroom learning environment for which the CLEQ tool was originally developed (Siu et al., 2005), oncology nurses may not have seen sharing their learning with others as being uniquely reflective of a personal opportunity for learning and growth. Further, while the act of sharing one’s learning may be more reciprocally beneficial within a classroom; in a complex, time-sensitive care setting, less of an opportunity for two-way learning may be present, with a significantly larger emphasis on transmission-based approaches. In relation to the second indicator, accomplishing learning goals in one’s own way was also removed. Within the clinical learning environment, this may not always be feasible or appropriate; hence, oncology nurses may not have found this to be uniquely reflective of opportunities to learn and grow. 4) Finally, the newly-trimmed resources factor, reflecting resources to accomplish organizational goals (Kanter, 1977), reflected three of the seven hypothesized indicators, with one moved to the information factor (as previously mentioned) and three items deleted. The deleted items included time available to accomplish learning goals, availability of in-services related to your educational needs, and availability of continuing education opportunities related to your educational needs. With the demands of the work setting, it is possible that acute care oncology nurses did not view these items as strongly reflective of available resources. Furthermore, the items that were reflective of resources in this study, were all
relationship based (i.e., availability of peers; health care professionals; and other people for sharing learning experiences, needs, and goals), and more in keeping with Siu et al.’s (2005) original instrument. According to James, Page, and Sprague (2016), cancer care provided by high-performing teams can result in improved clinical outcomes; clearly, a major organizational goal and an important resource for acute care oncology nurses.

**Nursing Stress Scale Revised.** In this study, the results offered support for a revised hierarchical factor structure of the NSSR (Gray-Toft & Anderson, 1981). This final measurement model included: one second-order factor with no indicators (*nursing stress*); four first-order factors (*problems with physicians and other nurses [new], uncertainty concerning treatment, workload, and death and dying*); and eighteen indicator variables (4; 5; 5; 4, respectively).

All first-order factors were again trimmed. The trimming was based on strong empirical and theoretical rationale. 1) The newly-trimmed/combined *problems with physicians and other nurses* factor included four indicators (two from the originally separate physician factor and two from the nurse factor). These included: *conflict with a nursing supervisor, criticism by a nursing supervisor, conflict with a physician, and criticism by a physician*. These indicators are clearly reflective of similar problems with both intra- and inter-professional team members to whom staff nurses would report and/or from whom they would take orders. While historically, physicians held dominant power positions within the health care system (Keddy, Jones Gillis, Jacobs, Burton, & Rogers, 1986), nurse-physician relationships have evolved over the past few decades, wherein the unique and essential contributions of both groups are more commonly recognized and valued. This may explain why criticism and conflict from either
professional member was seen to be reflective of a more similar, singular factor. It should be noted that one indicator was moved to another factor (described below), and five were deleted: *fear of making a mistake in treating a patient, making a decision concerning a patient when the physician is unavailable, floating to other units that are short-staffed, difficulty in working with a particular nurse (or nurses) outside the unit, and difficulty in working with a particular nurse (or nurses) on the unit.* In reference to the first three deleted indicators, it is possible that oncology nurses did not see them as reflective of *problems with physicians and other nurses,* as they do not directly reflect interpersonal issues. However, while the last two indicators reflect nurse-to-nurse work issues, these more horizontal difficulties may be somewhat unique from those issues encountered in a more vertical relationship (e.g., nursing supervisor-to-nurse or physician-to-nurse; Ebrahimi, Hassankhani, Negarandeh, Jeffrey, & Azizi, 2017). 2) The newly-trimmed/revised *uncertainty concerning treatment* factor reflected all hypothesized indicators, though one was deleted (*uncertainty regarding the operation and functioning of specialized equipment*). It is likely that oncology nurses did not see having to utilize specialized equipment as reflecting treatment uncertainty, as the indicator reflects one’s comfort with the operation and function of devices/objects/technology, etc., and an element of one’s role that demands competency and prior training. According to the CNO (2018b, 2020), nurses have a responsibility to use equipment and technology in a manner that promotes and provides safe nursing care, and to decline performing a procedure when it does not. As such, it is not surprising that the operation and functioning of specialized equipment was not seen as a strong indicator of treatment associated uncertainty. It should also be noted that one indicator was moved from the original
problems with physicians factor (disagreement concerning the treatment of a patient) and retained as part of the uncertainty concerning treatment factor. This indicator was viewed as distinctly reflective of treatment uncertainty. 3) The newly-trimmed workload factor included all hypothesized indicators, though one was deleted (breakdown of technology). It is possible oncology nurses did not see this as being directly reflective of workload stress, as technological breakdowns are somewhat rare in acute care settings, with seamless integration required for safe organizational adoption. As well, some areas may still use paper for many day-to-day practices as opposed to electronic health records, which are a major source of e-technology in modern health care settings across Ontario (eHealth Ontario, 2019). 4) The newly-trimmed death and dying factor included four of the hypothesized items. However, three were deleted: performing procedures that patients experience as painful, watching a patient suffer, and physician not being present when a patient dies. The first two indicators were deemed to be vaguely reflective of death and/or dying specifically. In reference to the last indicator, a physician may not be physically present the moment a patient dies, particularly when the patient has been deemed palliative within a cancer setting. As such, it is likely that acute care oncology nurses may not have found their lack of presence to be strongly reflective of stress associated with death and dying.

Moderating Effect of Individual Spirituality

Hypothesis 8: influence of individual spirituality on the workplace spirituality-nursing stress relationship. Prior to discussion of the final model results, interpretation of the non-moderating effect of individual spirituality on the workplace spirituality-nursing stress relationship (examined in isolation of the hypothesized model)
is presented ($\Delta R^2=0.004, F[1, 270]=1.4, p=.238$). Given Milliman et al.’s (2003) conception of workplace spirituality (including meaningful work, a sense of community, and alignment with organizational values), it was expected that these aspects would be more valued by those with high levels of individual spirituality. Moreover, when daily spiritual experiences (individual spirituality) were identified as frequent by oncology nurses, the inverse relationship among workplace spirituality and nursing stress was anticipated to be stronger. This prediction was not supported. However, given the mounting and increasingly universal interest in searching for spiritual meaning beyond one’s personal life and into one’s work life (Giacalone & Jurkiewicz, 2010), it is possible that the direct relationship between workplace spirituality and nursing stress would be stable, notwithstanding one’s awareness or acknowledgment of personal spiritual experience. Further, despite Underwood’s (2013) contention that daily spiritual experiences (based largely on positive feelings/experiences) can act as a renewable inner resource, it is plausible that in an acute care oncology context, where aspects of suffering are often a daily norm, that the protective effects of such a resource might often be suppressed; leaving little room to strengthen an otherwise strong workplace spirituality-nursing stress relationship. Alternatively, the researcher-adapted daily spiritual experience scale (Idler et al., 2003; Underwood, 2006) contained some religious language (despite the option for participants to substitute alternate words), while spirituality and religion can, in fact, be separate (Angeli, 2001; Daaleman, 2004). This may also have accounted for the missed protective effect, should the reference to religious language have affected the responses of those who did not identify as being religious in any way and/or those who identified as atheists. Further, Dehler and Welsh (2010) caution
organizations from leveraging employees’ individual spiritual side, for the sole purpose of impacting the “bottom line” (p.66). To some extent, the lack of impact of individual spirituality on the workplace spirituality-nursing stress relationship may also reflect this caution. Previous research by Rudaz, Ledermann, and Grzywacz (2019) demonstrated the absence of a moderating effect of daily spiritual experience, on pre- and 10 years post-negative affect among cancer survivors. This may further support the absent moderating effect noted in the current study, given links between negative affect and greater levels of felt stress identified throughout the literature (Brief, Burke, George, Robinson, & Webster, 1988; Depue & Monroe, 1986; Zellars et al., 2010).

**Final Model - Overall Discussion**

The results of this study provide new insights into the impact of authentic leadership, workplace spirituality, and structural empowerment (with a focus on learning) on important organizational outcomes; as well as enhanced understanding of the consequences of nursing stress. Although assessment of the partially latent SR model did not provide support for the overall/original study hypothesis (in absence of moderation), by adding a path from structural empowerment to workplace spirituality, physical health problems to good mental health, correlating two error terms associated with nursing stress, and dropping one indicator associated with workplace spirituality, the overall fit of the final model (post hoc model 6 [final: non-significant paths dropped]) was improved; thereby supporting a revised version of the hypothesized model. The final model (minus moderation) provided support for the majority of specific hypotheses explored in this study, though three were not supported: the direct effect of authentic leadership on nursing stress, structural empowerment on nursing stress, and the indirect effect of

**Final Model - Direct Effects of Authentic Leadership**

**Hypothesis 1: authentic leadership and workplace spirituality.** Findings from this study supported the positive link between authentic leadership and workplace spirituality ($\beta = .302, p < .001$). This finding was consistent with Jianglin et al.’s (2017) findings which also supported a link between the concepts. An aspect of workplace spirituality (meaningfulness of work) has also been linked to authentic leadership in service workers (Cassar & Buttigieg, 2013). As well, alternate forms of leadership (transformational and resonant) have been linked to aspects of/alternative forms of workplace spirituality (i.e., spirit at work; Arnold et al., 2007; McKee et al., 2011; Wagner et al., 2013, 2014) in health care workers, service workers, and nurses specifically. According to Bowen, Ferris, and Kolodinsky (2010) and Moxley (2000), the characteristics of a leader are powerful in that they can stimulate a more spirit-rich vs. a spirit-less workplace. Specifically, authenticity in a leader has been deemed critical to building a spirit filled work environment and helping employees feel valued (Bowen et al., 2010). Moreover, Houghton, Neck, and Krishnakumar (2016) assert that authentic leadership can play a key role in facilitating workplace spirituality. The presence of a relationship in the present study signals the fact that leaders perceived as authentic in acute care oncology settings may have a significant influence on the spiritual needs (i.e., a sense of meaningful work and connection to coworkers/colleagues) of the nurses they
are leading; a key component of employee holistic health. This is not surprising given Avolio and Gardner’s contention (2005) that authentic leaders can make a difference in organizations by enabling people to find meaning and connection in their work; promoting transparent relationships that nurture trust among followers; and by supporting positive work climates. As such, the links to a sense of meaning and community are apparent; both of which were rated moderately to highly by oncology nurses in the current study and found to be important in cancer care nurses work in previous studies (Carr, Traeger, Cashavelly, & Pirl, 2015; Hinds et al., 2003). The balanced information processing component of authentic leadership behaviour and the community aspect of workplace spirituality are also clearly linked. The former refers to a leader willing to solicit others’ perspectives prior to engaging in decision-making; while the latter reflects a sense of connection to one’s coworkers/colleagues (Milliman et al., 2003; Walumbwa et al., 2008).

**Hypothesis 2: authentic leadership and structural empowerment.** Findings from this study supported the positive link between authentic leadership and structural empowerment (with a focus on learning at work) ($\beta=.570, p<.001$). This is not surprising as a relationship among the concepts has been found in previous nursing studies (Dwyer, Hunter Revell, Sethares, & Ayotte, 2019; Regan et al., 2016), although this study is the first to specifically link authentic leadership to a learning-focused version of structural empowerment. According to Palmer (1998), a leader is someone with the power to create the conditions under which individuals must live and function. As well, an effective leader is one who proactively enables the empowerment of employees (Bowen et al., 2010). The relationship found in this study suggests that authentic leaders have the power
to enhance the conditions required for learning effectiveness, which are essential to oncology nurses’ capacity to learn at work. Given the CNO (2018a) requirement for nurses to maintain continuing competence, evidence of a direct link to authentic leadership is important to understand, particularly in a nursing setting with an increased necessity for learning (i.e., ever-changing care environment with variable treatment plans, indefinite patient outcomes, etc.). As such, ensuring the conditions for continuous learning are present, is both important and needed, and authentic leaders have the power to mobilize such access.

**Hypothesis 3: authentic leadership and nursing stress.** Findings from this study did not support the direct inverse link between oncology nurses’ perceptions of their immediate manager’s authentic leadership behaviours and the frequency with which they perceived certain situations on their unit as stressful. This is in contrast to previous studies which have shown significant inverse relationships between authentic leadership and measures of job stress in both teachers and executive managers (Ismail, Abdullah, & Abdullah, 2019; Weiss, Razinskas, Backmann, & Hoegl, 2018). Moreover, the presence of a clinical support nurse has also been associated with decreased work-related stress in pediatric inpatient oncology nurses (Chang, Kicis, & Sangha, 2007a). While the non-significant result was not expected, it may reflect the way in which nursing stress was operationalized in the present study. It is plausible that work environment stressors may still be perceived as stressful, whether one feels their manager is authentic or not; particularly in an acute care oncology context. Furthermore, no studies were found specifically linking the ALQ (Avolio et al., 2007) and NSSR (Gray-Toft & Anderson, 1981). An alternative argument might be that while authentic leaders can foster the
development of authenticity in their followers (Avolio & Gardner, 2005), which can, in turn, alleviate perceptions of work stress (Rahimnia & Sharifirad, 2015), the lack of a relationship may reflect a span of control issue. That is, leaders are unable to impact such perceptions when their direct report loads are too high. Span of control theory suggests there is a maximum number of employees that a manager can supervise effectively, beyond which there is no additional benefit (Meier & Bohte, 2000; Urwick, 1956). In Doran et al.’s (2004) study, the positive effect of transformational leadership on nurses’ job satisfaction was significantly diminished in areas with wide managerial spans of control. As such, the lack of a relationship between authentic leadership and the frequency with which certain nursing situations were perceived as stressful in this study, may therefore be reflective of a day-to-day proximity issue. According to Wong and Laschinger (2015), frontline managers are facing wider spans of control in today’s dynamic health care organizations.

Final Model - Direct and Indirect Effects of Structural Empowerment and Workplace Spirituality

**Hypotheses 4-7:** workplace spirituality and nursing stress; workplace spirituality and the authentic leadership-nursing stress relationship; structural empowerment and nursing stress; structural empowerment and the authentic leadership-nursing stress relationship. Findings from this study failed to support the direct inverse relationship between structural empowerment (with a focus on learning) and nursing stress. While this was unexpected, it is logical that operationally, the extent to which acute care oncology nurses’ feel that their workplace offers access to the learning-focused structures of opportunity, information, support, and resources may have
little influence on the frequency with which certain nursing situations (factors) are considered stressful. Aronson, Wilson, Akert, and Fehr (2001) explained that human beings often perceive things as stressful when they feel they have little control over them. In contrast, the same situation may not be perceived as stressful, when a sense of control is present. Given the vast number of unknowns associated with a cancer diagnosis and its treatment/management, it is not surprising that a sense of empowerment in one’s learning environment was not enough to have a significant influence on the extent to which certain nursing situations were perceived as stressful. To date, numerous unknowns continue to exist in the treatment of cancer (Canadian Cancer Society, 2020; Kim et al., 2018). Further, with workload identified as the most stressful work situation in this study, support is also bolstered for the link between stress perceptions and lack of control, given acute care nurses’ common lack of control over their daily assignments/workload. Aronson et al. (2001) asserted that an environment can also be perceived as stressful when there is a threat to well-being. Given the dynamic nature of an oncology nurse’s work, with numerous factors that can influence patient, family, and potentially the nurse’s well-being (e.g., variable treatment plans, code situations, etc.), it is further, not surprising that perceptions of nursing stress were not found to be substantially influenced by learning environment structures alone. Finally, from a theoretical standpoint, given that many of the stressors identified in the NSSR (Gray-Toft & Anderson, 1981) can in many ways be considered work environment conditions themselves, the lack of a strong relationship to the conditions for learning effectiveness instrument (CLEQ-EDR; Siu et al., 2005), may also reflect some post hoc noted element of conceptual commonality. This is the first study to examine relationships among structural empowerment (with a
focus on learning at work) and nursing stress. Previous research has found a significant inverse relationship between generic structural empowerment and various job stressors in hospital nurses (Guo et al., 2016).

Findings from this study also failed to support the indirect effect of authentic leadership on nursing stress through structural empowerment (with a focus on learning at work). This was somewhat surprising as it was predicted that structural empowerment might be a catalyst to this relationship, particularly given the aforementioned significant relationship between authentic leadership and structural empowerment. Previous studies have also demonstrated significant indirect effects of transformational leadership on work engagement, adverse patient outcomes, and quality of care via structural empowerment (Monje Amor, Abeal Vázquez, & Faiña, 2019; Asif, Jameel, Hussain, Hwang, & Sahito, 2019). However, given the non-significant relationship between leadership and stress, as well as empowerment and stress (previously discussed), this may explain why an empowering learning environment was not a substantive mediator of the leadership-stress relationship.

Conversely, the direct negative relationship between workplace spirituality and nursing stress was supported ($\beta=-.896, p<.001$). Oncology nurses who felt a strong sense of community and meaning in their work (Milliman et al., 2003), were less likely to perceive certain nursing situations as stressful. Empirically, the relationship between meaningful work (rated highest in the present study) and decreased perceptions of work stressors has been supported in long-term care nurses (Li et al., 2008). Negative relationships have also been found between work stress and both meaningful work and sense of community in Mexican manufacturing, government, oil and textile
managers/supervisors; and stress and meaningful work in American business students and employees from retail, banking, insurance, and health care industries (Daniel, 2015). In the oncology work setting, it is not surprising that these more personal fulfilling dimensions (vs. work structures) were found to combat the frequency with which certain work factors were perceived as stressful. The concept of workplace spirituality acknowledges that people bring their whole selves to work (spirit included; Saks, 2011). Thus, expecting people to work in an environment with aspects of workplace spirituality missing, can be stressful and fragmenting (Pfeffer, 2010). The absence or invisibility of workplace spirituality may be particularly stressful for oncology nurses who are frequently faced with existential questions related to death and dying at work, which was rated as the second highest aspect of work stress in this study. As such, it is notable that a sense of community and meaning in work, were found to be important in combatting certain stressful work factors from becoming substantial sources of felt stress. According to Zellars et al. (2010), not every potential stressor becomes a source of felt stress, particularly when an individual finds adequate ways to cope (Lazarus, 1981, 1991; Lazarus & Folkman, 1984). According to Treagold (1999), engagement in meaningful work is positively correlated with problem-focused coping (i.e., when faced with stress, an individual will attempt to alter the source [e.g., via delegation and/or setting priorities]; Zellars et al., 2010). Emblen and Pesut (2001) further assert that finding meaning in suffering can be a powerful attenuator to how it is experienced. As such, it is logical that support for finding meaning in work, could also attenuate the frequency with which certain work factors are perceived as stressful. Further, social support (an element
of workplace spirituality) has also been found to be an important resource for managing stress (Aronson et al., 2001; Norris & Kaniasty, 1996).

The indirect effect of authentic leadership on nursing stress via workplace spirituality was also supported ($B=-.089$, $95\% CI -.147$ to $-.044$, $p=.001$; $\beta=-.271$, respectively). While the direct effect of authentic leadership on nursing stress was not supported, the indirect effect affirmed that a relationship did exist among the variables, through workplace spirituality. Support for this relationship was gained, as both authentic leadership and nursing stress had significant direct relationships to workplace spirituality in the present study (as discussed above). As such, it is evident that with a leader’s clear ability to influence perceptions of a more spiritually healthy work setting (Arnold et al., 2007; McKee et al., 2011), perceptions of nursing stress in turn, seems to be less frequent for acute care oncology nurses. Previous research has demonstrated significant indirect effects of leader humility on ethical behaviour, gratitude, and empathy through workplace spirituality (Naseer et al., 2019).

**New direct path: structural empowerment and workplace spirituality.** The study results supported a new positive path from structural empowerment (with a focus on learning) to workplace spirituality ($\beta=.530$, $p<.001$). Given some similarities between the meaning and impact components of psychological empowerment, and the meaning in work component of workplace spirituality, this new finding is logical given the noted links between structural and psychological empowerment in previous studies and theoretical works (Kanter, 1977; Laschinger et al., 2001a; Smith et al., 2010; Spreitzer, 1995). Further, a systematic review on the relationship between structural and psychological empowerment among practicing nurses revealed significant associations
between the variables; with discrete links noted between structural empowerment and both impact and meaning specifically (Wagner et al., 2010). A more recent systematic review and meta-analysis ($k=6$, $N=4,275$) also supported the link between structural and psychological empowerment among nurses (Fragkos, Makrykosta, & Frangos, 2020). As well, continuous learning and development have been revealed as essential to fostering spirit at work (work is perceived as meaningful, feeling of making a contribution, a sense that work was important) among employees across diverse professions (Kinjerski & Skrypnek, 2006). A successful work environment has been discussed as one that offers access to empowering conditions (structure of power and opportunity) and one that considers employees’ personal experience of empowerment in the work environment (Laschinger et al., 2001a). It is logical that if one feels they have the learning tools needed to be effective in their jobs that they would: 1) experience more joy in their work and feel confident that their work is making a difference in the lives of others (meaningful work; Milliman et al., 2003); and 2) feel a sense of connection to people they work with and a link to a common purpose, through their common knowledge base, which enables them to be part of the group (sense of community; Milliman et al., 2003).

For oncology nurses, this common knowledge base is likely to be unique, given that this area of practice is recognized as a specialty area, often requiring enhanced education (Canadian Association of Nurses in Oncology, 2015). Links between aspects of generic structural empowerment and spirit at work have been found among physical and occupational therapists within the literature (Wagner et al., 2014), however no studies were found examining structural empowerment and workplace spirituality as depicted in this dissertation.
Final Model - Outcomes of Nursing Stress and Physical Health

Hypothesis 9: nursing stress and affective commitment. The findings from this study supported the inverse link between nursing stress and affective commitment ($\beta=-.760, p<.001$). It is not surprising that frequent interpretations of certain work situations as stressful, would result in a decreased desire to stay in acute care oncology RNs. As it is well documented that cancer care nursing comes with numerous chronic stressors, including: emotional distress, moral and ethical dilemmas, patient suffering, loss and grief, complex treatment regimens, and death and dying (Altounji et al., 2013; Cohen & Erickson, 2006; De Carvalho et al., 2005; Jones et al., 2013; Ko & Kiser-Larson, 2016), such a finding is critical to recruitment and retention efforts. A link between job stress and organizational commitment has previously been found among oncology nurses in Korea (Park & Ahn, 2015). However, no significant relationship was found among nursing stress (as conceptualized in the present study) and commitment for work in Jordanian hospital nurses (Hamaideh, Mrayyan, Mudallal, Faouri, & Khasawneh, 2008). More recently, no significant relationship was found among the expanded nursing stress (scale focused on job stressors) and organizational commitment in Bangladesh hospital nurses in 2018 (Akter, Akkadechanunt, Chontawan, & Klunklin, 2018). While one’s desire to stay in an organization may be impacted differently across the globe/across nursing specialties, the impact on affective commitment in acute care oncology nurses in Ontario was clear. In a country that continues to be impacted by rising cancer risk (Canadian Cancer Society’s Advisory Committee on Cancer Statistics, 2017; Statistics Canada, 2017), the impact of perceived nursing stress requires enhanced attention.
Hypothesis 10: nursing stress and physical health. Results from this study supported the positive relationship among the frequency with which certain nursing situations were perceived as stressful and physical health problems ($\beta=.422, p<.001$). In support of this finding, Aronson et al. (2001) stated that stress caused by negative interpretations of events, can directly impact the immune system, leading to enhanced susceptibility to disease (e.g., infectious diseases). According to Gleitman, Fridlund, and Reisburg (2004), the body’s response to perceptions of intense threat is largely internal, wherein the sympathetic nervous system is often activated, resulting in inhibited digestion and increases in heart rate. Stress has also been revealed as a risk factor for cardiac disease, bowel disease, and weight changes; with chronic episodes of job stress identified as detrimental to physiological health (Health Canada, 2008; Roberts & Grubb, 2014). As such, it is not surprising that increased perceptions of work stress were associated with an increase in physical health problems for oncology nurses. Previous research has demonstrated negative links between good physical health and workload, problems with peers, and problems with supervisors, in nurses working in Greek hospitals (Sarafis et al., 2016). As well, more frequent workplace stress has been linked to lower physical health in acute care hospital nurses in New South Wales and New Zealand (Chang et al., 2007b).

Hypothesis 11: nursing stress and mental health. The study results supported the negative link between nursing stress and good mental health; though the direct relationship was weak ($\beta=-.161, p=.014$). This suggests that one’s cognitive appraisal of work situations as stressful, does impact mental health directly, though not strongly. It is plausible that many can find work situations stressful and retain their mental wellness.
This is logical given Selye’s (1974) contention that stress is not what happens to a person, but how one reacts to it. As such, depending on one’s perception of a stressor, the impact on mental health may differ. Nevertheless, in this study, the relationship between perceptions of nursing stress and good mental health was significantly inverse. Previous research has also demonstrated negative links between good mental health and workload, uncertainty concerning treatment, conflict with physicians, problems with peers and supervisors, and death and dying stressors among Greek hospital nurses (Sarafis et al., 2016). Positive links have also been found between components of the Work Stressor Inventory for Nurses in Oncology (WSINO) including: workload, dealing with death and dying, interpersonal conflicts, and dealing with suffering; and both emotional exhaustion and psychological distress among hospital-based oncology nurses in France (Borteyrou, Truchot, & Rascle, 2014).

In the present study, it is conceivable that some oncology nurses’ mental wellness may not have been strongly and directly impacted by nursing stressors specifically, should their frequent contact with patients and families facing life-threatening cancer diagnoses, have led to an enhanced appreciation for their own health status/lives; thereby minimizing the impact of job stress on mental wellness. According to Arnold, Calhoun, Tedeschi, and Cann (2005), Beck, Eaton, and Gable (2016), and Vishnevsky, Quinlan, Kilmer, Cann, and Danhauer (2015), this reflects a form of vicarious posttraumatic growth (i.e., psychological growth experienced by caring for individuals affected by severely challenging life circumstances/trauma) leading to enhanced resilience. Such an explanation may partially explain the small direct effect size. It is also worth noting that the direct nursing stress-mental health relationship was stronger ($\beta=-.439, p<.001$) prior
to the addition of a path between physical health and mental health during structural model testing. The addition resulted in a new, significant, indirect path from nursing stress to mental health via physical health ($B=-11.993$, 95% CI -18.287 to -7.272, $p=.001$; $\beta=-.238$, respectively). This revealed that the previously stronger nursing stress-mental health relationship was likely somewhat spurious, in that it was found to be appreciably explained by physical health.

**New direct path: physical health and mental health.** The results of this study supported a new negative path from physical health problems to good mental health ($\beta=-.564$, $p<.001$). This is logical given Gierk et al.’s (2015) contention that a high somatic symptom burden is associated with an increase in psychological distress. More specifically, Gierk and colleagues (2015) found moderate positive associations among somatic symptom burden and depression, anxiety, and health anxiety among patients in a German psychosomatic outpatient clinic. Previous research has also revealed a positive link between poor perceived health and psychological distress in hospital-based oncology nurses in France (Escot et al., 2001). It is important to note the link between physical and mental health for oncology nurses, particularly given the growing recognition of the importance of a psychologically healthy workplace (Ontario Ministry of Labour, Training and Skills Development, 2019). Such a workplace enjoys improved engagement, better productivity, enhanced recruitment and retention of talent, as well as increased levels of creativity and innovation (Ontario Ministry of Labour, Training and Skills Development, 2019). It is also noteworthy that fatigue was the most bothersome somatic symptom in this study. According to McClung (2013) circadian rhythm disruptions and sleep issues caused by shift work, can lead to or exacerbate mood-related episodes and mood
disorders, which can, in turn, trigger or exacerbate episodes of depression (Moreno, 2019). Given many acute care oncology nurses are likely to be working shifts, this again supports the negative link between physical health problems and good mental health; emphasizing the important influence of fatigue.

5.3 Implications

Implications for Nursing Leadership/Practice/Policy

Nursing leadership. Nurse leaders would be wise to consider the results of this study when considering how best to enhance oncology nurses’ affective commitment and health in acute care settings. Few would argue the inherent challenge in providing compassionate, quality care in an environment perceived as stressful. As such, working in an environment that is also plagued with poor leadership, disempowering learning structures, and a place where a sense of meaning and community are also missing, could only contribute to this challenge. In this study, direct and indirect pathways were found to support the combined influence of empowering learning environments and workplace spirituality on the frequency with which oncology nurses found certain nursing situations to be stressful. Significant impacts on health and commitment were also revealed. This process was found to start with authentic leadership; an area that requires increased attention in this cohort of the nursing population.

Descriptive results demonstrated that oncology nurses rated their immediate managers’ authentic leadership behaviour as moderate \((M=2.41, SD=0.97)\). This was similar to previous Ontario RN studies \((M=2.28-2.35, SD=0.98-1.04; \text{Regan et al., 2016; Wong & Laschinger, 2013})\). Relational transparency, that is, displaying one’s genuine self through selective self-disclosure, openness, and truthfulness (Gardner et al., 2005)
was rated as highest. This is encouraging as such manager perceptions are likely to be important in encouraging openness in nursing staff, particularly in an environment that is often emotionally taxing. Managers should continue to develop and role model this leadership behaviour. Self-awareness was rated as lowest, though this may reflect respondents’ potential difficulty in assessing the self-awareness of another. Nevertheless, Ashkanasy and Daus (2002), Ashkanasy and Tse (2000), and George (2000) contend that high levels of self-awareness help leaders to take their own and others’ feelings into account without being guided by moment-centered emotional impulses. This is important to ensuring a non-biased approach to staff support strategies, aimed at benefitting as many constituents as possible. Increased attention to this area may be beneficial for leaders, when faced with diverse support options in oncology work settings. As a whole, given the significant relationships found to emanate from total authentic leadership in the present study, increased attention to bolstering immediate managers’ authentic behaviour is both supported and suggested.

**Nursing practice.** Implications for nursing practice are also evident, particularly given the noted benefits of an empowering learning environment at work on perceptions of workplace spirituality and subsequent nursing stress; as well as the resulting impact on commitment and health. A healthy workplace was found to contribute to both healthier and more committed oncology staff nurses. As such, impacts on staff nurse retention are evident.

Oncology nurses in the present study found their learning environments to be moderately structurally empowering ($M=13.18$, $SD=3.04$). This was fairly similar to slightly lower than previous education-centered structural empowerment studies of
newly-graduated nurse practitioners ($M=14.24$; Duff, 2019) and nursing students
($M=13.10$ [conventional lecture learning] - $M=15.99$ [problem-based learning]; Siu et al., 2005). However, the present study was unique to the workplace learning context, with several modifications to the original instrument (discussed earlier). Specifically, oncology nurses in the present study felt the greatest access to opportunities to learn and grow. According to Kanter (1977), employees in high opportunity jobs display heightened organizational commitment, and enhanced motivation to do well and advance in their careers. Such impacts have clear links to retention, patient care delivery practices, and personal continuous improvement. As well, given the additional educational competencies required of oncology nurses in an ever-changing practice area, access to this structure is undoubtedly beneficial in providing the highest quality of care. Canadian oncology RNs have acknowledged that opportunities to acquire specialized knowledge in cancer care exist within Canada (Bakker et al., 2010). As such, offering funding for continuing education and flexible scheduling in further support of such opportunities (if not already in place), can only serve to bolster oncology nurses’ perceptions/mobilization of such opportunities, even further. Respondents in the present study perceived the least access to information required to work effectively. The EFA informed/revised subscale in this study, directly reflected one’s educator as a source of information. Rationale for perceptions of somewhat less access may reflect the fact that not all nurses will desire and/or have time to seek regular educator feedback regarding their learning needs; particularly if they work outside weekday, daytime hours. As such, given that a key role of a unit-based nurse educator is to support all nursing staff in meeting their learning objectives/requirements (Coffey & White, 2019), there is potential for intervention here.
Necessitating the presence of nurse educators on patient care units outside of typical business hours, with enhanced opportunities to connect, may be a way in which to offer oncology nurses further access to this important structure. Individual assessments of learning needs and learning styles might also be possible with augmented educator presence. This may be particularly beneficial for those who find it difficult to learn in the absence of their formal teacher (educator in this context).

Perceptions of workplace spirituality were also moderate ($M=4.73$, $SD=1.07$). This result was similar to previous research involving working MBA students in the United States ($M=4.68$; Milliman et al., 2003). Participants in the present study reported a sense of meaning in their work as being the most present. This is not surprising given that cancer care nurses have described their work as rewarding, satisfying, and meaningful (Bakker et al., 2013). Hinds (2000) found high levels of role-related meaning seemed to sustain pediatric oncology nurses’ commitment, in their attempts to manage role-related stressors. The inverse relationship found between workplace spirituality and nursing stress in the present study also supports this finding. Fostering an environment where hospital-based oncology nurses can feel a sense of meaning in work is therefore essential, as a novel way to combat work stressor perceptions in this group. In contrast to meaningful work perceptions, alignment with organizational values was perceived as the least present by oncology nurses. According to Posner (2010), differences or gaps between the values of an organization and those of its members (i.e., person-organization fit), can result in the formation of attitudes that stifle motivation, impede performance, and result in higher levels of dissatisfaction, turnover, and stress. Further, alignment with organizational values has been positively related to organizational commitment and
negatively related to intent to quit in previous research involving MBA students working in diverse United States industries (Milliman et al., 2003). Slightly less than moderate perceptions of organizational value alignment in the present study, signal an increased risk for negative consequences. However, it is possible that lower values may be related to a lack of awareness of organizational values. Nevertheless, addressing either issue brings to light the importance of a more holistic response to supporting oncology nurses work. According to Pfeffer (2010), people bring all elements of who they are to work; and to overlook the importance of any aspect (i.e., intellectual, physical, emotional, social, occupational, spiritual, etc.; Edlin & Golanty, 2010), can only result in incomplete and fragmented support strategies. According to Benefiel, Fry, and Geigle (2014) and Milliman, Gatling, and Kim (2018), a full understanding of organizational reality is incomplete, without considering spirituality in the workplace. Further, workplace spirituality has been cited as beneficial to both individuals as well as organizations (Vasconcelos, 2018).

Participants’ overall daily spiritual experiences were reported as moderate ($M=3.54, SD=1.20$). This is similar to Murdock’s (2009) study of university students in the United States ($M=3.37, SD=1.39$), though comparison is somewhat limited as modifications were made to the original scale. Nevertheless, the study demonstrated that acute care oncology nurses experience a moderate amount of daily spiritual experience in their work. This is an important finding as Underwood (2013) asserts that frequent daily spiritual experience can serve as a renewable inner resource for people, in contrast to more transient sources like food, shopping, and entertainment. She further asserts that simply answering the *Daily Spiritual Experience Scale* (DSES; Underwood & Teresi,
2002) questions, can change the way people see each day; thereby stimulating a search for similar experiences in life (Underwood, 2013). Despite lack of a moderating effect on the workplace spirituality-nursing stress relationship in this study, the value of exploring daily spiritual experiences further, may be useful in assisting oncology nurses to find/seek out more sustainable, holistic sources of renewal. Scores on the DSES have been linked to weight loss, close friendships, increased happiness and helping behaviours, better health behaviours and self-rated health, decreased pain, and less burnout (Einolf, 2013; Kalkstein & Tower, 2009; Ng, Fong, Tsui, Au-Yeung, & Law, 2009; Underwood, 2013). Correlations between infrequent daily spiritual experiences and decreased commitment and mental health were revealed in the present study. As such, given the potential positive impact on nurses and clients alike, increased openness to exploring and supporting examination of such ordinary spiritual experiences (Idler et al., 2003) in oncology nurse practice settings is suggested. According to Underwood (2013), drawing one’s attention to daily spiritual experiences, can have implicit positive effects on both thoughts and behaviour.

**Nursing policy.** With investments in paid sick time and employee attrition substantial in many health care settings, this study has signaled a potential pathway to impact health and commitment in oncology nurses; and as such a potential approach to organizational cost saving through primary prevention policies focused on healthy workplace interventions. More importantly, the value of a healthy/committed workforce goes beyond fiscal cost, with short- and long-term benefits for nurses themselves; as well as the patients and families for whom they care. The study results demonstrated that investing in an empowering learning environment and subsequent support for workplace
spirituality, contributes to decreased perceptions of nursing stress, with clear impacts on health and retention. As such, the development of programs and policies at the organizational and provincial level that support empowering learning environments and the fostering of work spirit, as a means to combat work stress, are clearly essential. Some caution should be taken in this approach however, as Milliman et al. (2003) points out that support for workplace spirituality must be grounded in a clear philosophy that it is the *right thing to do*, not that it can lead to *higher profits*. As such, attention must be taken to ensure the primary focus is on appropriate organizational goals.

The frequency with which acute care oncology nurses perceived their work settings to be stressful was rated as moderate in this study (*M*=41.99, *SD*=7.77; close to the scale midpoint of 45). Comparison with previous research is limited as several modifications were made to the original tool, including the removal of several items which affected possible total scores (discussed earlier). Nevertheless, in Ko and Kiser-Larson’s (2016) study of outpatient oncology nurses, total nursing stress was reported as moderate (*M*=71.35, *SD*=9.43; somewhat close to the scale midpoint of 85). As such, both samples were fairly close to their midpoints, offering some evidence of consistency across studies. Given the negative impacts of perceived stressors on health and retention in the present study, implementing organizational policies to *assess* and *address* nursing stress on a more habitual basis are needed. This could include routine assessment and subsequent identification of units and/or specific nurses who perceive their work settings to be highly stressful and promptly intervening. Workload was perceived as the most frequently stressful aspect of oncology nurses work. This is not surprising as workload has been a well-known nursing issue for decades. With the use of workload measurement
tools in many health care organizations, procedures are in place to measure workload daily. However, enhanced nursing-focused support strategies are needed. Ensuring oncology nurses can access empowering learning structures, and subsequently, experience the fruits of a spiritual work setting, were shown to reduce perceptions of nursing stress in this study. The success of these support strategies however, requires concerted organizational support. Increasing staffing levels, implementing on-call staffing systems, ensuring guaranteed breaks, and integrating lean (Jones & Womack, 2003) approaches to work organization, may further create space for empowering learning conditions and subsequent work spirit experiences to be even more successful.

In contrast to workload, the EFA informed/newly-combined problems with physicians and other nurses component was reported as the least stressful. This result is likely reflective of the way in which nurse-physician relationships have evolved over the past few decades. In oncology, a recent study revealed Ontario cancer care nurses and oncologists rated their interprofessional interactions highly (Lee, Doran, Tourangeau, & Fleshner, 2014). This is an important finding as these relationships are critical to patients’ overall quality of care (Friese & Manojlovich, 2012), particularly given the important and difficult information both parties must share.

Findings from this study revealed acute care oncology nurses are a moderately committed professional group (\(M=4.73, SD=1.35\)). These results are somewhat higher than those reported by newly-graduated acute care RNs in Ontario (\(M=4.06, SD=1.22\); Smith et al., 2010). Affective organizational commitment of cancer care nurses will become increasingly important in the future, with forecasts of an increase in cancer risk as the current population ages (Canadian Cancer Society’s Advisory Committee on
Cancer Statistics, 2017; Statistics Canada, 2017). With a significant direct link from nursing stress to affective commitment identified in the present study, this finding further supports the need to create policies and processes that help to reduce the frequency with which nurses perceive their work as stressful; as a potentially sustainable means to increase work retention.

Physical health \( (M=10.82 \text{ [severity category=medium]}, SD=6.14) \) was rated at slightly below the scale midpoint of 16 and closer to better physical health. This result was only slightly lower than that of patients who attended a psychosomatic outpatient clinic in Germany \( (M=12.96 \text{ [severity category=high]}, SD=6.50; \text{ Gierk et al.}, 2015) \); though the timeframe for consideration in the present study was adjusted from seven days to 30. Oncology nurses reported being the most bothered by fatigue. According to the Canadian Centre for Occupational Health and Safety (2020) and Gander et al. (2019), fatigue resulting from shift work and/or extended hours can increase health care costs, impede patient care, compromise nurses’ safety and health, and lead to gastrointestinal disorders, cardiovascular disorders, exacerbation of existing disorders, and disruptions to both family and social life. Creating policies that limit 12-hour shift clustering, offering 8-hour shift options, as well as scheduled sleep break policies on night shifts (where they do not already exist), may be beneficial in reducing nurses’ fatigue. As well, having healthy snacks and beverages available might also be valuable. However, Gander et al. (2019) asserts that a \textit{one-size-fits-all} approach to managing fatigue is not always appropriate across diverse practice contexts. As such, a needs assessment may be required in each practice setting when creating policies to address this issue; with support from nursing unions, as applicable. Combating work stressors will also assist with
perceptions of physical health problems, as the link between stress and physical health was significant in this study. Occupational health screening and educational/symptom management support for physical health problems is also suggested. Participants in the present study were the least bothered by cardiopulmonary problems. This is not surprising as working in an acute care setting with significant cardiopulmonary problems, would undoubtedly be difficult.

Levels of perceived mental health ($M=70.51$, $SD=17.17$) were rated above the scale midpoint of 50 (i.e., closer to good mental health). This result was similar to a recent study of Australian health care workers, which included nurses ($M=76.8$; Milner, King, & Kavanagh, 2019). While this is somewhat reassuring, there is room for intervention. According to a systematic review conducted by Hall, Johnson, Watt, Tsipa, and O’Connor (2016), poor well-being (depression, anxiety, job stress, mental health, distress) has been inversely linked to patient safety across several studies. Implementing policies and programs to support oncology nurses’ mental health are therefore needed. Possible interventions may include: support for self-care, counseling resources, offering mental wellness assessments (if desired), staff recognition initiatives, staff retreats, and on site or online support groups. According to Kouzes and Posner (2012), recognizing contributions stimulates people’s ability to function at their best, particularly when work becomes difficult. As well, social support enhances psychological well-being and mental health (Kouzes & Posner, 2012).

**Implications for Nursing Education**

Testing a model that includes examination of an empowering workplace learning environment is beneficial for several reasons. First, exploration of whether oncology
nurses actually perceive their work setting as giving them access to the opportunity, information, support, and resources needed for learning, represents an advancement for nursing education science, and a novel way to examine structural empowerment at a deeper level. Knowledge is power, and given the autonomous nature of a nurse’s role, it is important to ensure nurses feel they have access to the necessary learning structures, to provide safe, quality, and ethical care to patients. Second, the link revealed between a structurally empowering learning environment at work (as defined in this study) and authentic leadership has not been previously examined. The link represents a novel finding for nursing education research focused on workplace learning. Aside from an empowering learning environment, the results of this study also point to opportunities for educators to consider holding in-services on the role of workplace spirituality in decreasing perceptions of work stress, and in turn, enhancing oncology nurses’ health and affective organizational commitment.

The study findings might also be useful to nursing faculty who prepare future graduates for the landscape of specialty nursing areas. Curricular changes that include a focus on ways to manage perceptions of and experience with nursing stress (i.e., primary prevention), through leadership efforts that promote an empowering learning environment, and subsequent support for workplace spirituality, would be best to discuss during one’s educational upbringing. As well, fostering an empowering learning environment in the classroom may be an additional way to introduce nursing students to what an empowering learning environment may look like in practice. Presently, many nursing programs across Ontario and elsewhere are philosophically grounded in empowering, learner centered, and heutagogical approaches, with a large focus on the
principles of andragogy and the importance of self-direction (Iwasiw, Andrusyszyn, & Goldenberg, 2020; Knowles, 1980).

**Implications for Nursing Theory/Research**

The results of this study present several implications for nursing theory and research. First, this study demonstrated that the complement of Avolio et al.’s (2004a) theory, Milliman et al.’s (2003) conception of workplace spirituality, and Kanter’s (1977) theoretical notions have explanatory value for influencing positive organization outcomes. The integrated model provided direct and indirect pathways to decreasing the frequency with which certain nursing situations are perceived as stressful. Further, the subsequent impact on affective commitment, and both physical health and mental health were apparent. These findings may signal an opportunity for further deductive study of these relationships in alternate nursing contexts/populations. Second, the EFA informed redevelopment of two work environment measures, presents opportunities for further study. The newly revised/developed tool for examining conditions for learning effectiveness at work, presents opportunities for a more focused examination of empowerment in diverse nursing areas. Given the need to maintain continuing competence (CNO, 2018a), maintaining a clear understanding of whether acute care nurses feel they have opportunities to learn and grow; information required to work effectively; support from supervisors, peers and subordinates; and resources to accomplish organizational goals (Kanter, 1977) is paramount. As well, the instrument may provide a blueprint for the creation of structurally empowering learning environments in hospital settings throughout the province. As well, the newly revised
nursing stress tool presents a means to examine nursing stress using an updated instrument more relevant to contemporary acute care nursing.

5.4 Limitations

As the study specifically focused on oncology RNs in acute care settings, the results may not be generalizable to other sectors. As well, causation cannot be inferred in the use of a non-experimental design as there was: no intervention, no randomization, and no control group (Woo, 2019). As a result, threats to internal validity are also concerning (Woo, 2019). The results do however have explanatory value in the use of theoretically derived hypotheses, as well as careful consideration of research design choices (Pedhazur & Pedhazur Schmelkin, 1991). Common method variance is also a concern, which refers to the amount of spurious covariance among the variables explored, by virtue of the common method used to collect the data (Buckley, Cote, & Comstock, 1990). Given the use of a survey in this study, this may relate to the potential effects of having the same rater respond to numerous questionnaire items at the same point in time. RSB was also a concern in the use of a self-report questionnaire (Woo, 2019). For example, respondents may choose to answer questions in a manner that will be viewed favourably by others (i.e., social desirability RSB). It is expected that this tendency was somewhat minimized by ensuring items were worded sensitively and confidentiality of responses was assured (Woo, 2019). Additionally, some degree of post hoc noted conceptual commonality may also be present among some of the variables. A further limitation includes the possibility that potential participant voices may be missing from the study if they failed to, or chose not to, complete/answer all questions presented, or did not allow the CNO to release their personal information for research purposes as part of their annual CNO license renewal.
In this study specifically, despite a request for a random sample of \( N = 1,000 \) acute care oncology practicing RNs in staff nurse positions, only 749 were available from the CNO. As such, a true simple random sample was not obtained. The pool of 749 participants, albeit large, became more of a convenience, non-probability sample as a result. According to Woo (2019), the problem with convenience sampling is that the people who are readily available, might be atypical of the overall population. As such, non-response bias may also be a concern, as it may be unreasonable to assume that those who responded were typical of the overall sample. However, support for a priori theory-driven prediction offsets the limitations related to generalizability to some extent (Laschinger et al., 2001a; Serlin, 1987). Lastly, it is likely that there are additional antecedents and consequences of nursing stress that were not examined in this study.

Given the highly personal nature of individual spirituality, it can be argued that it is difficult to capture using a standardized tool. Conceptual ambiguity has also plagued the development of both individual and workplace spirituality specifically; though this has changed in recent years. Close attention was paid to ensuring the tools chosen to represent individual and workplace spirituality were both parsimonious and psychometrically sound. Finally, studies to date frequently assume workplace spirituality and individual spirituality will result in positive outcomes. With this in mind, no potentially leading questions were included in the survey, nor was any correspondence to survey participants presented in a leading manner.

### 5.5 Dissemination and Knowledge Transfer

The ultimate aim of all nursing research is to add to the existing body of knowledge that guides practice. Dissemination of this study’s findings will be aimed at
hospitals, nursing academia, and organizations involved in oncology care across various disciplines. This may include publication in nursing and allied health journals dedicated to spirituality, leadership, administration, oncology, and the workplace. Research findings may be presented at workshops, scholastic institutions, hospitals, faith-based organizations, and conferences attended by hospital leaders and educators. Results may also be presented to politicians involved in health care policy development. This research may also be utilized to develop resource material in the form of print or web-based media, to be accessed by those working with cancer patients, and/or those experiencing stress within health care organizations.

5.6 Opportunities for Future Research

This study was the first to test the combination of Avolio et al.’s (2004a) model, Milliman et al.’s (2003) work, and Kanter’s (1977) theoretical notions in the acute care oncology nurse population. Replication of this study is suggested in other specialty areas (e.g., palliative and long-term care) and other provinces within Canada and across the globe. Examination of whether differences in perceptions exists among oncology nurses working in outpatient vs. inpatient acute care settings and/or adult vs. pediatric settings would also be valuable. Research investigating the impact of structurally empowering learning environments, workplace spirituality, and nursing stress on patient satisfaction and overall patient outcomes would also be worthwhile, given that quality patient care is a central goal of any acute care setting. Examination of the potential impact of additional healthy workplace interventions targeted at reducing perceptions of nursing stress, could also provide important insights into ways to further support oncology nurses in their work. As well, examination of the study variables in health care organizations whose
mission and vision are more theistically centered might also be interesting, in
determining whether differences exist based on religious affiliation. Qualitative research,
particularly ethnographic, could also provide added insight into what these nurses are
experiencing. Such studies could signal additional ways in which leaders could enhance
support of this highly valued priority group. Finally, conducting additional confirmatory
factor analyses of the measures used in this study with alternate samples is suggested;
particularly those with previously noted alterations/adaptations.

5.7 Conclusion

This study adds to the mounting repertoire of studies examining how best to
support acute care oncology nurses in their work. In the present study, a novel approach
to supporting cancer care nurses’ health and commitment was revealed, through the
complement of Avolio et al.’s (2004a) authentic leadership theory, Milliman et al.’s
(2003) conception of workplace spirituality, and a learning-centered version of Kanter’s
(1977) organizational empowerment theory. The results illustrate the impact that
authentic leaders can have on the work environment of acute care oncology nurses, with a
structurally empowering learning environment and workplace spirituality identified as
pathways to impact nursing stress, and foster commitment and health in this priority
group. More specifically, the study revealed the need for increased attention to hospital
learning environments and the more humanistic aspects of work (i.e., workplace
spirituality; Lavine, Bright, Powley, & Cameron, 2014). Failure to effectively address
issues affecting the health and affective commitment of today’s cancer care nurses will
continue to pose problems for nurses and organizations alike. More importantly, it may
have serious consequences for the patients and families who rely on them; both now and in the future.
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Appendices

Appendix A: Letters of Information

Exploring Mental Health, Physical Health, and Affective Commitment in Acute Care Oncology Nurses in Ontario

First Letter of Information to Study Participants

Principal Investigator:
Dr. Mary-Anne Andrusyszyn, RN, EdD, Professor

Co-Investigators:
Lesley Smith, RN, PhD Candidate
Dr. Carol Wong, RN, PhD, Professor
Dr. Yolanda Babenko-Mould, RN, PhD, Associate Professor
Dr. Barbara Pesut, RN, PhD, Associate Professor, and Canada Research Chair - Health, Ethics, and Diversity

Dear Nursing Colleague:

My name is Lesley Smith and I am a doctoral student in the Arthur Labatt Family School of Nursing at Western University. I would like to invite you to participate in a research study I am conducting by completing the enclosed questionnaire. I am interested in the experience of acute care oncology nurses within the province of Ontario, with the aim of hearing from 1,000 nurses. You have been randomly selected to participate in this study, because you indicated a willingness to be contacted for research purposes and noted that you work in acute care oncology, when you completed your annual College of Nurses of Ontario membership renewal. Given the fact that the workplace can have a large impact on an oncology nurses’ experience of work stress, it is important to understand how this environment can influence their health and commitment.
to their jobs, and how leadership can help. Your participation in this study may provide information that will help in creating meaningful work environments for those working with cancer patients and their families.

**Participation:**

In order to examine this topic, I will be using a validated questionnaire that asks for your opinion about your job and also about yourself. This form provides you with information about the study. Participation in this research study is voluntary (your choice). You may contact me at any time with any questions you may have, using the contact information provided below. You may refuse to participate, refuse to answer certain questions, or withdraw yourself from the study at any time. This will not affect your employment status in any way. Should you wish to withdraw from the study after you have mailed back your questionnaire, please contact me as per the information provided, and your hard copy survey will be shredded and disposed of in a secure container; and your data removed from the study completely. It is estimated that the questionnaire will take you approximately 20 minutes to complete. I encourage you to answer all of the questions listed in the questionnaire, however if you do not wish to answer specific questions, please feel free to leave them blank.

**Confidentiality:**

Your responses will be confidential to the research team. Individual responses will only be seen by the researcher who will enter your responses into a secure computer file for data analysis. Questionnaires will be identified by a code number so that reminder letters can be sent to individuals who have not yet responded. The coding system involves application of a specific code to each questionnaire matching
respondents separate contact information. This will enable me to identify participants who have not yet responded, while ensuring that all questionnaire data remains confidential; and that names are never attached to actual surveys. All collected data will be kept in a locked cabinet, in a locked office; accessible only to the researcher.

Completion and return of the questionnaire indicates your consent to participate in the study. Upon completion of the study, all data will be retained for a maximum of five years to ensure the research team has the ability to confirm the validity of the study results if needed. To further protect your confidentiality, only grouped data will be reported in all study communications. Your name will not be used and no information that discloses your identity will be released or published. Access to the aggregate data will be restricted to members of the research team only.

Correspondence:

In an attempt to enhance response rates, you may receive follow-up reminders encouraging participation in this research study. In the event you choose not to participate and would not like to receive further mailings, please return the blank questionnaire to the research team in the envelope provided. Alternatively, you may choose not to return your questionnaire as notice of your decision not to participate, which will involve no action on your part. Should you wish to have a copy of the results, please answer yes to the study results question located at the end of your survey package. Based on your response, the code attached to your survey package will enable me to access your contact information and provide you with a copy of the results. Please feel free to answer yes to this question regardless of your choice to participate in actual study.
While the results of this study may be published, they are based on a large sample of respondents, so that it will be impossible for individual responses to be identified.

**Ethical Considerations:**

You may not benefit personally from participation in this study. However, findings from this study will be important to nurse leaders and health care administrators at all levels of the health care hierarchy in identifying potential ways to support oncology nurses in their work. There is a potential risk of privacy breach, though this is not anticipated due to the secure measures put in place to protect your data noted above. In the event that the recollection of workplace stress causes you emotional distress, resources and referrals will be made available to you. Please do not hesitate to contact the referral services listed at the end of this letter should you experience any emotional distress in filling out the questionnaire.

**Contact:**

Should you choose to participate, please use the envelope provided to return the questionnaire to the research team at Western University. As a small token of appreciation for your time and contribution to this study, I have enclosed a seed pod for you to plant at your leisure. This gift is completely yours to keep, regardless of your decision to participate. As well, there is also an option to enter into a draw to win one 6th generation 32GB Apple iPod touch, as an additional token of appreciation. Should you wish to be entered into the draw, please answer yes to the *study draw* question located at the end of your survey package. Please feel free to answer yes to this question regardless of your choice to participate in the study. Only the code attached to your survey will be entered into the draw. However, should you win, your code will be used to access your
contact information, to facilitate mailing of the iPod. If you have any questions or concerns about the conduct of this study or your rights as a research subject, please feel free to contact: Office of Research Ethics, Western University. [redacted] or email: [redacted] This letter is yours to keep.

Representatives from Western University’s Health Sciences Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research. Should you have any further questions about the research, please do not hesitate to contact me or my supervisor, using the contact information provided below. Thank you very much for considering this request and I look forward to hearing from you.

Sincerely,

Lesley Smith, RN, PhD Candidate, Co-Investigator

Dr. Mary-Anne Andrusyszyn, RN, EdD, Professor, Principal Investigator

Referral Services:

*Occupational Health Clinics for Ontario Workers (OHCOW)*
Exploring Mental Health, Physical Health, and Affective Commitment in

Acute Care Oncology Nurses in Ontario

Second Letter of Information to Study Participants

Dear Nursing Colleague:

You may recall that a package containing an information letter and questionnaire regarding a research study being conducted to examine oncology nurses perceptions of their work environment was sent to you approximately two weeks ago.

If you have already responded by returning your completed questionnaire, I sincerely thank you for your time and support. If you have not responded, I encourage you to consider filling out the questionnaire, to assist me in accurately representing the experiences of oncology nurses across Ontario. Participation is strictly voluntary; therefore, I fully understand that you may have chosen not to participate in this study. If you do not wish to participate, please return the blank questionnaire in the pre-addressed, stamped envelope, after which you will not be contacted further. Alternatively, you may choose not to return a questionnaire as notice of your decision not to participate, which will involve no action on your part.

In the event that the recollection of workplace stress causes you emotional distress, please do not hesitate to contact the referral services listed at the end of this letter.

If you have any questions regarding this study, please do not hesitate to contact me or my supervisor by email or phone.

Sincerely,
Lesley Smith, RN, PhD Candidate, Co-Investigator

Dr. Mary-Anne Andrusyszyn, RN, EdD, Professor, Principal Investigator

Referral Services:

_Occupational Health Clinics for Ontario Workers (OHCOW)_
Exploring Mental Health, Physical Health, and Affective Commitment in
Acute Care Oncology Nurses in Ontario

Third Letter of Information to Study Participants

Dear Nursing Colleague:

Approximately five weeks ago, a letter was sent to you inviting you to participate in a study of oncology nurses’ perceptions of their work environments. Unfortunately, I have not heard from you and am writing to ask you one last time to consider helping me with this study by completing the questionnaire. I realize that nurses often have busy lives and that time is very valuable. However, if you could find some time to complete the questionnaire, I would truly appreciate your help.

I want to assure you that your responses will remain confidential and that no individual nurses’ responses will ever be identified when sharing the results. I would also be happy to send you a copy of the final results if you wish to have them; regardless of your choice to participate in the actual study. The option to obtain a copy of the results is included in a question at the end of your survey package.

As participation is strictly voluntary, I understand that you may have chosen not to participate in this study. However, if you have misplaced the first questionnaire package, I have enclosed an additional copy with the hope that you will share your thoughts by completing the questionnaire.

In the event that the recollection of workplace stress causes you emotional distress, please do not hesitate to contact the referral services listed at the end of this letter.
If you have already responded, I thank you for your time and support. If you do not wish to participate, please return the blank questionnaire in the pre-addressed, stamped envelope, after which you will not be contacted further. Alternatively, you may choose not to return a questionnaire as notice of your decision not to participate, which will involve no action on your part. Should you have any questions regarding this study, please do not hesitate to contact me or my supervisor by email or phone.

Sincerely,

Lesley Smith, RN, PhD Candidate, Co-Investigator

Dr. Mary-Anne Andrusyszyn, RN, EdD, Professor, Principal Investigator

Referral Services:

*Occupational Health Clinics for Ontario Workers (OHCOW)*
Appendix B: Instruments

*Authentic Leadership Questionnaire* (Avolio et al., 2007)

The following survey items refer to your leader’s (immediate manager) style, as you perceive it. **Judge how frequently each statement fits his or her leadership style using the following scale:**

Note: your immediate manager is the person you report to directly and is responsible for your performance appraisal.

<table>
<thead>
<tr>
<th>0 = Not at all</th>
<th>1 = Once in a while</th>
<th>2 = Sometimes</th>
<th>3 = Fairly often</th>
<th>4 = Frequently, if not always</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**My Immediate Manager:**

- 10. Solicits view that challenge his or her deeply held positions
- 12. Listens carefully to different points of view before coming to conclusions
- 13. Seeks feedback to improve interactions with others

© 2007, Avolio, Gardner, & Walumbwa, All rights reserved, Mind Garden ([www.mindgarden.com](http://www.mindgarden.com))  
*Note: Sample items provided only. Full instrument not included for copyright purposes.*
Workplace Spirituality Scale (Milliman et al., 2003)

<table>
<thead>
<tr>
<th>1 = Disagree strongly</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>7 = Agree strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I experience joy in my work</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2. My spirit is energized by my work</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>3. The work I do is connected to what I think is important in life</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Note: Sample items provided only. Full instrument not included for copyright purposes.
Conditions for Learning Effectiveness Questionnaire-Education Revised (Siu et al., 2005)

Please answer the following questions as they relate to your learning experiences on your unit. Indicate your choice by circling the appropriate number on the scale beside each item.

Note: modifications from the original scale are indicated in *italics*.

<table>
<thead>
<tr>
<th>How much support for the following is present?</th>
<th>None</th>
<th>Some</th>
<th>A Lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Specific information about the things you do well</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Specific comments about things you could improve</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Helpful hints or problem solving advice</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

*Note: Sample items provided only. Full instrument not included for copyright purposes.*
**Nursing Stress Scale Revised** (Gray-Toft & Anderson, 1981)

Note: modifications from the original scale are indicated in *italics*

<table>
<thead>
<tr>
<th></th>
<th>1 - Never</th>
<th>2 - Occasionally</th>
<th>3 - Frequently</th>
<th>4 - Very frequently</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Breakdown of <em>technology</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Unpredictable staffing and scheduling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Too many non-nursing tasks required, such as clerical work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Sample items provided only. Full instrument (including survey completion instructions) not included for copyright purposes.*
Affective Commitment Scale (Meyer & Allen, 2004; Meyer et al., 1993)

Listed below is a series of statements that represent feelings that individuals might have about the company or organization for which they work. With respect to your own feelings about the particular organization for which you are now working, please indicate the degree of your agreement or disagreement with each statement by circling a number from 1 to 7 using the scale below.

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Slightly disagree</th>
<th>Undecided</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I would be very happy to spend the rest of my career with this organization</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. I really feel as if this organization's problems are my own</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. I do not feel a strong sense of &quot;belonging&quot; to my organization</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Note: Sample items provided only. Full instrument not included for copyright purposes.
Mental Health Inventory-5 (Veit & Ware, 1983)

<table>
<thead>
<tr>
<th>1 - All of the time</th>
<th>2 - Most of the time</th>
<th>3 - A good bit of the time</th>
<th>4 - Some of the time</th>
<th>5 - A little of the time</th>
<th>6 - None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Have you felt calm and peaceful?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

© Developed at RAND as part of the Medical Outcomes Study

Note: Sample item provided only. Full instrument (including survey completion instructions) not included for copyright purposes.
**Somatic Symptom Scale-8 Revised** (Gierk et al., 2014; Kroenke et al., 2002)

During the past 30 days, how much have you been bothered by any of the following problems?

Note: modifications from the original scale are indicated in *italics*

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little bit</th>
<th>Somewhat</th>
<th>Quite a bit</th>
<th>Very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Stomach or bowel problems</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Back pain</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Pain in your arms, legs, or joints</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

*Note: Sample items provided only. Full instrument not included for copyright purposes.*
**Brief Daily Spiritual Experience Scale Revised** (Idler et al., 2003; Underwood, 2006)

<table>
<thead>
<tr>
<th><em>Never or almost never</em></th>
<th><em>Once in a while</em></th>
<th><em>Some days</em></th>
<th><em>Most days</em></th>
<th><em>Every day</em></th>
<th><em>Many times a day</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3. I feel deep inner peace or harmony</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© Lynn Underwood [www.descale.org](http://www.descale.org) permission required to copy or publish

*Note: Sample item provided only. Full instrument (including survey completion instructions) not included for copyright purposes.*
Demographic Questionnaire

Please tell me a little bit about yourself and your workplace.

1. **Present Age:**
   - Years: _____

2. **Sex:**
   - Male: _____
   - Female: _____
   - Other: _____

3. **How long have you worked as an RN?**
   - Years: _____
   - months: _____

4. **How long have you worked as an RN on your current unit?**
   - Years: _____
   - months: _____

5. **How long have you worked as an RN at your current organization?**
   - Years: _____
   - months: _____

6. **Work Status (circle answer):**
   - Casual
   - Part time
   - Full time

7. **How many hours do you typically work within a week? (circle answer):**
   - Less than 20
   - 20-39
   - Over 40

8. **Workplace type (circle answer):**
   - Acute care
   - Community
   - Long-term care
   - Other, please specify: _____

9. **What is the specialty area of your current unit (circle answer):**
   - Oncology
   - Other, please specify: _____

10. **Highest level of education (circle answer):**
    - Diploma
    - BScN
    - MScN
PhD
Other, please specify: _____

11. My immediate supervisor is (circle answer):
    An RN
    Other, please specify: _____

12. Nursing was my first choice as a career.
    Yes: _____  No: _____

13. Oncology was my first choice of nursing specialty.
    Yes: _____  No: _____

Thank you very much for taking the time to fill out our survey!
Your participation is appreciated!

If you have any questions please feel free to contact: lmsmith@uwo.ca

Please return your survey in the prepaid envelope provided.
Your responses will be kept confidential.

Study Results
Do you wish to obtain a copy of the study results?
    Yes: _____  No: _____

Study Draw
Do you wish to be entered into a draw to win one 6th generation 32GB Apple iPod touch?
    Yes: _____  No: _____
Appendix C: Instrument Permissions

*Authentic Leadership Questionnaire* (Avolio et al., 2007)

Lesley Smith

To whom it may concern,

This letter is to grant permission for Lesley Smith to use the following copyright material for his/her research:

Instrument: *Authentic Leadership Questionnaire (ALQ)*

Authors: Bruce J. Avolio, William L. Gardner, and Fred O. Walumbwa

Copyright: 2007 by Bruce J. Avolio, William L. Gardner, and Fred O. Walumbwa

Three sample items from this instrument may be reproduced for inclusion in a proposal, thesis, or dissertation.

The entire instrument may not be included or reproduced at any time in any published material.

Sincerely,

Leslie Strugar

Mind Garden, Inc.
www.mindgarden.com

---

**Authentic Leadership Questionnaire Research Permission**

Bruce J. Avolio, William L. Gardner, and Fred O. Walumbwa

Prepared on October 17, 2017 for:

Lesley Smith

You completed your evaluation at 12:47 AM EDT on September 28, 2017.
Hi Lesley,

Attached is the survey that we used. Two of the three workplace spirituality items are from Ashmos and Duchon (2000). If you want to measure more of a sense of community with one's work group then I would suggest looking at their community scale. If you want a scale that measures one's sense of community more with their overall organization (not just one's department or work team) then you may want to use our community scale.

Best of luck on your research!

John

John Milliman, PhD
Professor
Department of Management
College of Business
University of Colorado Springs
1420 Austin Bluffs Parkway
Colorado Springs, CO 80917
Dear Lesley,

Thank you for your interest in the *Conditions for Learning Effectiveness Questionnaire-Education*; as well as your requested changes to account for learning environments of oncology nurses within the clinical workplace setting. You are welcome to adapt and use the tool for the purposes of your research. When available, I ask that you please share the psychometric results of the tool. All the best with your research, and I look forward to hearing about your study results.

Kind regards,
Heidi

_____________________________
Dr. Heidi Siu, RN, BScN, MScN, PhD
Professor
Nursing Stress Scale Revised (Gray-Toft & Anderson, 1981)

Re: Nursing stress scale
Anderson, James G
Mon 2017-10-02 1:41 PM
To: Lesley Marie Smith

Lesley, you have our permission to use the attached Nursing Stress Scale. Best wishes.

James G. Anderson, Ph.D.
Professor of Medical Sociology
Professor of Health Communication
Fellow American College of Medical Informatics
Fellow Center for Education and Research in Information Assurance and Security
Affective Commitment Scale (Meyer & Allen, 2004; Meyer et al., 1993)

Re: Affective commitment subscale - Tool request
John Peter Meyer
Thu 2017-09-28 8:46 PM
To: Lesley Marie Smith

Dear Leslie,

You can get our commitment measures and permission to use them for academic research purposes from http://employeecommitment.com. I hope all goes well with your research.

Best regards,
John Meyer
Mental Health Inventory-5 (Veit & Ware, 1983)
Lesley,

thank you very much for your kind email. Your project sounds very interesting. Please feel free to use the SSS-8. There are no fees or license requirements. The items are included in the publication attached to this email.

I hope it will be helpful. Please don't hesitate to mail me again if you need any further information.

Good luck with your project and best regards,
Benjamin
Brief Daily Spiritual Experience Scale Revised (Idler et al., 2003; Underwood, 2006)

Re: Brief Daily Spiritual Experience Scale - Tool Request
Lynn Underwood
Thu 2017-09-28 11:29 AM
To: Lesley Marie Smith

Dear Ms Smith,

You have my permission to use the Daily Spiritual Experience Scale for non-profit use if you return the attached registration form to me and agree to the terms of use. If you do make alterations I would ask that you run these by me.

I have written a book on the scale designed for personal and professional use, *Spiritual Connection in Daily Life: 16 Little Questions That Can Make a Big Difference*, and it has been published in paperback. Information on it can be found at www.lynnunderwood.com/book. I think it would be helpful in your work with the scale. It is not expensive, and is on Amazon and in bookstores. In 2016 an international ebook is now available on Amazon international sites.

Also, on the www.lynnunderwood.com/book section of the site are some versions of the scale with alternate wording options in line rather than just in the introduction. This may be a good starting point for you if you want to make changes.

There was a recent radio interview on the scale http://www.abc.net.au/radionational/programs/spiritofthings/are-you-spiritually-connected/8376242. You might find it of interest.

A copy of the 6 item scale can be found in Underwood 2011. I will attach it.

Best wishes to you in your life and in your work,

Lynn Underwood PhD
Senior Research Associate

www.dsescale.org
Appendix D: Ethics Approval

Initial Ethics Approval

Western University Health Science Research Ethics Board
HSREB Delegated Initial Approval Notice

Principal Investigator: Dr. Mary Anne Andrulyszyn
Department & Institution: Health Sciences/Nursing, Western University

Review Type: Delegated
HSREB File Number: 109463
Study Title: Exploring Mental Health, Physical Health, and Affective Commitment in Acute Care Oncology Nurses in Ontario

HSREB Initial Approval Date: August 21, 2017
HSREB Expiry Date: August 21, 2018

Documents Approved and/or Received for Information:

<table>
<thead>
<tr>
<th>Document Name</th>
<th>Comments</th>
<th>Version Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western University Protocol</td>
<td></td>
<td>2017/08/17</td>
</tr>
<tr>
<td>Letter of Information &amp; Consent LOI 3</td>
<td>2017/08/14</td>
<td></td>
</tr>
<tr>
<td>Letter of Information &amp; Consent LOI 2</td>
<td>2017/08/14</td>
<td></td>
</tr>
<tr>
<td>Letter of Information</td>
<td>LOI 1</td>
<td>2017/07/31</td>
</tr>
<tr>
<td>Instruments</td>
<td></td>
<td>2017/08/01</td>
</tr>
</tbody>
</table>

The Western University Health Science Research Ethics Board (HSREB) has reviewed and approved the above named study, as of the HSREB Initial Approval Date noted above.

HSREB approval for this study remains valid until the HSREB Expiry Date noted above, conditional to timely submission and acceptance of HSREB Continuing Ethics Review.

The Western University HSREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use Guideline for Good Clinical Practice Practices (ICH E6 R1), the Ontario Personal Health Information Protection Act (PHIPA, 2004), Part 4 of the Natural Health Product Regulations, Health Canada Medical Device Regulations and Part C, Division 5, of the Food and Drug Regulations of Health Canada.

Members of the HSREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The HSREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000940.

Ethics Office, on behalf of Dr. Joseph Gilbert, HSREB Chair
EO: Erika Basil
Grace Kelly ___ Kateyn Harris ___ Nicola Morphet ___ Karen Gopaul ___ Patricia Sargeant ___

Western University, Research Support Services
Amended Ethics Approval

Western Research

Date: 2 November 2017

To: Mary Anne Andreaty

Project ID: 109463

Study Title: Exploring Mental Health, Physical Health, and Affective Commitment in Acute Care Oncology Nurses in Ontario

Application Type: HSREB Amendment Form

Review Type: Delegated

Full Board Reporting Date: 21 NOV 2017

Data Approval issued: 02 Nov 2017 11:38

REB Approval Expiry Date: 21 Aug 2018

Dear Mary Anne Andreaty,

The Western University Health Sciences Research Ethics Board (HSREB) has reviewed and approved the WREM application form for the amendment, as of the date noted above.

Documents Approved:

<table>
<thead>
<tr>
<th>Document Name</th>
<th>Document Date</th>
<th>Document Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrument Revised: October 30 2017 clean copy</td>
<td>30 Oct 2017</td>
<td></td>
</tr>
<tr>
<td>Western Protocol Revised October 30 2017 clean copy</td>
<td>30 Oct 2017</td>
<td></td>
</tr>
</tbody>
</table>

REB members involved in the research project do not participate in the review, discussion or decision.

The Western University HSREB operates in compliance with, and is constituted in accordance with, the requirements of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2), the International Conference on Harmonization Good Clinical Practice Consolidated Guideline (ICH GCP), Part C, Division 4 of the Food and Drug Regulations; Part 4 of the Natural Health Products Regulations; Part 3 of the Medical Devices Regulations; and the provisions of the Ontario Personal Health Information Protection Act (PHIPPA 2004) and its applicable regulations. The HSREB is registered with the U.S. Department of Health & Human Services under the IEB registration number NIOS 0000940.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Nicole Googhevan-Muir, Ethics Officer on behalf of Dr. Joseph Gilbert, HSREB Chair
Curriculum Vitae

Name: Lesley Marie Smith

Post-secondary Education and Degrees:

The University of Western Ontario
London, Ontario, Canada
2001-2005 B.Sc.N.

The University of Western Ontario
London, Ontario, Canada
2000-2006 B.Mus.A. (Voice)

The University of Western Ontario
London, Ontario, Canada
2007-2010 M.Sc.N.

Western University
London, Ontario, Canada
2011-2020 Ph.D.

Honours and Awards:

Western Entrance Scholarship
2000-2001

Canada Millennium Scholarship

Sigma Theta Tau International Society of Nursing Research Grant
2008

Alexander Hotson Award
2010

Ontario Graduate Scholarship
2013-2014

Student Appreciation Award Nominee
2017, 2019

Related Work Experience:

Registered Nurse
London Health Sciences Centre
2005

Registered Nurse
Children’s Hospital London Health Sciences Centre
2008-2009
Practical Nursing Instructor  
Conestoga College Institute of Technology and Advanced Learning  
2009-2010

Research Assistant  
Western University  
2009-2012

Teaching Assistant  
Western University  

Registered Nurse  
Hospital for Sick Children  
2006-Present

Bachelor of Nursing Professor  
University of New Brunswick-Humber College  
2014-Present

Publications:


