Quality of Work Life: Investigation of Occupational Stressors among Obstetric Nurses in Northeastern Ontario

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy (PhD) in Interdisciplinary Rural and Northern Health

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Laurentian University
Sudbury, Ontario, Canada

THESIS DEFENCE COMMITTEE/COMITÉ DE SOUTENANCE DE THÈSE
Laurentian Université/Université Laurentienne
School of Graduate Studies/École des études supérieures

Title of Thesis Titre de la thèse	QUALITY OF WORK LIFE: INVESTIGATION OF OCCUPATIONAL STRESSORS AMONG OBSTETRIC NURSES IN NORTHEASTERN ONTARIO
Name of Candidate Nom du candidat	Nowrouzi, Behdin
Degree Diplôme	Doctor of Philosophy

Department/Program Département/Programme	Rural and Northern Health	Date of Defence Date de la soutenance	August 19, 2013

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Abstract

Purpose: Nursing is a stressful occupation with various physical and psychosocial stressors inherent in its practice. While the physical stressors of nursing are generally understood, less understood are the psychological and social stressors of the profession. With the many changes in healthcare facilities and structures that are occurring today and, in turn, affecting nurses, it is increasingly important to better understand the psychosocial stress experiences of nurses. Grounded in the Job Demand-Control-Support Framework, the objectives of this study were to: 1) examine factors associated with quality of work life (QWL) of Registered Nurses working in four small urban hospital-based obstetric programs, 2) determine if nursing occupational stress, QWL, and various factors (e.g., demographic, locations with and without cross-training) are associated with nurses' work ability, where work ability is the worker's capacity to perform their work, as was measured by the work ability index, and 3) review and evaluate some workplace interventions targeting occupational stress management and burnout for nurses.

Methods: A mixed methods approach was used. A cross sectional study was conducted in 2012 in four northeastern Ontario hospitals (i.e., Health Sciences North, North Bay Regional Health Centre, *The* Sault Area Hospital, and Timmins and District Hospital). Only at Health Sciences North were nurses cross-trained to work in any of the three areas of the birth unit (labour, delivery and post-partum). A stratified random sample of registered nurses (n=111) was selected from the total number of 138 registered nurses on staff in the labour, delivery, recovery, and postpartum areas. Participants provided demographic details and answered questions about work stress, work ability, and quality of work life, using either online or paper-based questionnaires. This was followed by six semi-structured qualitative interviews that were used to investigate QWL, stress and related factors in greater depth.

Results: A total of 51 (45.9% response rate) online questionnaires were returned while another 60 (54.1% response rate) paper-based questionnaires were completed. In total, 111 nurses completed the survey (80.4% response rate). The majority of participants were female (94.6%) ranging in age from 24 to 64 years (mean= 41.9, s.d. =10.2). Location of cross-training was associated with a high QWL (OR: 3.82, 95% CI, 1.01 to 14.5). Three variables, QWL (p=0.005), location with cross-training (p=0.048), and mean number of patients per shift (p=0.024), significantly contributed to the variance in work ability scores. In logistic regression modeling, the factor significantly associated with high work ability was home-work interface (OR: 1.32; 95% CI, 1.06 to 1.66). The five key themes that emerged from the qualitative analysis were: workplace stress, relationships with colleagues, changes in care delivery and model of care, demands for resources, and QWL.

Conclusion: The study results suggest that place may be an important influence on the stress and quality of work life of obstetrical nurses. Importantly, the nurses in Sudbury—the largest city with the largest participating hospital in the study—were cross-trained in their practice of obstetrics. The nurses in the other three locations were not cross-trained. Given this circumstance, location of cross-training as a possible factor in decreasing stress and enhancing quality of work life warrants further investigation. Hospital size, size of the community, continuing education opportunities, organizational structure and leadership, are some additional factors meriting investigation for their possible impact on quality of work life and stress among nurses.

The study also contributes to understanding of work ability in relation to the occupational health of obstetrical nurses. In order to be high functioning, workplaces need to maximize the employees' actual and potential skills and ameliorate and working conditions. In northern

Ontario, positive work settings are imP.ortant to the recruitment and retention of nurses, and therefore, further study of occupational stress among nurses working in this geographic area.

Acknowledgements

I would like to thank my supervisor Dr. Nancy Lightfoot for all the support and encouragement she has provided throughout my duration in the Interdisciplinary PhD program. I have learned a great deal about the many facets of interdisciplinary health research. This experience has been both challenging and extremely rewarding. I will always look back on this mentorship experience with fond memories.

I would also like to extend my grateful appreciation to my thesis committee members: Dr. Lorraine Carter for her continued support and assistance with the qualitative analyses; Dr. Michel Larivère for his thought provoking questions regarding occupational health and his expertise in the area of multivariate analyses; Dr. Ellen Rukholm for her invaluable input and for ensuring that a nursing perspective remained at the forefront of the thesis; and Dr. Robert Schinke for his guidance and assistance with the qualitative analyses. As well, I would like to express appreciation to Diane Gardner-Belanger for her support of the project and direction throughout this undertaking.

I would like to thank my family, especially my mother, Dr. Akhtar Tajaddod for her support thought the years. I cannot express in words how much your incredible understanding, care, and support means to me. Finally, I would like to thank my best friend, fiancée, and partner in life, Jennifer Casole, for her patience and persistence in encouraging me to complete this work. Thank you for your support throughout my graduate studies.

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Paper 2, Work Ability and Work-related Stress: A Cross sectional Study of Obstetrical Nurses in Urban Northeastern Ontario. Paper located in Chapter V.

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Paper 3, Paper #3 Occupational Stress Management And Burnout Interventions In Nursing And their Implications For Health Work Environments: A Literature Review. Paper located in in Chapter VI.

First author wrote the manuscript and the remaining authors helped with data analyses and manuscript preparation. Other authors also helped with interpretation of the study findings.

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1. Introduction

For 30 years, the United States National Institute for Occupational Safety and Health has recognized the importance of occupational stress by identifying stress-related psychological disorders among the ten leading work-related diseases and injuries [1]. Given the widespread impact of workplace stressors on working people's health, substantial health and economic costs, both related to absenteeism and decreased productivity, should not be surprising [2]. Between 50% to 80% of the diseases experienced by employees at work are stress-related; higher levels of job stress can lead to poor health outcomes and injury [1]. Stress is also a significant contributing factor to organizational inefficiency, high staff turnover, absenteeism because of occupational stress, increased costs of health care, and decreased job satisfaction [3]. According to the *Canadian Community Health Survey: Mental Health and Well-being* (2004), of 36,984 Canadians who reported on their stress at work, 38.8% of participants between the ages of 15 and 75 stated being slightly stressed at work; 25% were relatively stressed at work and 5.4% were extremely stressed at work [4]. Job stress has also been linked to psychosocial types of stress including the following: burnout [5-8], job dissatisfaction [9-11], role conflict, [12] and role stress [12, 13]. Stress-related health problems and issues can include: gastrointestinal problems, sleep disturbances, mood fluctuations, headaches, as well as acrimonious relationships with family and friends [14, 15]. A growing body of evidence supports the assertion that workplace stress plays an important role in several types of chronic health problems, in particular, cardiovascular disease [16, 17], diabetes [18], and chronic low back pain [19-21].

Work, then, is a significant cause of ill health [22] and occupational ill health is expensive both in human and financial terms [22]. The direct costs of treating work-related illnesses and injuries and the indirect costs are borne, to some extent, by the employer [23]. Although employers seldom pay directly for hospital, medical, and pharmaceutical costs,

employers do pay health insurance premiums (e.g., workers' compensation boards) and workers' compensation benefits [23]. Nowhere are the increasing costs of work-related chronic ill health more apparent than in the area of occupational stress [15]. The International Labour Organization has reported that inefficiencies arising from occupational stress may cost up to 10% of a country's gross national product [24]. Therefore, occupational stress presents serious health and social problems. This is particularly true in the profession of nursing.

Nursing is a stressful occupation [25] with physical and psychosocial stress inherent in practice [26]. Indeed, stress in nursing has been an area of research for nearly 50 years [27, 28]. At the same time, it should be noted that stress is unavoidable and may even be desirable to a certain degree [26, 29]. At moderate levels, stress is a motivator and improves a worker's participation in his or her job. However, when stress becomes excessive, it may become distracting, de-motivating, and even hazardous[29]. In 2004, the Canadian Federation of Nurses Union reported that 86% of nurses experienced their workplaces as stressful; 86% reported their workplace as understaffed; 88% said they were under-resourced at work; and 91% reported heavy workloads [30]. In the 1990s in Canada, healthcare experienced a period of downsizing and restructuring [31]. The outcome was that many nurses found themselves in occupationally stressful work settings [30]. During this period, shortened inpatient hospital stays, transfer of care to out-patient and community settings, and decreases in nurse-to-patient ratios occurred [30].

According to the results of the 2005 *National Survey of the Work and Health of Nurses*, absenteeism rates for nurse supervisors and registered nurses totaled 17.7 million hours (e.g., due to illness and injuries) per year [32]. This is the equivalent of 9,754 full-time nursing jobs [32]. Furthermore, the results indicated that unpaid overtime was even more common among nurses

than paid overtime. Over half (54%) of nurses said that they often arrived early or worked late in order to get their work done; 62% reported working through breaks. Two-thirds (67%) felt that they often had too much work for one person and 45% said that they were not given enough time to do what was expected of them[32].

Working in obstetrics for physicians has shown to be an especially stressful area of healthcare [33] because of its long work hours and the disruptions of personal time. There is limited research examining the obstetrical nursing environment. Given the amount of time and energy people expend at the workplace, it is crucial for employees to be satisfied with their lives at work [34]. Work occupies an important place in many individuals' lives, and the workplace environment is likely to affect not only their physical but also their psychological well-being and quality of work life (QWL) [35].

Occupational Stress and Its Implications for Nurses

Developing an understanding of the current evidence as it relates to occupational stress is critical to this investigation. Excessive occupational stress has been linked with increased susceptibility for physical and mental health issues, decreased job satisfaction, role conflict, geography (e.g., teaching versus community hospitals) and role stress [36-40]. Supporting the link between job stress and job satisfaction is a cross sectional Icelandic study of 219 randomly selected nurses. The authors confirmed a relationship between occupational stress and various factors that include strenuous working conditions, opportunities to practice different aspects of the professional role, and support from co-workers [41]. Further, the strenuous conditions of Icelandic nurses were experienced more severely among hospital nurses than among nurses working outside hospital settings [41]. Hospital nurses worked more hours per week, provided more direct patient care, and had fewer opportunities to take breaks at appointed times than other

nurses. Hospital units likewise experienced greater staff shortages than other nursing settings [41]. Nurses working in hospitals also experienced more unforeseen changes in their work schedules than nurses working in other settings [41]. Future studies are recommended into factors associated with occupational stress (e.g., workload, autonomy to make decisions, level of time-pressure demands). Research into the impact of working in rural and northern settings and how such characteristics might influence nurses' choice of workplace and specialty is also recommended.

There is growing recognition of the problem posed by occupational stress in obstetrics. Labour and delivery units are among the most challenging hospital units because of long work hours and disruptions to nurses' personal time [31]. In a cross sectional survey design study, a convenience sample of 107 southern Ontario nurses across various units (including labour, delivery, recovery, and postpartum areas) were asked to rate their occupational stress, job satisfaction, and coping strategies using measures of job stress [31]. The largest number of respondents were from medical wards (18.7%), followed by surgical (14%), chronic (12.1%), labour and delivery (10.3%), intensive care units (9.3%), ER (7.5%), OR (3.7%), special care nursery (3.7%), obstetrics (2.8%), psychiatric (2.8%), and 12% from other wards. Avoidance, social support, and a tendency to turn to others for advice and comfort were found to be significantly linked with job stress, although none of these coping strategies decreased nurses' levels of organizational stress [31]. However, a relationship between problem resolution and job satisfaction was reported to be highly significant, and it added 42% to predicting stress levels [31]. While the results support the link between job stress and poor health outcomes, the study focused had several limitations. First, the research focused only on two community hospitals in southern Ontario and the results may not be generalizable to the rest of region or province [31]. Moreover,

obstetrical nurses formed only a small part of the total sample (2.8%). Another limitation was its convenience sampling strategy, which was a threat to the study's external validity. Future studies may include longitudinal studies that examine on the long-term effects of hospital restructuring, coping strategies over time, and nurses' job satisfaction [36]. Such a study is important because restructuring often places nurses in working environments that are under-resourced and involve high patient to nurse ratios. Additionally, nurses may perceive restructuring as devaluation of their professional role, status, and worth [42]. Studies exploring these ideas are particularly warranted in rural and northern settings.

The dearth of rural nursing studies makes it impossible to know whether rural and urban nurses perceive personal and organizational factors of job satisfaction comparably [43]. Using a mixed-method design, Molinari and Monserud recruited 103 rural hospital registered nurses (RNs) from hospitals throughout northwest United States [43]. Only RNs working for more than one year were asked to participate in the study; the authors did not justify their inclusion criterion. Through analysis of open-ended questions, themes were identified that were subsequently used to explain and support the quantitative findings [43]. It was found that factors including time away from work, rural lifestyle, recreation opportunities, and climate and social activities influenced respondents' intention to stay on the job [43]. Rural nurses with the most job satisfaction preferred rural lifestyles and had rural backgrounds [43]. These participants lived close to family, friends, and spousal employment [43]. Therefore, to bolster retention, employers may consider marketing rural lifestyle opportunities and interviewing applicants about their rural backgrounds and connections [43]. Future directions should include employing a mixed methods design and larger samples may provide information that would increase the chances of establishing successful rural organizations, improving recruitment retention strategies, and

mitigating job stress [43]. Moreover, factors such as rural lifestyle and social and community activity may be additional factors that influence rural retention rates.

Salmond and Ropis (2005) conducted a comparative mixed-methods descriptive study to explore the causes and severity of occupational stress in hospital based medical-surgical and home care nurses in New Jersey, United States [44]. The study also examined the relationship between occupational stress and nurses' affect such as decreased well-being [44]. The investigators hypothesized that nurses employed on medical surgical units would report elevated stress levels compared to nurses employed in home care and that nurses reporting high job stress would have negative affect scores [44]. The affect scores are based on the Affect Balance Scale [45] that measures mental well-being or overall affect. Each response was scored via a three-point scale that assesses the frequency of occurrence of the positive or negative feeling and generates an affect score. A convenience sample of 89 RNs and licensed practical nurses in two hospitals and three home care agencies in New Jersey participated in the study. The researchers used Speilberger and Vagg's Job Stress Survey [46] to measure occupational stress and Bradburn's Affect Balance Scale [45] to measure mental and overall health. Additionally, semi-structured interviews were used to gather in-depth information about the areas of stress (e.g., overall job stress; support and perceived well-being; and workplace stressors such as team conflict, unclear role expectations, heavy workload, lack of autonomy) identified by a subset of five nurses employed on medical-surgical units and five working in home care [44]. To test the hypothesis that medical-surgical RNs would have higher stress scores than their counterpart RNs working in home care, the investigators performed independent sample t-tests. The authors categorized job stress for medical-surgical nurses as significantly higher than job stress for nurses working in home care ($p<0.001$). Workload issues and lack of a support team with which

to share and collaborate were major stressors [44]. It was concluded that workplace stress had undesirable effects on the health and safety of workers and on the health and effectiveness of their organizations [44]. Given the study's small convenience sample, there is a need to reproduce these findings with a larger population and broader geographic region [44]. Moreover, because of the study's descriptive nature, the results do not permit causal inferences to be drawn in understanding the relationship between nurses' health and occupational stressors.

Judkins and Rind (2005) conducted a descriptive cross sectional study to examine the relationship between work hardiness, job satisfaction, and stress among community health nurses. Hardiness functioned as a buffer of stress and is understood to be a collection of personality characteristics that include commitment, control, and challenge [47]. Data were collected from a convenience sample of 98 RNs in Texas [47]. Hardiness was measured using the Hardiness Scale (HS) [48]. Stress was measured using the Nursing Stress Scale (NSS) [49]. Job satisfaction was measured using Mueller McCloskey's Job Satisfaction Scale [50]. The investigators found that nurses with high levels of hardiness tended to have lower stress and higher levels of job satisfaction [47]. The researchers, based on the links between high stress and productivity, absenteeism, job dissatisfaction, and quality of patient care, emphasized how important it is to find ways to improve these work environments. They further suggested that a highly supportive work environment would improve retention and decrease staff turnover [47]. The small sample size, the convenience sampling strategy, and the cross sectional descriptive methodology are limitations of the study. Another limitation due to the sample strategy is that it is not possible to establish a causal relationship between stress and job satisfaction.

Nurses are commonly exposed to high levels of occupational stress because of their work environments and the nature of their work [51, 52]. For example, several studies have found that

the working environment for nurses is related to depression, low job satisfaction, some symptoms of burnout [53, 54], and increased blood pressure and cortisol level [55]. As well, occupational stress in nursing is widespread, with numerous studies identifying work environmental stressors such as work overload, shift work, burnout, and role stress [51, 52]. Many studies have used quantitative methods to examine sources of stress. Chang et al. (2006) examined the environmental occupational stressors of Australian hospital nurses in Sydney (N = 320) in a cross sectional survey where participants completed four questionnaires that examined stress and quality of work life [56]. The purpose of the study was to describe the relationships among demographic characteristics, workplace stressors, coping mechanisms, physical state of health, and mental state of health among Australian nurses as measured by the SF-36 Health Survey [56]. Workload was identified as the chief stressor for Australian nurses working in public acute care hospitals. Statistically significant correlations between stressors (e.g., workplace supports, the number of years worked in the unit, and workload) and physical and mental health were observed [56]. Stepwise multiple regressions revealed age to be the only significant factor of physical health. The authors concluded that the best coping factors of mental health were escape–avoidance, distancing and self-control [56]. The results have implications for employers, including recommendations for stress management, social support, and workload reduction. The relatively low response rate (36%) and the fact that the nurses worked only in large urban hospitals are study limitations.

In 2005, a cross sectional study explored the relationships and relative contributions of select work characteristics (e.g., stress, workload, and weekends off, etc.), shift worker health (e.g., sleep and depression, etc.), and demographic variables (e.g., age, family issues such as caring for a family member that could lead to job dissatisfaction, etc.) to job satisfaction in a

sample of 247 critical care nurses across the United States [57]. Ruggiero et al. (2005) employed a modified version of the Dillman Tailored Design Method [58] during the data collection phase. The General Job Satisfaction Scale [59] was used to measure job satisfaction. The Pittsburgh Sleep Quality Index [60] was used to measure nurses' subjective sleep quality and sleep disturbances. The Beck Depression Inventory-II was used to measure depression [61]. Demographic data were obtained through the Standard Shift-Work Index General Biographic Information Section [59].

The authors reported that depression, emotional stress, sleep quality, and physical and mental workload were inversely correlated to the job satisfaction of the nurses [57]. Interestingly, the physical and mental workload outcomes were not statistically significant. However, sleep quality, emotional stress, depression, and number of weekends off per month were significantly correlated with job satisfaction ($p<0.05$). The researchers concluded that organizational variables and autonomy are important influences on job satisfaction. A limitation of the study was the variability in shift work from one to 120 nights per year. The wide fluctuation in shift schedules might explain the lack of significant differences between day-, night- and rotation-shift nurses with respect to job satisfaction, depressed mood, global sleep quality, emotional stress, and the number of weekends off per month [57]. Moreover, inferences regarding temporal associations between the independent and dependent variables cannot be established due to the cross sectional nature of this study.

Questions about type and location of employment have prompted other researchers to examine job stress in rural and small urban settings [31, 62]. Some research suggests that geography may be a mitigating factor to elevated levels of occupational stress and burnout [31, 62]. Burnout was assessed using the emotional exhaustion (EE), depersonalization (DP), and

personal accomplishment (PA) subscales of the Maslach Burnout Inventory [63]. Depersonalization has been defined as an 'alteration in the perception or experience of the self so that one feels detached from and as if one is an outside observer of one's mental processes or body' (p. 488-490) [64]. Authors of a cross sectional design study using a convenience sample of psychiatric nurses (N=136) working in two psychiatric hospitals in rural Australia found that the nurses experienced lower burnout across all three subscales[62]. The average score on the EE subscale was 15.9 (Standard deviation (SD) = 13.9) for rural nurses which indicates that they were in the normative medium burnout category as the normative range for medium burnout is 14–20 [62]. According to the depersonalization scale, rural nurses were in the moderate burnout category (normative range 5–7) [62]. On the PA subscale, the average score was 37.2 (SD = 11.8) for rural nurses. The mean scores for rural nurses were in the normative low burnout category (e.g., normative range > 34) [62].

Unlike nurses in urban hospitals, the majority (66.1%) of rural psychiatric nurses stated that they were satisfied with their job, particularly with their current situation at work, aspects of support (e.g., lack of support from management), and level of involvement in decision-making in their unit [62]. Independent of the levels of stress and burnout reported by rural nurses, the majority of them indicated that they were satisfied with their current situation at work, present level of involvement in decision making, and the degree of support they were receiving [62]. Interestingly, these findings did not support the established relationship between high levels of stress and job satisfaction in nurses.

In another study examining the role of geography and stress, Australian researchers aimed to identify key workplace demands and resources for nurses working in very remote areas of Australia and thus they measured levels of occupational stress [65]. Through a cross sectional

research design, 1,009 nurses working in rural and remote regions were asked to complete a structured questionnaire. Nurses working in very remote Australia experienced higher levels of psychological stress and emotional exhaustion [65]. The average score of psychological stress was 13.0 (SD = 5.8) compared to the scores of psychiatric nurses (mean = 10.3, SD = 5.1), South Australian human service workers (mean = 11.5, SD = 5.8) [66], and Australian police officers (mean = 11.8, SD = 5.1) [67]. This study highlighted the need to reduce job stress and bolster career and educational resources in order to foster long-term work engagement and reduce emotional exhaustion for rural nurses [65]. These strategies may decrease nursing workforce turnover. Future studies could examine the reasons for the higher levels of job stress in various areas of nursing, such as the roles of: workload and relationships with colleagues and other health care professionals; then they could provide effective interventions (e.g., corporate retreats, financial incentives and recognition of their work [11, 12]) to alleviate these stressors [68].

Role stress in nurses continues to be an area of great interest to the profession, particularly since stress affects the mental and physical health of nurses as well as costs the community [69, 70]. Role stress is the stress experienced by people because of their role in the organization [71]. Santos et al. (2003) described occupational stress, strain, and coping across institutional types for inpatient registered nurses using a mixed method design study [13]. Through a cross sectional design study, the occupational stress inventory (OSI) [72] was administered to a convenience sample of 694 American nurses from four hospitals. The purpose of the study was to determine the influence of age on the following subscales of the OSI and role stress: job role overload, role insufficiency, role ambiguity, role boundary, responsibility, and physical environment [13]. The study participants were from rural and urban hospitals across the Midwest. The quantitative findings were clarified by conducting 20 focus groups. The

researchers identified physical demands and responsibility of inpatient work as the most important problems. Role boundary and role overload were identified as significant types of stress-inducing roles [13]. As a result of increased patient acuity and early discharge, the physical impact of treating sicker patients who require more intense care and treatments was exacerbated. All of the issues identified seemed to be intensified for the "baby boomer" generation of registered nurses. This group of nurses is caught between many competing demands for their time, both in the work environment and at home [13]. Many have children they are still supporting and some may even have grandchildren. At the same time, some members of this cohort are balancing issues with their parents' health. Since the data were collected from the American Midwest, the generalizability of these findings to other institutions or regions may be limited [13].

Glazer and Beehr conducted a cross-cultural examination of the effects of role stressors on organizational commitment, anxiety, and intention to leave among nurses in Italy, Hungary, the United States, and the United Kingdom [73]. The researchers postulated that role stressors (e.g., conflict, ambiguity, and overload) are directly linked with the three criterion variables (e.g., organizational commitment, anxiety, and intention to leave). Their second hypothesis asserted that anxiety would mediate the relationships between role stressors and intention to leave nursing practice [73]. These variables were measured using a cross sectional design of 1396 nurses at 15 hospitals across the four nations. As predicated, all three role stressors were correlated positively with anxiety, continuance commitment, and intention to leave. Furthermore, they were inversely linked with affective commitment, or the worker's positive emotional attachment to the organization. Anxiety and organizational commitment played a key mediating role in the efforts of work stressors on intention to leave. Thus, the stress process can be generalized across the

cultures studied. The number of completed surveys fluctuated from fewer than 200 to more than 500 across the four countries [73]. Due to missing data, analyses were conducted on 1,396 respondents (e.g., 523 from Hungary, 367 from Italy, 183 from the U.K., and 323 from the U.S.A.) who had complete data for every variable. Another shortcoming was that a general definition of role stressors, or role overload was used rather than occupation specific stressors [73]. However, it was assumed that nursing practice was similar across cultures and it would have been inappropriate to impose specific job-related stressors without actually identifying what the specific stressors are for nurses in each nation [73]. Organizational studies to determine if people in similar occupations across cultures report similar types of job-related stressors are recommended [73].

A review of studies across countries and nursing specialties indicates that common occupational stressors for nurses include the following: role stress [12, 13], workload, role ambiguity, interpersonal relationships, and death and dying concerns (e.g., patient death and having to convey information to family) [74-76]. Role stress is relevant in small northern urban areas in northeastern Ontario where 54.2% of the nurses (RNs and RPNs) are 45 years of age or older because studies show that age is related to occupational stress [77]. It is important to understand how work stress affects nurses in northern small urban areas, and which factors in their working environments are associated with poorer health outcomes and lower QWL levels [41]. These factors may be different than those previously identified in large urban centers or even in rural and remote areas. There is also growing concern that rapidly changing patterns of workplaces present factors associated with occupational illness and injury. Hospitals seeking financial efficiencies are seeking reforms in delivery of care. For example, are job stress levels different among nurses who have received cross-training in obstetrics at Health Sciences North

in Sudbury than those who have not received cross-training? It is important to identify factors associated with occupational stress in this population of nurses. Nurses are known to be vulnerable to occupational injury, given the nature of their work environment and proneness to disability which, taken together, can result in higher costs to employers [78-80]. As a corollary to these serious health issues, elevated levels of occupational stress have been found to reduce nursing quality of care and QWL [81].

It is widely recognized that factors in the nursing work setting and the work organization have an impact on nurses' QWL [82-87]. Therefore, occupational stress is an increasingly recognized health issue affecting the QWL of nurses [62, 88, 89]. The quality of nurses' work life, as well as the quality of health services in general, can be improved by identifying the stressors in the work environment [90]. However, there is a shortage of evidence examining the occupational stressors in the work environment of nurses working in small northern urban areas.

Occupational stress represents a serious risk to the QWL for nurses [91, 92]. Nurses directly confront severe illness and death which is considered an unique stressor that other professions do not experience, and this impacts their QWL [41]. A cross sectional study of Croatian nurses (n=1,392) working at four university hospitals identified eight major groups of occupational stressors that impacted QWL. The study was meant to add to the existing literature in the area of occupational health through detailed analysis of the relationship between occupational stress and QWL. The authors reported that organizational pressures, setting, financial issues, public criticism, hazards at workplace, interpersonal conflict in the workplace, shift work, and professional demands all played a role in diminished QWL for nurses [84]. The study had several limitations. Methodologically, the cross sectional design of the study did not allow causal conclusions to be drawn. No assumption could be made as to whether nurses

experiencing higher levels of occupational stress were more likely or less likely to respond to a survey of this type [84]. Another limitation was that at some hospital departments, heads of departments did not allow their staff to participate. Only self-reported measures were used in the assessment of working conditions.

Some researchers recommend a combination of self-reporting and observed working conditions in occupational stress research [84]. Due to the complexities of association between QWL and occupational stress, it may be helpful to take an additional step in clarifying these findings using a qualitative approach, such as semi-structured interviews, to help explain the quantitative findings.

More than 20 years of research reveals that stressful hospital work environments are associated with occupational stress in the nursing profession and have severe consequences on nurses' QWL [84, 93-97]. In an American study, researchers examined the extent to which organizational factors of inpatient psychiatric environments in general hospitals were associated with psychiatric nurses' experiences of stress [93]. Using a cross sectional study design, a secondary analysis linked survey data and hospital data to examine associations among organizational factors of the nurse work environment and psychiatric nurse burnout and stress. The relationship between organizational factors in 67 U.S. hospitals and levels of stress for 353 psychiatric nurses were examined using clustered regression analysis [93]. The authors found that decreased levels of stress were significantly linked with inpatient environments that had better overall quality work environments, positive nurse-physician relationships, and higher psychiatric nurse-to-patient staffing ratios [93]. Adjustments in organizational management of inpatient psychiatric environments could have a positive effect on psychiatric nurses' capacity to sustain safe and effective patient care environments.

The downsizing and health reforms that occurred twenty years ago in Canada have precipitated numerous occupational health and quality of work life issues within nursing work environments [42]. The importance of creating quality working environments for health care professionals and, specifically, for registered nurses is well established in the literature [98]. In a study of rural Canadian nurses, Penz and colleagues sought to understand the factors impacting job satisfaction in rural work environments. The aim of the study was to examine the relationships between individual, workplace, and community characteristics as factors of job satisfaction among acute care rural RNs in Canada [98]. The survey sample included a stratified random sample of 1, 238 RNs working in rural practice. The authors found that nine variables accounted for 38% of the total variance in job satisfaction. Four variables: 1) available and up-to-date equipment and supplies, 2) satisfaction with scheduling and shifts, 3) lower psychological job demands, and 4) home community satisfaction explained 33% of the variance. Importantly, the study provided evidence about factors of job satisfaction for acute care RNs who work in rural and remote Canadian hospital settings [98]. One limitation of the study was due to the cross sectional design of the original survey design. Thus, the capacity to establish causality cannot be adequately ascertained [98]. Future studies should examine a larger set of rural and northern factors impacting quality of work life and job satisfaction to gain a broader and better understanding of the nursing work environment and its impact on quality of work life.

In a 2004 cross sectional study, researchers examined the individual and organizational changes that have accompanied the move to managed health care on reported musculoskeletal disorders (MSDs) of the neck, shoulder and back [99]. A total of 1,163 registered nurses from New York and Illinois were included in the study. The inclusion criteria were licensed registered nurses currently working as nurses, had been in the current job for at least one year, and who did

not report a non-work-related injury/accident up to three months before the onset of symptoms [99]. Data were collected via an anonymous eight-page questionnaire. Outcome measures included musculoskeletal disorder as measured using the Nordic questionnaire of musculoskeletal symptoms [99]. Psychological demands were measured with eight items from the Job Content Questionnaire [100]. It was revealed that the prevalence of reported neck, shoulder, and back musculoskeletal disorder cases among this nurse population was 20%, 17%, and 29%, respectively. The investigators indicated that health care organizational changes were associated with reported musculoskeletal disorders, even after the researchers controlled for demographics, work characteristics and psychological and physical job demands [99]. The odds ratios for neck, shoulder, and back MSDs showed a consistent and increasing trend with the level of reported health care system change. The adjusted odds ratios for musculoskeletal disorders for more than six levels of change versus 0 to 1 levels of change were (1) neck: OR = 4.45 (95% confidence interval [CI] = 1.97, 10.08), (2) shoulder: OR = 2.63 (95% CI = 1.17, 5.91), and (3) back: OR = 3.42 (95% CI = 1.61, 7.27) [99]. For instance, an odds ratio of 4.45 represented that among all nurses who reported more than six health care system changes were more than four times as likely to meet the criteria for a neck musculoskeletal disorder compared with those who reported 0 or 1 changes after the authors adjusted for all other variables considered in their analysis [99]. An association between organizational changes and MSDs that are independent of the effect of physical job demands was found. It was concluded that changes in health care delivery are having a profound impact on patient care and nursing practice. The cross sectional design of the study is a limitation that prevented the authors from interpreting the temporal relations among the variables examined. Moreover, the study design was also restricted to the

current workforce; nurses who no longer worked in nursing because of a musculoskeletal disorder or other health conditions were not included [99].

The number of studies examining the QWL of obstetrics nurses and its implications on work stress has been very limited [101]. In a Chinese study, Yuan et al. (2007) explored occupational stress among nurses working in an obstetric unit in a hospital setting using a cross sectional design [101]. The aim of this cross sectional study was to investigate the sources of stress and ways of coping among obstetric nurses (N=58) using the occupational and coping questionnaires. It was found that working with high-risk patients, shift work, heavy workload, lack of recognition by the community, and lack of social support from nursing managers were major stressors for this group of nurses [101]. A limitation of the study was that it took place in one hospital unit thereby limiting the study's sample size to only 58 participants. Nonetheless, the findings suggested that these may be potential risk factors for occupational stress among nurses working in obstetrics. The limited amount of evidence warrants further examination of the working conditions of obstetrics nurses.

Occupational Stress and Its Consequences for Employers

Healthcare organizations are confronting significant challenges to provide high quality care with current nursing shortages in relation to nursing turnover [102]. As a corollary, attempts to ameliorate nursing working conditions are vital to retaining nurses currently in the system and recruiting newcomers to the profession [103-105]. Employers are well situated to clearly identify the underlying factors of occupational stressors and nurse turnover in their organizations. In doing so, employers, in collaboration with employees, are better positioned to implement successful intervention strategies to improve working conditions and, therefore, create healthy workplaces. Furthermore, employers are more able to effectively satisfy, encourage, and foster a

health work environment and quality nursing staff. In health care organizations, work stress may promote absenteeism and turnover, both of which diminish quality of health service delivery and care [106]. Hospitals in particular are encountering nursing shortages across many units, including obstetrics, emergency, and operating room nursing [9, 107-111]. The human resources demand for acute care services is increasing concurrently with changing career expectations, among potential health care workers and growing dissatisfaction among existing hospital staff [112]. Fostering an organizational culture that promotes healthy workplaces may ameliorate the recruitment and retention of RNs.

Given the direct and indirect effects of occupational stress, some Canadian hospital employers are examining ways to reduce workplace stressors, including developing programs that go beyond occupational health and safety initiatives and provide career and educational opportunities to nurses [32]. Organizational characteristics linked with workload, management style, empowerment and autonomy, promotional opportunities, and work schedules are believed to contribute to turnover and, therefore, researchers suggest that administrative interventions aimed at improving quality of work life are imperative for long-term resolution [110].

Occupational stress is resulting in hospitals being unable to find enough nurses willing to work under current conditions in inpatient settings [113]. A study conducted by Aiken et al. (2001) supports this assertion. The researchers conducted a cross sectional study of 700 hospitals across five countries and involved 43,329 nurses from Canada (17,450), England (5,006), Germany (2,681), Scotland (4,721), and the US (13,471)[113]. It was an international collaborative effort and investigators developed a questionnaire dealing with perceptions of nurses with respect to their working environments and quality of nursing care, job satisfaction, career plans, and attitudes regarding job stress. Low morale, job dissatisfaction, and intent to leave their

current employers were common across the five nations. A clear majority of Canadian nurses (63.6%) reported the number of patients assigned to them increased in the past year, which is particularly disturbing given the widely reported rise in patient acuity levels in an aging Canadian population [107, 113]. These findings imply that, in addition to having responsibility for more clients, staff nurses may also have to take on more responsibilities for managing services and personnel at the unit level, which takes time away from direct patient care and increases their levels of job stress [113]. Resolving these issues is important in alleviating occupational stress levels and in promoting recruitment and retention strategies. The authors suggested that managerial intervention is essential to preserving the safe delivery of health care services, by promoting worker autonomy of daily decision-making responsibilities and providing educational opportunities [113]. Therefore, identifying factors associated with job stress is an important step in northeastern urban hospitals because occupational stressors also have important ramifications for health care services delivery.

Governments and health care institutions are responding to these health concerns by implementing diverse strategies (e.g., restructuring, merging, reforming policy, downsizing, and substitution) to bring about greater efficiency, higher productivity, and improvements in health services delivery [31, 114]. Other employers are examining ways to decrease absenteeism and promote healthy workplaces [115, 116]. Yet, the shortage of healthcare professionals in rural and northern communities remains one of the most difficult problems facing Canadian healthcare delivery [107]; it represents a serious challenge to equitable healthcare delivery [107, 117, 118]. Importantly, employers must recognize their part and become actively engaged in the application of management styles that foster organizational commitment at all levels [77].

Relationship between Occupational Stress and Nursing Shortages

A clear understanding of the nursing health workforce is required prior to discussing the importance of recruitment and retention strategies. Rural and northern Ontario communities experience great challenges in creating, recruiting, and retaining an adequate health care workforce, in particular primary health care nurses [119-121]. With many nurses approaching retirement and fewer individuals entering the profession, nursing is experiencing a serious workforce shortage [107]. Not surprisingly, nursing is an especially stressful occupation and physical and psychosocial stressors are inherent in the nursing practice in rural and northern settings.

Workforce supply within a health service such as nursing is a function of both recruitment and retention [120]. A large body of research has been established over the last 20 years on the recruitment and retention of nurses and other health care professionals in northern and rural areas [122-126]. Recruitment is an issue intimately linked to, but distinct from, retention. Recruitment includes the enticement and selection of health care professionals (e.g., RNs) to a particular organization or profession and is a necessity for retention [120]. Recruitment strategies and selection criteria are pivotal factors in subsequent retention because the better the match a worker is to a role and organization, the longer they are likely to remain, independent of the effect of additional retention strategies [63].

Workforce retention is defined by duration between commencement and termination of employment [59]. Retention does not infer an unlimited length of service in one geographic area, or with a single organization. Rather, it represents a minimum length of service [66, 67, 72, 127]; however, exactly what comprises this "minimum threshold" is unclear. There are no definitive benchmark metrics to measure this baseline. It is likely to change according to whether it is

defined by the health service, position, or profession [120]. Furthermore, it is contingent on the location and characteristics of the community which influences the ease with which the health worker can be replaced [120]. Thus, retention represents some concept of length of service, or possibly can be assessed in terms of a return on the investment costs associated with training and recruitment [100, 120]. Given the fiscally austere funding environment of current governments, measuring retention is important to consider from an economic and health human resources' perspective.

Retaining rural nurses may be a challenge due to stressors not identified in the nursing literature [128]. According to the World Health Organization (2006), there is a shortage of 4.3 million healthcare workers globally[129]. This is expected to increase by 20% in the next two decades [129]. The shortage is pronounced in the nursing profession, which is the largest group of health professionals in hospital settings where approximately six in ten nurses work in hospitals [32, 111]. In Canada, registered nurses provide care to approximately 6.6 million people living in rural and remote areas [126]. However, the nature of nursing in these parts of the country is poorly understood [126]. In recent years, the Ministry of Health and Long-Term Care has organized various measures to improve the posting process and the recruitment and retention of health workers in underserved areas. Exacerbating matters is the fact that many healthcare workers, including nurses, are overburdened and overstressed [130]. In addition to the health human resources crisis, elevated levels of occupational stress have been found to reduce nursing practice quality [81]. This development is deemed to be one of the reasons why fewer young people are entering the nursing profession[131]. However, there is very little that is known about what constitutes a positive work environment in rural and northern settings [132-135].

In Canada, nurses constitute the largest healthcare profession with over 340, 000 RNs and licensed practical nurses nationwide [136]. The nursing shortage and high turnover rate of nurses is expected to worsen over the next ten years, making the recruitment and retention of nurses a priority for health care [130]. According to the *Tested Solutions for Eliminating Canada's Registered Nurse Shortage* (2010) report on human health services, Canada will be short almost 60,000 full-time equivalent registered nurses by 2022 **[107].** Rural and northern communities are on average sicker, from lower socioeconomic status, and have lower levels of education [118]. They also have worse access to health care than people in urban areas [118]. Exacerbating matters is the shortage of healthcare professionals in rural communities which remains an intractable problem that poses a serious challenge to equitable healthcare delivery [126]. However, the nature of nursing in these parts of the country is poorly understood [126].

Past and present studies have identified a number of concerns about the supply and demand of RNs. At the vanguard of these concerns is the grave ramification of negative working conditions on not only nurses' health, but on recruiting and retaining an adequate supply of nurses to meet current and future demands [109]. The quality of work life for nurses has diminished to the point where it is obstructing the capacity of the health care system to recruit and retain the staff needed to provide effective patient care [137]. Compared to other health care occupational groups, nurses leave practice at a much greater rate. A typical turnover rate for hospital nurses is 15% per year [138]. The financial consequences to employers for replacing a medical-surgical nurse is $42, 000 and a specialty nurse is $64, 000 [138]. At the same time, demographic changes have led to an aging nursing workforce and an increased need for care as the baby boomer generation approaches retirement[77, 139]. As a result, most western countries,

including Canada, are facing serious nurse shortages [140]. These shortages have been associated with decreased standards of patient care [113].

There is a growing body of evidence that low nurse retention in health care settings is connected to heavy workloads and high levels of job-related stress, burnout, and job dissatisfaction [8, 141, 142]. Given this situation, health service organizations need to have greater and broader understanding of the issues underlying nurses' intent to leave practice. An understanding of these issues is important if health care organizations are to meet patient needs for nursing care in the present and future [143, 144]. During this period, an employee will consider leaving their nursing position, institution, or profession. Meanwhile, decreased job satisfaction plays a vital part in the intention of an individual nurse to leave employment. Job satisfaction is, in turn, affected by the level of occupational stress experienced by the nurse [145]. Understanding more about the interrelationships between intent to leave practice, stress, and job satisfaction can be used by employees to develop and institute practices designed to decrease occupational stressors, bolster job satisfaction, and mitigate nursing staff turnover.

A review of employee stress in healthcare environments across 17 countries revealed that nurses in the majority of countries experience high levels of stress and strain [71]. Elevated levels of work-related stress are believed to affect the physical and mental health of nurses [38], work ability, and QWL [37, 39, 40]. Increased rates of work absenteeism can directly influence work schedules, service delivery, overtime, and cost to an organization. They can also have an indirect impact on occupational stress, staff motivation, and turnover [32]. Occupational stress is liable to a detrimental factor for nurses because stress is closely linked to staff absenteeism, poor staff retention, and ill-health [146-148]. As a result, there are recruitment and retention problems in primary health care in many countries, including Canada [149].

Numerous studies have shown that nursing is strenuous work and, hence, occupational stress is prevalent among nurses, impacting their quality of work life [13, 148, 150-153]. Specifically, occupational stress is a major health problem for both nurses and organizations [31, 154, 155] and can lead to burnout [31, 62], illness [156], job turnover [84], absenteeism [31, 62, 84], poor morale, and reduced efficiency and performance [9, 157]. Shader et al. (2001) found that occupational stress results in increasing turnover rates and leads to more nurses leaving the nursing profession. Moreover, a high level of occupational stress and burnout has been found to reduce nursing practice quality [81]. The definition of nursing practice quality mirrors the skills and expertise required by health practitioners who work in areas where distance, weather, limited sources, and lack of health human resources influence the character of the lives and professional practice [132]. This development is deemed to be one of the reasons why fewer young people are entering the nursing profession [131].

Burnout, occupational stressors, and diminished decision-making capacity contribute to the intention to leave the nursing practice [8, 9, 158, 159]. In a 2010 Canadian cross sectional study, a random sample of 1,636 (25.0%) unionized registered nurses working in the public health sector were stratified by specialty and size of the institution to ensure representativeness [160]. The authors found that workplace demands are the most crucial determinants of emotional exhaustion and indirectly induce intention to leave nursing practice. It was found that a dual strategy is needed to bolster recruitment and retention strategies. Specifically, there must be a decrease in work allocation coupled with an increase in available employment and career resources. In particular, the roles and responsibilities of RNs should be reorganized to reduce work overload and increase the meaningfulness of their work [160]. Nurses' level of burnout and how it may lead to withdrawal manifestations is especially important in the current context of

nursing shortages [160]. Shortcomings in the study include its low response rate (33.2%) and its use of cross sectional data to examine presumed causal factors [160]. Another limitation is that the study focused on burnout and job stress as it pertains to the individual, the employers, and their relationship. Future studies may examine factors of occupational stressors and consider the broader variables related to the external environment of the organization (e.g., technology, labour, values and social attitudes) [160].

Concern about potential population health and socioeconomic ramifications of a rural and northern nursing shortage in Canada has led to investigations of the intent to leave a nursing position as an indicator of retention of the rural nursing workforce in the USA [161, 162]; however, similar research in Canada is deficient [163]. A growing body of literature though is examining the reasons to leave nursing practice in rural and remote settings in Canada. In a 2011 study, researchers examined the factors of the intent to leave a nursing position in rural and remote Canada. Data collected as part of a national cross sectional mail survey of RNs in rural and remote Canada, provided the data (N= 3,051) for the logistic regression analysis of factors of intent to leave the nursing practice [135] in 2001 - 2002. Variables for this analysis were selected from the survey data based on a conceptual framework that linked potential factors of intent to leave nursing practice to the individual RN worker, the workplace, the community context and satisfaction related to both the workplace, and the communities within which the RN lived and worked [163].

The authors found that RNs were more likely to plan to leave their nursing position within the next 12 months if they: had higher self-reported levels of occupational stress, did not have children or relatives, had diminished job satisfaction and less control over their job scheduling, were required to be on call, performed advanced decisions, worked in a remote

setting, were male, had higher levels of education, were employed by their primary agency for a shorter time, and had lower community satisfaction [163]. Such findings may help guide health policy and provide organizations with strategies to ameliorate their recruiting and retention plans. A limitation of this project was that direct rural-urban comparisons were not made. Another limitation is that the survey data was collected in late 2001 and 2002, so changes in the rural nursing profile may have occurred [163]. Further, the questionnaire data were gathered in 2001 and 2002, so, again, changes may have occurred [135]. A final limitation relates to the variables selected for statistical analysis. Important workforce retention and recruitment factors such as nursing leadership, opportunities for professional continuing education, and spousal employment opportunities are negated. Humphries et al. (2009) developed a logic model for primary health care for small rural and remote communities [164]. This model emphasized that workforce retention encapsulates several critical factors including: leadership, continuing education and professional development, interdisciplinary teamwork, career opportunities and advancements, effective recruitment and workforce succession planning, and adequate infrastructure [164].

The manner in which nurses deal with occupational stress has been of interest both to researchers and to health care administrators over the past 40 years [71]. To the best of my knowledge, there has not been any study in Canada to investigate the types of occupational stress present among nurses in a northern Ontario urban setting. The goal of this study was to identify the types of stress present in the work environment of nurses. Therefore, it is vital that nursing work settings are structured in ways that allow nurses to fully participate in their work and encourages nurses to remain in their jobs [165]. Documenting and improving our understanding

of these healthcare professionals' workplaces could lead to better recruitment and retention strategies of health care professionals in rural and northern regions.

Regrettably, the constant workforce undersupply, recruitment challenges, and low retention rates of staff limit access to health services for many northern and rural residents [120]. Access to services may be withdrawn in communities that do not have sufficient RNs to deliver health services, or residents may have to travel long distances to receive care (e.g., cancer treatment). Complicating the health human resources issue is the inequitable distribution of health care workers across the country; this represents a serious challenge to health services delivery [166, 167]. The imbalanced distribution of health care professionals can contribute to significant disparities in health outcomes between the rural and urban population [168, 169]. For example, only 9 percent of nurses practice in rural and northern areas in Ontario, which is largely disproportionate to the population in these communities [170]. The shortage of nurses is exacerbated by an aging population and an increase in demand for health services due to the growing burden of chronic diseases [120].

Conclusion

A review of the literature demonstrates strong evidence of a relationship between occupational stress and job satisfaction, between occupational stress and intent to leave employment, and between job satisfaction and the intent to leave in several different groups and specialties of nurses including obstetrics. The current study will examine these variables in the obstetrics units across four northeastern Ontario hospital settings. A search of the current literature found no studies that targeted this population of obstetrics nurses working in northern or rural settings. A comprehensive understanding of the multifactorial issues impacting occupational stress is needed. Presently, research is often conducted without a solid theoretical and conceptual base. Employing the Job Demand-Control-Support Framework [171] model may

provide a clearer understanding of the factors impacting workplace stress. A broader conceptualization of nurse stress and burnout in the work place needs to be developed and implemented. Empirical studies could then be conducted to investigate these very complex relationships, prospectively, over time. Once work stress is examined from a more solid theoretical and conceptual basis, then intervention studies can be initiated to assess the most useful ways to mitigate work stress.

Rural nursing differs from urban nursing in several ways [172]. Rural communities' health needs differ from those in urban populations. Furthermore, rural residents experience more chronic disease and more occupational health issues [172-174]. The population is more elderly and obese, has less healthcare insurance, and purchases more expensive medications [167]. Rural theory states residents define health functionally and seek care later than urban residents, meaning nurses must practice more crisis management [167]. These trends alter the type of healthcare strategies provided in rural hospitals. Nonetheless, occupational stress persists as a significant concern in nursing, affecting both individuals and organizations. For nurses, regardless of whether occupational stress is perceived positively or negatively, the neuroendocrine response yields physiologic reactions such as cardiovascular disease [16, 17], gastrointestinal disease [14, 15], diabetes [18] , and low back pain [19-21] that may ultimately contribute to illness. In the health care organization, work stress may contribute to absenteeism and turnover, both of which detract from the quality of care [175].

There are many varied opportunities for nurses who choose to work in rural and northern settings and for urban-based providers who provide care or outreach services to rural communities. To do this most effectively, nurses must learn what rural and northern residents prefer relative to their health care needs. Together, as collaborators, effective solutions can be

developed and implemented to meet rural and northern Canadians' nursing care needs and to deliver appropriate and relevant health services.

2. Research Questions

The four questions explored in this study are the following:

1. What is the quality of work life of nurses working in the labour, delivery, recovery, and postpartum areas at Health Sciences North (e.g., in the study, this is the only hospital where nurses receive cross training), North Bay Regional Health Centre, Sault Area Hospital, and Timmins and District Hospital?
2. What are the factors of work ability among nurses working in selected labour, delivery, recovery, and postpartum areas at Health Sciences North, North Bay Regional Health Centre, Sault Area Hospital, and Timmins and District Hospital?
3. What are the factors of quality of work life among nurses working in selected labour, delivery, recovery, and postpartum areas at Health Sciences North, North Bay Regional Health Centre, Sault Area Hospital, and Timmins and District Hospital?
4. What is the quality of work life of nurses who are cross-trained compared to those with no cross-training for working in the labour, delivery, recovery, and postpartum areas at Health Sciences North, North Bay Regional Health Centre, Sault Area Hospital, and Timmins and District Hospital?

Study Framework

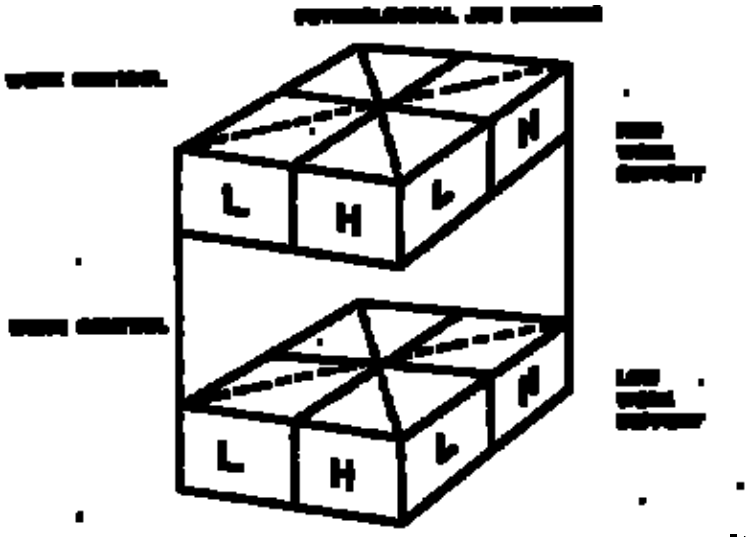
The study is grounded in the Job Demand-Control-Support Framework. This framework was used to determine the design of the study. It also informed aspects of the data analysis process in relation to both quantitative and qualitative findings.

Job Demand-Control-Support Framework

The Job Demand-Control-Support (JDCS) is an expansion of the Job Demand-Control model[176] framework used to define the concepts of stress and quality of work life in the nursing work environment in northeastern Ontario. As noted above, the framework is an organizational model that is helpful in the process of data analysis and interpretation of findings. This model has dominated research on occupational stress in the last 20 years [17]. It focuses on two dimensions of the work environment: *job demands* and *job control* [176]. *Job demands* refer to work load and have been operationalized mainly in terms of time pressure and role conflict [171]. *Job control*, which is sometimes called decision latitude, refers to the person's ability to control his or her work activities [171]. Decision latitude includes two components: skill discretion and decision authority[171].

The two dimensions of the JDCS represent a complex set of interactions among demand, control, and social factors that may impact health outcomes. According to the model, the highest strain occurs in a work environment when demands are high, control is low, and social support is low. Social support at work, was later added to the model; as a result, the demand-control-support model was defined. This revised model postulates that the highest risk of illness is expected in employers with high demand, low control, and low social support in the workplace [177]. This additional component of the model emphasizes the psychological and social factors people experience in the work environment are underpinned in social and interpersonal relations among participants in the work setting [178-182].

Figure 0_1. The Job Demand-Control-Support, where L=low and H=high. Adapted from de Jonge et al., 1996, p. 212 [183]



Use of the JDCS framework enables comprehensive understanding of stress that extends beyond traditional biomedical approaches to occupational stress. Furthermore, its two dimensions are factors associated with occupational stress among nurses [171, 184]. According to the JDCS model, jobs that utilize skills, provide control, and offer a supportive work environment contribute to better psychological and physical health than other jobs. Mentally demanding jobs with low levels of control and/or less supportive environments are found to be detrimental to health [184]. Several nursing studies have identified that diminished control over workplace decisions results in elevated occupational stress levels [62, 185].

Linkage of Framework to QWL, Occupational Stress and Cross-Training

The framework helps explain how occupational stress may be mitigated if nurses have greater job control and decision-making capacity. In nursing environments where this opportunity is afforded, there are lower levels of occupational stress [125]. In terms of quality of work life, studies have reported that increased job autonomy and job control is linked to higher QWL among nurses and allied health professionals [186, 187]. It is hypothesized that cross-training will afford nurses with increased clinical competencies to work in all areas of the

birthing unit and permit for greater decision-making capacity in the delivery of obstetrical care to their patients.

Strengths And Limitations of The JDCS Model

Numerous studies have identified that a lack of autonomy or control in the work setting can lead to high levels of occupational stress and poor health outcomes [31, 37, 62, 159, 185]. According to the JDCS model, decision-making capacity within the work process reduces a worker's stress and increases learning, whereas psychological demands increase learning as well as stress. Presently, the JDCS model has been systematically reviewed only in the context of physical health outcomes [188]. Both the model itself and inconsistent results based on empirical tests of the model have elicited considerable theoretical and methodological criticism [184].

One of the criticisms of this model is its reliance on "objective" measures of the work environment to the exclusion of other measures [189]. Workers will respond differently to the same group of control and demand conditions and thus experience varied biological outcomes. As a result, a measure of individual worker differences, specifically, various psychosocial coping styles, must be included in the JDCS [190].

3. Methods Overview

In this section, key information about the setting is provided. The rationale for using a mixed methods design in this study set in Northeastern Ontario and the two major parts of the study are also explained.

Rationale for Northeastern Ontario

In northeastern Ontario, the North East Local Health Integration Network represents 4.5% of the province's population and 40% of Ontario's land area. The large geography and relatively small, dispersed population of northeastern Ontario result in challenges to health

service delivery. Given this disperse population, a chronic shortage of nurses in northern Ontario continues to present challenges to health care delivery. Understanding the occupational stressors in the workplace among nurses enables stakeholders to promote not only a healthier workforce but also identify factors implicated in recruitment and retention of nurses.

Rural and northern residents are unique in their culture, health needs, and health behaviors, which may be both challenging and rewarding. As previously indicated, they are on average sicker, from lower socioeconomic status, and have lower levels of education than Ontarians in other parts of the province. They also have inferior access to health care than people in urban areas. The occupational stressors facing nurses working in northern communities will reflect these distinct characteristics and warrant investigation. This undertaking is in contrast to many quantitative studies that have examined occupational stress in large metropolitan urban areas in Canada [31, 62], the US [43, 191], Europe [20, 41, 192], Australia [65, 193, 194], and China [101]. However, no studies have assessed occupational stress among registered nurses in northern urban areas of Canada. This research can have direct health services consequences by identifying the occupational stressors present in the workplace of nurses working in northeastern cities in Ontario. It also will describe the work ability of obstetrical nurses working in acute care small northeastern Ontario work settings. Given the limited number of employment opportunities in the north, it is important that employers and employees work closely to create a positive workplace that fosters career advancements and supports job satisfaction [133].

Previous studies have examined the types of occupational stress among nurses either quantitatively or qualitatively. The workplace makes specific demands on nurses who may constitute a primer to illness as well as psychological or physical distress. Therefore, the assessment of employees' QWL would seem important. Related to this is whether the types of

stresses identified in the literature among nurses working in urban locations is similar to those experienced by those working in northern regions. Building positive work environments is a crucial component of retaining health care professionals in the north and recruiting those from other regions to re-locate to the north for lifestyle and career opportunities.

3.1 Why Mixed Methods

A mixed methods approach was used in this study to facilitate understanding of the participants' experiences of quality of work life. During the quantitative phase, randomly selected participants from the four selected hospitals in northeastern Ontario (e.g., Sudbury, North Bay, Sault Ste. Marie, and Timmins) completed three self-administered questionnaires either in print format or online. Semi-structured interviews followed starting in April 2012. During the interviews, participants responded to questions derived principally from the quantitative findings although the literature was also consulted during the development of the questions. The goal of using the two methods in sequence was to achieve a rich understanding of the nurses' perceptions of the quality of their work lives [195].

3.2 Quantitative: Phase I

Sample

The sample size for this study was determined based on a power calculation, following the method described by Cohen (1992) [160]. Effect size was determined based on a meta-analysis of interventions to reduce occupational stress, in which QWL was an outcome measure [196]. This result yielded an effect size of 0.41, a large effect for a multiple regression, logistic regression, and ANOVA analyzes. With an alpha level of 0.8, a significance level of $p=0.05$ and assuming a moderate effect size of 0.31 for the relationship between quality of work life and occupational stress, a sample size of 120 is required. This analysis assumes three independent

variables: geographic location, type of health organization (e.g., teaching hospital, community hospital), and training (e.g., whether they received cross training); it also assumes one dependent variable, quality of work life. G*Power 3.1 was used to calculate sample and effect size for this sample [197].

A total of 111 registered nurses were randomly selected from the total number of registered nurses on staff in the labour, delivery, recovery, and postpartum areas and participated in the study. Stratified random sampling was used as it was anticipated that each subgroup of nurses was likely to differ substantially in their responses. Using a stratified random design approach, 51 participants were randomly selected in Sudbury, 21 in North Bay, 20 in Sault Ste. Marie, and 18 in Timmins. The response rate for Health Sciences North was 100% (51/51 participants), 67.7% (21/31 participants) for North Bay Regional Health Centre, 62.5% (20/32 participants) for Sault Area Hospital, and 75% (18/24 participants) for Timmins & District Area Hospital. All nurses had an equal chance of being selected for the study. A list of the names of these nurses was obtained from the unit and assigned a number. Then, the list was randomized. A random number generator selected nurses from 51 in Sudbury, 31 in North Bay, 32 in Sault Ste. Marie, and 24 in Timmins. A total of 138 nurses represent potential participants from the four hospital sites.

Data Collection

Paper materials were mailed to each participant at the workplace, one of the four hospital sites across northeastern Ontario. Participants were provided with a package containing a cover letter form (See Appendix A), and an informed consent form (See Appendix A) which explained the purpose of the study and the three questionnaires. In the cover letter, respondents were informed that completion of the three questionnaires would be regarded to be their consent to

participate. The letter also explained that participation was voluntary and that results would be reported in aggregate format. The informed consent forms were also made available online along with the three questionnaires for nurses preferring this modality. Nurses wishing to participate online were asked to contact the investigator for access information.

In general, it took approximately 45 minutes to complete the three questionnaires (115 questions). Participants completing the questionnaires online were assigned a unique, one-time use identification number to ensure that there were be no duplicate entries. Ideas that presented as particularly strong in the completed questionnaires were considered for exploration in the interviews. Interview questions were also shaped by knowledge of the literature.

As described, the self-administered questionnaire consisted of three parts. The survey was made available to participants in print format and online. Participants for this study included registered nurses working at Health Sciences North (in the study, this is the only hospital where nurses receive cross training), North Bay Regional Health Centre, Sault Area Hospital, and Timmins and District Hospital. Since the four hospitals are located across a large geographic area in northeastern Ontario, a self-administered questionnaire was determined to be appropriate. Furthermore, this approach also enabled flexibility. Participants could complete the questionnaire at their own leisure, either on paper or online. Face-to-face interviews would have been too time consuming, costly (e.g., travel expenses, accommodations, etc.), and impractical. Similarly, telephone interviews were not feasible because they would have taken too long to administer and would have led to excessive cost (e.g., long distance charges). Moreover, phone calls may have inconvenienced the registered nurses during times when they were preoccupied with work duties.

Questionnaires offer an objective means of collecting information about people's knowledge, beliefs, attitudes, and behaviour [198, 199]. In this study, the questionnaires were

delivered as part of a package. When they were returned, responses were entered into an electronic database setup to store the confidential data. As well, as completed questionnaires were returned, they were assigned an identification number (e.g., alphanumeric and in serial order). Questionnaires were collected from March 1, 2012 to May 15, 2012.

Definitions of Key Constructs Used in the Study including the Questionnaire

Three key constructs are important to this study: quality of work life (QWL), occupational stress, and rurality. These will be further detailed and, in doing so, operational definitions will be specified.

Quality of Work Life

QWL is defined as the way in which work is good for an individual in the broadest context and in the way an employee would evaluate their job [200]. In this study, QWL is defined as a way of thinking about people, work, and organizations. Its distinguishing elements are a concern about the impact of work on people as well as on organizational effectiveness and the idea of participation in organizational problem solving and decision making [201]. QWL not only affects job satisfaction but also satisfaction in other life domains such as leisure, family, financial, health, housing, friendships, education attainment, community engagement, neighborhood, spiritual, environment, cultural and social status [202]. Furthermore, the association between work and non-work life domains [203] and work-related stress [204] are factors that should conceptually be included in QWL [200].

Work Ability

Work ability was defined as the worker's capacity to perform their work, and was measured by an index describing their health resources in relation to work demands [205, 206].

Stress

In this study, stress was defined from the Nursing Stress Scale [49], as an internal cue in the physical, social, or psychological environment that threatens the equilibrium of an individual [1, 49]. This definition is selected because of its comprehensive approach to health and well-being.

Rural

The benchmark for understanding Canada's rural population for this analysis was based on the "rural and small town" definition (RST). Rural and Small Town (RST) refers to areas outside Census Metropolitan Areas (CMAs) and Census Agglomerations (CAs) [207]. A CMA has a total population of 100,000 or more with 50,000 or more in the urban core and a CA has an urban core of 10,000 or more. Both CMAs and CAs include neighbouring towns and municipalities where 50% or more of the workforce commutes to the urban core [208]. The term Larger Urban Centre (LUC) refers to both CMAs and CAs [207]. The RST definition provides a lucid conceptualization of the term rural to compare the geographical location, population, commuter flow, and access to urban centres for health care [53, 59, 209]. The definition was selected because it is widely cited in the health services literature and encapsulates the rural population of northern Ontario [103, 183]. This is the population residing in towns and municipalities beyond the commuting zone of larger urban centres (e.g., the non-CMA/CA population) [103].

Similar to rural, defining "northern" presents its own challenges to health researchers [183]. For the purposes of this inquiry, the Ontario government's planning parameters of Parry Sound and North determined what was to be considered "northern." This determination is linked to the placements of the North East Local Health Integration Network and the North West Local

Health Integration Network (LHINs) which are considered the two "northern LHINs" [210]. The region of northern Ontario is defined by the geographic jurisdictions encompassed by the northeast and northwest LHINs, a population with over 800,000 residents in an area approximately 870,000 square kilometers in size. Northern Ontario's LHINs contain 90% of Ontario's land mass [211]. Yet, the North West LHIN only encompasses 1.6% of the province's population [144]. Similarly, the North East LHIN only represents 4.5% of the province's population [212]. Therefore, geography and population density are significant factors that have propelled these priorities across the north. The large geography and relatively small, spread out population of Northern Ontario results in challenges to health service delivery.

3.3 Qualitative: Phase II

Interview guide

A semi-structured interview guide was developed with the help of Dr. Shannon Dowdall-Smith, a pediatric Clinical Nurse Specialist at Health Sciences North, and the thesis committee which also included a nurse. Key findings in the literature of occupational stress in nursing, medicine, and psychology as well as ideas that had presented in the quantitative findings were used in the development of the questions. The questions were developed through an iterative process that involved returning to the literature and consulting with the nursing experts on several occasions.

In all, nine questions were developed. In the interview, they progressed from non-threatening questions of general invitation whereby the interviewee could become comfortable with the process to more specific questions. Questions used early in the interview began as follows, "Tell me about….". Questions at the mid-point of the interview focused on stress, while questions near the end of the interview asked about QWL. Cross training questions were

integrated into the exchange if the nurse had been cross trained. This order of questions was used to establish trust and comfort with sharing, while also ensuring that topics central to the study were explored.

Considered together, the interviews were useful for delving into and exploring the nurses' feelings and opinions about their work lives (See Appendix E). To ensure an appropriate delivery, questions were rehearsed with two senior co-investigators who assisted in developing personal ease and conversational style.

Sample

Interview participants included nurses who participated in the quantitative phase of the study from the Health Sciences North and North Bay Regional Health Centre as well as nurses who did not participate in phase I. These three hospital sites were selected to facilitate comparison of nurses who were cross-trained (e.g., Health Sciences North) and those who were not (e.g., North Bay Regional Health Centre and Sault Area Hospital). Additionally, travel to all sites was a limiting factor. To capture the experiences of nurses who may have left the workplace as a result of stress, a snowball sampling strategy was used to identify eight potential participants who met these criteria.

Six interviews were completed, two in each of the three communities [213, 214]. As a means of finding participants for interviews, I asked participants about colleagues who had taken time off work because of stress and who might be interested in taking part in the study. All participants were interviewed in a place convenient to them. The setting selected was conducive to participants' comfort during the interviewing process and the interviews were taped. The interviews were approximately one hour in length. While, as previously mentioned, there was a general ordering of the questions, flexibility was used in this ordering to enhance flow [215].

Data Collection

The individual semi-structured interviews (e.g., phase II) with nurses at Health Sciences North, North Bay Regional Health Centre, and Sault Area Hospital generated data that elaborated on and contributed to understanding the numeric findings. Recruitment of participants occurred by placing an ad (see Appendix F) on the bulletin board in the obstetrics unit at Health Sciences North, North Bay Regional Health Centre, and Sault Area Hospital in May and June, 2012. The ad provided my contact information. Interested volunteers from the three hospital sites contacted me by telephone and e-mail to set up an interview time, at a setting comfortable to the participant. Participants were compensated $20 for their time.

Data Analysis

Techniques of thematic analysis, most significantly coding for content, were used with the data [216]. The process was both inductive and deductive in nature and involved careful preparation of a code book, consultations with Committee members, and, at times, recoding [217]. The outcomes of the analysis process were five themes and one level of subthemes. The five major themes were: workplace stress, relationships with colleagues, changes in care delivery and model of care, demands for resources, and QWL.

A thematic analysis approach was used to discern themes and one level of sub-themes per theme [218]. Following careful transcription of the interviews, data reduction was done to reduce the volume of the data and to allow for closer examination [219]. This step was followed by "careful reading and re-reading of the data" [220]. A coding process was then used to categorize the data to reveal themes common to the data. Coding categories were developed collaboratively with a member of the supervising committee. Working alone, we each read a sample of transcripts, taking note of major topics discussed in the interviews. We then met to

compare and revise the categories we had arrived at individually. Subsequently, we went through a second exercise, this time applying the mutually generated codes and identifying possible ambiguities in the codes [221]. Codes were then applied to the larger data set, and a code book was maintained as a record of the criteria used to ensure consistent application.

After themes and subthemes were generated, they were represented visually. Table 1 presents the participants' attitudes toward cross training [222]. In total, five principal themes were identified: workplace stress, relationships, changes in care delivery and model of care (cross-training), limited resources, and QWL.

Personal Biases

My interests in the area of occupational health and return to work issues fueled my interest in examining the occupational stressors among healthcare professionals. This undertaking was furthered by my clinical experiences as an occupational therapist and my mother's experience as a psychiatric and emergency room nurse working in a hospital setting. As a corollary, I had a series of disclosures and research assumptions that require identification. During this thesis, I self-reflected using a reflexive research journal on a weekly basis to report my thoughts, feelings, reactions, and observations related to my subjective experience [223-225]. The journal was used for personal growth and self-reflection and to identify any biases. This practice enabled me to make a personal connection to the profession of nursing from my role as a researcher. It further facilitated an outsider's perspective in the observation of the nurses in the interview process and enabled me to express my voice within the interpretive framework [226, 227]. This approach supported an understanding and assessment for the meaning of nurses' experiences with occupational stress. Exploring nurses' perspectives regarding workplace stress may assist organizations in better understanding what constitutes a healthy workplace. During

data collection, I strived to identify my prior assumptions and experiences. Personal and intellectual biases were explicitly stated at the outset of the study to enhance the credibility of the results. They were re-visited as required during the interview process.

More on Reflexivity

Reflexivity has been described as the act of thinking critically about the interaction between the self and the data during the analysis process. It is necessary in both face-to-face encounters and when data is presented in written text [217]. In this study, reflexivity was necessary during the data collection and analysis stages of the qualitative phase.

As suggested, I considered how my personal biases and the research act itself, including the role of prior personal assumptions and experiences had shaped the data collection phase. I recognized that my participation would change the context of the study and my relationship with the participants[228, 229]. Reflexivity permitted me to focus on my own personal biases and leading behaviors and actions that may have influenced the flow of the qualitative interviewing process [228, 229]. Using a reflexive research journal on a weekly basis, I reported my thoughts, feelings, reactions, and observations related to my subjective experience [223-225]. Practicing reflexivity also enhanced the credibility of the findings and increased the methodological rigor of the study. In order to ensure rigor, I used a systematic, self-reflective research design; data collection strategy; approach to interpretation; and communication strategy.

The specific ways in which I practiced reflexivity involved keeping a log book. When I was struck by an idea that I thought might be important, I noted it in my log book. I dated all entries and made sure that each entry was sufficiently developed so I would understand it later when I re-read it. I also recorded when I thought I was imposing my own worldview on an

observation and developed various propositions as the interviews unfolded. These propositions occurred when I saw connections among participants, perceptions, and events.

Respondent Validation

For quality assurance purposes, data collection and analysis was reflexive and iterative. Member checking was used to ensure factual accuracy and authenticity of the participants' responses about job stress. Member checking is an important means of error reduction [229]. It is based on recognition of the potential for gaps in understanding between the researcher and the participants [43]. It is a fuller acknowledgement that what participants have to offer may be quite complex; for example, they may possess tacit knowledge, or use insider vocabulary which the researcher may or may not have grasped. My accounts were compared with those of the participants to establish a level of correspondence between the two sets [229]. Participants were asked to provide their interpretation of the data during this phase. For example, nurses were asked to assist with the interpretation of the initial data, provide feedback half way through the process and in relation to the completed analysis. The participants' interpretations were integrated into the transcripts. Further, participants were asked to verify the accuracy and to authenticate the data's representation of their experiences with occupational stress. Their feedback was incorporated into the interpretation process.

Rigor

Being explicit and as self-aware as possible about personal assumptions, values, and biases, and how they may come into play during the study augments the study's confirmability [230]. Clarity in my role coupled with data checks (e.g., for bias, deceit, informant knowledgeability) contributed to the study's reliability [230]. As well, interview participants

examined the accuracy of the conclusions made through member checking [230]. Careful commitment to these practices increased the transferability of the findings.

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1. CHAPTER IV: Paper #1 Quality of work life among obstetric nurses in urban northeastern Ontario: a population-based cross sectional study

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Objective: This study examined the quality of work life (QWL) of Registered Nurses working in four small urban hospital-based obstetric programs. At one of the four hospitals, the nurses were cross trained to work in all aspects of obstetrical care, while, at the other locations, the nurses were not cross trained and worked in one specific area of obstetric care.

Methods: This mixed methods population-based study was conducted in 2012 in four urban hospitals, in Sudbury, North Bay, Sault Ste. Marie, and Timmins, in northeastern Ontario. A stratified random sample of registered nurses (n=111) selected from the 138 eligible registered nurses (80.4%) of staff in the labour, delivery, recovery, and postpartum areas at the four hospitals participated. Data were collected by questionnaire, which included the Nursing Stress Scale and the Work-Related Quality of Life Scale, and in semi-structured interviews. Logistic regression analyses were used to consider QWL in relation to the following: 1) demographic factors, and 2) stress, job, and career satisfaction; educational attainment. The semi-structured interviews (n=6) were used to investigate location of cross-training, QWL, and stress in greater depth.

Results: In the logistic regression model, only location of cross-training (OR: 3.82; 95% CI: 1.01 to 14.5) was significantly associated with QWL. The five key themes that emerged from the semi-structured qualitative interviews were: workplace stress, relationships with colleagues, changes in care delivery and model of care, demands for resources, and QWL.

Conclusions: This study highlights a statistical relationship between to the stress and quality of life experiences of obstetrical nurses and contributes to the profile of nurses working in northeastern Ontario. These findings have direct health service consequences by identifying the occupational barriers facing nurses working in northern cities in Ontario. Given the limited number of employment opportunities in the north, it is paramount that employers and employees

work closely together in creating a positive workplace that fosters career advancement and that supports and promotes job satisfaction.

Keywords: Occupational Health, Workforce Issues, Work Organization, Quality of Life, Obstetrics and Gynecology, Stress

Introduction

Quality of work life (QWL) influences the performance and commitment of employees in various industries including government, education, and health care (Huang, Lawler, & Lei, 2007; Nembhard, 2001). A high QWL has been reported to attract new employees and retain a workforce (Akdere, 2006). Thus, health organizations are actively seeking ways to ensure a high QWL for their employees (Akdere, 2006). Improved QWL as defined by employee satisfaction and overall happiness can result in many advantages for the employee, the organization, and consumers (Nadler & Lawler, 1983). Some of these benefits include strengthened organizational commitment, improved quality of care, and increased productivity for both the individual employee and the organization (Golubic, Milosevic, Knezevic, & Mustajbegovic, 2009; Rossi, 2006; Royuela, López-Tamayo, & Suriñach, 2009; Sale, 2007; Saraji & Dargahi, 2006).

In its broadest sense, QWL has been defined as the way in which work is good for the individual and how the employee would evaluate his or her job (Van Laar, Edwards, & Easton, 2007). Its distinguishing elements include the impact of work on people and organizational effectiveness, as well as participatory organizational problem solving and decision making (Nadler & Lawler, 1983).

QWL affects not only job satisfaction, but also satisfaction in other life domains including: leisure, family, financial well-being, health, housing, friendships, education attainment, community engagement, neighborhood interactions, spiritual well-being, the environment, and cultural and social status (Macik-Frey, 2007). Furthermore, the association between work, non-work life domains (Loscocco & Roschelle, 1991), and work-related stress (Killian, 2004) is also a factor in QWL (Van Laar et al., 2007). Evidence has demonstrated that

a negative quality of work-life situation is related to lack of work-life balance (Pino & Rossini, 2012; Spreitzer, 1995; Van Laar et al., 2007).

Despite the evidence that QWL is an important influence on health services and patient care, there is minimal research on QWL among primary health care nurses (Pinker & Shumsky, 2000). The literature that does exist has identified various factors that may impact the QWL of nurses (Pinker & Shumsky, 2000). These variables are explored below.

Nursing is a stressful occupation (Richards, Farmer, & Selvaraj, 2005) with specific physical and psychosocial stressors (Alves, 2005). The 2005 *National Survey of the Work and Health of Nurses* reported absenteeism due to illness and injury for nurse supervisors and registered nurses to be 1.7 million hours in 2005 (Canadian Institute for Health Information, 2005). This number of hours is the equivalent of 9,754 full-time nursing jobs (Canadian Institute for Health Information, 2005). Although absenteeism has been related to stress and identified as an issue in all kinds of nursing, obstetrical nursing is an especially stressful area of nursing due to long and unpredictable work hours and disruptions to nurses' personal time (Promecene & Monga, 2003). In other instances, caring for and supporting parents whose infant has died is demanding, difficult, and stressful (Gensch & Midland, 2000; Moon Fai & Gordon Arthur, 2009; Säflund, Sjögren, & Wredling, 2004). Obstetrical nurses may experience a sense of personal failure as the following statement suggests, "'I feel helpless because I can really only listen and be there to help …I cannot lessen this devastating loss'" (Robinson, Baker, & Nackerud, 1999, p. 184).

Given the time and energy people spend at work, it is important that work be a place where people are generally satisfied and happy (Requena, 2003). Additionally, work affects not only the employee's physical but also his or her psychological well-being and general QWL

(Chan & Wyatt, 2007). Thus, employers and occupational health experts need to understand the components that comprise a healthy work experience.

In northern and rural settings such as northern Ontario, positive work environments are essential to the recruitment and retention of health care professionals. Given the enticements of larger settings in southern locations such as a superior quality of life (e.g., increased likelihood of employment, more employment choices, greater access to social and entertainment opportunities, etc.), it is necessary for the North to take deliberate steps to ensure it has the health professionals it needs. Additionally, studies have shown that strong, positive QWL within health care organizations can contribute to other positive outcomes including workers' physical and psychological health and enhanced health services delivery (Pino & Rossini, 2012; Vagharseyyedin, Vanaki, & Mohammadi, 2011). Strong QWL has been associated with reduced costs, improved quality of care, enhanced organizational commitment, and greater client satisfaction (Kandasamy & Ancheri, 2009; Krueger et al., 2002; Shao, Chou, Yeh, & Tzeng, 2010; Vagharseyyedin et al., 2011). Other studies have reported increased quality of care as a result of elevated QWL (Beasley, Karsh, Hagenauer, Marchand, & Sainfort, 2005; Brooks & Anderson, 2004; Lees & Kearns, 2005; Saraji & Dargahi, 2006). In the context of northerneastern Ontario, these outcomes are as desired in smaller urban (e.g., Timmins and North Bay) and larger urban settings (e.g., Sudbury and Sault Ste. Marie), as elsewhere in the province.

In a 2012 QWL survey conducted at Health Sciences North in Sudbury, Ontario, 39% (n=1,814) of hospital employees reported that the hospital was a 'very good' or 'excellent' place to work, and 30% rated the hospital as a 'poor' or 'fair place' to work (Mulligan, 2013). A work environment that encourages employees to make full use of their skills is vital to recruiting and

retaining nurses and vital to organizational success (Lowe, 2000). This finding is especially important in northern Ontario where employment opportunities for nurses are limited.

Previous studies have shown that strong, positive QWL within health care organizations can contribute to other positive outcomes including workers' physical and psychological health and health services delivery (Pino & Rossini, 2012; Vagharseyyedin et al., 2011). Increased quality of care has been reported to be a result of elevated QWL (Beasley et al., 2005; Brooks & Anderson, 2004; Lees & Kearns, 2005; Saraji & Dargahi, 2006).

Conceptual Framework

In this study, the Job Demand-Control-Support (JDCS) (Figure 1) framework was used to explore potential associations between QWL, stress, and location of cross-training in the work environment. The framework also used an approach to data analysis and interpretation of the findings. The JDCS has been used extensively in research of occupational stress over the last 20 years (J. V. Johnson & Hall, 1988). It focuses on two dimensions of the work environment: *job demands* and *job control* (Karasek Jr, 1979). *Job demands* refer to work load operationalized as time pressure and role conflict (Karasek, 1985). *Job control*, which is sometimes called decision latitude, refers to the person's ability to control his or her work activities (Karasek, 1985). Decision latitude includes two components: skill discretion and decision authority (Karasek, 1985).

The framework helps explain how occupational stress may be mitigating if nurses have greater job control and decision-making capacity. In nursing environments where this opportunity is afforded, there are lower levels of occupational stress (Henderson Betkus & MacLeod, 2004). In terms of quality of work life, studies have reported that increased job autonomy and job control is linked to higher QWL among nurses and allied health professionals

(Cole et al., 2005; Solomon, Salvatori, & Berry, 2001). It is hypothesized that location of cross-training will afford nurses with increased clinical competencies to work in all areas of the birthing unit and permit for greater decision-making capacity in the delivery of obstetrical care to their patients.

Aims

The purpose of this mixed methods study was to examine the quality of work life of Registered Nurses (i.e., nurses) working in obstetrics at four hospitals in northeastern Ontario and to explore factors influencing the nurses' QWL. Location of cross-training was defined as nurses in Sudbury at Health Sciences North (51 participants) who could work in all three areas of obstetrical care (labour, delivery and post-partum). Conversely, the remaining nurses (61 participants) in at North Bay Regional Health Centre, Sault Area Hospital, and Timmins and District Area Hospital were not cross-trained and worked in one of the three areas of obstetrical care. Differences in QWL, occupational stress, and related demographic variables (e.g., age, gender, marital status) among these two groups of nurses were examined. An additional objective was to identify and examine the physical and psychosocial stresses that these nurses experience at work. Qualitative findings generated in the semi-structured interviews led to a number of recurring themes and subthemes.

Methods

This two-part study used a mixed-method sequential explanatory (Creswell, 2008) approach to examine the quality of work life, location of cross-training, and job stress experienced by nurses working in the labour, delivery, and post-partum areas of selected northeastern Ontario cities.

This study is the first study of the relationship between factors associated with quality of work life (QWL) of Registered Nurses working in four small urban hospital-based obstetric

programs. Because northern Ontario is experiencing challenges in recruiting and retaining health professionals, studies that reveal the experiences of nurses at work in the north are important. The study is also important to institutions where cross-training is being considered.

Ethical considerations

Ethics approval was provided by the research ethics boards for the university and the four hospitals involved in the study.

Quantitative Phase

Participants

A total of 138 nurses were eligible to participate in the study, including 51 nurses in Sudbury, 31 nurses in North Bay, 32 nurses in Sault Ste. Marie, and 24 nurses in Timmins. The nurses names were stratified randomly by location of cross-training, and geographic location. Nurses working in obstetrics at four northeastern Ontario hospitals (Health Sciences North, North Bay Regional Health Centre, Sault Area Hospital, and Timmins and District Hospital, see Figure 1_3) were invited to participate in the cross sectional part of the study through an invitation package sent by mail or email. The package included a cover letter, informed consent form, and study questionnaires.

Heath Sciences North is a 454 bed hospital (Health Sciences North, 2013) located in Sudbury, ON (pop. 160, 274) (Ferguson, Carlson, Zivnuska, & Whitten, 2012); North Bay Regional Heath Centre in North Bay, ON is a 291 bed hospital (North Bay Regional Health Centre, 2013) located in North Bay, ON (pop. 53, 651) (Carlson, Kacmar, Zivnuska, Ferguson, & Whitten, 2011); Sault Area Hospital is a 291 bed hospital (Sault Area Hospital, 2011) located in in Sault Ste. Marie, ON (pop. 75, 141) (Halpern, 2005); and Timmins and District Area Hospital is a 161 bed hospital located in Timmins, ON (pop. 43, 165) (Hart, 2005). These

hospitals are the largest in northeastern Ontario. At the time of the study, 51 nurses were employed in obstetrics at Heath Sciences North, 36 at North Bay Regional Heath Centre, 36 at Sault Area Hospital, and 26 at Timmins and District Area Hospital. After receiving ethics approval, participants were given a ten dollar gift certificate for completing the survey.

Data Collection

The 15-page questionnaire, available in English, included questions about seven potential major sources of stress closely related to the conceptual categories of stress (e.g., death and dying, conflict with physicians, inadequate preparation, lack of support, conflict with other nurses, workload, and uncertainty concerning treatment); demographic information; occupational histories; and work ability. Work ability is defined as the worker's capacity to perform their work, and is measured by an index describing their health resources in relation to work demands (Tuomi K., Ilmarinen J., Jahkola A., L., & A., 1994; Tuomi, 1998). It was measured by an index describing their health resources with regard to work demands and quality of work life (e.g., job and career satisfaction, general well-being, stress at work, control at work, home-work interface, and working conditions).

Outcome Measures

The Work-Related Quality of Life Scale (WRQLS)

A number of QWL measures including those from the 42-item Brooks Quality of Nursing Work Life questionnaire were considered to be the measurement basis of QWL (Brooks, 2001). Test-retest of the total scale of the WRQLS was considered due to good reliability (0.90). After careful deliberation, the Work-Related Quality of Life Scale (WRQLS) was selected as one of the measures used in the survey because it captures employment and non-employment facets of life, as well as more current issues such as occupational stress (Van Laar et al., 2007).

Furthermore, the measure provides greater relevance to healthcare workplaces than any previous measure of WRQLS (Van Laar et al., 2007).

The WRQLS is a 24-item psychometric scale used to gauge the perceived quality of work by an employee based on six psychosocial sub-factors: job and career satisfaction, general well-being, homework interface, stress at work, control at work, and working conditions (Van Laar et al., 2007). The WRQLS has five response options ranging from "strongly disagree" to "strongly agree." Individual item responses are added together to obtain a total score (Van Laar et al., 2007). The scale captures employment and non-employment facets of life, as well as more current issues such as occupational stress. The construct validity of the QWL scale is supported by factor analysis (Van Laar et al., 2007). Overall scale reliability for the item pool is strong with a Cronbach's alpha of 0.96. This indicates that the items measure middle-range theoretical concepts in a consistent manner (Van Laar et al., 2007).

In this study, QWL was defined by the following statement taken from the Work Related Quality of Life Scale (WRQLS), Question 24: "I am satisfied with the overall quality of my working life." The possible responses were: 'Strong Agree," "Agree," "Neutral," "Disagree," and "Strongly Disagree." In addition, high QWL was defined as scores of 4 or 5, and low QWL was defined by scores of 3, 2, and 1 on a five point Likert scale by the WRQLS question 24: "I am satisfied with the overall quality of my working life."

Nursing Stress Scale (NSS)

The Nursing Stress Scale (NSS) (Gray-Toft & Anderson, 1981) was also selected. The NSS is the most widely used and best known measure of stress for nurses (French, Lenton, Walters, & Eyles, 2000). The scale was designed around situations identified to cause stress for nurses in the performance of their duties. The NSS (Gray-Toft & Anderson, 1981) is 34 item scale. It has four response options ranging from "very frequently" to "never" and is divided into

seven subscales based on the concepts of psychological, physical, and social work environments. Good internal (0.79) consistency has been reported (Gray-Toft & Anderson, 1981). The NSS is the first measurement tool that addresses frequency of work stressors experienced by nurses. The scores are based on nurses' responses to descriptions of situations that have been identified as stressful for nurses in the workplace as well as stress in psychological, physical, and social work environments.

Demographic Data

In addition to the above tools, the questionnaire included demographic questions about: gender, ethnicity, age, education, and place of birth. The questionnaire also included questions about work settings such as: employment status, years of experience, types of shifts worked, patient workload, and hours worked per week.

Data Analysis

Frequencies, percentages, cross-tabulations, and age-adjusted odds ratio estimates were computed using STATA 11.0 (StataCorp, 2009). We did not have direct access to the list of participants. Each participant was assigned an alphanumeric number. Random selection of those alphanumeric numbers was done using the runiform function in STATA 11.0 (StataCorp, 2009). The unit manager was notified of the random number and instructed to ask the nurse (corresponding to that number) if they would consent to be contacted by myself to introduce the study. Assumptions and data were checked and met; there were no outliers.

Logistic regression models were fitted to provide estimates of multivariable odds ratio and corresponding 95% confidence intervals. Backward stepwise logistic regression analysis was performed using STATA, using a cut-off of $p<0.05$ for inclusion. Binary logistic regression was performed, and QWL (e.g., low and high) was considered as the dependent dichotomous

variable. Four variables were included as independent variables: location of cross-training, total stress scores, employment status, and education attainment. Potential factors that were also included were individual nurses' age, gender, ethnicity, place of birth; marital status, work ability, work absenteeism rates, education, and workload were included (McNeely, 2005). Independent variables selected for logistic regression analysis were based on their relationship with intent to stay in their current position and QWL as reported in the literature (Boyatzis, 1998; Golubic et al., 2009; Gunnarsdottir, Clarke, Rafferty, & Nutbeam, 2009; Martel & Dupuis, 2006; McNeely, 2005; Rice & Snyder, 2008; Saraji & Dargahi, 2006; Stordeur, D'Hoore, & Vandenberghe, 2001; Vagharseyyedin et al., 2011). In addition, Fisher's exact two-tailed test was used to examine their relationship with QWL.

Qualitative Phase

Participants

Recruitment of participants for the semi-structured interviews occurred through purposive sampling techniques. In the final question of the survey, interested respondents were invited to provide their e-mail address so they could be contacted about a follow-up interview. These individuals were contacted by email about the possibility of participating in an interview. Six one-hour interviews were conducted with nurses from the Health Sciences North (n=2), North Bay Regional Health Centre (n=2), and Sault Area Hospital in person (n=2). The interviews were audio recorded and transcribed verbatim. For completing the interview, participants received $20.

Techniques of thematic analysis, most significantly coding for content, were used with the interview data (Guest, MacQueen, & Namey, 2012). The process was both inductive and deductive in nature and involved careful preparation of a code book, consultations with

committee members, and, at times, recoding (Burns & Grove, 2005). The outcomes of the analysis process were five themes and one level of subthemes; the five major themes were: workplace stress, relationships with colleagues, changes in care delivery and model of care, demands for resources, and QWL. While initial coding was principally descriptive in nature, as the analysis process progressed, it shifted to thematic and explanatory-based coding. Coding was facilitated through use of NVIVO 8 (QSR, 2007). The transcription symbol "/" was used to indicate phrase boundaries (Bailey & Tilley, 2002). Capital letters were used to mark an increase in the voice tone relative to previous talk. Respondents were coded (R1, R2, R3, R4, R5 and R6).

Rigour

Rigour was ensured in three ways. The first involved the use of member checking after each interview. After a transcription was completed, the participant received a copy of the transcript by e-mail and was invited to make additions and/or changes for clarity and accuracy. Comments were returned either by email or phone. This feedback from the participants was vital to understanding the relationships between occupational stress, location of cross-training, and QWL. Member checking is a recognized means of error reduction (Mays & Pope, 2000).

I also consulted with other members of the research team prior to and during the analysis process. Agreement on the overall analysis strategy, coding categories, and the principal themes represent important commitment to the integrity of the study.

Finally, data collection and analysis were reflexive and iterative in nature. Being explicit and as self-aware as possible about personal assumptions, values and biases, and how they may come into play during the study contributed to the study's confirmability (Miles & Huberman, 1994). Clarity in my role coupled with data checks (e.g., for bias, deceit, informant knowledgeability, etc.) contributed to the study's reliability (Miles & Huberman, 1994).

Knowledge Dissemination

A summary of the findings was made available to the participants upon request and available for pickup at their respective hospital. This summary was mailed to the four obstetrics units while presentations were made at each of the four hospital sites.

Results

Quantitative

A total of 51 (45.9% response rate) questionnaires were completed online while another 60 questionnaires (54.1% response rate) were completed using the paper format (n=111). In total, 111 nurses completed the survey (80.4% response rate). Fifty-one respondents (100% response rate) at Health Sciences North completed the survey online. Twenty-two respondents (70.1% response rate) at North Bay Regional Health Centre, 20 respondents (62.5% response rate) at Sault Ste. Marie, and 18 respondents (75% response rate) at Timmins and District Hospital completed the paper version of the survey.

Table 1 presents a demographic profile of the nurses. The majority of participants were female (94.6%), ranging in age from 24 to 64 years (mean= 41.9, 10.2). Forty-six percent of respondents worked in Sudbury at Health Sciences North; 19.8% worked in North Bay at North Bay Regional Health Centre; 18.0% worked in Sault Ste. Marie at Sault Area Hospital; and 16.2% worked in Timmins at Timmins and District Hospital. The nurses had, on average, 16.3 years (10.8) of nursing experience and 11.6 years (9.01) of obstetrical nursing experience. Sixty-three percent of respondents worked full-time, 33% worked part-time, and 4.5% were casual workers. The majority of respondents (68.2%) described their ethnicity as English-Canadian. Approximately 25.8 % of respondents self-identified as Francophone and 3% of the sample described their ethnicity as a combination of two ethnicities, such as French and Aboriginal.

Fisher's exact two-tailed test was used to examine simple significance of the association between QWL and location of cross-training, NSS total stress scores, type of hospital (e.g., teaching vs. community hospital), and employment status. Fisher's exact two-tailed test analysis revealed a statistically significant association between QWL and location of cross-training, NSS total stress scores, type of hospital (teaching vs. community hospital), and employment status. Cross-trained nurses were more likely to report a higher QWL (N=111, $p < 0.01$) than non-cross-trained nurses. Respondents with NSS total stress scores over 65 were likely to experience lower QWL (N=111, $p < 0.01$). Full-time employees also reported higher QWL than part-time employees (N=88, $p<0.004$). Fisher's exact testing done for other variables (e.g., place of birth, gender, ethnicity, education attainment, work absenteeism, years of experience, mean hours worked per week, and overtime hours worked per week) were not found to be statistically significant.

Multivariable Factors Associated with Obstetrical RN QWL

The following variables in the multivariable logistic model were considered in relation to the outcomes of either high or low QWL: location of cross-training, age, occupational stress, income, employment status, and type of hospital (e.g., teaching or community hospital). High quality of work life was defined as scores of '4' or '5' and low quality of work life was defined by scores of '3', '2' and '1' on a five point Likert scale by the WRQLS question 24: "I am satisfied with the overall quality of my working life. Unadjusted odds ratio estimates for study participant characteristics are found in Table 2. Both significant and insignificant variables were included in the simple model. Variables statistically significantly related to work ability were as follows: cross-trained nurses (OR: 5.32; 95% CI: 1.84 to 15.4), total stress scores of non-cross trained nurses (OR: 0.20; 95% CI: 0.07 to 0.59), and part-time employment status (OR: 0.13; 95% CI: 0.29 to 0.62). Nurses who were cross-trained were over five times as likely as non-

cross-trained nurses to have a high QWL. Nurses with total stress scores greater than 65 were five times as likely to experience low QWL. Part-time employed nurses were more than seven times as likely to have low QWL.

Age adjusted odds ratio estimates for study participant characteristics are found in Table 3. QWL was considered as a dependent dichotomous variable. Location of cross-training was statistically associated (OR: 3.82; 95% CI: 1.01 to 14.5) with high QWL. Nurses who were cross-trained were 3.82 times as likely as non-cross-trained nurses to have a high QWL. The other variables (e.g., total stress scores, employment status and education attainment) were not statistically significant.

Qualitative

Analysis of the semi-structured interviews yielded five core themes: workplace stress, relationships with colleagues, changes in care delivery and model of care, demands for resources, and QWL. Figure 2 provides an overview of these categories.

The majority of the study respondents spoke about the stressors of their work environment. These stressors included the actual work the nurses do as well as their relationships with colleagues. One respondent offered the following insight into the pressure she experienced from physicians and her nurse-manager:

> They [the physicians] you know/ and they'll even go to the managers who tell us 'no no there's only three of them' and that's what it's supposed to be but if they buck enough the physicians and they go and talk to the manager they can't really stop them. So that's stressful like when they already know we already got three moms and you want to bring in two more inductions/ so a lot of times as soon as

> one delivers they'll say bring the other patient in/ It could be like eleven at night and they're still wanting to push these inductions. So that's kind of stressful. (R3)

Another theme discovered in the interviews was the need for relationships. While relationships can refer to the interactions between colleagues in a social setting, for nurses, relationships can also be an important part of the teamwork required to provide safe patient care. One respondent shared the following about her relationships with colleagues and how they progressed from limited interactions to more collegial exchanges. Moreover, when the relationships were stronger, work was improved:

> Even though you know that's intimidating when you start a new job, you don't know people and sometimes you don't want to go to these functions by yourself but after doing that a few times I found that I got to know people better and they were even more kind of friendly towards you in the work setting which helped your work life that way. (R2)

All respondents commented on the quality of their work lives. Given that job satisfaction and overall happiness at work were reported by the nurses, the take away is that, in general, the nurses enjoyed positive work lives. One respondent reflected on her work setting in the following way:

> Well it's usually a good floor to work on, it's usually a happy environment and you get to share in people's like probably the best experience of their life is having their first baby, or second or third. Uhmm and you get to share in that, see how happy they are. SOMETIMES it's not always happy but that's a small percentage of the deliveries. Uhmmm and that why I guess why I enjoy working there. (R2)

The majority of the nurses said that location of cross-training was beneficial and that it helped increase clinical competency. In this study, the term cross training refers to being competent to provide care in all aspects of obstetric care. The passage below presents one instance through which clinical competence was augmented:

> Um I don't know necessarily which AREA of cross-training was more challenging, I mean learning how to take care of a lady in labour and as she's delivering a baby I found you know stressful and challenging at first because it was completely new to me. But, it was never to the point that I, I didn't enjoy it, I still, I enjoyed it even during the training part. (R1)

Thus, although there are stressors when cross training is involved, such as the above reference to the work of the nurse at the birth of a new baby, there is also recognition that cross training leads to new skills and even enjoyment.

While the resources identified by the nurses as necessary were diverse, they particularly mentioned the following: professional development and continuing education, additional human resources, and equipment for the obstetrical unit. The following quotation reveals one nurse's concern about accessing education and the personal costs she has incurred in order to get the training she needs:

> Well in my current role if I speak about my stressors, um it's a, it's a stressor of mine to um, uh, to be creative enough to uh, uhm access uh educational funds um from a college point of view. So I've paid, self-paid many um workshops and in-services because I knew that it wasn't going to be funded. And yet I don't feel like I can access the bursary at the hospital, not putting in enough hours um. So, I

> probably struggle more than they do, that's kind of ironic because I work in an educational institution but I struggle more than they do for funds. (R2)

In order to be experts in the provision of safe patient care for new mothers and their infants, the nurses recognize their need to keep up their skills and to develop new ones.

Discussion

The overall response rate (80.4%) was good. However, the sample size might have been increased by augmenting the remuneration provided in the study, lengthening the data collection period, and inviting all nurses at each site to participate in the study. There are several limitations in this study. The representativeness of participants in this study is of potential concern. The sample population was confined to four selected northeastern Ontario hospitals such that the results are not generalizable to other obstetric nurses in other parts of Ontario. Secondly, those nurses who had left obstetrics were not reflected in the sample and may provide a different view of the relationship between QWL and cross-training. Selection bias may have influenced the study results. Third, location of cross-training found a statistical relationship found with a high QWL but included only those cross-trained nurses at one hospital location (Health Sciences North). Therefore, this relationship may have been due to other factors including organizational system and leadership characteristics.

The association between employee a high QWL and location of cross-training emphasize the importance of positive workplace conditions for nurses' QWL and for their empowerment. At the same time, the statistically significant odds ratio may have been influenced by selection bias since nurses who did not want to participate in cross-training had left the unit before its implementation. Furthermore, in this study, all nurses who were cross-trained were located at Health Sciences North and thus other factors may have contributed to their high QWL. For

instance, several organizational characteristics including social support by management during the cross-training transition period may have played a significant role in promoting cross-training.

From the qualitative interviews, we found that cross-training provided both positive and negative issues. It is important to state that the interviews served to explain and provide greater depth to the quantitative findings. The lack of resources was identified by some of the nurses identified as a source of stress because looking for equipment took up a great deal of their time. It also acted as a barrier in training student nurses and in providing care to families. Others stated that during the period of transition, in which nurses begin cross-training, there were feelings of apprehension, stress and anxiety. The negative implications of cross-training may be mitigated through skillful management. Many of the potentially negative impacts stem from thoughtless implementations of cross-training (Schultz et al., 2003). Some research suggests that if managed strategically and with care, cross-training should provide a net benefit for patients, their families, nurses, and employers (Schultz, McClain, & Thomas, 2003).

Some nurses also commented on positive experiences including learning new skills and becoming proficient in all areas of obstetrical nursing. Cross-training has been shown to augment health care services delivery by better allocating staff to meet patient loads and by providing better quality than temporary nurses hired from a supplemental agency (Inman, Blumenfeld, & Ko, 2005). Operating without well trained staff increases the risk of patient neglect and medication error. If other units have cross-trained nurses, they could supplement those in the short-staffed unit to maintain quality (Inman et al., 2005).

Some clinically experienced nurses who had worked in one area (e.g., labour, delivery and post-partum) of obstetrics left their jobs. As an outcome, new graduates and inexperienced

nurses had fewer mentors to foster their clinical training. We postulate that as the number of nurses who are cross-trained increases across hospitals in Ontario, the number of clinically experienced mentors will also rise. In turn, there will be more mentors to help new graduates integrate into the workforce and foster meaningful mentoring relationships.

Greater employee satisfaction among employees is related to them rising to the challenges of organizational restructuring and to being more resilient to occupational stress and burnout (Spence Laschinger, 2008). Employer interventions that bolster employee viewpoints of empowerment may increase the employee's ability to respond more effectively to today's challenging healthcare work environments (Spence Laschinger, 2008). Moreover, patients' perception of the quality of nursing care is related to nurse satisfaction. Therefore, to meet organizational quality goals in providing a higher quality of work life to all nurses, it is vital for employers to safeguard that empowering work conditions are in place to promote nurses' satisfaction with their jobs and in the delivery of excellent health services (Spence Laschinger, 2008).

QWL initiatives in health care settings can improve the morale of employees and organizational effectiveness (Lenthall et al., 2009). Furthermore, QWL can improve the quality of care provided as well as recruitment and retention strategies of nurses (Easton, 2011; Opie et al., 2010). Promoting QWL approaches may be a more practical and long-term approach in the discourse about health human resources and health services delivery (Nembhard, 2001).

In this study, total stress scores were not statistically significant in determining a high QWL among the nurses at the four hospital locations. Higher reported stress levels have been identified as a factor of nurses likely to plan to leave their nursing positions within 12 months in rural and remote practice settings in Canada (McNeely, 2005). An employee’s intention to leave

is also related to their job satisfaction (Larrabee et al., 2003). A dissatisfied workforce performing below his or her full potential is a considerable cause for concern, particularly at a time when government, employers and educators are promoting continuous learning as a way of building a cohesive, healthy, and knowledgeable workforce (Lowe, 2000). Nevertheless, the negative implications of cross-training may be mitigated through skillful management, increased social supports in the workplace and through bolstering career and educational opportunities.

Research further demonstrates that workers can only learn so many tasks before they begin forgetting how to perform others (Nembhard, 2001).

In this study, it was found that cross-trained nurses experienced higher QWL than non-cross-trained nurses. A possible explanation could be that organizational features can affect how nurses view their QWL. Employer characteristics such as policies and procedures, leadership style, operations, and general contextual factors of the workplace have a significant effect on how respondents view their QWL (Krueger et al., 2002; Ministry of Finance - Ontario, 2012). This is because QWL is an umbrella term encompassing many concepts. Therefore, focusing on only one aspect of QWL is an inappropriate way to examine QWL (Krueger et al., 2002).

These study results focus on nurses in small, urban, northern Ontario provides insight into their occupational health and work settings. This is in contrast to numerous studies that have examined occupational stress among nurses in large metropolitan urban areas in Canada (Tyson, Pongruengphant, & Aggarwal, 2002), the United States (Ulrich et al., 2007), Europe (Guppy & Gutteridge, 1991; Linder-Pelz, Pierce, & Minslow; Sveinsdottir, 2006), Australia (Linder-Pelz et al.), India (McVicar, 2003), and China (Wu, Chi, Chen, Wang, & Jin, 2010). The QWL of nurses working in northern communities may reflect distinct characteristics such as a rural and northern lifestyle and a greater sense of belonging to a community than the QWLs of nurses working in

large metropolitan areas do. Since individuals in rural and northern regions have been reported to value self-sufficiency, self-reliance, independence, and stoicism, these concepts may also influence the results in this study (Lightfoot, 2008). This idea merits investigation.

Rural and northern Ontario communities have unique challenges in creating, recruiting, and retaining an adequate health care workforce and, in particular, primary health care nurses. With many nurses approaching retirement and fewer individuals entering the profession, nursing is experiencing a serious workforce shortage (Pong & Pitblado, 2005). The physical and psychosocial stressors of nursing may be greater in rural and northern settings. Exacerbating the situation is that rural and northern residents are, on average, sicker (Wilson et al., 2009) and have to travel greater distances to receive services, including health services, compared to residents in southern Ontario. By identifying the types of stressors that nurses face in the workplace, the health of working nurses and improvement their QWL is promoted. Broadly, this study can be added to a growing body of knowledge related to healthy work environments in public and private industries.

The aforementioned quantitative findings are largely in line with the viewpoints expressed in the interviews. Cross-training may be better supported by workers with greater organizational supports and those that have opportunities to expand both their career and educational prospective.

In relation to participants' views about workplace stress, two key points emerged. Firstly, workplace stress was a source of physical and mental stress for the respondents. Secondly, interventions that mitigate occupational stressors (e.g., acute low back pain, burnout, job dissatisfaction, depression) may result in healthier workers and a more positive work environment (Grobler et al., 2009; Seymour & Dupre, 2008; Wilson et al., 2009). As knowledge

expands in the field of occupational stress and health, different kinds of interventions will need to be identified. Replication of this study with larger and more diverse samples, including managers, is warranted.

The shortage of healthcare professionals in rural communities remains a serious challenge to equitable healthcare delivery (WHO, 2003; Wilson et al., 2009). In Canada, the nursing shortage and high turnover rate of nurses are expected to worsen over the next ten years, making recruitment and retention of nurses a priority for health care. The country will be short almost 60,000 full-time equivalent nurses in the next 10 years (Pong & Pitblado, 2005). Although recent studies indicate that the nursing workforce is currently at its highest, shortages still exist and are projected to continue for several decades (Barrett, Lipsky, & Nawal Lutfiyya, 2011; Rabinowitz et al., 2012). Some of these barriers include an aging workforce, declining enrollments in programs of nursing, greater career opportunities for women, and higher salaries in other disciplines (Bushy & Leipert, 2005). Additionally, rural and northern hospitals in many western countries face difficulty recruiting and retaining nurses (Farmer, Iversen, Bond, & Duthie, 2003; Wilkinson, Laven, Pratt, & Beilby, 2003). These challenges include a higher percentage of poverty, lower life expectancy (I. Johnson et al., 2000), a larger percentage of the elderly, and a greater number of individuals living with chronic conditions (Pong, 2000; Rabinowitz, Diamond, Hojat, & Hazelwood, 2008).

This research is important for its impact on direct health services. In particular, it is important for identifying the occupational barriers facing nurses working in northern cities in Ontario. Given the limited number of employment opportunities in the north, employers and employees need to work together to create a positive workplace that fosters career advancements and supports job satisfaction. In terms of policy implications, the recruitment and retention of

nurses to northern and rural areas is a serious undertaking for decision makers and planners. Building positive work environments is a crucial component of retaining health care professionals in the north and recruiting those from other regions to move here for lifestyle and career opportunities (French et al., 2000; Golubic et al., 2009; Grobler et al., 2009; MacLeod, Browne, & Leipert, 1998; McVicar, 2003; Mimura & Griffiths, 2003; Pinikahana & Happell, 2004; Pitblado, Medves, & Stewart, 2005; Portney & Watkins, 2000; Shader, Broome, Broome, West, & Nash, 2001).

Conclusions

The present study highlights the relationship between factors associated with quality of work life (QWL) of Registered Nurses working in four small urban hospital-based obstetric programs.. Additional research is needed to further examine the relationship between QWL and related factors. These may ultimately lead to the development and implementation of QWL programs that are tailored to meet the needs of employees and employers. The study highlights the importance of establishing a high QWL for nurses' health. Moreover, it provides preliminary evidence of the work environment of obstetrical nurses working in northeastern Ontario and potential opportunities for interventions to increase their QWL. Such interventions may target organizational and manager characteristics as well as approaches that ameliorate nurses working conditions. These approaches have been shown to increase QWL and may lead to healthier work environments and in other work settings (Golubic et al., 2009; Laschinger, Finegan, Shamian, & Almost, 2001).

Conflict of interest statement

The authors have no conflict of interest to declare.

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Figure 1_1. The Job Demand-Control-Support, where L=low and H=high. Adapted from de Jonge et al., 1996, p. 212 (De Jonge, Janssen, & van Breukelen, 1996)

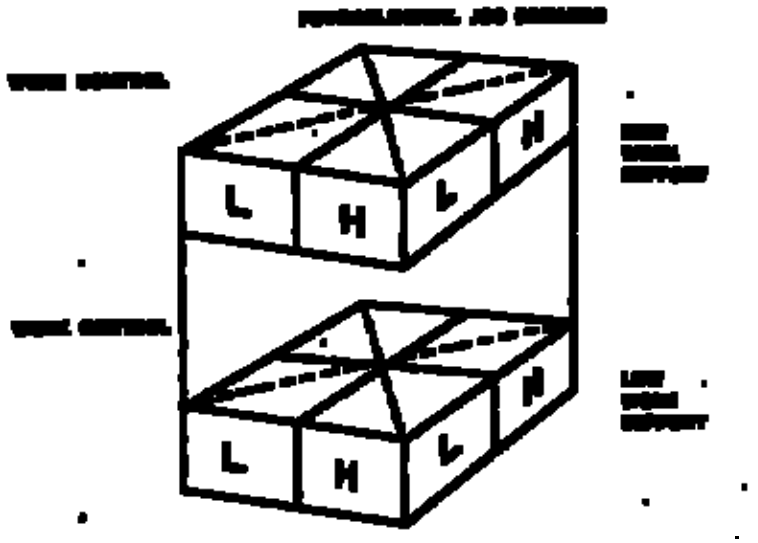

Figure 1_2.

Thematic Categories from Semi-Structured Interviews

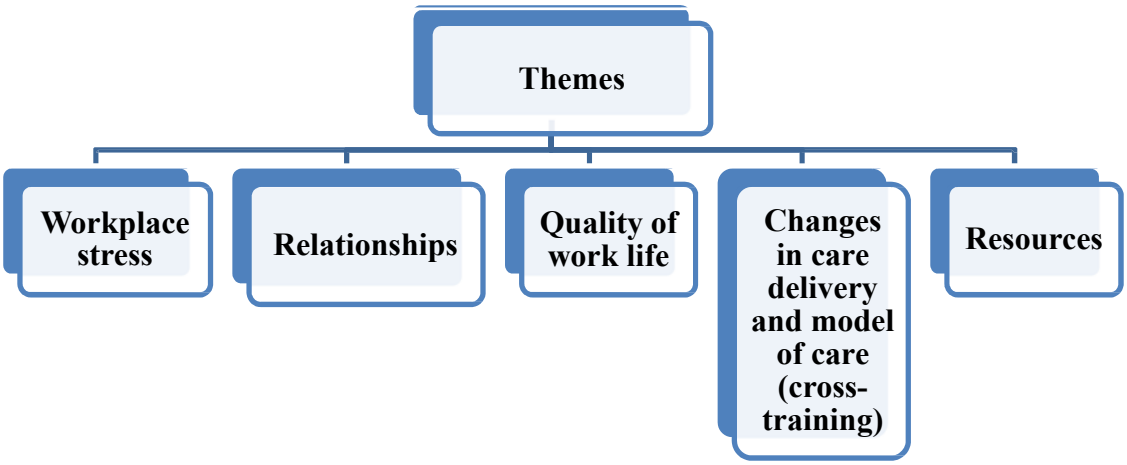

Table 1_1. Characteristics of participants

	n	%	HSN	NBRHC	SAH	TDH
Gender			n / %	n / %	n / %	n / %
Female	87	94.6	50 | 98.0	18 | 94.8	12.0 | 100	7 | 70.0
Male	5	5.4	1 | 2.0	1 | 5.2	0 | 0	3 | 30.0
Age						
Under 35	20	24.4	10 | 22.2	5 | 35.7	4 | 28.6	1 | 11.1
35-44 years	29	35.3	18 | 40.0	4 | 28.6	3 | 21.4	4 | 44.4
45-54 years	19	23.2	12 | 26.7	2 | 14.3	4 | 28.6	1 | 11.1
55 years or above	14	17.1	5 | 11.1	3 | 21.4	3 | 21.4	3 | 33.3
Nursing experience						
10 or less years	29	34.1	16 | 33.3	6 | 37.5	5 | 38.5	2 | 25.0
11-20 years	26	30.6	18 | 37.5	4 | 25.0	2 | 15.4	2 | 25.0
Greater than 20 years	30	35.3	14 | 29.2	6 | 37.5	6 | 46.2	4 | 50.0
Marital Status						
Married/Common-law	69	78.4	38 | 77.6	11 | 64.7	11 | 84.6	9 | 100
Single	9	10.2	5 | 10.2	3 | 17.6	1 | 7.7	0 | 0
Divorced	5	5.7	2 | 4.1	2 | 11.8	1 | 7.7	0 | 0
Separated	3	3.4	3 | 6.1	0 | 0	0 | 0	0 | 0
Widowed	2	2.3	1 | 2.0	1 | 5.9	0 | 0	0 | 0
Born northeastern Ontario						
Yes	84	92.3	48 | 100	8 | 80.0	17 | 94.4	11 | 73.3
No	7	7.7	0 | 0	2 | 20.0	1 | 5.6	4 | 26.7
Was your spouse/significant other born and/or raised in northeastern Ontario?						
Yes	69	85.2	39 | 86.7	12 | 80	10 | 76.9	8 | 100
No	7	8.6	3 | 6.7	3 | 3	1 | 7.7	0 | 0
Not applicable	5	6.2	3 | 6.7	0 | 0	2 | 15.4	0 | 0
Highest attained nursing education						
RN Diploma	50	45.0	32 | 64.0	14 | 63.6	2 | 9.5	2 | 11.1
RN University Degree	59	53.2	17 | 34.0	7 | 31.8	19 | 90.5	16 | 88.9
Masters	2	1.8	1 | 2.0	1 | 4.5	0 | 0	0 | 0
Ethnicity						
English-Canadian	58	68.2	25 | 53.2	14 | 82.4	11 | 84.6	8 | 80.0
Francophone	22	25.8	18 | 38.3	2 | 11.8	0 | 0	2 | 20.0
Aboriginal	3	3.5	2 | 4.3	1 | 5.9	1 | 7.7	0 | 0
Other	2	2.5	2 | 4.3	0 | 0	0 | 0	0 | 0

Note. HSN=Health Sciences North, NBRHC=North Bay Regional Health Centre, SAH=Sault Area Hospital, and TDH=Timmins and District Hospital.

Table 1_2. Unadjusted Odds ratio estimates and approximate 95% confidence intervals for stress, job and career satisfaction, education attainment and nurse uncertainty concerning treatment

	Low QWL	High QWL	Odds ratio estimate	95% CI
Location of cross-training				
No (Sault Ste. Marie, North Bay, Timmins)	22 (81.5%)	38 (45.2%)	1	
Yes (HSN)	5 (18.5%)	46 (54.8%)	5.32	1.84-15.4
Total stress scores				
Low (Total score <65)	5 (10.6 %)	19(37.3%)	1	
High (Total score >65)	42 (89.4 %)	32 (62.8%)	0.20	0.07-0.59
Employment status				
FT	18 (90%)	37 (54.4%)	1	
PT	2 (10%)	31(45.6%)	0.13	0.29-0.62
Education attainment				
RN Degree	17(27.9%)	44 (72.1%)	1	
RN Diploma	10 (20.0%)	40(80.0%)	1.55	0.63-3.77

Note. High quality of work life was defined as scores of '4' or '5' and low quality of work life was defined by scores of '3', '2' and '1' on a five point Likert scale by the WRQLS question 24: "I am satisfied with the overall quality of my working life. The total NSS stress score was partitioned into two groups based on the median value (65). Respondents with scores below 65 were characterized as the low stress group and those with scores ≥ 65 were placed in the high stress group.

Table 1_3. Age Adjusted odds ratio estimates and approximate 95% confidence intervals for RN QWL

	Low QWL	High QWL	Odds ratio estimate	95% CI
Location with cross-training				
No (Sault Ste. Marie, North Bay, Timmins)	22 (81.5%)	38 (45.2%)	1	
Yes (HSN)	5 (18.5%)	46 (54.8%)	3.82*	1.01-14.5
Missing	0	0		
Total stress scores				
Low (Total score <65)	5 (10.6 %)	19(37.3%)	1	
High (Total score >65)	42 (89.4 %)	32 (62.8%)	0.95	0.88-1.01
Missing	5	8		
Employment status				
FT	18 (90%)	37 (54.4%)	1	
PT	2 (10%)	31(45.6%)	0.27	0.04-1.55
Missing	10	13		
Education attainment				
RN Degree	17(27.9%)	44 (72.1%)	1	
RN Diploma	10 (20.0%)	40(80.0%)	1.63	0.33-8.05
Missing	0	0		

Note. High quality of work life was defined as scores of '4' or '5' and low quality of work life was defined by scores of '3', '2' and '1' on a five point Likert scale by the WRQLS question 24: "I am satisfied with the overall quality of my working life. *<p<0.05

Figure 1_3. Map of Hospital Sites across northeastern Ontario

Legend:

1. Heath Sciences North – Sudbury, Ontario, Canada
2. Timmins and District Area Hospital – Timmins, Ontario, Canada
3. Sault Area Hospital – Sault Ste. Marie, Ontario, Canada
4. North Bay Regional Heath Centre – North Bay, Ontario, Canada

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5. CHAPTER V: Paper #2 Work Ability and Work-Related Stress: A Cross sectional Study of Obstetrical Nurses in Urban Northeastern Ontario

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Background: The aim of this study was to determine: 1) if quality of work life (QWL), location of cross-training, stress variables, and various demographic factors in nurses are associated with work ability, and 2) nursing occupational stress, QWL, and various related factors are associated with nurses' work ability. Work ability is defined as the worker's capacity to perform their work, and is measured by an index describing their health resources in relation to work demands.

Methods: This cross sectional study was conducted in 2012 in four hospitals in northeastern Ontario (Health Sciences North, North Bay Regional Health Centre, Sault Area Hospital, and Timmins and District Hospital in Ontario, Canada). A stratified random sample of registered nurses (n=111) were selected from the total number of 138 registered nurses on staff in the labour, delivery, recovery, and postpartum areas. Participants provided demographic information and answered questions about work stress, work ability, and quality of work life. Two separate multiple regressions considered whether 1) demographic and related factors (e.g., age, ethnicity, gender, marital status, and nursing experience) were associated with work ability, and 2) stress and quality of work life variables (e.g., QWL scores, total stress scores, home-work interface, and mean number of patients per shift) were associated with work ability. Logistic regression was used to examine whether select variables (e.g., total stress scores, mean number of patients per shift, home-work interface, hospital type, and various demographic factors) were associated with work ability.

Results: The majority of participants were female (94.6%) ranging in age from 24 to 64 years (mean= 41.9, s.d. =10.2). A total of 51 (45.9% response rate) online questionnaires were returned; another 60 (54.1% response rate) paper-based questionnaires were completed. In total, 111 nurses completed the survey (80.4% response rate). No significant regression equation was found for the demographics model (p=0.15), with an R^2 of 0.111. For the stress and QWL model,

one variable: QWL (home-work interface) (p=0.015), cross-trained nurses (p=0.048), and having more than 4 patients per shift (p=0.024) significantly contributed to the variance in work ability scores. In the logistic regression model, factors statistically significantly associated with work ability were home-work interface (OR: 1.32; 95% CI: 1.06 to 1.66).

Conclusions: Work ability in the occupational health and work environment of obstetrical nursing is important. To be high functioning, workplaces should maximize the use of their employees' actual and potential skills. Organizations in healthcare are introducing new forms of work and organizational design, as well as changes in the delivery of care. Educational and career prospects may mitigate nurses' occupational stress levels and thus maintain, or even increase, their work ability. Employers should be aware that work redesign interventions must incorporate measures to provide employees freedom to accomplish the higher job demands associated with restructuring, so that job strain can be averted and inherent motivation can be improved.

Keywords: Stress, work ability, workplace, obstetrics, nurses, employment, quality of work life, work organization

Background

There has been growing interest in the psychosocial and physical work environment of healthcare workers, especially among registered nurses [1]. The reason for this is that nurses are at high risk of stress, burnout, role conflict, and job dissatisfaction [2]. While examining stress is very challenging in an occupation as diverse and challenging as nursing, the effectiveness of organizational interventions to minimize or eliminate sources of stress depends upon a comprehensive understanding of the types of stresses for nurses [3, 4].

Nursing is strenuous work and occupational stress is prevalent among nurses, thus affecting their quality of work life (QWL) [5-10]. Specifically, occupational stress is a major health problem for nurses and organizations [11-13] and can lead to burnout [12, 14], illness [15], job turnover [1], absenteeism [1, 12, 14], poor morale, and reduced efficiency and performance [16, 17]. Excessive occupational stress has also been associated with increased risk for physical and mental health issues, decreased job satisfaction, role conflict, type of hospital setting (teaching versus community), and role stress [18-22].

Between 50% to 80% of the diseases experienced by employees at work are stress-related, and higher levels of job stress can lead to poor health outcomes and injury [23]. Stress is a significant contributing factor to organizational inefficiency, high staff turnover, and absenteeism because of sickness, increased health care costs, and decreased job satisfaction [24]. In an American study (2001), occupational stress was associated in higher turnover rates and nurses leaving the profession [9]. A high level of occupational stress has also been found to negatively influence nurses' delivery of care [25, 26]. The American cross sectional survey included nurses from 12 units (n=246) in a university hospital in the southeastern United States. The researchers found that increased occupational stress, lower group cohesion, and low work

satisfaction all resulted in an increase of nursing turnover [9]. The greater the job stress is, the lower the group cohesion ($r = -0.41$, $P < 0.001$). Additionally, the lower the work satisfaction ($r = 0.51$, $P < 0.001$), the higher the anticipated turnover ($r = 0.37$, $P < 0.001$). For the 20 to 30 year old nurse, work satisfaction and job stress were significant factors of anticipated turnover ($R^2 = 16$, $P < 0.001$). For the 31 to 40 year old nurse, work satisfaction was predictive of anticipated turnover ($R^2 = 0.31$, $p < 0.001$). For the 41 to 50 year old nurse, work satisfaction and group cohesion were predictive of anticipated turnover ($R^2 = 0.28$, $p < 0.001$). Moreover, occupational stress has been found to reduce nursing practice quality [25]. These findings may contribute to why fewer young people are entering the nursing profession [27]. The challenges are compounded in rural areas where the settings are much more isolated [28, 29] and nurses' scope of practice may be larger.

Acute care hospitals in northeastern Ontario provide care in a variety of clinical areas, including obstetrics. Nurses working in northern hospitals are often presented with complex nursing decisions, work long hours and do shift work, and experience swift patient turnover [30]. Retention of highly-trained and specialized workers in the acute hospital setting is pivotal. Ensuring that sources of occupational stress are mitigated is one strategy that may assist in retention of nurses.

Recently, there has been an increase in international studies that focus on nursing stress [1, 20, 31-34]. In 2006, a cross sectional study was conducted that explored different types of work strain experienced by nurses, particularly those of an essentially psychological nature. The types of work strain explored included: emotional demand, mental effort, problems with peers and/or supervisors, which can lead to higher maladaptive chronic fatigue outcomes, and the recovery process for work strain. A sample of 760 (54.3% response rate) Australian nurses

working at a large urban hospital completed the study [35]. The authors found that elevated workloads worsened the psychological, rather than the physical, demands of nursing. Furthermore, psychological strain affected sleep quality and recovery from overall work strain between work shifts. Thus, a pattern in which workload demands, sleep quality, and recovery are associated in the etiology of maladaptive stress or fatigue outcomes among nurses is suggested [35].

As a stressful occupation [36], nursing practice is characterized by physical and psychosocial stress [37]. Research indicates that nurses are overworked [38] and that occupational stress is prevalent among nurses, given the frequency of heavy workloads, burn out, and job dissatisfaction [1, 2, 39-41]. It has been reported that occupational stress can have detrimental ramifications on the quality of nursing and patient safety [2]. A 2005 mixed-methods descriptive study, in the United States, explored the causes and severity of occupational stress among hospital-based medical-surgical and home care nurses in New Jersey [42]. The authors discovered that job stress was linked to psychosocial types of stress including burnout [32, 43-45], job dissatisfaction [4, 16, 46, 47], role conflict [48], and role stress [8, 49]. Stress-related health problems and issues can include: gastrointestinal problems, sleep disturbances, mood fluctuations, and headaches. Acrimonious relationships with family and friends can also be the result of stress in the workplace [50, 51].

Stressful aspects of nursing include a highly demanding work environment coupled with poor supports, rapidly changing circumstances, shortages of resources (including staff), difficult patients, and dealing with death and dying [34]. Canada is in the midst of a nursing shortage that is expected to intensify as baby boomers age and the demand for healthcare grows, in particular in rural and northern regions of the country [52, 53]. Nurses provide care to approximately 6.6

million (21.7% of Canadians) people living in rural and remote areas [54, 55]. However, the nature of nursing in these parts of the country is poorly understood [54, 55] due to a dearth of research into the occupational health of rural nurses and stress in their work environments [56, 57]. Policy and practice changes, such as strategies to increase the recruitment and retention of nurses, organizational initiatives to reduce levels of stress in nursing due to staffing and workload issues, and leadership/management initiatives, are needed to improve the quality of services that nurses provide. There are many rural and remote areas in Canada in which nurses are the only professional healthcare providers [55].

In Canada, the health needs of Canadians will continue to change based on current trends. By 2022, Canada will be deficient almost 60,000 full-time equivalent nurses [52]. Nurses across the country are reporting increased stress and dissatisfaction with nursing, with job-related stress being one of the principal reasons that nurses change jobs [58, 59]. With increased job stress comes lower job satisfaction and higher turnover intention [60, 61]. In 2004, the Canadian Federation of Nurses Union reported that 86% of nurses experienced their workplace as stressful, 86% reported that their workplace was understaffed, 88% said they were under-resourced at work, and 91% reported heavy workloads [62]. The restructuring period of the 1990s ushered in a period of downsizing and left nurses in woeful working conditions [62]. During this period, shortened inpatient hospital stays, transfer of care to out-patient and community settings, and decreases in nurse-to patient ratios occurred [62].

In the 2005 *National Survey of the Work and Health of Nurses,* which surveyed Canadian nurses, absenteeism rates for nurse supervisors and nurses totaled 17.7 million hours due to illness and injuries [63]. This number of hours is the equivalent of 9,754 full-time nursing jobs [63]. Furthermore, unpaid overtime was more common among nurses than paid overtime. Less

than one in five (19%) female nurses had more than one job. Over half (54%) of nurses said that they often arrived early or worked late in order to get their work done; 62% reported working through breaks. Two-thirds (67%) felt that they often had too much work for one person, and 45% said that they were not given enough time to do what was expected of them [63]. This situation is a direct call to nurses' unions, nurses, and employers to work collaboratively to address these critical occupational health issues.

Thus, this paper presents the results of the cross sectional component of a larger mixed-methods study that was designed to examine the quality of work life (QWL) of Registered Nurses working in four small urban hospital-based obstetric programs. The aim of this study was to determine if: 1) there is a relationship between select demographics, QWL, location of cross-training, stress variables (e.g., factors associated with), and work ability (e.g., outcome measure) in nurses working in the labour, delivery, recovery, and postpartum areas at (Health Sciences North, North Bay Regional Health Centre, Sault Area Hospital, and Timmins and District Hospital, see Figure 2_1); and 2) nursing occupational stress, various related variables, and QWL are associated with work ability. Work ability is defined as the worker's capacity to perform their work, and is measured by an index describing their health resources in relation to work demands.

Methods

Ethics review

This study was approved by the Laurentian University Research Ethics Board, Health Sciences North Ethics Committee, North Bay Regional Health Centre Research Ethics Board, the Joint Sault Area Hospital/Group Health Centre Research Ethics Board, and Timmins and District Hospital Research Ethics Board.

Design

A cross sectional design was utilized for the study. Nurses working across four northeastern Ontario hospitals were invited to participate. The population in this study was composed of nurses (staff nurses) working at Health Sciences North, North Bay Regional Health Centre, Sault Area Hospital, and Timmins and District Hospital in Ontario, Canada.

Definitions

Location of Cross-training

In our investigation, a cross-trained nurse in obstetrics is a nurse who is able to perform the job tasks and responsibilities of the three areas of the obstetrical unit including labour, delivery, recovery, and postpartum. Only nurses at Health Sciences North (51 participants) were cross-trained. The remaining nurses at North Bay Regional Health Centre (31 participants), Timmins and District Area Hospital (24 participants), and Sault Area Hospital (32 participants) were not cross-trained. Of the total 138 nurses at the four hospitals, 36.9% were cross-trained and 63.0% were not cross-trained.

Work Ability

Work ability is a worker's capacity to perform his or her work. It is measured by an index describing health resources (e.g., physical health, mental health, work absenteeism, self-reported perception of meeting job tasks and responsibilities) in relation to work demands [64, 65].

QWL

For the purposes of this study, quality of work life is defined according to question 24 of the Work-Related Quality of Life Scale: "I am satisfied with the overall quality of my working life." Evidence has shown that a negative QWL situation is related to a lack of work-life balance [66-68].

Data Collection

The 15-page questionnaire, available only in English, included questions about seven major sources of stress closely related to the conceptual categories of stress (e.g., death and dying, conflict with physicians, inadequate preparation, lack of support, conflict with other nurses, workload, and uncertainty concerning treatment); demographic information (gender, ethnicity, place of birth and marital status); two-year occupational histories; work ability; and QWL of current position, job and career satisfaction, current general well-being, current stress at work, current control at work, current home-work interface and current working conditions.

Participants

A total of 138 nurses were eligible to participate in the study. These nurses were stratified randomly by hospital site, and geographic location. At the time of the study, 51 nurses were employed in obstetrics at Heath Sciences North, 36 at North Bay Regional Heath Centre, 36 at Sault Area Hospital, and 26 at Timmins and District Area Hospital. After receiving ethics approval, participants were given a ten dollar gift certificate for completing the survey.

Nurses working in obstetrics at these four northeastern Ontario hospitals were invited to participate in the study through an invitation package sent by mail (n=60) and email (n=51). The package included a cover letter, an informed consent form, and the questionnaire. The population from which the sample derived included all staff nurses at the four hospitals working in obstetrics. The four hospital sites were Heath Sciences North in Sudbury, ON (454 beds) [69], (pop. 160,274) [70]; North Bay Regional Heath Centre in North Bay, ON (291 beds) [71] (pop. 53,651) [72]; Sault Area Hospital in Sault Ste. Marie, ON (291 beds) [73] (pop. 75,141) [74]; and Timmins and District Area Hospital in Timmins, ON (161 beds) [75] (pop. 43,165) [76]. These hospitals are the largest in northeastern Ontario. For completing the survey, study participants were given a ten-dollar gift certificate.

A total of 111 nurses were randomly stratified out of 138 nurses according to whether they were cross-trained, whether they worked in a teaching/community hospital, and by workplace location. Unit managers were provided with a list of numbers that corresponded to the nurses' identification numbers. Nurses were approached by the manager and asked for consent to be contacted about the study. Following this approach, we invited nurses by telephone to complete the questionnaire in paper format or online. If a nurse declined, the nurse's identification number was removed and another identification number was drawn at random.

Outcome Measures

Through the questionnaire, the participating nurses provided information about gender, age, place of birth, marital status, education attainment, workplace, and total duration of employment, duration of employment at the current workplace, years of experience in nursing and in obstetrics, work hours, employment status, and income. The Nursing Stress Scale [77] and the Work Ability Index [65] were included as components of the questionnaire in order to gather data about the various occupational stressors in the workplace. The Work-Related Quality of Life Scale [67] for healthcare workers was used to assess the QWL of nurses. These measures were selected because of their strong psychometric properties and their widespread use in occupational stress and QWL research.

Nursing Stress Scale (NSS)

The Nursing Stress Scale (NSS) is the most widely used and best known measure of stress among nurses [78]. It is also the first measurement tool that addresses frequency of work stressors experienced by nurses. The scale includes descriptions of situations identified to cause stress for nurses in the performance of their duties.

The NSS has four response options: "very frequently," "frequently," "occasionally," and "never." Divided into seven subscales (e.g., death and dying, conflict with physicians, inadequate

preparation, lack of support, conflict with other nurses, workload, and uncertainty concerning treatment) based on the concepts of psychological, physical, and social work environments, the NSS has good internal consistency (0.79) [77]. Individual item responses are added together for groups of items and for all 34 items in order to obtain subscale scores and total scores, respectively [77]. The NSS is the first measurement tool that addresses frequency of work stressors experienced by nurses. The scores are based on nurses' responses to descriptions of situations that have been identified as stressful in the workplace as well as stress in psychological, physical, and social work environments [77].

Work Ability Index (WAI)

The WAI Questionnaire was developed by researchers at the Finnish Institute of Occupational Health as an instrument for use in occupational health care [65]. Work ability is defined as the ability of a worker to perform his or her job, based on specific work demands, individual health conditions, and mental resources. The WAI uses point scales between one and five, but varies for each factor [65]. A widely used 57-item scale, the WAI [65] is often used for evaluating nurses' work ability. An analysis of ten European countries showed that the Cronbach's alpha for total sample amounted to 0.72, while coefficients for national samples ranged from 0.54 for Slovakia to 0.79 for Finland [79]. A Cronbach's alpha score of 0.70 is considered a minimally acceptable measure of reliability [80].

The WAI includes seven subscales (e.g., current work ability compared with life time best, work ability in relation to the demands of the job, number of current diseases diagnosed by a physician, estimated work impairment due to diseases, sick leave during the past year, the worker's prognosis of work ability two years from now, and mental resources). Responses range

from 0 to 10. Possible scores range from 7 to 49 and are classified as follows: 7 to 27 (poor work ability), 28 to 36 (moderate work ability), 37 to 43 (good), and 44 to 49 (excellent work ability).

The Work-Related Quality of Life Scale (WRQLS)

A number of QWL measures including Brooks' survey of quality of nursing work life questionnaire [75] were considered as the measurement basis of QWL [81]. After careful deliberation, the Work-Related Quality of Life Scale (WRQLS) was selected because it explores employment and non-employment facets of life, as well as current issues in the respondent's life such as occupational stress. Overall scale reliability for the item pool is very good, with a Cronbach's alpha of 0.96. A Cronbach's alpha score of 0.70 is considered a minimally acceptable measure of reliability [80].

The WRQLS is a 24-item psychometric scale used to gauge the perceived quality of work by an employee based on six psychosocial sub-factors: job and career satisfaction, general well-being, home-work interface, stress at work, control at work, and working conditions [67]. The WRQLS has five response options ranging from "strongly disagree" to "strongly agree." Individual item responses are added together to obtain a total score [67]. The scale captures employment and non-employment facets of life, as well as more current issues such as occupational stress. The construct validity of the QWL scale is supported by factor analysis [67].

Data analyses

Frequencies, percentages, cross-tabulations, and age-adjusted odds ratio estimates were computed using Stata version 11.0 [30]. Fisher's exact two-tailed test was used to examine if WAI scores were associated with various categorical variables (e.g., gender, place of birth, marital status, education attainment, teaching versus community hospital setting, and income). Hierarchical multiple regression was calculated to determine factors associated with work ability

(e.g. age, gender, ethnicity, marital status, education, and nursing experience). Multiple regression analysis was used to test the hypothesis that "age, gender, ethnicity, education, marital status, and nursing experience have no effect on nurses' work ability scores." Assumptions and data were checked and met; there were no outliers.

Multiple regression analysis was also used to determine if age, gender, ethnicity, marital status, and nursing experience were associated with nurses' work ability scores. The second multiple regression model was calculated to determine if work ability index scores were based on the following variables: QWL total scores, QWL (home-work interface) scores, total stress scores, location of cross-training, and number of patients per shift. Backward stepwise logistic regression analysis was performed using STATA, with a cut-off of $p<0.05$ for inclusion. Binary logistic regression was performed, and work ability. Low work ability was defined as scores less than 37 and high work ability was defined as scores 37 or greater. Work ability was considered as a dependent dichotomous variable. Five factor variables were included as independent variables: total stress scores, mean number of patients per shift, home-work interface, location of cross-training, and hospital type.

Results

In total, 111 nurses completed the survey (80.4% response rate), either online or in paper format. The quality of data was identical for the paper and online versions of the questionnaire based on missing values. 51 respondents (100% response rate) at Health Sciences North, 22 respondents (70.1% response rate for site) at North Bay Regional Health Centre, 20 respondents (62.5% response rate for site) at Sault Ste. Marie, and 18 respondents (75% response rate for site) at Timmins and District Hospital completed the paper version of the survey. In fact, the majority of respondents completed the paper based survey. A total of 51 (45.9% response rate)

online questionnaires were returned, while another 60 (54.1% response rate) were completed using the paper format (n=111).

The majority of participants were female (94.6%) ranging in age from 24 to 64 years (mean= 41.9, s.d. 10.2). The mean age of respondents at Heath Sciences North was 41.6 (9.5) years, 44.1 (8.64) years at Timmins and District Hospital, 41.2 years (11.3) at Sault Area Hospital, and 40.6 years (11.9) at North Bay Health Centre. 46% of respondents worked at Health Sciences North, 19.8% worked at North Bay Regional Health Centre, 18.0% worked at Sault Area Hospital, and 16.2% at Timmins and District Hospital. The nurses had, on average, 16.3 years (s.d. 10.8) of nursing experience and 11.6 years (s.d. 9.01) of experience working in obstetrics. 63% of respondents worked full-time, 33% worked part-time, and 4.5 % were casual workers. Of the 111 nurses included in the analysis, 60 (54.1%) were cross trained (nurses at Health Sciences), while the remaining 51 (45.9%) were not cross-trained (nurses at North Bay Regional Health Centre, Sault Area Hospital and Timmins and District Hospital). Additionally, 21 (29.2%) had 'low' or 'medium' work ability (WAI less than 37), whereas 51 (70.8%) had "good" or "very good" work ability (WAI greater than or equal to 37) [1].

Hierarchical multiple regression was calculated to determine if work ability was associated with age, gender, ethnicity, marital status, and nursing experience. Results for demographic multiple regression variables are presented in Table 2. No significant regression equation was found (F (5,111) =1.67, p=0.15), with an R^2 of 0.111. The demographic variables explained 11.1% of the variance in work ability scores, and none of the variables were associated with nurses work ability scores.

The second multiple regression model was calculated to determine if work ability was related to QWL total scores, QWL (home-work interface) scores, total stress scores, cross-

training variables, and number of patients per shift. This model is found in Table 2_4. Three variables including QWL (home-work interface) (p=0.005), cross-training (p=0.048), and mean number of patients per shift (p=0.024) significantly contributed to the variance in work ability scores. A significant regression equation was found (F (5,111) =6.08, p<.0001), with an R^2 of .348, or 34.8%, thus explaining variance in work ability scores. Home-work interface had the largest positive influence on work ability scores while cross-training demonstrated an inverse relationship with work ability scores. 59% of nurses responded that they "agreed" or "strongly agreed" with the statement, "My current working/patterns suit my personal circumstance." Similarly, 63.9% responded that they "agreed" or "strongly agreed" with the statement, "My employer provides adequate facilities and flexibility for me to fit work in around my family life."

Variables Associated with Work Ability

Variables associated with work ability are shown in Table 4. Binary logistic regression analysis was performed. WAI was considered as a dependent dichotomous variable (e.g., 21 (29.2%) and had "low" or "medium" work ability (WAI < 37), whereas 51 (70.8%) had "good" or "very good" work ability (WAI ≥ 37) [1]. Home-work interface was the only statistically significant factors associated (OR: 1.32; 95% CI: 1.06 to 1.66, p= 0.015) with work ability. The age adjusted odds ratio showed that those with higher home-work interface scores are 1.32 times as likely to have higher work ability scores. Non-cross-trained nurses were more likely to have higher work ability scores than cross-trained nurses, as were nurses who had a mean score of four or fewer patients per shift. The other variables (total stress scores and hospital type) were not statistically significant.

Discussion

Although the overall response rate (80.4%) was satisfactory, the sample size might have been augmented by increasing the remuneration provided to participants, lengthening the

data collection period, and inviting all potential participants at each site, rather than utilizing a random sample.

Home-work interface had the largest positive influence on work ability scores. Home-work interface is related to work life-balance and is about having a measure of an employee's control over his or her work [67]. Consistent with previous research [1, 82], it is clear that work ability is an important factor related to QWL and nurses' occupational health and well-being. Control over nurses' home-work environment was found to be an important component of work ability. These results are supported by the Job Demand-Control-Support (JDCS) framework [83]. This framework emphasizes two dimensions of the work environment: job demands and job control coupled with social support within the workplace. This finding is suggestive of that fact that those workers who had higher home-work interface scores appear to have greater control over when, where and how they work. As a corollary, these nurses have greater job control and lower job demands, within a supportive work environment and this may positively influence their health. Our finding is also consistent with evidence that demonstrates that home-work interface is related to work life-balance and is about having a measure of an employee's control over his or her work [67, 84].

Location of cross-training demonstrated an inverse relationship with work ability scores. This relationship may be due to lack of sufficient training and mentorship of novice nurses by clinically experienced nurses, increased job demands as a result of cross-training (working in all three areas of the obstetrical unit) and a younger group (compared to provincial average) of nurses at Health Sciences North who are early to mid-career clinicians. We postulate those nurses who are transitioning into a cross-trained work environment may initially experience higher job demands because they lack the capacities and resources to work across all areas of

obstetrical care. Expert nurses develop skills and understanding of family-centered care over time through a proficient educational base as well as a multitude of experiences [85]. Their expertise may result in increased work ability scores over time.

In relation to the quality of a worker's output, cross-training may diminish a worker's productivity [86]. For example, a nurse trained for too many tasks, such as working across the labour, delivery, and post-partum areas could begin to forget how to do certain tasks. Moreover, cross-training downgrades if it is not used [86]. In obstetrical nursing, if a nurse is cross-trained for another area of care but never works there, not only will much of the training be forgotten but protocols may change and, thus, the nurse will require further training [86]. Depreciated skills could render a cross-trained nurse unable to provide quality care in the other areas. Finally, Inman (2005) cautions that another possible negative impact of cross-training on quality is that cross-trained nurses will be more likely to be shifted to other units, thereby diminishing continuity of care [86].

Binary logistic regression analysis indicated that higher home-work interface integration was significantly associated with higher work ability for nurses. Home-work interface integration examines the respondents' agreement that the organization understands and tries to help the worker with pressures outside of work. Therefore, it appears that higher work ability scores related to accommodating family and work commitments lead to elevated work ability scores. One possible explanation is that work-life balance relates to the degree to which employees feel they have control over when, where, and how they work. This reflects a worker's perception that they can fulfill life inside and outside of paid employment, to the benefit of the individual, organization, and broader society [84]. This is reflective of the extent to which the employer supports the employee's home life. It further validates findings by Ferguson and colleagues

(2012) that highlights that employees experience heightened home-work balance when there is support from employers and co-workers, and that this circumstance influences satisfaction at work and at home [70]. Empirical studies have shown that home-work balance relates to job and family satisfaction, being married, organizational commitment, and family performance [72]. While employers stand to gain substantially from nurses who achieve home-work balance, this balance remains an elusive goal for many employees [74]. In this study, having four or less patients per shift was related to higher work ability scores for the nurses. Other studies also support this finding [33, 87, 88] which may, in fact, influence nurses to leave their positions as reported in the United States [76].

This profile of Canadian nurses' work ability in a northeastern Ontario setting confirms research findings in the United States [89], Iceland [2], Europe [90], Australia [91], India [4], and China [20, 92]. The study also has implications for policy makers and employers encouraging them to develop retention strategies [2, 53]. The statistical evidence for variables associated with work ability places importance on factors associated to work ability that are relevant to small urban and northern settings. Given the study's sample of northern Ontario nurses working in small urban hospitals, this study provides a snapshot of their workplaces and occupational health. As a result, the statistical models used in the study are relevant for rural and northern research and practice.

Interventions such as bolstering educational and career advancement opportunities to modify nurses' occupational stressors may lead to the development of pleasant working environments where work ability can be sustained [1]. This kind of outcome would be in line with studies that emphasize the relevance of organizational interventions to eliminate negative occupational stressors and promote organizational and staff health and well-being. Such

interventions include stress management training, regular meetings with colleagues and superiors, redistribution of shift work, and improved policies on professional health hazards [93].

The interrelated nature of work-related factors and their impact on work ability makes it challenging to identify potential relationships with the outcome measures. Several studies, however, suggest examining career and employment opportunities for nurses to foster their professional development while they meet their usual job responsibilities and likewise augment their work ability [1, 82, 89, 94, 95]. It is plausible that some of these variables may be related to how employers offer assistance to their employees and impact both their work ability and QWL. It would be beneficial to understand the relationship between employer support and work ability and its effect on occupational stress, QWL, job satisfaction, and productivity.

To foster high functioning and effective workplaces, employers should maximize employees' actual and potential skills. More than ever before, organizations in both the private and public sector are introducing new forms of work and organizational design and changes in delivery of care such as cross-training [71, 73]. Providing educational and career prospects may mitigate nurses' occupational stress levels and thus sustain their work ability [1]. Furthermore, these interventions may bolster intrinsic motivation and encourage workers to develop and acquire the skills they need to meet increasing job demands. Concurrently, such initiatives may increase levels of job stress and other negative health-linked outcomes among employees, and generate significant costs in terms of work absenteeism, lost time, and low productivity [71].

Employers may also assist by recognizing that work redesign interventions must incorporate measures to provide employees freedom to accomplish the higher job demands associated with restructuring, so that job strain can be averted and inherent motivation be improved [73, 96, 97]. Examples of ways to provide independence include giving individuals

and groups of nurses' responsibility over day-to-day operational decisions as well as being receptive to their feedback about the operation of their work groups. Additionally, reorganizing production work will empower nurses to influence their own working situations, work procedures, and pace of work. [71].

Limitations

The representativeness of participants in this study is of potential concern and constitutes a limitation. Firstly, the cross sectional design by which exposure and health outcomes were measured concurrently does not permit causative conclusions. Furthermore, a single survey cannot establish causal relationships between work ability and occupational stress.

Secondly, the sample population is confined to the obstetric units of four northeastern urban centers in Ontario. Generalizations beyond the study participants should be made with caution. Third, while the role of work stress and its relationship to work ability is of great interest, employees may not accurately recall sources of occupational stress.

Finally, the views of the nurses in these units may not be representative of nurses elsewhere in different work settings (e.g., mental health, emergency, etc.), regions, or provinces. Differences may be due to the specific organizational behaviors and workplace cultural practices as well as different jurisdiction regulations and laws. It is also important to recognize that the nurses who may experience the greatest stress may have left the workplace and, therefore, are not represented in the sample. It is anticipated that, in the future, through a snowball sampling technique in relation to the semi-structured interviews, these nurses could be identified and may choose to share their experiences. How employers assist their workers in dealing with work stress and work ability is of great interest; however, assessing this relationship is a complex

study. One concern is that employees may not accurately recall details of their occupational histories in order to provide accurate pictures of their self-reported work ability.

Conclusions

The results of this study provide a framework for future studies including larger sample sizes and increasingly rigorous designs to determine the relationship between work ability and nurses' QWL, stress, and other associated variables. Finally, studies using mixed methods approaches could be used to identify the variables associated with work ability as well as to categorize themes revealed through interviews, personal narratives, and focus groups with the goal of enhanced relationships between employees and employers and improved quality of work life for all stakeholders. Interviews may also be conducted outside of the workplace to offer respondents the opportunity to provide candid responses outside of the workplace setting. Exit interviews with participants when they leave their workplace would help researchers in avoiding selection bias in future studies. As well, prospective cohort studies could identify factors of work ability and QWL.

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Table 2_1. Characteristics of participants

	n	%	HSN	NBRHC	SAH	TDH
Gender			n / %	n / %	n / %	n / %
Female	87	94.6	50 | 98.0	18 | 94.8	12.0|100	7 | 70.0
Male	5	5.4	1 | 2.0	1 | 5.2	0 | 0	3 | 30.0
Age						
Under 35	20	24.4	10 | 22.2	5 | 35.7	4 | 28.6	1 | 11.1
35-44 years	29	35.3	18 | 40.0	4 | 28.6	3 | 21.4	4 | 44.4
45-54 years	19	23.2	12 | 26.7	2 | 14.3	4 | 28.6	1 | 11.1
55 years or above	14	17.1	5 | 11.1	3 | 21.4	3 | 21.4	3 | 33.3
Nursing experience						
10 or less years	29	34.1	16 | 33.3	6 | 37.5	5 | 38.5	2 | 25.0
11-20 years	26	30.6	18 | 37.5	4 | 25.0	2 | 15.4	2 | 25.0
Greater than 20 years	30	35.3	14 | 29.2	6 | 37.5	6 | 46.2	4 | 50.0
Marital Status						
Married/Common-law	69	78.4	38 | 77.6	11 | 64.7	11 | 84.6	9 | 100
Single	9	10.2	5 | 10.2	3 | 17.6	1 | 7.7	0 | 0
Divorced	5	5.7	2 | 4.1	2 | 11.8	1 | 7.7	0 | 0
Separated	3	3.4	3 | 6.1	0 | 0	0 | 0	0 | 0
Widowed	2	2.3	1 | 2.0	1 | 5.9	0 | 0	0 | 0
Born northeastern Ontario						
Yes	84	92.3	48 | 100	8 | 80.0	17 | 94.4	11 | 73.3
No	7	7.7	0 | 0	2 | 20.0	1 | 5.6	4 | 26.7
Was your spouse/significant other born and/or raised in northeastern Ontario?						
Yes	69	85.2	39 | 86.7	12 | 80	10 | 76.9	8 | 100
No	7	8.6	3 | 6.7	3 | 3	1 | 7.7	0 | 0
Not applicable	5	6.2	3 | 6.7	0 | 0	2 | 15.4	0 | 0
Highest attained nursing education						
RN Diploma	50	45.0	32 | 64.0	14 | 63.6	2 | 9.5	2 | 11.1
RN University Degree	59	53.2	17 | 34.0	7 | 31.8	19 | 90.5	16 | 88.9
Masters	2	1.8	1 | 2.0	1 | 4.5	0 | 0	0 | 0
Ethnicity						
English-Canadian	58	68.2	25 | 53.2	14 | 82.4	11 | 84.6	8 | 80.0
Francophone	22	25.8	18 | 38.3	2 | 11.8	0 | 0	2 | 20.0
Aboriginal	3	3.5	2 | 4.3	1 | 5.9	1 | 7.7	0 | 0
Other	2	2.5	2 | 4.3	0 | 0	0 | 0	0 | 0

Note. HSN=Health Sciences North, NBRHC=North Bay Regional Health Centre, SAH=Sault Area Hospital, and TDH=Timmins and District Hospital.

Table 2_2. Multiple Regression Analysis for Demographic Variables Associated With Work Ability Scores of Nurses (n=111)

	p	β	R^2	*F*
Age	0.079	0.39	0.11	6.08
Ethnicity	0.062	-0.22		
Gender	0.662	-0.051		
Marital Status	0.014	-0.29		
Nursing experience	0.135	-0.32		

Note. *$p<.05$. Gender: Male, Female. Ethnicity: English-Canadian, Aboriginal, Francophone, Marital Status: Not married, Married.

Table 2_3. Multiple Regression Analysis for Variables Associated With Work Ability Scores of Nurses(n=111)

	p	β	R^2	*F*
Location of Cross-training	0.048	-.283	0.347	6.08
QWL scores	0.49	0.11		
Total stress scores	0.43	-.100		
Home-work interface	0.005	0.400		
Mean number of patients per shift	0.024	-.281		

Note. Cross-trained: No, Yes. QWL scores: Low, High. High quality of work life was defined as scores of '4' or '5' and low quality of work life was defined by scores of '3', '2' and '1' on a five point Likert scale by the WRQLS question 24: "I am satisfied with the overall quality of my working life.

Table 2_4. Multivariable age adjusted odds ratio estimates and approximate 95% confidence intervals of factors associated with of work ability for nurses (n=111)

	Low WAI	High WAI	Unadjusted Odds Ratio Estimate	95% CI	Adjusted Odds Ratio Estimate	95% CI
Location of Cross-training						
No (Sault Ste. Marie, North Bay, Timmins)	13 (85.0%)	47 (54.7%)	1		1	
Yes (HSN)	12 (15.0%)	39 (45.3%)	0.89	0.36-2.19	0.41	0.15-2.16
Total stress scores						
Low (Total score <65)	9 (19.5 %)	38(80.9%)	1		1	
High (Total score >65)	13 (25.5%)	38(74.5%)	0.69	0.26-1.81	0.47	0.13-1.75
Home-work interface						
Low	18 (80.0%)	48(65.8%)	1		1	
High	2 (20.0%)	25(34.2%)	4.69*	1.01-21.8	1.32*	1.06-1.66

Note. Cross-trained: No, Yes. Total Stress Score: Low, High. Mean number of patients per shift: 4 or less patients, 5 or more patients. Home-work interface: Low, 1=High. Hospital type: Teaching hospital, Community hospital. *p=0.049, **p=0.015

Figure 2_1. Map of Hospital Sites across northeastern Ontario

Legend:

1. Heath Sciences North – Sudbury, Ontario, Canada
2. Timmins and District Area Hospital – Timmins, Ontario, Canada
3. Sault Area Hospital – Sault Ste. Marie, Ontario, Canada
4. North Bay Regional Heath Centre – North Bay, Ontario, Canada

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6. Chapter VI: Paper #3 Occupational Stress Management And Burnout Interventions In Nursing And their Implications For Health Work Environments: A Literature Review

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Abstract

The aim of this paper is to review and evaluate workplace interventions targeting occupational stress management and burnout for nurses associated with healthy work environments and its relationship to their quality of work life (QWL). A literature search was conducted using the keywords nursing, nurses, stress, distress, stress management, burnout, and intervention. The intervention studies reported on in this review were all workplace intervention strategies based mainly on individual stress management and burnout intervention. Recommendations are provided to improve the QWL of nurses by creating a higher quality of work in health organizations, workplace health promotion, and recruiting and retaining nurses in rural and northern regions. These regions have unique health human resources needs and require special attention given to the shortage of nurses working in primary health care.

Introduction

The basic rationale underpinning the concept of stress in the workplace is that work situations have certain demands, and that problems in meeting these demands can lead to illness or psychological distress [1]. Occupational stress is a major health problem for both employees and organizations, and can lead to burnout, illness, labour turnover, absenteeism, and decreased recruitment and retention [2].

Healthy work environments are vital for the retention and recruitment of health professionals and for health system sustainability [3]. Health care organizations are under scrutiny to control costs and increase their productivity while responding to increasing demands arising from growing and aging populations [4]. A clear understanding of the nursing health workforce is required prior to discussing the importance of recruitment and retention strategies.

According to the World Health Organization (2006), there is a global shortage of 4.3 million health care workers [5, 6]. This is expected to increase by 20% in the next two decades [5]. This shortage is especially pronounced in the nursing profession, which is the largest group of health professionals in hospital settings, and approximately six in 10 nurses work in hospitals [7, 8]. The work environment of nurses in Canada has received growing attention due to high work absenteeism and shortages in nursing staff, augmented by dramatic cutbacks and restructuring of health care services in the 1990s [4]. In 2004, the Canadian Federation of Nurses Union reported that 86% of nurses found their workplace stressful, and 86% reported their workplace as understaffed; 88% said they were under-resourced at work, and 91% experienced heavy workloads [9]. The restructuring period of the 1990s in health care ushered in a period of downsizing and left nurses working in terrible conditions [9]. Also during the 1990s, shortened in-patient hospital stays, transfers of care to out-patient and community settings, and decreases in nurse-to-patient ratios occurred [9].

In Canada, approximately 95% of the country's land mass is rural and remote [10]. Registered Nurses (RNs) provide care to approximately 6.6 million (21.7% of Canadians) people living in rural and remote areas [11, 12]. However, the nature of nursing in these parts of the country is poorly understood [11, 12]. RNs are overworked [13] and, if the health needs of Canadians continue to change based on current trends, Canada will be short almost 60,000 full-time equivalent RNs by 2022 [14]. In 2005, a study of RNs in rural and remote Canada confirmed that the rural workforce is getting older, and those health human resources goals must focus on younger nurses to ensure sustainability [15]. However, very little is known about the determinants of a positive work environment in rural and northern settings [15]. Understanding the work environment is closely linked to recruitment and retention strategies because promoting a healthy workplace increases retention and recruitment efforts [15].

Regrettably, the constant workforce undersupply, recruitment challenges, and low retention rates of staff limit access to health services for many northern and rural residents [16]. Access to services may even be withdrawn in communities that do not have sufficient RNs to deliver health services, or residents may have to travel long distances to receive care, such as cancer care. Complicating the health human resources issue is the inequitable distribution of health care workers across the country which represents a serious challenge to health services delivery [17, 18]. The imbalanced distribution of health care professionals can contribute to significant disparities in health outcomes between the rural and urban population [19, 20]. For example, only 9 % of nurses practice in rural and northern areas in Ontario, which is largely disproportionate to the population in these communities [21]. The health workforce shortage of nurses is exacerbated by an aging population, and an increase in demand for health services due to the growing burden of chronic diseases [16].

As the Canadian nursing workforce ages, the overall health of its members may decline, challenging the profession to care for the health of the public. Therefore, beyond the profession itself is the health of nurses. Nurses are now often aged 30 or older when they graduate and begin their nursing careers [22]. In 2009, most nurses were aged 40 to 59 and nurses in this age group constituted 57.1% of the RN workforce [22]. Moreover, the nursing workforce is aging and, in 2011, the average age of an RN was 46.0 years [23, 24].

Presently, inquiry has focused largely on occupational stress [25-29], on nurses' health [30], burnout [31-33], work-related injuries [34-36], and occupational job satisfaction [37-39]. It is clear that nurses continually experience changes in their role and function within the workplace. An up-to-date review of the quality of work life (QWL) literature in nursing could evaluate interventions that focus on mitigating these important occupational health issues. Occupational stress increases the risk for the development of types of chronic health problems, in particular, cardiovascular disease [40, 41], diabetes [42] and chronic low back pain [43-45]. Moreover, they are important because these are potentially modifiable factors associated with QWL.

The aim of this review is to evaluate workplace interventions targeting occupational stress management, burnout for nurses associated with healthy work environments, and its relationship to their QWL. An examination of the current literature will focus on stress in the work environment of nurses and will be followed with a critical analysis of stress management interventions for nurses and their implications of QWL. Similarly, there will be an overview of the literature pertaining to burnout in the work environment of nurses and interventions targeting nurses.

Workplace Stress and Nursing

Occupational stresses and health risks of nursing stem from both physical and mental types of stress including musculoskeletal injuries. Furthermore, nurses experience elevated stress levels associated with shift work and/or irregular hours, unremitting exposure to disease and death, and for some, toxic chemical and pharmacological compounds [30, 35].

There is growing recognition of the problem posed by occupational stress in obstetrics. Labour and delivery units are among the most challenging hospital units because of long work hours and disruptions to nurses' personal time [46]. In a cross sectional survey design study, a convenience sample of 107 southern Ontario nurses across various units (including labour, delivery, recovery, and postpartum areas) were asked to rate their occupational stress, job satisfaction, and coping strategies using measures of job stress [46].The largest number of RN survey respondents were from medical wards (18.7%), followed by surgical (14%), chronic (12.1%), labour and delivery (10.3%), intensive care units (9.3%), ER (7.5%), OR (3.7%), special care nursery (3.7%), obstetrics (2.8%), psychiatric (2.8%), and 12% other wards. Avoidance, including physical or psychological withdrawal through distraction or fantasy, social support (e.g., colleagues supporting one another during stressful situations) and a tendency to turn to others for advice, communication, and comfort, were found to be significantly linked with job stress, although neither of these coping strategies decreased nurses' levels of organizational stress [46]. A relationship between problem resolution and job satisfaction was reported to be highly significant [46]. A link between job stress and poor health outcomes was found; however, the study focused only on two community hospitals in southern Ontario [46]. Moreover, obstetrical nurses formed only a small part of the total sample (2.8%). The study's convenience sampling strategy was a threat to the external validity and selection bias was possible. Longitudinal studies should be conducted to study the long-term effects of hospital restructuring,

coping strategies over time, and nurses' job satisfaction. [47]. Restructuring often places nurses in working environments that are under-resourced and involve high patient-to-nurse ratios. Moreover, nurses may perceive restructuring as devaluation of their professional role, status, and worth [48]. Studies exploring these ideas are particularly warranted in rural and northern settings because there is a dearth of research evidence and fewer employment opportunities.

Concern about potential population health and socioeconomic ramifications of a rural and northern nursing shortage in Canada have led to investigations of the intent to leave a nursing position as an indicator of retention of the rural nursing workforce in the USA [49, 50]; however, similar research in Canada is lacking [51]. Increasingly, research is examining the reasons to leave nursing practice in rural and remote settings in Canada [52]. In a 2011 study, researchers examined the factors of the intent to leave a nursing position in rural and remote Canada. Data collected as part of a national cross sectional mail survey of RNs in rural and remote Canada utilized logistic regression analysis to identify factors associated with intent to leave nursing practice [52].

The authors found that nurses were more likely to plan to leave their nursing position within the next 12 months if they: had higher self-reported levels of occupational stress, did not have children or relatives, had diminished job satisfaction and less control over their job scheduling, were required to be on call, performed advanced decisions, worked in a remote setting, were male, had higher levels of education, were employed by their primary agency for a shorter time, and had lower community satisfaction [51]. Such findings may help guide health policy and provide organizations with strategies to ameliorate their recruiting and retention plans.

Humphreys et al., (2009) developed a logic model for primary health care for small rural and remote communities [16]. This model emphasizes that workforce retention needs to consider the roles of: leadership, continuing education and professional development, interdisciplinary teamwork, career opportunities and advancements, effective recruitment, workforce succession planning, and adequate infrastructure [16]. Recruitment strategies and selection criteria are pivotal factors in subsequent retention because the better the match a worker is to a role and organization, the longer they are likely to remain, independent of the effect of additional retention strategies [53].

Stress Management Interventions

Occupational stress is a serious threat to the QWL of health care employees and can cause hostility, aggression, absenteeism, and turnover, as well as reduced productivity [54]. In a 2005 study, Shapiro and colleagues examined mindfulness-based stress reduction (MBSR) as an intervention for health care professionals (e.g., nurses, physicians, etc.) to help cope with their occupational stress [55]. Thirty-eight health professionals from the United States participated in the study [55]. This pilot study used a randomized control study design that implemented a two (e.g., experimental versus wait-listed control group) by two (baseline, post-treatment) design. Participants were randomly allocated to an eight week MBSR group (n=18) or a wait-list control group (n=20). The control group received the identical MBSR intervention after the experimental group completed the program [55]. The intervention was modeled after a well-established, cost-effective stress reduction program, mindfulness-based stress reduction (MBSR), developed by Kabat-Zinn et al. [56]. Psychological distress, anxiety, and depression were assessed with the Brief Symptom Inventory [57]. The Maslach Burnout Inventory, which assesses emotional exhaustion, depersonalization, and personal achievement subscales, was used to measure facets

of job-related burnout. Occupational stress was measured with the Perceived Stress Scale, a global measure of perceived stress [58]. Life satisfaction was measured with the Satisfaction with Life Scale [59] and self-compassion with the Self-Compassion Scale [60]. The authors observed that an eight-week MBSR intervention could be effective for reducing stress and increasing quality of life and self-compassion in health care professionals. Statistically significant between-group differences were observed for the Perceived Stress ($p=0.04$) and Self-Compassion Scales ($p=0.004$). Participants assigned to the wait-list control condition received the equivalent MBSR intervention immediately after the experimental group completed the intervention [55].

Compared with controls, the intervention (MBSR) group demonstrated a significant mean reduction (27% vs. 7%, $p=0.04$) in perceived stress and increase in self-compassion (22% vs. 3%, $p=0.004$) [55]. 88% of participants in MBSR group had improvements in their stress scores, and 90% demonstrated increases in self-compassion [55]. Furthermore, the MBSR condition showed trends toward greater positive changes in all of the dependent variables examined. Compared with controls, intervention participants reported greater satisfaction with life (19% vs. 0%, $p=0.06$), decreased job burnout (10% vs. 4%, $p=0.21$), and decreased distress (23% vs. 11%, $p=0.25$) [55]. Thus, there are potential benefits to a meditation-based intervention for health care professionals [55]. The study lacked a credible placebo control group [55], and the generalizability was restricted by the small sample size. Future studies should include larger samples sizes and also follow-up at the one and two year mark to examine if long-term benefits occur. Moreover, studies should incorporate measures of QWL and its relationship on occupational stress, as well as the home-work facet of the work environment in order to gain a comprehensive understanding of work stress. Research needs to be done to understand the

relationship between workplace factors and their relationship with workers' health outside of the work environment.

Another technique that is commonly used as a form of stress mitigation is assertiveness training [61]. In a randomized controlled trial of assertiveness training, 60 Chinese volunteer nurses were assigned to one of two treatments: assertiveness training or alternative treatment control, which acted as a control and contained updated knowledge of new computer technology in patient settings [62]. Assertiveness training is a self-care and cognitive-behavioral approach that nurses use to liberate themselves from the inhibiting effects of working in the health care system. It encourages them to utilize more direct and adaptive means of manipulating their interpersonal environment to obtain outcomes [63]. Participants received six two hour workshops over a two week period, with a further two weeks of follow-up. The two group experimental design was employed to evaluate the outcome effect of assertiveness training. Pre-, post-, and follow-up self-report assessment measures were used. The Rathus Assertiveness Schedule [64] was used to measure assertiveness behavior and The Perceived Stress Scale [58] to measure the degree to which situations in one's life are regarded as stressful. The post-training questionnaire was developed by the authors to assess the respondent's reactions to the training [62]. The researchers observed that respondents in the treatment group who received assertiveness training reported significantly lower levels of stress ($p<0.01$) and this was maintained at follow-up ($p<0.001$) [62]. By the end of training and at follow-up, the assertiveness training group, again, reported significantly lower levels of stress and higher levels of assertiveness. The treatment group respondents also reported higher levels of assertiveness scores than the control group ($p<0.05$) [62]. A limitation of the study was that female volunteers in the study were selected through a convenience sampling strategy and the study's generalizability was restricted by the

small sample size. It would be more informative to have compared the assertiveness training group against a more established stress management intervention (e.g., mindfulness-based stress reduction). The study's follow-up period was also too short to evaluate significant effects that may be attributed to stress management interventions [61].

Burnout and nursing

Questions about type and location of employment have prompted other researchers to examine job stress in rural and small urban settings [46, 65]. Some studies suggest that geography may be a mitigating factor to elevated levels of occupational stress and burnout [46, 65]. A cross sectional design study using a convenience sample of psychiatric nurses (n=136) working in two psychiatric hospitals in rural Australia revealed that the nurses experienced lower burnout on the emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA) subscales of the Maslach Burnout Inventory [65, 66]. The average score on the EE subscale was 15.9 (Standard deviation (SD) = 13.9) for rural nurses, which indicates that they were in the normative medium burnout category of 14 to 20 [65]. Based on the Depersonalisation Scale, rural nurses were in the moderate burnout category [65]. On the PA subscale, the average score was 37.2 (SD = 11.8) for rural nurses, where the mean scores for rural nurses were in the normative low burnout category above 34 [65]. Unlike nurses in urban hospitals, the majority (66.1%) of rural psychiatric nurses stated that they were satisfied with their job, particularly with their current situation at work, aspects of support (e.g., lack of support from management), and level of involvement in decision-making in their unit [65]. Regardless of burnout reported by rural nurses, the majority of them indicated that they were satisfied with their current situation at work, present level of involvement in decision making, and the degree of support they were receiving [65]. These findings did not support the established relationship between high levels of stress and job satisfaction in nurses.

Burnout Intervention Studies

In another study from the United Kingdom, researchers evaluated the effect of Psychosocial Intervention Training (PSI) [67] on the knowledge, attitudes, and levels of clinical burnout in a group of forensic mental health nurses [68]. Forensic mental health nurses who work with patients suffering from severe and lasting mental illness have been shown to be susceptible of developing clinical burnout syndrome [69]. Researchers employed a quasi-experimental pre-test/post-test design and used 33 participants who were randomly allocated to either a waiting list control condition or to a PSI training group. Baseline assessments of knowledge, attitude, and burnout were completed by asking staff nurses working in a medium secure psychiatric unit to complete questionnaires [69]. Trainee knowledge was assessed using a 30 item multiple choice question paper that aimed to measure the trainee's knowledge about mental illness related to schizophrenia and psychological approaches [68]. Attitude was assessed using a measure developed by the authors specifically for this study [68] and burnout was assessed using the Maslach Burnout Inventory [66]. 20 of the nurses volunteered to be included in a PSI training course and were randomly allocated either to receive training or to a waiting list control group. The duration of the training was six months and, on completion, subjects in the experimental and control group were administered the questionnaires again [68].

The researchers found that nurses in the experimental group showed significant improvements in their knowledge and attitudes about serious mental illness and a significant decrease in burnout rates [68]. At baseline, the differences in scores were not significant. However, after the intervention, there was a significant difference in knowledge scores for the groups ($p<0.01$). The experimental group's scores increased by 24.50 to 79.99, while the control group's scores increased by 1.08 to 53.66. However, staff in the control group showed a

marginal, but statistically non-significant improvement, in knowledge and attitudes, and increase in burnout [68].

In terms of positive attitudes towards their patients' care, baseline measures showed no significant differences in the mean scores between the two groups [68]. At follow-up, the scores for the experimental group had increased from 58.18 to 80.96. However, the control group's mean scores had declined from 55.96 to 54.02. The differences between the scores for the two groups at follow-up were statistically significant ($p<0.01$). Burnout scores were not significant at baseline. Follow-up scores between the experimental and control groups showed statistically significant differences on all three subscales (emotional exhaustion, depersonalization, personal achievement) measured by the Maslach Burnout Inventory [66]. The study findings have important implications for educational and health service providers. Nurses provided with training in PSI did show significant improvements in their knowledge, and attitudes towards clients suffering from serious mental illness; nurses in the experimental group also showed reductions in their levels of burnout. Such interventions have an impact on nursing delivery of care [70] and also on their health and QWL. However, the study has several limitations including the generalizability of the findings to other disciplines of nursing. The external validity of the study is further hampered by the small sample size ($n=33$) of nurses participating in the study. In terms of sampling strategy, the participants volunteered to take part in the study and this may suggest they were more motivated to learn new information, and possibility were more amenable to change with respect to their beliefs and attitudes than the staff who did not volunteer [70]. A larger sample size is warranted to confirm or expand the findings of this study with other nursing specialties.

Recommendations

In Canada, it is clear that stress levels present serious health implications within health care professions including nurses [40-44]. By industry, stress levels are highest in education, health, and social services at 40% [71]. Women are more likely than men to report high levels of stress [71] and, since nursing is a female dominated profession, this is of concern.

The experience of occupational stress is a multifaceted, complex process [3] and relationships between occupational stress and QWL is a combination of simple and complex pathways, composed of characteristics of both environmental demands and personality dimensions. A number of recommendations for nurses have arisen from this critical analysis of the work site stress reduction and stress management literature from 1980s to present [3]. However, work based management interventions have largely targeted white collar and managerial workers rather than those in health care [61]. There is a greater need for studies that examine issues such as work stress, burnout, and their relevance to nurses.

Two issues are vital with respect to evaluating stress management and burnout interventions. First, there needs to be some attempt to use some common measurement approaches to permit investigators to make comparison across studies at the national and international levels. Second, interventions need to be more rigorously evaluated [61].

Before intervening in any clinical problem, health professionals need to have a solid understanding of the scope of the problem. Numerous intervention studies focus, at best, on individual assessment and treatment, but not on understanding organizational aspects of the stress process. Hence, a certain proportion of the stress encountered by health care professionals, including nurses, is due to organizational changes, and no amount of individual stress management training or mitigation strategies will reduce that. Thus, any approach to stress and

burnout management needs to consider a combination of organizational issues and specific individual interventions [61]. If quality of work life and workers health is an outcome of interest, they must also include healthy work environments and organizations.

Workplace health promotion

One approach to addressing stress management approaches through a comprehensive and systematic approach is by considering health promotion strategies. The need to examine the underlying workplace determinants of health and productivity is being more and more recognized [72]. Initiatives and actions are steered by the World Health Organization's definition of health as complete physical, mental, and social well-being, not simple absence of disease or ill health [73]. Job and organizational factors should foster positive mental and physical health outcomes for employee [72].

Lowe argues that both employees and employers must use health promotion programs to strengthen culture and leadership, two of the building blocks of a healthy organization [74]. Meeting employee health and wellness needs should become easier if they are active participants in their process, and not merely recipients of health resources. Employees will take ownership or become leaders within their work environments. As employers and employees work synergistically to make the work setting healthier, the trust this establishes should result in more cooperative workplace relationships [72]. Over time, higher levels of trust will foster a wider range of workplace improvements. For nurses and other unionized workers, Lowe asserts that the joint framework and implementation of comprehensive health promotion programs yielded more than reduced employee health risks and benefits costs. Positive results also stem from how the program is developed [72], and there are gains in productivity through reduced work absenteeism [75].

Major stumbling blocks persist in mitigating stress in the workplace. Employers' quest for solutions to rising health and disability benefits costs has fueled much discussion about the need to build healthier workplaces. Yet, action has been slow [72]. Comprehensive workplace health promotion programs can reduce employee health factors associated with work stress, reduce employers' health care costs, and improve productivity [72]. In addition, other strategies such as fostering a higher QWL in health organizations to improve workers' health and well-being as well as increase their quality of work life can be implemented.

Creating a Higher Quality of Work in Health Organizations

QWL is an issue that has been of interest in recent years. Many employees, including those in the health care sector view their occupation as the most important aspect of their lives, with quality of life increasingly determined by other aspects [76, 77]. To improve recruitment and retention strategies, it is pivotal to understand why positive challenges become occupational stress and how this relationship can be thwarted [78]. There is some evidence to demonstrate that a happy employee is productive and dedicated [79-83]. A growing body of research indicates that QWL may have an important impact on employee behavioral responses, such as job satisfaction, job performance, retention, and personal alienation [84-87].

The daily experiences of Canadian workers including those in health care such as nurses in many different work settings and occupations provide numerous reasons to make the goal of higher QWL a national priority. Improving the quality of work will mean addressing issues from rights and security to skills and fulfillment [74].

Recruiting and Retaining Nurses in Rural and Northern Regions

Numerous studies demonstrate that nursing is strenuous work and, hence, that occupational stress is prevalent among nurses, impacting their QWL [88-93]. Specifically, occupational stress is a major health problem for both nurses and organizations [46, 94, 95] and

can lead to burnout [46, 65], illness [96], job turnover [77], absenteeism [46, 65, 77], poor morale, and reduced efficiency and performance [97, 98]. Shader et al. (2001) found that occupational stress results in increasing turnover rates and leads to more nurses leaving the profession. Moreover, a high level of occupational stress has been found to reduce nursing practice quality [99]. This development is deemed to be one of the reasons why fewer young people are entering the nursing profession [100]. These reasons are compounded in rural areas where the settings are much more isolated [20, 101]. Challenges lie ahead for recruitment and retention of nurses in rural areas. In 2000, the authors of a study of rural Saskatchewan nurses found that within the next five years, 40% of the rural nurses expect to retire; this figure jumps to 66% in the next ten years. By comparison, of the urban nurses surveyed, 34% plan to retire in the next five years and 50% plan to retire in the next 10 years [20, 101, 102].

Documenting and improving our understanding of these health care professionals' workplaces may lead to better recruitment and retention strategies of health care professionals in rural and northern regions. By identifying what comprises a healthy work environment for nurses in northern and rural communities, recruitment and retention strategies can be implemented at the personal, community, and organizational levels.

Discussion

The intervention studies reported in this review were all workplace intervention strategies and based mainly on individual strategies. Occupational stress research often lacks a comprehensive theoretical framework and standardized measurement tools [103], which focus simultaneously on individual and organizational factors [3, 61].

Management style, incentives and career structures, educational opportunities salary scales, recruitment, posting and retention practices are some of the organizational factors that can influence the geographical distribution of health human resources [77, 104]. Any retention

strategy should be linked to the broader national and LHINs structures and functions in order to take advantage of existing partnerships and increase efficiencies [105]. For example, health policy should be directed at upgrading of rural health facilities and improve the working environment as part of a national health facility expansion plan [105]. This approach is sound by providing financial funding to support the infrastructure that rural and northern practitioners require to provide clinical care. Conversely, a plan to expand public or private-funded health services in urban areas may work against new strategies for attracting people to work in rural areas [105]. Recruitment and retention of nurses can be more successful when done with an understanding of the perceptions of nurses in northern and rural regions and in partnership with employers [106].

From the qualitative thematic analysis, five key themes that emerged were: workplace stress, relationships with colleagues, changes in care delivery and model of care, demands for resources, and QWL. Future studies could consider examining one of these themes as a potential intervention approach in mitigating workplace stress. For example, a longitudinal prospective cohort study would follow a group of nurses who differ with respect to a stress management intervention approach (e.g., mindfulness-based stress reduction). The objective of the study would be to determine how this intervention affects stress levels. An advantage of using a prospective cohort study is that it can help to determine the effectiveness of the intervention and risk factors for occupational stress because they are longitudinal observations over time. Furthermore, the data collected is at regular intervals, so recall bias is minimized [107]

Given the nursing shortage that exists around the world, there has been a great deal of interest in how nurses contend with stressors that exist within their professional role [108-110]. While stress management and burnout intervention studies have been examined and discussed,

many researchers have used urban and large hospital samples. There is a shortage of research examining stress management and burnout interventions with nurses in small urban and rural areas. This presents both challenges and opportunities. Presently, there is very little research capacity regarding the types of stress within the workplace of nurses. However, this encourages future researchers to strive to design quality experiments, to incorporate random assignment to treatment and control groups, and to report the results with this population. As more primary studies are conducted, there will also be a need to update systematic reviews and to continue to reassess stress management intervention results. Expanding qualitative approaches to evaluate stress management and burnout interventions for nurses is also needed.

The viability of the rural nursing workforce depends on addressing human resource issues associated with workplace stress and job satisfaction [111]. The literature demonstrates that the challenges of rural & northern practice, which initially attract nurses, become a source of occupational stress and result in higher levels of job dissatisfaction, absenteeism and role conflict. From a recruitment and retention perspective, it is crucial that administrators and health policy-makers foster an environment of understanding of the realities of northern and rural nursing practice and is unique to the quality of the work environment for RNs. National recognition and support of factors related to job satisfaction and quality work environments may help retain those RNs working in northern and rural communities.

Beyond the geographic lens, studies are needed because there is the problem that interventions must be continually updated due to economic, social, and political changes; new health policies; and economic factors such as unemployment. The viability of the rural nursing workforce depends on addressing human resources issues associated with workplace stress and job satisfaction [78]. The literature demonstrates that the challenges of rural and northern

practice, which initially attract nurses, become a source of occupational stress and result in higher levels of job dissatisfaction, absenteeism, and role conflict. From a recruitment and retention perspective, it is crucial that administrators and health policy makers foster an environment of understanding of the realities of northern and rural nursing practice that is unique to the quality of the work environment for nurses. National recognition and support of factors related to job satisfaction and quality work environments may help retain those nurses working in northern and rural communities.

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7. Discussion

This mixed methods sequential explanatory study examined the quality of work life (QWL); location of cross-training; work ability; and job stress experienced by nurses working in the labour, delivery, and post-partum areas of selected northeastern Ontario cities. Firstly, the quantitative results from Chapters IV, V and VI will be discussed. This will be followed by a detailed examination of the findings and their implications on nurses' occupational stress, and QWL. A discussion of the qualitative results presented in Chapter IV and their implications on nurses' work experiences, QWL, and job stress follows, which will explore what the findings mean for nurses, employers, health services, and policy makers.

This investigation was conducted to examine physical and psychosocial stressors in the labour, delivery, recovery, and postpartum areas at Health Sciences North, North Bay Regional Health Centre, Sault Area Hospital, and the Timmins and District Hospital in northeastern Ontario. In Sudbury, the nurses are cross-trained, while in North Bay, the training is in particular skills (e.g., nurses work only in labour, delivery, or post-partum). Of these four hospitals, the Sudbury hospital was the only hospital, at the time of data collection, in which the nurses were cross-trained to provide care in all of maternal care. In the other hospitals, nurses are trained for particular domains of care. Stressful experiences of nurses in the two larger hospitals, which vary in training and practice, were also compared.

The three research objectives for this thesis were: 1) examine factors associated with quality of work life (QWL) of Registered Nurses working in four small urban hospital-based obstetric programs, 2) determine if nursing occupational stress, QWL, and various factors (e.g., demographic, locations with and without cross-training) are associated with nurses' work ability, where work ability is the worker's capacity to perform their work, as was measured by the work

ability index, and 3) review and evaluate some workplace interventions targeting occupational stress management and burnout for nurses.

In this dissertation project, the function of the Job Demand-Control-Support (JDCS) framework was to explain the key definitions of stress and QWL in the work environment because the JDCS framework enables comprehensive understanding of stress that extends beyond traditional biomedical approaches to occupational stress. It encompasses the social support factor that considers life facets outside of work and their connections to employment. This model has dominated research on occupational stress in the last 20 years [1]. It focuses on two dimensions of the work environment: job demands and job control [2]. *Job demand* refers to work load and has been operationalized mainly in terms of time pressure and role conflict [3]. *Job control*, which is sometimes called decision latitude, refers to the person's ability to control his or her work activities [3]. Decision latitude includes two components: skill discretion and decision authority[3]. Furthermore, its two dimensions (e.g., job demands and job control*)* are factors associated with occupational stress among nurses [3-8].

The two dimensions of the JDCS represent a complex set of interactions among demand, control, and social factors that may impact health outcomes. According to the model, the highest strain occurs in a work environment when demands are high, control is low, and social support is low. Social support at work, was later added to the model; as a result, the demand-control-support model was defined. This revised model postulates that the highest risk of illness is expected in employers with high demand, low control, and low social support in the workplace [9]. This additional component of the model emphasizes the psychological and social factors people experience in the work environment are underpinned in social and interpersonal relations among participants in the work setting [10-14].

According to the JDCS model, jobs that utilize skills, and provide control and a supportive work environment contribute to better psychological and physical health. Mentally demanding jobs with low levels of control and/or less supportive environments are detrimental to health [4]. Several nursing studies have identified that diminished control over workplace decisions results in elevated occupational stress levels [15, 16]. Furthermore, this theoretical framework was used to guide data analysis and interpret findings.

Response rate

A total of 51 (45.9%) questionnaires were completed online, while another 60 questionnaires (54.1%) were completed using the paper format (n=111). In total, 111 nurses completed the questionnaire. This yielded a good response of 80.04 %.

Limitations

This research has some limitations, which require consideration in relation to interpretation of study results. Firstly, the representativeness of cases in this study is of potential concern. The sample population of obstetrics nurses was confined to northeastern Ontario. The results, therefore, cannot be generalized to other parts of Ontario. The cross sectional questionnaire provides only a snapshot in time and cannot be utilized to demonstrate causation. A single questionnaire can establish whether or not a relationship exists between two variables, but it is not sufficient to determine the direction of causality [17, 18]. The wording of some questions assumed a general understanding on behalf of the respondents. For example, the question "What is your current work ability compared to your life time best?" assumed that respondents understood the definition of work ability and would recall their entire work history. Employees may not recall their entire work history and retrospective bias will threaten the validity of the study findings. QWL is defined as the way in which work is good for an individual in the broadest context and the way an employee would evaluate their job [19]. In this study, QWL is defined as

a way of thinking about people, work, and organizations linked together. Its distinguishing elements are a concern about the impact of work on people as well as on organizational effectiveness [20]. Although we cannot be absolutely certain that all respondents interpreted the questions in this way, the results presented in chapters IV and V are based on the assumption that this interpretation was generally acceptable. It is acceptable because the Work-Related Quality of Life scale[19] for healthcare workers uses this definition of QWL.

Secondly, it is very important to note that the thoughts and experiences of nurses who had left obstetrics at the study hospitals were not reflected in the sample. These nurses may provide a different view of the relationship between QWL and location of cross-training. Because the nurses were only cross-trained at Heath Sciences North, leadership characteristics and organizational system factors may have attributed to a higher QWL scores in this group when compared to the three sites where nurses did not receive cross-training. Selection bias may have influenced the study results because nurses who left their position due to the implementation of cross-training were not captured in either phase of the study.

Thirdly, respondents were asked to recall their occupational and health histories over a two year period. Therefore, recall bias represents a threat to the internal validity of the study. Finally, the number of respondents in this sample is relatively small and, thus, a larger study with more respondents is warranted in future.

Quality of work life of nurses

In Chapter IV, the relationship between QWL and location of cross-training of nurses was discussed. In this study, QWL was defined by the following statement taken from the Work Related Quality of Life Scale (WRQLS), Question 24: “I am satisfied with the overall quality of my working life.” The possible responses were: ‘Strong Agree,” “Agree,” “Neutral,” “Disagree,” and “Strongly Disagree.” In addition, high QWL was defined as scores of 4 or 5, and low QWL

was defined by scores of 3, 2, and 1 on a five point Likert scale by the WRQLS question 24: "I am satisfied with the overall quality of my working life" [19]. QWL scores were high for nurses who were cross-trained, with a mean of 3.92 (SD=1.00) on their QWL scores. The mean score for non-cross-trained nurses was 3.32 (SD=1.29). There was a statistically significant difference ($p<0.01$) between cross-trained nurses and non-cross-trained nurses in regards to their QWL scores. High QWL was defined as scores of 4 or 5 and low QWL was defined by scores of 3, 2 and 1 on a five point Likert scale by the WRQLS statement #24: "I am satisfied with the overall quality of my working life" [19]. We postulated that workers' increased clinical competencies as a result of cross-training provided more job control over their immediate work environment, thereby acting as a mitigating factor against occupational stress. Cross-trained nurses may work across all the areas of the birthing center and this may result in decreased workloads through better staff allocation. Moreover, they became more familiar with cross-training and their job demands diminished, which lowered their stress levels. Jointly, they resulted in the respondents enjoying a higher QWL than their non-cross-trained counterparts.

Backward stepwise logistic regression analysis was performed to examine quality of work life and associated factors. The variables in the multivariable logistic model considered in relation to the outcomes of either high or low QWL were: location of cross-training, age, occupational stress, income, employment status, and type of hospital (i.e., teaching or community hospital). Unadjusted odds ratio estimates for study participant characteristics are found in Table 2. Both significant and non-significant variables were included in the simple model. QWL was considered as a dependent dichotomous variable. Location of cross-training was statistically significantly associated (OR: 3.82; 95% CI: 1.01 to 14.5) with high QWL. There were no interaction effects. The other variables in the model (total stress scores, employment status, and education

attainment) were not statistically significant. Assumptions and data were checked and met; there were no outliers.

A nurse's stress threshold, sometimes referred to as stress "hardiness," is likely to be dependent upon his/her characterological features, and also on the situations under which demands are being made [21]. Therefore, a single event may not inevitably constitute a source of stress for all nurses, or for a particular individual at all times, and may have a variable impact on stress depending upon the extent of the incongruity [22]. Assessing stress is likely to be very difficult in an occupation as diverse and challenging as health care, yet the effectiveness of organizational interventions to reduce or eliminate sources of stress depends upon a sound understanding of the stress phenomenon for nurses.

The statistical association between employee a high QWL and location of cross-training highlights the importance of positive workplace conditions for nurses' QWL and for their empowerment. These conditions may have been unique to Health Sciences North and included increased support from management, greater social supports both from administration and from colleagues as cross-training was implemented. Additionally, the statistically significant odds ratio may have been influenced by selection bias since nurses who did not want to participate in cross-training had left the unit before its implementation. Greater empowerment may allow nurses to have greater decision-making capacity, thus greater job control which in turn leads to them managing their job demands more efficiently. We believe that these factors coupled with a supportive work environment not only leads better health outcomes but also helps in mitigating factors related to a stressful workplace.

From the qualitative interviews, we found that location of cross-training had both positive and negative ramifications of QWL. It is important to state that the interviews served to explain and provide greater depth to the quantitative findings, using a sequential explanatory approach

[23]. From the interviews, some of the nurses identified that looking for equipment took up a great deal of their time and efforts during cross-training. It also acted as a barrier in training student nurses and in providing care to families. Others stated that during the period of transition, in which nurses begin cross-training, there were feelings of apprehension, stress and anxiety. The negative implications of cross-training may be mitigated through skillful management. Many of the potentially negative impacts stem from thoughtless implementations of cross-training (Schultz et al., 2003). Furthermore, if managed strategically and with care, cross-training should provide a net benefit for patients, their families, nurses, and employers [24].

Some nurses also commented on positive experiences including learning new skills and becoming proficient in all areas of obstetrical nursing. Cross-training has been shown to augment health care services delivery by better allocating staff to meet patient loads and by providing better quality than temporary nurses hired from a supplemental agency [25]. Moreover, these nurses will have greater clinical competencies by being able to work across all three areas of obstetrical care including labour, delivery and post-partum. IN terms they will allow them to have greater job control and minimize their job demands. Operating without well trained staff increases the risk of patient neglect and medication error. If other units have cross-trained nurses, they could supplement those in the short-staffed unit to maintain quality [25].

Some clinically experienced nurses who had worked in one area (e.g., labour, delivery or post-partum) of obstetrics left their jobs. As an outcome, new graduates and inexperienced nurses had fewer mentors to foster their clinical training. We postulate that as the number of nurses who are cross-trained increases across hospitals in Ontario, the number of clinically experienced mentors will also rise. In turn, there will be more mentors to help new graduates integrate into the workforce and foster meaningful mentoring relationships. Moreover, as these nurses transition

from novice to expert clinicians, they will also augment their work ability scores. This is due to their capacity to utilize all available resources to the best of their abilities.

While the nurses interviewed stated that obstetrical nursing is generally a positive experience given its outcomes, some employees resist all types of change. If cajoled to cross-train, these workers might feel stress and their morale could suffer. If these workers did not cross-train, they might resent co-workers who did. Another potential negative implication of cross-training is the possibility of poor training; a negative training experience could harm the morale of staff and promote a negative work environment [25].

Greater employee satisfaction among employees is related to them rising to the challenges of organizational restructuring and to being more resilient to occupational stress and burnout [26]. Employer interventions that bolster employee viewpoints of empowerment may increase the employee's ability to respond more effectively to today's challenging healthcare work environments [26]. Moreover, patients' perception of the quality of nursing care is related to nurse satisfaction. Therefore, to meet organizational goals in providing a higher quality of work life to all nurses, it is vital for employers to safeguard that empowering work conditions are in place to promote nurses' satisfaction with their jobs and in the delivery of excellent health services [26].

Providing nurses with additional educational and career opportunities may lead to healthier work environments [27]. Offering educational and career opportunities can contribute to decreasing nurses' occupational stress levels, prompting retention and even recruitment of nurses. More research is required into how to provide opportunities for nurses to continue to develop professionally while fulfilling their usual work responsibilities [27].

Importantly, the manner in which nurses deal with occupational stress is linked to effective recruitment and retention strategies [28-31]. Simply put, over stressed and burned out workers leave the nursing profession. To implement appropriate and relevant recruitment and

retention, more needs to be known about the workplace setting of nurses. Documenting and improving our understanding of these healthcare professionals' workplaces may lead to better recruitment and retention strategies of health care professionals in rural and northern regions. By identifying what comprises a healthy work environment for nurses in northern and rural communities, recruitment and retention strategies could be implemented at the personal, community, and organizational levels.

Changes in care delivery and model of care and implications for health services delivery

In Chapter IV, it was noted that cross-trained nurses experienced higher QWL than non-cross-trained nurses. In the logistic regression model, only being a cross-trained nurse (OR: 3.82; 95% CI: 1.01 to 14.5) was statistically significantly associated with high QWL. The other variables (i.e., total stress scores, employment status, and education attainment) were not statistically significant with high QWL. A possible explanation could be that organizational features can affect how nurses view their QWL. Employer characteristics such as policies and procedures, leadership style, operations, and general contextual factors of the workplace have a significant effect on how respondents view their QWL [32, 33]. Furthermore, it is suspected that cross-training provided greater team synergy and improved communication among nurses and with colleagues. Selection bias may have influenced the study results. Also, nurses who had left obstetrics were not reflected in the sample and may provide a different view of the relationship between QWL and location of cross-training.

From a management perspective, morale is important because it impacts many other objectives. In this study, location of cross-training may have improved morale and lowered turnover rates as shown in other studies of cross-training [25]. One reason training diminishes turnover is that nurses consider training as a benefit that consequently boosts their morale. Many health care professionals, including nurses, enjoy learning new skills and feel pride in their

professional growth [34]. Likewise, many enjoy a wider variety of work and responsibilities. Some nurses may also feel that cross-training enables them to better help people and provide better continuity of care. From the qualitative interviews, teamwork and interdisciplinary interactions were recognized as essential to care, as the nurses also identified some of the inherent challenges and stressors of working in this environment. This is particularly true for obstetrical nurses who may be able to care for a family from throughout the entire birthing process.

While the influence of location of cross-training is regarded as generally positive, some employees may view cross-training as a burden. Some employees resist all types of change. If cajoled to cross-train, these workers might feel stress and their morale could suffer. If these workers did not cross-train, they might resent co-workers who did. Another potential negative implication of cross-training is the possibility of poor training; a negative training experience could harm the morale of staff and promote a negative work environment [25].

The aforementioned quantitative findings are largely in line with the viewpoints expressed in the interviews. Based on the study participants' recommendations, location of cross-training may better be supported by workers with greater organizational supports and mentorship programs, professional competency expectations, therapeutic communication techniques, and physical assessment skills.

Stress management, burnout interventions, and QWL

QWL initiatives (e.g., stress management and burnout interventions) in health care settings can improve the morale of employees and organizational effectiveness [35]. In Chapter VI, the intervention studies reported were all workplace intervention strategies based mainly on individual strategies. Occupational stress research often lacks a comprehensive theoretical framework and standardized measurement tools [36], which focus simultaneously on individual and organizational factors [5, 37].

Furthermore, QWL can improve the quality of care provided as well as recruitment and retention strategies of nurses [38, 39]. Promoting stress management strategies, QWL initiatives (e.g., stress management and burnout interventions) in health care settings can improve the morale of employees as well as organizational effectiveness [35] and mindfulness-based stress reduction [40]; QWL initiatives may be a more practical and long-term approach in the discourse about health human resources and health services delivery [41]. Solutions to stress and imbalance require a positive perspective, extoling the positives of active jobs and work-life balance for achieving employment and organizational health [42]. Managers who understand this are more likely to introduce organizational systems, policies, and practices that encourage nurses to flourish in their jobs and lives outside of work [42].

Employees often have ideas about what makes a healthy workplace. Their recommendations for improvement often push far beyond health promotion programs into aspects such as economic rewards, hours, and schedules; relationships with co-workers; and more input and job resources. Moreover, among those employees whose work interfered with their personal lives, reduced workload also was a highly sought after change, as was more flexible work accommodations [42]. Greater employee satisfaction among employees may also be related to nurses rising to the challenges of organizational restructuring and to being more resilient to occupational stress and burnout [26]. Employer interventions that bolster employee viewpoints of empowerment may increase the employees' abilities to respond more effectively to today's challenging healthcare work environments [26]. Moreover, patients' perceptions of the quality of nursing care is related to nurse satisfaction [26]. Therefore, to meet organizational quality goals in providing high QWL to all nurses, it is vital for employers to ensure that empowering work conditions are in place to promote nurses' work satisfaction in delivering excellent health services [26].

A work environment that encourages employees to make the fullest possible use of their skills is vital to organizational success. For the organization, these benefits are indeed profound. Employees who experience low job stress or have a high QWL will contribute more and cost less to employers than workers who lack these positive psychosocial job conditions [42]. Key indicators are lower work absenteeism; higher job satisfaction; lower turnover and higher retention rates; strong commitment to the organization; and fully contributing skills, knowledge, and abilities [42]. Moreover, this contributes to both provincial and national prosperity and QWL [43]. There needs to be greater transparency and dialogue between employers, employees, and nursing union leaders about QWL and how to provide a healthy work environment [43].

Improving the QWL of nurses is particularly urgent today, after almost 20 years of hospital restructuring and downsizing [44, 45]. Lowe (2000) asserts that the QWL of Canadian workers is underpinned by four pillars. First is the opportunity to engage in tasks that are meaningful and fulfilling to workers personally. For example, providing nurses with greater decision-making capacity and autonomy will foster positive relationships with their colleagues and managers and may bolster their job satisfaction. Second, Lowe argues that employers must provide a decent standard of living and not just a reasonable wage, and a sense of economic security [44, 45]. This entails providing employees with career and educational opportunities that will not only increase their salaries, but also their clinical competencies as health care professionals. The third pillar consists of health, well-being, and social support (e.g., support for family life, or life outside work) [44, 45].

Social support is a grouping of social relationships, emotional and behavioral interactions, and a worker's perception about the adequacy or availability of different types of support [46]. Social support mediates the relationships among health care related occupational stress and the physical health and psychological health of nurses [46]; good social support resulted in good

quality of life [46]. On the other hand, low social support has been linked to poor physical and psychological health and increased nurses' vulnerability to mental health related work absenteeism [47]. In Chapter V, higher home-work interface integration was a statistically significant factor associated with high work ability for nurses. Therefore, it appears that higher scores related to accommodating family and work commitments led to elevated work ability scores. Work-life balance relates to the degree to which employees feel they have control over when, where, and how they work. This is a crucial component of QWL, but it is important to note that workers' health and well-being also directly affect their ability to be productive in their jobs. For nurses, providing excellent patient care and delivery of health services is intimately tied to being healthy and resilient workers. Marital status was significantly ($p=0.014$) related to high work ability, suggesting that being married leads to higher work ability. Studies have indicated that different sources of social support work in unique ways to mitigate the strain of work stress [48]. Beyond the home environment, social support from coworkers was important; additionally, social support and diminished level of stress were components in nurse retention [49]. In another study, Geiger-Brown and colleagues examined common themes that nurses expressed regarding their work environment and how they viewed the impact of work on their personal health and well-being [50]. The researchers used constant comparative analysis to review raw data and identify themes, patterns, and meanings. These findings also indicated that when administrators make change within their organizations, they provide a better environment and encourage teamwork within the nursing environments [50].

Research may also demonstrate the moderating effect of social support on the stress-performance relationship is important to verify the significance of using sources of social support in the workplace for highly stressed employees [49]. Conversely, if research shows the direct effect of social support on job performance, sources of support in the workplace become

significant for all employees [49]. By understanding the effect of stress on occupational performance and the effect of social support on both job stress and job performance, better stress management approaches incorporating social support systems may be established [49]. As a result, the quality of care might be improved when provided by nurses with strong social support. Providing environments with enhanced levels of social support and reduced levels of stress might help to retain staff and thus alleviate the nursing shortage, particularly in rural and northern regions [49].

According to Johnson (1991), social support at work and occupational support may operate as important coping mechanisms, which may alter the impact of social occupational stress [51]. The job support referred to overall levels of helpful social interaction available on the job from both co-workers and supervisors [52]. Low levels of psychosocial resources, such as weak social networks and low social support, have emerged as factors associated with stress in health-related research. As well, social support from coworkers may enhance the level of reported job performance (e.g., work ability) and decrease the level of reported occupational stress [49].

Both nurses and their employers need to actively and continually examine the work-life balance, and make adjustments as required [53]. Flexibility on both sides will be required, along with discussion and compromise within practical constraints fostering the identification of solutions [54].

Lowe's fourth pillar is related to rights [43]. In a knowledge-based economy, workers' active participation in decision-making must be a basic tenet of the organization's work environment. Several studies have linked nurses' well-being and health to their decision-making capacity in their workplace [55-58].

Evidence supports the relationship between QWL and education and career advancement

Interventions such as bolstering educational and career advancement opportunities to modify nurses' occupational stressors may lead to the development of pleasant working environments where work ability can be sustained [27]. This kind of outcome would be in line with studies that emphasize the relevance of organizational interventions to eliminate negative occupational stressors and promote organizational and staff health and well-being. Such interventions include stress management training, regular meetings with colleagues and superiors, redistribution of shift work, and improved policies on professional health hazards [59].

In Chapter VI, several stress management and burnout interventions were discussed. For example, the demands of dual career families are among the many issues arising in both home and work that need to be monitored and addressed by way of an alliance in the workplace [54]. The constructs addressed in the Home-Work interface factor of the work-related quality of life scale have also been referred to as work-life balance and work-family conflict in the boarder literature [6, 60]. Within the current QWL model, the Home-Work Interface factor reflects the extent to which the employer is perceived to support employees' families and home lives.

Occupational stressors of obstetrical nurses

Nursing is a stressful occupation [61] and physical and psychosocial stress are inherent in its practice [55]. Stress is unavoidable and may even be desirable to a certain degree [55]. Workplace stress may be related with numerous factors that affect the day-to-day nursing activities, including the experience of nurses in providing clinical care, patient acuity, the need to be constantly vigilant, and responding to changes in patient status [55]. Other factors include workload and productivity; providing care in complex emergency cases; types of settings; and nursing relationships with the patient, family, and other colleagues involved in patient care [55]. In the 2005 *National Survey of the Work and Health of Nurses* which surveyed Canadian nurses, absenteeism rates for nurse supervisors and RNs were reported to total 17.7 million hours due to

illness and injuries [62]. This is the equivalent of 9,754 full-time nursing jobs [62]. Working in obstetrics may be an especially stressful area of healthcare because of its potentially long and inflexible work hours and disruptions of nurses' personal time [63]. Given the amount of time and energy people expend at the workplace, it is crucial for employees to be satisfied with their life at work [64]. Work occupies an important place in many individuals' lives and the work environment is likely to affect not only their physical, but also their psychological, well-being, as well as their QWL [65].

In Chapter IV, total stress scores were not statistically significant in determining a high QWL between nurses who were cross-trained and those who were not. The odds ratio was 0.95 (OR: 0.95; 95% CI: 0.88 to 1.01) with the reference group being those with low stress level scores. The cross-trained group of nurses was nearly as likely as the non-cross-trained group of nurses to experience a high QWL. Higher reported stress levels have been identified as a factor of nurses likely to plan to leave their nursing positions within 12 months in rural and remote practice settings in Canada [25, 66].

Initiatives introduced by the various governments to address the problem of stress in nursing have the ability and potential to go some way towards improving the workplace. However, more comparative studies employing both quantitative and qualitative methods are required to clarify how interventions might be directed at specific clinical areas [21]. Lowe argues that improvements are most likely in leadership/management styles and interprofessional conflict will lead to better QWL outcomes [67]. Ideally, workplaces of all sizes and in all sectors should experience a high QWL. Employers who are motivated by the imperatives of productivity, competitiveness, flexibility, and efficiency need to be made aware of the mounting evidence that work quality (e.g., skill, job autonomy, and health work environment) contributes directly to the achievement of their objectives. For nurses, a partnership with their employer will facilitate

dialogue about their mutual objectives and promote synergistic cooperation towards a higher QWL. Other factors such as workload (e.g., human resources), wages, and shift work are likely to persist as problems, at least for the foreseeable future [21]. Inadequate pay is increasingly a source of stress, exacerbated by high workload and falling levels of staffing [21].

Changes in care delivery and model of care in nursing and its relationship to QWL, stress, and work ability

The goal of cross-training is to enhance knowledge of interpersonal activities by introducing team members to the roles and responsibilities of their teammates. Proponents argue that cross-training leads to improved team communication, coordination, and controlled team regulation by helping members to better understand the activities of those around them [68]. By facilitating and disseminating knowledge about what has to be shared with members and what activities must be performed interdependently, workers are better positioned to anticipate the needs of other team members. Furthermore, the knowledge acquired from cross-training can educate workers on how to compensate for teammates' limitations [69, 70].

It is important to note that the results represent a snapshot in time of the occupational environment of obstetrical nurses in northeastern Ontario. The pattern of reported sources of stress for nurses may be dynamic, especially given the location of cross-training. With relatively greater emphasis on conditions of employment, such as pay, workload, cross-training, and shift work scheduling, sources of stress may emerge in new places and add to, rather than replace, occupational stressors [21]. Moreover, stress intervention measures should focus on stress prevention for workers and should address organizational issues. Accomplishing this will require further comparative studies and new tools to evaluate the intensity of individual distress [21].

Work ability and its relationship to nurses QWL

Work ability is defined as the worker's capacity to perform their work, and is measured by an index describing their health resources in relation to work demands [71]. In Chapter V, the study examined how in the stress and QWL multiple regression model, three variables—QWL (home-work interface) (p=0.005), location of cross-training (p=0.048), and mean number of patients per shift (p=0.024)—significantly contributed to the variance in work ability scores. A significant regression equation was found (p<.0001), with an R^2 of .348, or 34.8%, thus explaining variance in work ability scores. In this case, the variance of 34.8% is shared between work ability and QWL (home-work interface), location of cross-training, and mean number of patients per shift. This means that home-work interface had the largest positive influence on work ability scores, while location of cross-training demonstrated an inverse relationship with work ability scores. It appears that cross-trained nurses were less capable of completing their work in relation to their work demands and health resources.

Location of cross-training demonstrated an inverse relationship with work ability scores. This relationship may be due to lack of sufficient training and mentorship of novice nurses by clinically experienced nurses, increased job demands as a result of cross-training (working in all three areas of the obstetrical unit) and a younger group (compared to the Ontario average) of nurses at Health Sciences North who are early to mid-career clinicians. We postulate those nurses who lack training and have increased job demands experienced lower work ability scores because they lack the capacities and resources to perform their work as they increase their clinical competencies in obstetrical care. Expert nurses develop skills and understanding of family-centered care over time through a proficient educational base as well as a multitude of experiences [72]. Their expertise may result in increased work ability scores over time. We believe once they have consolidated their learning, their work ability will also rebound.

Additionally, the quality of a worker's output diminishes with increasing cross-training . For example, a nurse trained for too many tasks, such as working across the labour, delivery, and post-partum areas could begin to forget how to do certain tasks. Moreover, cross-training downgrades if it is not used [25]. In obstetrical nursing, if a nurse is cross-trained for another area of care but never works there, not only will much of the training be forgotten but protocols may change and, thus, the nurse will require further training [25]. Depreciated skills could render a cross-trained nurse unable to provide quality care in the other areas. Finally, Inman (2005) cautions that another possible negative impact of cross-training on quality is that cross-trained nurses will be more likely to be shifted to other units, thereby diminishing continuity of care [25].

The other variables (e.g., total stress scores) were not statistically significant. The concept of work ability is gaining attention in scientific research on occupational health [27, 71, 73-75]. High work ability scores (i.e., scores greater than 37 out of 49 on the work ability index) [71] are also associated with health, well-being, and functional status [76]. Despite the evidence that work ability is associated with a person's own evaluations of their health [77, 78], additional studies are needed to gather information about the long-term effects of work ability on health and well-being [79]. For nurses, the bases for work ability are health and well-being, but work ability encompasses professional knowledge and competence (skills), values, attitudes, and motivation, and the actual work [80].

Two decades of research have pinpointed that high psychological job demands and a low level of control over these demands increase a nurses' exposure to job stress [22, 81, 82]. Research on the impact of workplace on workers' health and well-being demonstrates that occupational stress increases the risk of musculoskeletal injuries, accidents, physical and mental illness, substance abuse, and smoking [5, 83, 84]. Excessive occupational stress has been linked

with increased risk for physical and mental health issues, decreased job satisfaction, role conflict, geography, and role stress [84-88].

Qualitative results

The qualitative interviews described in Chapter IV revealed the participants' views about workplace stress. In particular, two key points emerged. The first is that the workplace was a source of physical and mental stress. Second, interventions that mitigate occupational stressors (e.g., acute low back pain, burnout, job dissatisfaction, and depression) may result in healthier workers and a more positive work environment [89-91]. As knowledge expands in the field of occupational stress and health, different kinds of interventions will be identified. Replication of this study with larger and more diverse samples, including managers, is warranted.

Analyzing for subthemes provided evidence of the relationships between the themes and the nurses' QWL, cross-training experiences, and work environments. The first theme, workplace stress, included four key subthemes. The first of these subthemes, busy work environment, referred to the ongoing demands of the clinical setting including staff shortages and new systems. The second subtheme was physical stressors; this subtheme identified the various types of physical stressors experienced by the nurses including acute low back, shoulder, and neck pain. The third subtheme was mitigating stress, which referred to the efforts by nurses to prevent stressful situations; examples include improving communication with colleagues, identifying where equipment is located before a shift begins, and working collaboratively. The final subtheme was emotional stressors. This subtheme focused on when something goes wrong in obstetrics, such as the passing of a patient. The nurses identified this stress as particularly significant given the general goal and nature of obstetrical nursing.

The second theme, relationships, consisted of nine subthemes. The first subtheme was interdisciplinarity and teamwork, while inclusive of the teamwork and interdisciplinary

interactions essential to care, also include specific challenges and stressors. Management and employee relations comprised the second subtheme, and identified that the relationship with the unit manager was key in facilitating a positive QWL and in minimizing stress. The next subtheme was enjoyable working environment; for most participants, obstetrical nursing was a positive experience.

Nurse-nurse relations was a subtheme about the relationships that exist between nurses. While these relationships were reported to be positive, some respondents suggested that they could be strengthened through communication and training opportunities. Equally important was the nurse's relationships with physicians, an idea reflected in the subtheme called physician relations. Elevated workload levels and staff shortages were noted to negatively affect nurses' relationships with physicians.

The next subtheme addressed was new grads and mentoring. The nurses expressed concern about the lack of mentoring by some clinically experienced nurses of new graduates. This relationship needs to be developed and expanded, especially given the expanding role of cross-training in obstetrical nursing. The nurses also discussed power imbalances. Power differences among nurses, between nurses and their unit managers, and with other health care professionals, particularly physicians, were described. Among nurses' relationships, personal relationships with colleagues were important to work-life balance. The nurses reported having strong relationships with their colleagues and attending social events together outside of the work environment. This was a source of pride and an indication of a higher QWL for some.

The third theme, changes in care delivery and model of care (cross-training), was intimately tied to the concept of cross-training. As discussed previously, changes in care delivery and model of care benefits nurses as they learn new skills and increase their clinical competencies. At the same time, it can elevate work stress. The first subtheme related to model of

care was the shift in care as nurses' work with one patient across all areas. High stress levels were reported to be a result of lack of functioning equipment. Some nurses identified that looking for equipment took up a great deal of time. It also acted as a barrier in training student nurses and in providing care to families. Period of transition was also identified as theme. This is the period during which nurses begin cross-training. According to the nurses, changes in care delivery and model of care involves feelings of apprehension, stress, and anxiety. At the same time, some nurses also commented on positive experiences of cross-training, including learning new skills and becoming proficient in all areas of obstetrical nursing.

Drawbacks of cross-training was a subtheme in line with research by Inman et al. [25]. This subtheme revealed that some clinically experienced nurses who had worked in one obstetrical area (e.g., labour, delivery, and post-partum) left their jobs. As an outcome, new graduates and inexperienced nurses had fewer mentors to foster their clinical training.

Nurses' dislike of cross-training was identified as subtheme as well. In examining work sharing in factory assembly lines, Schultz and colleagues (2003) cautioned that the behavioral effects of cross-training can reduce or even eliminate its potential benefits [24]. Similarly, some of the nurses indicated that cross-training was a source of stress and increased their professional clinical responsibility to the College of Nurses of Ontario. Comparison with American-based care was noted by one respondent. The nurse had worked in both the Canadian and American health care systems. She commented that the American system had implemented cross-training many years ago in her hospital with a higher level of organization. According to this nurse, the Canadian transition to cross-training is disorganized.

Increased responsibilities and maintaining competencies were identified as other consequences of cross-training and as sources of stress. As a result of cross-training, nurses have higher stress levels and greater accountability to the College of Nurses of Ontario and to families

and patients. Some nurses felt more continuing education opportunities in rural and northern communities were warranted. Relevant to northern and rural settings, challenges of small northern hospitals was identified as another subtheme. Given the health human resources shortage of nurses in northern Ontario, the nurses identified the need for more local training and education so that they would not have to travel to southern Ontario for this professional development and education. Scope of practice was another subtheme related to the broadening of nurses' clinical skills. Increased scope of practice brings more responsibility and accountability to the regulatory body, and can be a source of increased occupational mental and physical stress.

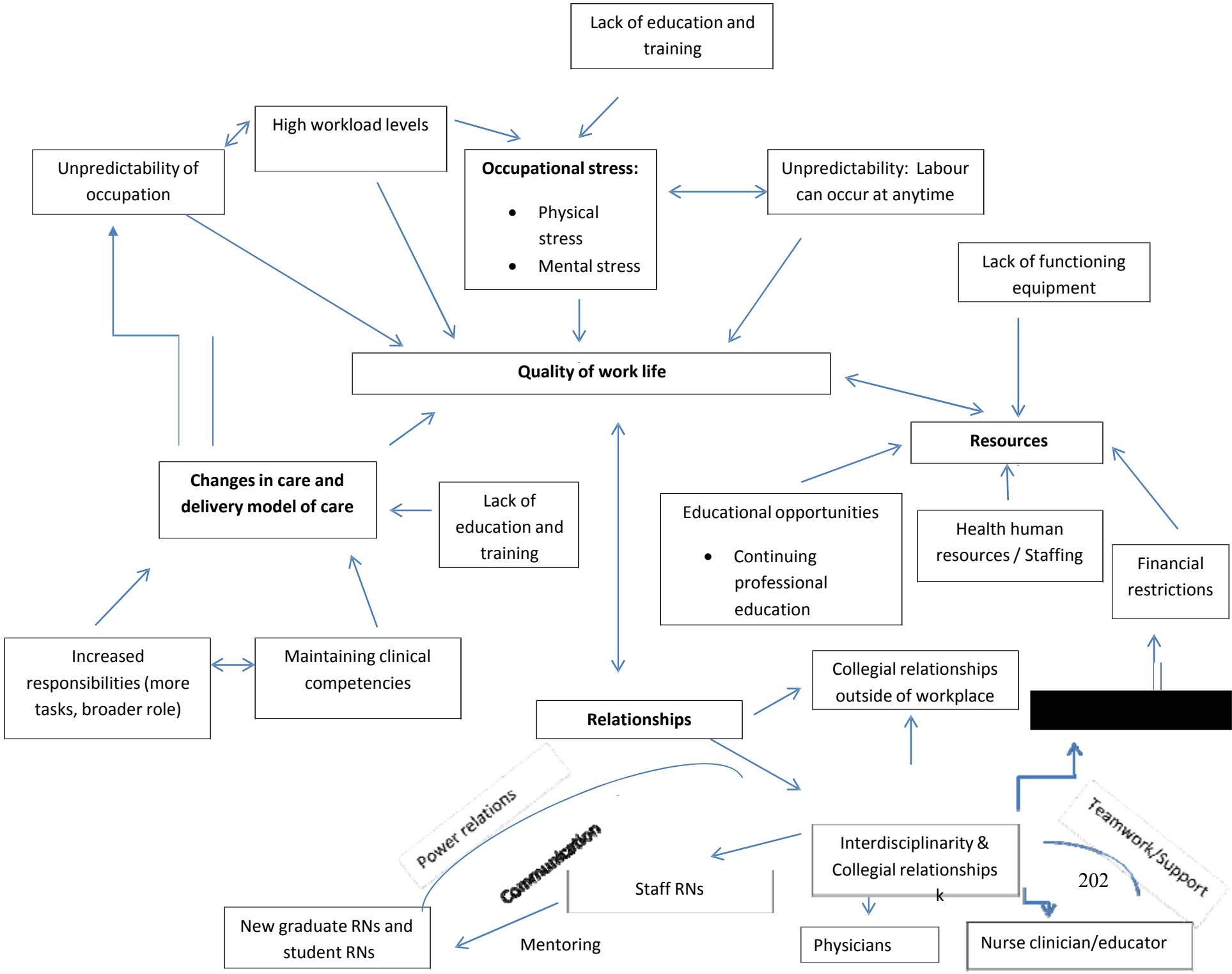
The fourth theme was of the idea of resources. Subthemes included typical shifts, career advancement and training, support, and financial restrictions, among other things. The typical shift was described as being eight or 12 hours in length with a 30-minute break. Studies have shown that increased educational and work opportunities promote a healthy work environment for nurses and increases their work ability [27]. Career advancement and training were also identified by the nurses; both financial incentives and educational opportunities are necessary to keep their clinical skills relevant. Many felt that they were left on their own for their continuing education and development. Work stress was linked to a lack of staffing among nurses [92]; thus, support was identified as another subtheme. Generally, there are good support systems available to obstetrical nurses, but, in certain areas, there are communication breakdowns. Financial restrictions also emerged as a subtheme. The nurses felt that working in a financially austere environment meant inadequate resources such as malfunctioning or broken equipment and a lack of nursing staff. A lack of education and training was emphasized, as was a lack of continuing professional development and training for nurses. There was a high rate of staff turnover with the implementation of cross-training at some hospital sites. Some of the nurses felt that they had to take more time off work as sick days because of the physical and mental demands of the

workplace. The stressors of the workplace made some nurses sick; this is supported by numerous studies [56, 93, 94] and has severe consequences on health and well-being.

The fifth theme identified by nurses was QWL. Nurses perceived QWL as a comprehensive term that encapsulated both work and non-work factors. QWL for nurses was evident in the strength of their relationship with colleagues, social events, and collaborations with other health care professionals. This sense of QWL is in line with that used in this study, which defines QWL as a way of thinking about people, work, and organizations. Its distinguishing elements are a concern about the impact of work on people as well as on organizational effectiveness and the idea of participation in organizational problem solving and decision making [20]. Recommendations for improvement pertained to improvements in equipment and facilities in the unit as well as more opportunities for training and education. Enjoyable working environment was a further subtheme. Generally, the work environment was a positive space that allowed nurses to develop and build meaningful relationships and maintain their clinical skills. This finding is unique as many studies report a nursing environment laden with physical and mental stress [27, 95], high workloads [96], burnout [59, 97], and job dissatisfaction [98, 99].

These findings are presented in a conceptual map to demonstrate the relationship of the themes with the subthemes (See Figure 7_1).

Figure 7_1. Conceptual map of themes and subthemes



JDCS Framework Elucidates the Role of Occupational Stress in QWL

These findings are congruent with the Job Demand-Control-Support [3] framework used to explore potential associations between QWL, stress, and cross-training in the work environment. The JDC model postulates that job strain (a proxy for occupational stress) stems from the interaction between two facets of the work environment: psychological job demands and job control [3]. In addition, social and psychological factors people experience in the work environment are entrenched and interpersonal relations among participants in the workplace [10-14]. Job demands, which refer to work load operationalized as time pressure and role conflict [3], are placing greater clinical responsibilities and workloads on nurses which, in turn, diminishes QWL and raises stress levels. Job control, which is sometimes called decision latitude, refers to the person's ability to control his or her work activities [3].

We hypothesize that those nurses who experienced low job control, high job demands and low social supports in the workplace experienced negative health outcomes. Those would could not manage increasing workloads or working across different areas of obstetrical care may have also had their job demands increase, while not receiving much support from their managers. Conversely, those nurses that experienced higher job control and lower job demands coupled with high social supports in the work environment experienced better health outcomes including having a higher QWL. In Chapter VI, several interventions, including mindfulness-based stress reduction [40], programs designed to decrease stress by increasing coping resources [100], and assertiveness training [37] were identified.

In Chapter VI, a primary prevention public health approach was suggested to address stress management and burnout. The need to examine the underlying workplace determinants of health and productivity is becoming more recognized [42]. Initiatives and actions are being led

by the World Health Organization's definition of health as complete physical, mental, and social well-being, not simple absence of disease or ill health [101]. Job and organizational factors should foster positive mental and physical health outcomes for employees [42]. As well, health promotion programs strengthen organizational culture and leadership, two of the foundations of a healthy work organization [42]. For nurses in rural and northern settings with limited work employment opportunities, this may be a plausible approach that mitigates stress levels and promotes a higher QWL [42]. In unionized settings, joint design and implementation of comprehensive health promotion programs have shown to reduce employee health risks and benefit costs [102].

A statistically significant relationship between location of cross-training in nurses and total stress scores was not detected, as noted in Chapter V. Similarly, there was no relationship between occupational stress scores and work ability. How employers assist their workers in dealing with work stress and work ability is of great interest; however, assessing this relationship is a complex study. One concern is that employees may not accurately recall details of their occupational histories to provide accurate enough pictures of their self-reported work ability.

Increasingly, employers in health care are introducing innovative and new forms of work and organizational designs as well as changes in the delivery of health care. Educational and career prospects may mitigate nurses' occupational stress levels and thus maintain, or even increase, their work ability. Stress was not statistically associated in our findings reported in Chapters IV and V. However, employers are encouraged to recognize that work interventions must incorporate measures to provide employees freedom to accomplish the higher job demands associated with restructuring, so that job strain can be averted and inherent motivation can be improved. Moreover, they must recognize a high QWL as their corporate responsibility in the

public sector, as well as to their employees and the broader community. This is particularly true in providing excellent work environments for employees in small urban centres where employment possibilities are limited.

Future studies and direction

QWL is an issue that has been of greater interest in recent years. Many employees, including those in the healthcare sector, view their occupation as the most important aspect of their lives, with quality of life increasingly determined by other aspects [27, 103]. To improve recruitment and retention strategies, it is vital to understand why positive challenges become occupational stressors and how this relationship can be thwarted [104]. There is evidence to demonstrate that a happy employee is productive and dedicated [23, 94, 105-107]. A growing body of research has shown that QWL may have an important impact on employee behavioral responses, such as job satisfaction, job performance, retention, and personal alienation [54, 108-110].

The interrelated nature of the occupational stress-related factors and their impact on return to work make it challenging to identify potential relationships with QWL [27, 65, 111]. Numerous studies reveal that job stress leads to burn out, diminished job satisfaction, work ability, and low QWL [112, 113]. Future research on determinants of work ability should incorporate the social and economic environment of workers [114]. It is plausible that some of these factors (e.g., lack of work autonomy, limited resources, burnout, etc.) may be related to how employers offer assistance during stressful periods in the employee's working life. Furthermore, factors such as the organizational setting within workplaces and social and economic policies that influence labour participation are also important to consider [114]. Lowe asserts that changing these factors requires shifts in leadership from many groups and

individuals. Healthy change requires considerable effort by many groups and stakeholders. For nurses, unit managers and administrators ought to develop and implement strategies (e.g., stress management, work flexibility) to address and improve the QWL conditions for nurses through discussion and change at all levels (e.g., management and workers) of the organization. Apart from initiatives to decrease job demands, it is important to explore the kind of support these nurses consider to be most appropriate in their present work situation [115]. Another initiative for strengthening the support systems of obstetrical nurses is to develop and implement a mentoring and buddy system consisting of senior colleagues supporting new graduates [115].

The QWL of nurses working in northern communities may reflect distinct characteristics, such as a rural and northern lifestyle and a greater sense of belonging to a community. Since individuals in rural and northern regions have been reported to value self-sufficiency, self-reliance, independence, and stoicism, these concepts may also influence the results in this study [116]. This idea merits investigation.

It would be beneficial to understand the relationship between return to work and workload, occupational stress, productivity, job satisfaction, and work ability. Expanding results with further qualitative studies could also be used to identify themes through narratives and focus groups within the organization at different corporate levels. Furthermore, quantitative studies will help validate this study's results and could target other types of nurses in other jurisdictions by using a larger sample size. A mixed methods approach may be beneficial in understanding these relationships and variables by combining a survey sent to employees and conducting semi-structured interviews.

Future studies could consider examining one of five qualitative themes identified as a potential intervention approach in mitigating workplace stress. For example, a longitudinal

prospective cohort study would follow a group of nurses who differ with respect to a stress management intervention approach (e.g., mindfulness-based stress reduction). The objective of the study would be to determine how this intervention affects stress levels. An advantage of using a prospective cohort study is that it can help to determine the effectiveness of the intervention and risk factors for occupational stress because they are longitudinal observations over time. Furthermore, the data collected is at regular intervals, so recall bias is minimized [117].

In terms of location of cross-training, the results of this study provide a framework for future studies including larger sample sizes and increasingly rigorous designs to determine the relationship between work ability and nurses' QWL, stress, and location of cross-training. Ideally, we would compare cross-training across multiple sites in northern Ontario. Finally, studies using mixed methods approaches could identify the variables associated with QWL ability, as well as to categorize themes revealed through interviews, personal narratives, and focus groups with the goal of enhanced relationships between employees and employers and improved quality of work life for all stakeholders.

Given the hierarchical nature of organizations, future research may use a hierarchical linear modeling approach to further examine the views of both employers and employees within an organization from northeastern Ontario [118, 119]. In hospitals, hierarchies include workers nested in units. Most traditional statistical analyses assume that observations are independent of each other. The assumption of independence means that participants' responses are not correlated with each other. This assumption may be plausible when data are randomly sampled from a large population [120]. However, when people are clustered within naturally occurring organizations (e.g., hospitals), the responses provided by nurses or other respondents from the

same cluster are likely to exhibit some degree of relatedness with each other, provided they are sampled from the same organizational unit (e.g., obstetrical nursing) [110]. Hierarchical linear modeling allows researchers to adjust for, and model, this non-independence.

Hierarchical linear modeling has been used in occupational health, rehabilitation, medicine, and psychology to tackle some common problems associated with multilevel data, thereby advancing the understanding of the dynamic inner workings of organizations [118]. Independent of the methodological approach used, researchers should focus on the interaction between the many factors involved in the return to work process. Research may focus on creating interventions that bolster the QWL or work ability of nurses and in creating partnerships between employees and employers. There are several statistical advantages to using this approach. With clustered data, traditional statistical analyses that assume independence will generate incorrect standard errors. As a result, the standard errors are smaller than they should be [110]. Therefore, the Type I error rate is exaggerated for all inferential statistical tests that make the assumption of independence. In addition to statistical advantages, multilevel analyses facilitate the explanation of both between and within cluster variability of an outcome variable of interest (e.g., QWL).

Rationale for Northeastern Ontario and relationship to QWL

In northeastern Ontario, the North East Local Health Integration Network represents 4.5% of the province's population and 40% of Ontario's land area[121]. The large geography and relatively small, dispersed population of northeastern Ontario create challenges to health service delivery [121, 122]. Given this dispersed population, a chronic shortage of nurses in northern Ontario continues to present challenges to health care delivery [122]. Understanding the occupational stressors in the workplace among nurses enables stakeholders to promote not only a healthier workforce but also identify factors implicated in recruitment and retention of nurses.

Rural and northern residents are unique in their culture, health needs, and health behaviors which may be both challenging and rewarding [116]. They are, on average, sicker, from lower socioeconomic status, and have lower levels of education than Ontarians in other parts of the province [91]. They also have inferior access to health care than people in urban areas [91]. The occupational stressors facing nurses working in northern communities will reflect these distinct characteristics and warrant investigation. This undertaking is in contrast to many quantitative studies that have examined occupational stress in large metropolitan urban areas in Canada [45], the United States [123], Europe [94, 124, 125], Australia [124], India [21], and China [84, 126]. However, no studies have assessed occupational stress among registered nurses in northern urban areas of Canada. This research can have direct health services consequences by identifying the occupational stressors present in the workplace of nurses working in northeastern cities in Ontario. Given the limited number of employment opportunities in the north, it is important that employers and employees work closely together in creating a positive workplace that fosters career advancements and supports job satisfaction.

Previous studies have examined the types of occupational stress among nurses either quantitatively [15, 45, 94]. The workplace makes specific demands on nurses which may constitute a primer to illness as well as psychological or physical distress [127]. Therefore, the assessment of employees' QWL is important. [19]. Related to this is whether the types of stresses identified in the literature among nurses working in urban locations is similar to those experienced by those working in northern regions. Building positive work environments is a crucial component of retaining health care professionals in the north and recruiting those from other regions to re-locate to the north for lifestyle and career opportunities [15, 21, 27, 89, 128-133].

8. Conclusions

This study highlights the importance of QWL for employers and their employees. This research has the potential to offer important information to four different groups. First, nurses from primary to tertiary care may be able to use the results of this study to advocate for better working conditions and to understand the factors that provide a healthy work environment. Improving the quality of work life of nurses has the potential to provide a work environment that is not only healthier for nurses but also provides better health service delivery to clients. As nurses acquire greater clinical competencies to manage their increasing job demands, we caution that it may also disturb the continuity of care that nurses provide and also increase their liability with their regulatory body (College of Nurses of Ontario). Research has shown that the greater the level of involvement of health care professionals in the return to work process, the sooner the likelihood that the employee returns to work [134]. We believe this level of participants will foster an environment that also allows nurses to improve their work ability through better access to educational and career opportunities.

Second, this is a novel and under-investigated research topic that deserves increased attention from researchers, particularly given the pervasiveness of workplace absenteeism among nurses in Canada [33]. Some research has emerged from the United States, United Kingdom, and Canada, but it has an almost exclusive focus on nurses working in large urban centers.

Third, employers who are motivated by the imperatives of productivity, competiveness, flexibility, and efficiency need to be made aware of the growing evidence that work quality (e.g., skill, discretion, autonomy, consultation, a health work environment) contributes directly to the achievement of their goals [43]. Therefore, employers and employees must work together to achieve success. Lowe cautions that we must not underestimate the problems that employers

encounter [43]. Overcoming organizational barriers to change are challenging, and many employers are trapped in old ways of thinking about people issues in the workplace. For instance, heavy workloads and time scarcity are major change barriers in nursing. These obstacles invariably are identified as preventing managers from doing more to promote a healthy organization [42]. Furthermore, overworked employees won't espouse a new change initiative, even one aimed at improving their work environment [42]. The best way for managers to become facilitators of healthy change is to directly involve them in improving the drivers of health and increasing QWL in the work setting for their employees.

Finally, governments could also promote partnerships with employers, workers and unions, educational and training institutions, and other labour-market stakeholders [43]. In Europe, employers, workers, unions, and governments view each other as partners. Within many organizations, workers are consulted on issues affecting and pertaining to them; the workers councils in which such discussions take place are becoming common across Europe [43]. Critics argue that this worker friendly approach comes at the expense of less flexibility, overstaffing, and generous social security benefits that have hamstrung European industries and states [43]. However, these opponents neglect the way the organization of work in Europe is changing. Bureaucratic restrictions are being eased and new technologies introduced. There is greater work flexibility in work assignment and job responsibilities are expanding; training and education opportunities are improving. The mindset is that work should encompass more than paid employment and consider social, political, and economic aspects as well. This approach is vital in shaping public policy and guiding occupational health strategies in improving the QWL of workers.

To end on a personal note, I have enjoyed this journey and have learned a great deal about undertaking research and the complexities of the health care system. I would like to continue my studies with a post-doctoral fellowship where I can examine occupational stress and QWL in different populations. I am currently examining the recruitment, retention and occupational profile of northern Ontario physicians. In Canada overall, 21.1% of the population live in rural and remote areas served by only 9.4% of the nation's doctors (2.4% of the specialists and 16% of the family doctors) [135]. In Ontario, 14% of the family doctors and 2.5% of the specialists practice in rural areas covering 20% of the population (these statistics include the urban areas of Northern Ontario) [135]. An important factor in ensuring and sustaining appropriate, accessible, comprehensive, and high quality primary health care services in northern and rural areas is the provision of an adequate, appropriately qualified health workforce [136]. We need a deeper understanding of what contributes to a doctor feeling like a part of the community in which they work. What contributes to a positive quality of work life that retains doctors in a rural setting? This understanding may be part of future research that enables a deeper level of collaboration between academic centers, governments and communities.

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Appendix A: Consent Fonns

Letter of Information (Phase I: Survey)

Study Title:
Quality of Work Life: Investigation of Occupational Stressors Among Nurses in northeastern Ontario

Principal Investigator:
Behdin Nowrouzi, PhD (Candidate)
Co-investigators:
Nancy Lightfoot, Ph.D., Director, School of Rural and Northern Health, Laurentian University (Supervisor)
Diane Belanger-Gardner, Administrative Director, Health Sciences North
Lorraine Carter, PhD., *Nipissing University*
Michel Larivere, Ph.D., C.Psych. School of Human Kinetics, Laurentian University
Ellen Rukholm, Ph.D., School of Nursing, Laurentian University
Robert Schinke, Ed.D., School of Human Kinetics, Laurentian University

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I am a Ph.D. student at Laurentian University in the School of Rural and Northern Health conducting a research study examining the quality of work life study of nurses.

Purpose of Study
The purpose of this study is to describe the types of physical and psychosocial workplace stresses among registered nurses at Health Sciences North(nurses who received cross training), North Bay Regional Health Centre, Sault Area Hospital and Timmins and District Hospital. Specifically, this investigation will examine the types of physical and psychosocial stress among registered nurses working in the labour, delivery, recovery and postpartum areas at Health Sciences North, North Bay Regional Health Centre, Sault Area Hospital and Timmins and District Hospital.

What does participation in the survey involve?
If you agree to participate in this study, we invite you to complete and return the enclosed survey. We estimate the survey will take approximately 45 minutes to complete. You will be asked about your quality of work life and types of stress in your workplace. The survey may be completed using the enclosed paper-based form, or online at **http://workplace.behdin.com/index.php?sid=1**. All responses will be kept confidential and anonymous. If you do not wish to participate in this study, please return the blank questionnaire in the enclosed postage paid envelope. This will ensure that we do not contact you again about this study. Your participation in this study is completely voluntary. It is your choice to be part of the study or not. If you decide to participate, you can decide to stop at any time, even after signing the consent form. If you decide to stop participating, there will be no consequences to you.

What are the risks?
There are no known risks involved in participating in this study. However, there may be minimal risk that emotional distress or discomfort may be created by some of the questions. Should you experience distress or discomfort while completing the questionnaire, you can suspend or end your participation in the study without providing a reason. Participation in this study is entirely

voluntary. In the event that you experience any difficulties, you may wish to contact the Employee Assistance Program at Health Sciences North, North Bay Regional Health Centre, Sault Area Hospital and Timmins and District Hospital at 1-800-268-5211.

What are the benefits?
You may receive no individual benefits from participating in this study, although you may find that completing this survey provides an opportunity to reflect upon your employment and health. This information will be used to identify existing types of work stresses (e.g., physical, psychological etc.) impacting nurses in northeastern urban areas of Ontario. Additionally, the results of this study will identify factors that may influence workers quality of work life and job satisfaction. If you are interested in the study findings, a summary of the findings will be used to produce a report available to the public, and can be sent to you (if desired). Only group information obtained from this study will be reported and will form the basis of a thesis for Behdin Nowrouzi as part of the Interdisciplinary PhD requirement in the School of Rural and Northern program at Laurentian University. In addition, the results will be submitted for publication.

How will confidentiality be maintained?
All aspects of the study will be kept strictly confidential and only the investigators will have access to the questionnaires. Your questionnaire will be coded with only an identification number that allows us to keep track of who has returned either a completed or blank survey. No names or identifying information will be included on any surveys or will be used in any presentation or report that may be produced. All data will be reported in a grouped format only. All information will be securely locked in the graduate student office cabinet of Behdin Nowrouzi at the School of Rural and Northern Health. All hardware will be password protected and only pseudonyms will be used as individual identifiers. AES 256 will be used to encrypt data collected. Only the research team will have access to the surveys. All measures of privacy, confidentially and security will be respected. This includes keeping the information secured in a locked filing cabinet for a period of not more than five years.

What is the cost of participating in the survey?
The cost to you will be the time to complete this survey, which will take approximately 45 minutes.

Will I be compensated for participating in the survey?
Study participants will be given $10 Tim Horton's gift certificate for participating in the study.

Ethics
This study has been reviewed and approved by the Laurentian University Research Ethics Board, Health Sciences North Ethics Committee, North Bay Regional Health Centre Joint Research and Ethics Committee, Sault Area Hospital/Group Health Centre Research Ethics Board, and Timmins and District Hospital Research Ethics Board. If you have concerns or questions about your rights as a participant or about the way the study is conducted, you may contact:

Jean Dragon, Ph.D.
Laurentian University Research Office

E-mail: jdragon@laurentian.ca
Telephone: 1-705-675-1151 ext. 3213 or 1-800-675-1151 ext. 3213

Questions

For any questions about your role in this study, please contact Behdin Nowrouzi at (705) 285-4141 or bx_nowrouzi@laurentian.ca. You may also contact Dr. Nancy Lightfoot, Director, School of Rural and Northern Health, at (705) 675-1151 ext. 3972, 1-800-675-1151 ext. or nlightfoot@laurentian.ca 3972.

Sincerely,

Behdin Nowrouzi, PhD (Candidate), MPH, MSc. OT. OT. Reg. (Ont.)
School of Rural and Northern Health, Laurentian University

Informed Consent Form (Phase I: Survey)

Study Title:

Quality of Work Life: Investigation of Occupational Stressors Among Nurses in northeastern Ontario

Principal Investigator:

Behdin Nowrouzi, PhD (Candidate)

Co-investigators:

Nancy Lightfoot, Ph.D., Director, School of Rural and Northern Health, Laurentian University (Supervisor)

Diane Belanger-Gardner, Administrative Director, Health Sciences North

Lorraine Carter, PhD., *Nipissing University*

Michel Larivere, Ph.D., C.Psych. School of Human Kinetics, Laurentian University

Ellen Rukholm, Ph.D., School of Nursing, Laurentian University

Robert Schinke, Ed.D., School of Human Kinetics, Laurentian University

---

I have read the information presented in the information letter about a study being conducted by Behdin Nowrouzi (PhD student, Laurentian University), Diane Belanger-Gardner (Hôpital Regional de Health Sciences North), Lorraine Carter (Laurentian University), Nancy Lightfoot (Laurentian University), Michel Larivere (Laurentian University), Ellen Rukholm (Laurentian University), and Robert Schinke (Laurentian University).

I understand that I am being asked to complete three surveys to help identify existing types of work stresses (e.g., physical, psychological etc.) impacting nurses' quality of work life in northeastern urban areas of Ontario.

I understand that by signing this form and returning a completed survey I have consented to participate in the above mentioned study. I understand that my participation is voluntary and that I may withdraw at any time. I understand that I will not benefit from my involvement in the study and that a copy of this information letter has been provided to me. I voluntarily consent to participate in this study.

Date _____

Participant's Signature_____

For further information, please contact:

Behdin Nowrouzi

PhD Student, School of Rural and Northern Health

Laurentian University

E-mail: bx_nowrouzi@Laurentian.ca

Tel: (705) 285-4141

Letter of Information (Phase II: Interview)

Study Title:
Quality of Work Life: Investigation of Occupational Stressors Among Nurses in northeastern Ontario

Principal Investigator:
Behdin Nowrouzi, PhD (Candidate),
Co-investigators:
Nancy Lightfoot, Ph.D., Director, School of Rural and Northern Health, Laurentian University (Supervisor)
Diane Belanger-Gardner, Administrative Director, Health Sciences North
Lorraine Carter, PhD., *Nipissing University*
Michel Larivere, Ph.D., C.Psych. School of Human Kinetics, Laurentian University
Ellen Rukholm, Ph.D., School of Nursing, Laurentian University
Robert Schinke, Ed.D., School of Human Kinetics, Laurentian University

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Dear potential participant:

I am a Ph.D. student at Laurentian University in the School of Rural and Northern Health conducting a research study examining the quality of work life of nurses at Health Sciences Northand North Bay Regional Health Centre.

Study purpose
The purpose of this study is to describe the types of physical and psychosocial stress present in the labour, delivery, recovery and postpartum areas at Health Sciences North, North Bay Regional Health Centre, Sault Area Hospital and Timmins and District Hospital. Specifically, this investigation will examine physical and psychosocial stresses present in the labour, delivery, recovery and postpartum areas at Health Sciences North, North Bay Regional Health Centre, Sault Area Hospital and Timmins and District Hospital.

What does participation in the survey involve?
You will take part in an interview with Behdin Nowrouzi held at a location convenient to you and the interview will take approximately 1 hour. Your experiences as a health care professional are valuable and important to this study and will be audio-recorded and later transcribed. You will be asked to share your thoughts about what you consider to be important issues in the workplace. Moreover, you will be asked what aspects foster a healthy workplace environment for employees at your organization. It is also your right as a participant in the study to refuse a particular question or to withdraw from the study at any time. Your participation in this study is voluntary. It is your choice to be part of the study or not. If you decide to participate, you can decide to stop at any time, even after signing the consent form. If you decide to stop participating, there will be no consequences to you.

What are the risks?
The risks to you in this study are minimal. The interview will take up some of your time and that may cause you some inconvenience. Your decision to participate or not is voluntary and will be

kept strictly confidential. You may choose not to answer any questions that make you feel uncomfortable. You may withdraw from the study at any time. In the event that you experience any difficulties, you may wish to contact the Employee Assistance Program at Health Sciences North, Health Sciences Northand North Bay Regional Health Centreat 1-800-268-5211.

What are the benefits?
Participation in this study will provide valuable information on the type of worker stresses (e.g., psychosocial and physical) impacting nurses in northern and rural regions of Ontario and Canada. The results of this study will identify factors that may influence workers quality of work life and job satisfaction.

How will confidentiality be maintained?
The interviews will not have your name on them, nor the name of your workplace. The information you share will be summarized along with information obtained from other participants. If the results of the study are published or presented at a scientific meeting, you will not be identified. All individual information will be kept confidential and will not be made available to the public. The audio recordings will be kept in a locked cabinet behind a locked door at the school of Rural and Northern Health at Laurentian University. Only members of the research team will have access to the transcripts. All measures of privacy, confidentially and security will be respected. This includes keeping the information secured in a locked filing cabinet for a period of not more than five years.

What is the cost of participating in the survey?
Study participants will be paid $20 for participation in the interview.

Ethics
This study has been reviewed and approved by the Laurentian University Research Ethics Board, Health Sciences NorthEthics Committee and North Bay Regional Health CentreJoint Research and Ethics Committee. If you have concerns or questions about your rights as a participant or about the way the study is conducted, you may contact:

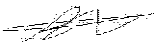
Jean Dragon, Ph.D.
Laurentian University Research Office

E-mail: jdragon@laurentian.ca
Telephone: 1-705-675-1151 ext. 3213 or 1-800-675-1151 ext. 3213

Will I be compensated for participating in the survey?
You will be compensated $20 for your time

Questions
For any questions about your role in this study, please contact Behdin Nowrouzi at (705) 285-4141 or bx_nowrouzi@laurentian.ca. You may also contact Dr. Nancy Lightfoot, Director, School of Rural and Northern Health, at (705) 675-1151 ext. 3972, 1-800-675-1151 ext. or nlightfoot@laurentian.ca 3972.

Sincerely,



Behdin Nowrouzi, PhD (Candidate), MPH, MSc. OT. OT. Reg. (Ont.)
School of Rural and Northern Health, Laurentian University

Informed Consent Form (Phase II: Interview)

Study Title:
Quality of Work Life: Investigation of Occupational Stressors Among Nurses in northeastern Ontario

Principal Investigator:
Behdin Nowrouzi, PhD (Candidate)
Co-investigators:
Nancy Lightfoot, Ph.D., Director, School of Rural and Northern Health, Laurentian University (Supervisor)
Diane Belanger-Gardner, Administrative Director, Health Sciences North
Lorraine Carter, PhD., *Nipissing University*
Michel Larivere, Ph.D., C.Psych. School of Human Kinetics, Laurentian University
Ellen Rukholm, Ph.D., School of Nursing, Laurentian University
Robert Schinke, Ed.D., School of Human Kinetics, Laurentian University

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I have read the information presented in the information letter about a study being conducted by Behdin Nowrouzi (PhD student, Laurentian University), Diane Belanger-Gardner (Hôpital Regional de Health Sciences North), Lorraine Carter (Laurentian University), Nancy Lightfoot (Laurentian University), Michel Larivere (Laurentian University), Ellen Rukholm (Laurentian University), and Robert Schinke (Laurentian University).

I understand that I am being asked to take part in a one hour interview that will be recorded to help identify the types of work stresses (e.g., physical, psychological etc.) impacting nurses in northeastern urban areas of Ontario.

I have had the opportunity to ask questions about my involvement in this study, and to receive any additional details I wanted to know about the study. I understand that I can refuse to answer any questions that I do not like and can withdraw from the study at any time. Taking part in the interview is my decision and no one is forcing me to be involved. I have been given a copy of this form.

I consent to the interview.

Date _____
Participant's Signature_____

For further information, please contact:
Behdin Nowrouzi
PhD Student, School of Rural and Northern Health
Laurentian University
E-mail: bx_nowrouzi@Laurentian.ca
Tel: (705) 285-4141

Appendix B: Nursing Stress Scale

Nursing Stress Scale

Summary: The Nursing Stress Scale (NSS) is the most widely used measure of stress for nurses [77]. The scale was designed to describe situations that have been identified as causing stress for nurses in the performance of their duties. Seven major sources of stress closely related to the conceptual categories of stress include: death and dying, conflict with physicians, inadequate preparation, lack of support, conflict with other nurses, work load, and uncertainty concerning treatment. The questions describe situations that have been identified as causing stress for nurses in the workplace and examine stress in psychological, physical and social work environments. It has been used in studies examining types of stress across pediatric, emergency, psychiatric, and operating room areas.

General Purpose: To measure the frequency and the major sources of stress experienced by nurses on hospital units.

of items: 34

Estimated time of completion: Less than 10 minutes

Scale: 4 pt. Likert scale (0-4) range, from Never (0) to Very Frequently (4)

Language: Available in English and French.

Scoring: Individual item responses are added together for groups of items and for all 34 items in order to obtain subscale scores and the total scores, respectively [51].

Reliability: *Internal consistency*

Internal consistency of the NSS was measured by the Spearman-Brown coefficient (.79), the Guttman split-half coefficient (.79), a coefficient alpha (.89) and a standardized item alpha (.89) [51]. The NSS is the first measurement tool concerned with the frequency of work stressors experienced by nurses. A reliability of .81 is considered satisfactory for this newly developed instrument (Burns & Grove, 1997).

Test-retest reliability

Test-retest reliability was .81 for 31 nurses working in five different units over a 2-week interval. Test-retest reliability exceeded .70 in four of seven subscales; the remainders were Inadequate Preparation (.42), Lack of Staff Support (.65) and Uncertainty Concerning Treatment (.68) [51].

Validity *Construct Validity*

The construct validity of the NSS is reinforced by factor analysis [221]. Items that had a factor loading greater than 0.30 were removed for analysis. Factor loadings for the items of the NSS varied from .34 to .86 and were evenly spread among seven factors. Each subscale provided multiple variances in the work stressors: Uncertainty Concerning Treatment (5.5%), Workload (5.6%), Conflict With Other Nurses (6.5%), Lack of Staff Support (7.2%), Inadequate Preparation (9.1%), Conflict With Physicians (11.8%) and Death and Dying Patients (39.3%).

Reference Gray-Toft, P. and J.G. Anderson, *The Nursing Stress Scale: Development of an instrument.* Journal of Psychopathology and Behavioral Assessment, 1981. **3**(1): p. 11-23.

Nursing Stress Scale

1. Breakdown of the computer.

1. Never
2. Occasionally
3. Frequently
4. Very Frequently

2. Criticism by a physician.

1. Never
2. Occasionally
3. Frequently
4. Very Frequently

3. Performing procedures that patients experience as painful.

1. Never
2. Occasionally
3. Frequently
4. Very Frequently

4. Feeling helpless in the case of a patient who fails to improve.

1. Never
2. Occasionally
3. Frequently
4. Very Frequently

5. Conflict with a supervisor.

1. Never
2. Occasionally
3. Frequently
4. Very Frequently

6. Listening or talking to a patient about his/her approaching death.

1. Never
2. Occasionally
3. Frequently
4. Very Frequently

7. Lack of opportunity to talk openly with other unit personnel about problems on the unit.

1. Never

2. Occasionally
3. Frequently
4. Very Frequently

8. The death of a patient.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

9. Conflict with a physician.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

10. Fear of making a mistake in treating a patient.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

11. Lack of an opportunity to share experiences and feelings with other personnel on the unit.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

12. The death of a patient with whom you developed a close relationship.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

13. Physician not being present when a patient dies.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

14. Disagreement concerning the treatment of a patient.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

15. **Feeling inadequately prepared to help with the emotional needs of a patient's family.**
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

16. Lack of an opportunity to express to other personnel on the unit my negative feelings towards patients.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

17. Inadequate information from a physician regarding the medical condition of a patient.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

18. Being asked a question by a patient for which I do not have a satisfactory answer.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

19. Making a decision concerning a patient when the physician is unavailable.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

20. Floating to other units that are short-staffed.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

21. Watching a patient suffer.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

22. Difficulty in working with a particular nurse (or nurses) outside the unit.
1. Never
2. Occasionally
3. Frequently

4. Very Frequently

23. Feeling inadequately prepared to help with the emotional needs of a patient.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

24. Criticism by a supervisor.
Never
Occasionally
Frequently
Very Frequently

25. Unpredictable staffing and scheduling.
Never
Occasionally
Frequently
Very Frequently

26. A physician ordering what appears to be inappropriate treatment for a patient.
Never
Occasionally
Frequently
Very Frequently

27. Too many non-nursing tasks required, such as clerical work.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

28. Not enough time to provide emotional support to a patient.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

29. Difficulty in working with a particular nurse (or nurse) on the unit.
Never
Occasionally
Frequently
Very Frequently

30. Not enough time to complete all of my nursing tasks.
Never
Occasionally

Frequently
Very Frequently

31. A physician not being present in a medical emergency.
Never
Occasionally
Frequently
Very Frequently

32. Not knowing what a patient or a patient's family ought to be told about the patient's medical condition and its treatment.
Never
Occasionally
Frequently
Very Frequently

33. Uncertainty regarding the operation and functioning of specialized equipment.
Never
Occasionally
Frequently
Very Frequently

34. Not enough staff to adequately cover the unit.
Never
Occasionally
Frequently
Very Frequently

Factor 1: Death and dying
3,4,6, 8, 12, 13, 21

Factor II: Conflict with physicians
2, 9, 10, 14, 19

Factor III: Inadequate preparation
15, 18, 23,

Factor IV: Lack of support
7, 11, 16

Factor V: Conflict with other nurses
5, 20, 22, 24, 29

Factor VI: Work load
1, 25, 27, 28, 30, 34,

Factor VII: Uncertainty concerning treatment
17, 26, 31, 32, 33

Nursing Stress Scale

Summary: The Nursing Stress Scale (NSS) is the most widely used measure of stress for nurses [77]. The scale was designed to describe situations that have been identified as causing stress for nurses in the performance of their duties. Seven major sources of stress closely related to the conceptual categories of stress include: death and dying, conflict with physicians, inadequate preparation, lack of support, conflict with other nurses, work load, and uncertainty concerning treatment. The questions describe situations that have been identified as causing stress for nurses in the workplace and examine stress in psychological, physical and social work environments. It has been used in studies examining types of stress across pediatric, emergency, psychiatric, and operating room areas.

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Nursing Stress Scale

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2. Criticism by a physician.

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2. Occasionally
3. Frequently
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3. Performing procedures that patients experience as painful.

1. Never
2. Occasionally
3. Frequently
4. Very Frequently

4. Feeling helpless in the case of a patient who fails to improve.

1. Never
2. Occasionally
3. Frequently
4. Very Frequently

5. Conflict with a supervisor.

1. Never
2. Occasionally
3. Frequently
4. Very Frequently

6. Listening or talking to a patient about his/her approaching death.

1. Never
2. Occasionally
3. Frequently
4. Very Frequently

7. Lack of opportunity to talk openly with other unit personnel about problems on the unit.

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2. Occasionally
3. Frequently
4. Very Frequently

8. The death of a patient.
1. Never
2. Occasionally
3. Frequently
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1. Never
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1. Never
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2. Occasionally
3. Frequently
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2. Occasionally
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4. Very Frequently

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16. Lack of an opportunity to express to other personnel on the unit my negative feelings towards patients.
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17. Inadequate information from a physician regarding the medical condition of a patient.
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3. Frequently
4. Very Frequently

18. Being asked a question by a patient for which I do not have a satisfactory answer.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

19. Making a decision concerning a patient when the physician is unavailable.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

20. Floating to other units that are short-staffed.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

21. Watching a patient suffer.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

22. Difficulty in working with a particular nurse (or nurses) outside the unit.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

23. Feeling inadequately prepared to help with the emotional needs of a patient.

1. Never
2. Occasionally
3. Frequently
4. Very Frequently

24. Criticism by a supervisor.
Never
Occasionally
Frequently
Very Frequently

25. Unpredictable staffing and scheduling.
Never
Occasionally
Frequently
Very Frequently

26. A physician ordering what appears to be inappropriate treatment for a patient.
Never
Occasionally
Frequently
Very Frequently

27. Too many non-nursing tasks required, such as clerical work.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

28. Not enough time to provide emotional support to a patient.
1. Never
2. Occasionally
3. Frequently
4. Very Frequently

29. Difficulty in working with a particular nurse (or nurse) on the unit.
Never
Occasionally
Frequently
Very Frequently

30. Not enough time to complete all of my nursing tasks.
Never
Occasionally
Frequently
Very Frequently

31. A physician not being present in a medical emergency.
Never
Occasionally
Frequently
Very Frequently

32. Not knowing what a patient or a patient's family ought to be told about the patient's medical condition and its treatment.
Never
Occasionally
Frequently
Very Frequently

33. Uncertainty regarding the operation and functioning of specialized equipment.
Never
Occasionally
Frequently
Very Frequently

34. Not enough staff to adequately cover the unit.
Never
Occasionally
Frequently
Very Frequently

Factor 1: Death and dying
3,4,6, 8, 12, 13, 21

Factor II: Conflict with physicians
2, 9, 10, 14, 19

Factor III: Inadequate preparation
15, 18, 23,

Factor IV: Lack of support
7, 11, 16

Factor V: Conflict with other nurses
5, 20, 22, 24, 29

Factor VI: Work load
1, 25, 27, 28, 30, 34,

Factor VII: Uncertainty concerning treatment
17, 26, 31, 32, 33

Appendix C: Work Ability Index (Questionnaire)

Work Ability Index

Summary: The WAI Questionnaire was developed by the researchers of the Finnish Institute of Occupational Health [202] as an instrument for use in occupational health care. The primary objective of this self-report questionnaire is to assess an individual's work ability.
In the last decade, the WAI Questionnaire has been widely applied in studies of occupational Health [86]. As a measure of work ability for nurses, WAI is a very predictive instrument. It predicts strongly the level of several indicators of mental and physical well-being [222].

General Purpose: Items of the Work Ability Index:

Items	Range of scores
Current work ability compared with their life time best	0-10
Work ability in relation to the demands of the job	2-10
Number of current diseases diagnosed by a physician	1-7
Estimated work impairment due to diseases	1-6
Sick leave during the past year	1-5
Worker's prognosis of work ability 2 years from now	1-7
Mental resources	1-4

# of items: 57

Estimated time of completion: 10-15 minutes

Scale: Points scale (1-5) but varies for each factor.

Language: US English.

Scoring: The WAI Score ranges from 7 to 49 points. Higher scores indicate better work ability. Work ability is considered to be poor in the range 7–27, moderate in the range of 28–36, good in the range of 37–43 and excellent if the score ranges from 44 to 49.

Reliability: *Internal reliability*

Ten European country analysis showed that the Cronbach's alpha for total sample amounted to 0.72, while coefficients for national samples were ranging from 0.54 for Slovakia to 0.79 for Finland [222].
Test-retest reliability

Test-retest reliability was .81 for 97 elderly construction workers over a 4-week interval. Exactly the same WAI score was reported by 25% of the participants and 95% of the individual differences between measurements were found to be <6.86 points

Validity *Construct validity*

Analyses of correlations showed predictive power of WAI as strong and consistent with expected directions.

Reference Tuomi, K., Ilmarinen, J., Jahkola, A., Katajarinne, L. & Tulkki, A., *WorkAbility Index.* 1998, Finnish Institute of Occupational Health: Helsinki, Finland.

WorkAbility Index

Work Abilty Index

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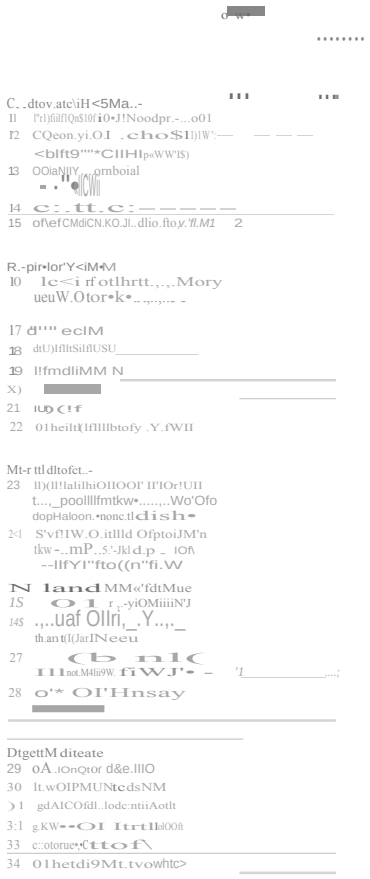
3. Numt>.r of current dittllllll diagnosltd by ft physician



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Yes ☐
No ☐

Source: Tuomi et al. 2006

Appendix D: Work-Related Quality of Life Scale (Questionnaire)

Work Related Quality of Life Scale (WRQLS)

Summary: The WRQLS scale encapsulates both employment and non-employment facets of life as well as more current issues such as occupational stress. Furthermore, the measure provides greater relevance to healthcare workplaces than any previous measure of WRQLS [197]. A psychometric analysis of the QWL found six factors underpin peoples quality of work life including: job and career satisfaction, general well-being, stress at work, control at work, home-work interface and working conditions.

General Purpose: A questionnaire design was used to gather cross-sectional data on healthcare workers' QWL.

# of items: 24

Estimated time of completion: 5 minutes

Scale: 5 pt. Likert scale range (0-5), from Strongly Agree (0) to Strongly Disagree (5)

Language: Chinese (Mainland), Farsi, Turkish, UK English, US English, Welsh

Scoring: Individual item responses are added together to obtain a total score [197].

Reliability: Overall scale reliability for the item pool was found to be very good, with a Cronbach's alpha of 0.96 [197].

Validity: *Content Validity*

As well, the construct validity of the QWL scale was supported by factor analysis [197].

Construct Validity

Overall scale reliability for the item pool was found to be very good, with a Cronbach's alpha of 0.96. This indicates that the items all measure middle-range theoretical concepts in a consistent manner [197].

Reference: Van Laar, D., Edwards, J. A. & Easton, S. The Work-Related Quality of Life scale for healthcare workers. *Journal of Advanced Nursing* **60**, 325-333 (2007).

Work-Related Quality of Life Scale

Please indicate your answers by filling in the circles like this • if you make a mistake do this: —

To what extent do you agree with the following? *Please fill in the appropriate circle.*		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I have a clear set of goals and aims to enable me to do my job	O	O	O	O	O
2.	I feel able to voice opinions and influence changes in my area of work	O	O	O	O	O
3.	I have the opportunity to use my abilities at work	O	O	O	O	O
4.	I feel well at the moment	O	O	O	O	O
5.	My employer provides adequate facilities and flexibility for me to fit work in around my family life	O	O	O	O	O
6.	My current working hours / patterns suit my personal circumstances	O	O	O	O	O
7.	I often feel under pressure at work	O	O	O	O	O
8.	When I have done a good job it is acknowledged by my line manager	O	O	O	O	O
9.	Recently, I have been feeling unhappy and depressed	O	O	O	O	O
10.	I am satisfied with my life	O	O	O	O	O
11.	I am encouraged to develop new skills	O	O	O	O	O
12.	I am involved in decisions that affect me in my own area of work	O	O	O	O	O
13.	My employer provides me with what I need to do my job effectively	O	O	O	O	O
14.	My line manager actively promotes flexible working hours / patterns	O	O	O	O	O
15.	In most ways my life is close to ideal	O	O	O	O	O
16.	I work in a safe environment	O	O	O	O	O
17.	Generally things work out well for me	O	O	O	O	O
18.	I am satisfied with the career opportunities available for me here	O	O	O	O	O
19.	I often feel excessive levels of stress at work	O	O	O	O	O
20.	I am satisfied with the training I receive in order to perform my present job	O	O	O	O	O
21.	Recently, I have been feeling reasonably happy all things considered	O	O	O	O	O
22.	The working conditions are satisfactory	O	O	O	O	O
23.	I am involved in decisions that affect members of the public in my own area of work	O	O	O	O	O
24.	I am satisfied with the overall quality of my working life	O	O	O	O	O

Factor 1: Job and career satisfaction
1, 2, 3, 4, 5, 6

Factor II: General Well-Being
18, 19, 20, 21, 22, 23

Factor III: Stress at Work
7, 8

Factor IV: Control at Work
12, 13, 14

Factor V: Home-Work Interface
15, 16, 17

Factor VI: Working Conditions
9, 10, 11

Appendix E: Demographic Questionnaire

For each item indicate with a check (√) your answers to the following demographic questions.

Gender**:** ☐ **Male** ☐ **Female**

Year of birth**:** _____

In what country were you born**?** _____

If Canada, in which province? _____

What is your ethnicity**:**

☐ **English-Canadian**

☐ **Francophone**

☐ **Aboriginal**

Other (please specify) _____

Marital status**:** ☐ **Single (**Skip to question 7**)** ☐ **Divorced**

☐ **Married/Common-Law** ☐ **Widowed**

☐ **Separated**

Was your spouse/significant other born and/or raised in northeastern Ontario?

☐ **Yes** ☐ **No** ☐ **Not applicable**

Were you born and/or raised in northeastern Ontario?

☐ **Yes** ☐ **No**

How long have you been living in northeastern Ontario?

_____ **years**

Which of the following best describes your gross annual income

☐ **Less than $20,000**

☐ **$20,000-$29,999**

☐ **$30,000-$39,999**

☐ **$40,000-$49,999**

☐ **$50,000-$59,999**

☐ **$60,000-$69,999**

☐ **$70,000-$79,999**

☐ **$80,000 or more**

Please indicate the highest nursing education you have obtained.

☐ **RN Diploma**

☐ **RN University Degree**

☐ **Nurse Practitioner Certificate**

☐ **Masters**

☐ **Doctorate**

☐ **Post-Doctorate**

Other, *please specify:* _____

What is your current employment status? *Please check one*.

☐ **Full-time, permanent**

☐ **Full-time, contract**

☐ **Part-time, permanent**

☐ **Part-time, contract**

☐ **Self-employed**

☐ **Casual**

Other, *please specify***:**

_____

Was your nursing education obtained in northeastern Ontario?

☐ **Yes,** *please specify the community* _____

☐ **No**

Please indicate your nursing experience in years

_____ **total years** _____ **years in northeastern Ontario**

Please indicate your nursing experience in years in the area of *obstetrics*

_____ **total years** _____ **years in northeastern Ontario**

How many years have you been working in your current position?

_____ **total years** _____ **years in northeastern Ontario**

Please indicate the average number of hours you work per week in nursing.

_____ **hours per week**

Please indicate the average *overtime* hours you work per week in nursing.

_____ **hours per week**

If you worked any overtime in the past year, please indicate how you were compensated. *Please check all that apply.*

☐ **Banked hours**

☐ **Overtime payment**

☐ **No compensation**

Other, *please specify*

_____

Please indicate the type of shifts you work and the number of clients/patients you care for on those shifts. *Please check all that apply.*

Shifts worked:	**Average number of clients/patients per shift:**
☐ **Days**	_____
☐ **Evenings**	_____
☐ **Nights**	_____
Other, *please specify* _____	_____

Appendix F: Interview Guide

Cross-training specific questions

1. Tell me what it's like to be a cross-trained nurse?
2. Tell me about your preferred area work?
3. Are you happy that your colleagues are cross-trained? Tell me about your experiences with cross-training?
4. Describe your previous experience with cross-training in nursing?
5. Describe a typical shift for me?
6. What are some of the types of stress in your work setting?
7. Tell me about your stress about your job in the cross-sectional ?
8. Tell me about your quality of work life?
9. Tell me how cross-section training has impacted your stress level?

Appendix G: Recruitment Ad for Qualitative Phases

Quality of Work Life: Investigation of Occupational Stressors Among Obstetrics Nurses in northeastern Ontario

Title of Study: **Quality of Work Life: Investigation of Occupational Stressors Among Nurses in northeastern Ontario**

Researchers:

- Behdin Nowrouzi, PhD Candidate
  Laurentian University
- Diane Belanger-Gardner, Administrative Director, Health Sciences North
- Joanne Laplante, Program Manager-Maternal Child Care Centre, North Bay Regional Health Centre
- Nancy Lightfoot, Ph.D., Director, School of Rural and Northern Health, Laurentian University
- Lorraine Carter, PhD., School of Nursing, Laurentian University
- Robert Schinke, EdD School of Human Kinetics, Laurentian University
- Michel Larivere, Ph.D., C. Psych. School of Human Kinetics, Laurentian University

You are invited to participate in an interview for a research project. This study will help us understand the quality of work life and types of stress in the workplace among registered nurses at Health Sciences North and North Bay Regional Health Centre. We really value your time and input. Participation is completely voluntary.

The interview will last for about 1 hour and should you agree to participate in this research, you will be asked questions about:

- Yourself and your work experience
- Issues related to stress in the workplace
- How stress impacts the quality of your work life

To take part in the study contact Behdin Nowrouzi by email: bx_nowrouzi@laurentian.ca

For any questions about your role in this study, please contact Behdin Nowrouzi by email: bx_nowrouzi@laurentian.ca (**preferred**) or at (705) 285-4141. You may also contact Dr. Nancy Lightfoot, Director, School of Rural and Northern Health, at (705) 675-1151 ext. 3972, 1-800-675-1151 ext. or

Appendix H: Transcription Conventions

Transcription Conventions

	Symbols	Meanings
1	Participants	
	P	Participant
	I	Interviewer
2	Phrases	
	/	Used to indicate phrase boundaries
	.	A one second pause between utterances
	//	Indicates the beginning of an overlap in speaking turns
3	Intonation CAPITAL LETTERS	MARKS AN INCREASE IN THE VOICE TONE RELATIVE TO PREVIOUS TALK
4	Gestures/clarifying information *[italics]*	Gestures used by the participants and explanatory information are included in italics in square brackets
5	#	Used to indicate words or utterances not able to be distinguished from audio-tape

Adapted from Bailey, P. H., & Tilley, S. (2002). Storytelling and the interpretation of meaning in qualitative research. Journal of Advanced Nursing, 38(6), 574-583.