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POSTDOCTORAL STUDIES**

Karen Graham

AUTEUR DE LA THÈSE / AUTHOR OF THESIS

M.Sc. (Nursing)

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FACULTÉ, ÉCOLE, DÉPARTEMENT / FACULTY, SCHOOL, DEPARTMENT

**Examining the Relationships Between Canadian Public Health Nurses' Job Satisfaction and their
Autonomy, Control-Over-Practice, and Workload**

TITRE DE LA THÈSE / TITLE OF THESIS

Barbara Davis

DIRECTEUR (DIRECTRICE) DE LA THÈSE / THESIS SUPERVISOR

CO-DIRECTEUR (CO-DIRECTRICE) DE LA THÈSE / THESIS CO-SUPERVISOR

Kristen Woodend

Dianne Groll

Gary W. Slater

Le Doyen de la Faculté des études supérieures et postdoctorales / Dean of the Faculty of Graduate and Postdoctoral Studies

**EXAMINING THE RELATIONSHIPS BETWEEN CANADIAN PUBLIC HEALTH
NURSES' JOB SATISFACTION
AND THEIR
AUTONOMY, CONTROL-OVER-PRACTICE, AND WORKLOAD**

Karen Graham

Thesis submitted to the
Faculty of Graduate and Postdoctoral Studies
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Faculty of Health Sciences
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Abstract

Objective: To examine relationships between three modifiable work factors (autonomy, control-over-practice, workload) and Canadian public health nurses' job satisfaction.

Design: Secondary analysis of a cross-sectional survey.

Setting: All Canadian provinces and territories.

Participants: Canadian registered nurses working in public health (n = 271).

Methods: Analysis of select data from the *2005 National Survey of the Work and Health of Nurses (NSWHN)*. Bivariate analyses were used to examine demographic data, multivariate logistic regression analyses to examine relationships between the selected variables, and Chi-square tests to determine regional variations in job satisfaction across Canada. The relevance of findings was discussed with practicing public health nurses (PHNs), policy makers, and researchers at an end-of-study Knowledge Translation (KT) 'Think-Tank'.

Results: The interaction between autonomy and workload was a significant predictor of PHNs' job satisfaction, (OR: 0.97, 95% CI: 0.96, 0.99, $p < 0.01$) as was the interaction between age and workload (OR: 1.01, 95% CI: 1.00, 1.01, $p < 0.01$). No statistically significant differences were found in PHNs' job satisfaction between regions. Think-Tank participants were interested in learning about results, selected priority areas for application to public health practice and management, and identified future directions for research.

Conclusions: With the significant workload findings and generational differences, development of workload measurement tools and public health human resource strategies tailored to a multi-generational workforce are recommended. National enumeration strategies to identify the number of practicing PHNs are also recommended to inform public health practice and policy as are future KT activities to facilitate research dissemination.

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Table of Contents

Abstract.....	ii
Acknowledgements.....	iii
Table of Contents.....	iv
List of Tables.....	vi
List of Figures.....	vii
 CHAPTER ONE	
Introduction.....	8
Public Health Nursing in Canada.....	12
Statement of the Problem.....	16
Purpose and Research Questions.....	18
 CHAPTER TWO	
Conceptual Framework and Literature Review.....	19
Conceptual Framework: Job Satisfaction.....	19
Literature Review of Selected Job Satisfaction Factors.....	22
Job Satisfaction.....	23
Autonomy.....	30
Control-Over-Practice.....	39
Workload.....	44
 CHAPTER THREE	
Methods.....	53
Primary Study.....	53
Research Design and Study Setting.....	53
Sampling Procedure.....	54
Data Collection Measures.....	55
Data Analyses.....	56
Secondary Analysis	
Research Design and Study Setting.....	57
Study Variables.....	58
Sampling Procedure.....	64
Data Analyses.....	66
Knowledge Translation.....	73
Ethical Considerations.....	75
Summary.....	77
 CHAPTER FOUR	
Results.....	78
Research Questions.....	78
Demographic Characteristics of Sample.....	78
Distribution of Autonomy, Control-Over-Practice and Workload Scores.....	82
Individual Factor Descriptives.....	83

Research Question #1.....	85
Research Question #2.....	89
Research Question #3.....	93
Knowledge Translation Think-Tank.....	93

CHAPTER FIVE

Discussion and Implications.....	95
Public Health Nurses' Profile.....	95
Public health and new nurses.....	97
Public health nursing leadership.....	99
Conceptual Framework.....	101
PHN Practice Characteristics.....	104
Job Satisfaction.....	104
Autonomy.....	105
Control-Over-Practice.....	108
Workload.....	109
Research Questions	
Relationship of Variables with Job Satisfaction.....	110
Interaction of Age with Workload and Job Satisfaction.....	112
Regional Variation in National PHN Job Satisfaction.....	115
Role Delineation.....	116
Study Limitations.....	119
Study Strengths.....	121
Recommendation Generation Process.....	123
Recommendations.....	125
Reference List.....	127

APPENDICES

Appendix A: Original Conceptual Model.....	149
Appendix B: Search Terms Utilized.....	150
Appendix C: Study Definitions and Variable Description.....	151
Appendix D: Selected NSWHN Questions.....	153
Appendix E: Study Analytic Framework.....	155
Appendix F: KT Think-Tank Participants.....	158
Appendix G: University of Ottawa Research Ethics Board Approval.....	160
Appendix H: Letter of Invitation to Knowledge Exchange Participants.....	163
Appendix I: KT Think-Tank Participants Photograph.....	165
Appendix J: KT Think-Tank Evaluation.....	166

List of Tables

Table 1: Select Demographic and Work Characteristics of Sample.....	79
Table 2: Distribution of Study Sample by Geographic Region.....	81
Table 3: Work Environment Variables' Total Score Descriptives.....	82
Table 4: Sample Response to Study Variable Factors.....	84
Table 5_a: Logistic Regression Analysis of Job Satisfaction: Interaction Model.....	85
Table 5_b: Logistic Regression Analysis of Job satisfaction: Main Effects Model.....	88
Table 6: Logistic Regression Analysis of Job Satisfaction by work environment variables plus age.....	89
Table 7: Logistic Regression Analysis of Job Satisfaction by work environment variables plus years working.....	92
Table 8: Comparing PHN job satisfaction between Canadian Regions.....	93
Table 9: Study Highlights in Brief.....	123
Table 10: KT Think-Tank Study Highlights Selection.....	124

List of Figures

Figure 1: Study Conceptual Framework.....	21
Figure 2: Study Sample Selection.....	65
Figure 3: Interaction of Autonomy and Workload on Satisfaction.....	87
Figure 4: Interaction of Age and Workload on Satisfaction (A).....	90
Figure 5: Interaction of Age and Workload on Satisfaction (B).....	91
Figure 6: Revised Conceptual Framework.....	102

CHAPTER ONE

Introduction

This thesis research examines the relationship between job satisfaction and three selected work environment variables pertinent to Canadian public health nurses (PHNs). It includes five chapters which will outline the work of PHNs, synthesize the available literature, describe the study conceptual framework, outline the methods used, provide analyses results, and discuss findings as they relate to the literature and current PHNs' practice. In the final chapter, recommendations are presented which resulted from discussion about findings at a Knowledge Translation Think-Tank with frontline PHNs and decision-makers.

In this first chapter, the concept of PHNs' job satisfaction and its relevance to the Canadian healthcare system are introduced. Three selected modifiable workplace variables are presented (autonomy, control-over-practice, and workload) and the study purpose provided.

Little is currently understood about the work environment of Canadian public health nurses (PHNs) and how it impacts their job satisfaction (Armstrong-Stassen & Cameron, 2005; Best & Thurston, 2006; Underwood, et al., 2010). Nurses' job dissatisfaction has been linked to absenteeism, retention issues, increased healthcare costs, and ultimately diminished client outcomes (Duffield, Roche, O'Brien-Pallas, & Catling-Paull, 2009; Tullai-McGuinness, 2008). The PHN's client may be an individual, a family, or an entire population (Hogan, 2008; Meagher-Stewart, Edwards, Smith, Young, & Woodford, 2004). Although recent studies have improved understanding of PHNs' roles, researchers recommend further examination of this healthcare sector to ensure Canadians continue to receive high quality public health services and programs in the most efficient manner possible (Meagher-Stewart, Underwood, et al., 2009).

Evidence suggests Canada is nearing a critical shortage of nurses (Murphy, et al., 2009). We are not recruiting nor retaining the number of nurses required for the future healthcare needs of Canadians (Canadian Institute for Health Information [CIHI], 2005; 2007a). Unhealthy working environments have been identified as a key culprit vis-à-vis this

nursing human resource issue (Quality Worklife Quality Healthcare Collaborative, 2010). The Canadian Nurses' Association (CNA) has predicted 60% of nurses will be working in the community by 2020 (Villeneuve & MacDonald, 2006). Without appropriate interventions, these projected increased demands for nurses in the community sector will have to be addressed in the context of an estimated shortage of 60,000 registered nurses by 2022 (Murphy, et al., 2009). This constitutes over 25% of the current Canadian nursing workforce (CIHI, 2007b). Research has identified that effective Canadian health human resource planning requires service delivery strategies that ensure the community health workforce is used to its full potential (Underwood, Baumann, Akhtar-Danesh, et al., 2009).

Further compounding recruitment issues, all provinces covered by the CNA now require registered nurses to hold a university degree as a basis for entry-to-practice in Canada (CNA, n.d.). The Northwest Territories and Nunavut will complete this transition in 2010 (CNA). Public health must now compete with all other nursing sectors to recruit baccalaureate-prepared registered nurses. While workload issues in other healthcare areas may be addressed with different categories of providers, including licensed practical nurses and healthcare aids, it is predominantly registered nurses who provide public health programs and services (Bauman, Underwood, et al., 2006; Hogan, 2008). Additionally, research has revealed the lack of appeal the public health sector has to many new nursing graduates who have learned little of this domain in their university undergraduate programs (Ryan, 2007). Although there is considerable research examining the determinants of job satisfaction for nurses working in acute care areas (Hayes, et al., 2006; Lavoie-Tremblay et al., 2008; Spence Laschinger, 2008), a paucity of research exists in Canadian public health

and other community-based healthcare sectors (Armstrong-Stassen & Cameron, 2005; Underwood, Bauman, Ciliska, et al., 2010).

Job satisfaction is a multidimensional concept that includes both personality traits and environmental factors (Roelan, Koopmans, & Groothoff, 2008). Researchers suggest approximately 45% of job satisfaction variability can be accounted for by personality which is an individual factor difficult to modify (Roelan, Koopmans, & Groothoff). The remaining 65% can be attributed to organizational environment variables that may be modifiable, providing managers and decision-makers with specific measurable areas where employee satisfaction strategies can be focused (Roelan, Koopmans, & Groothoff). Nurses who are satisfied in their jobs are better able to work to the full scope of their competencies (Meagher-Stewart, Underwood, et al., 2009).

Nursing competencies include the skills and knowledge acquired through education and experience and may expand beyond nurses' scope of practice (Underwood, 2007). The College of Nurses of Ontario (CNO) defines the scope of practice as those "activities registered nurses are educated and authorized to perform under jurisdictional legislation" (CNO, n.d., p.25). Additional insight into nurses' competencies may result in an increased scope of practice which could improve the efficiency and effectiveness of health services offered by PHNs. This cannot be accomplished without a thorough understanding of the determinants of these nurses' job satisfaction and their work environment which they have identified as the number one enabler to working to the full scope of their practice and competencies (Underwood, Baumann, Akhtar-Danesh, et al., 2009).

Job satisfaction and its relationship to the work environment have been examined for decades (Kanter, 1977). It has been studied internationally in both the public and private

sectors as a predictor of intention to leave (Al-Enezi, Chowdhury, Shah, & Al-Otabi, 2009; deMoura, Abrams, Retter, Gunnarsdottir, & Ando, 2009; Yildiz, Ayhan, & Erdogmus, 2009). Canadian nurse researchers have reported healthy work environments as being positively correlated with improved client outcomes (Leiter & Spence-Laschinger, 2006; Purdy, 2008; Tourangeau, Coghlan, Shamian, & Evans, 2005). Job satisfaction has also been studied in relation to work environments in multi-generational nurse studies within the acute care sector (Storey, Cheater, Ford, & Leese, 2009; Wilson, Squires, Widger, Cranley, & Tourangeau, 2008). Different age groups have identified varied workplace needs and priorities, compounding organizational challenges to accurately identify the determinants of job satisfaction of a multi-generational workforce (Davis, 2009).

Three modifiable work environment factors have been frequently identified in the literature as correlated with nurses' job satisfaction; autonomy (Hayes, et al., 2006; Meagher-Stewart, Underwood, et al., 2009; Spence-Laschinger, 2008), control-over-practice (Murphy, et al., 2009; Underwood, Bauman, Akhtar-Danesh, et al., 2009); and workload (CNA, 2010; Glynn, Maclean, Forte, & Cohen, 2009; Storey, et al., 2009). Several researchers have noted the applicability of these factors to PHNs' practice (Best & Thurston, 2006; Campbell, Fowles, & Weber, 2004; Haynie, Hartman, & Lundberg, 2007). Although there is a growing body of literature about the role PHNs play in Canadian healthcare, compilation of more evidence has been recommended to better understand this nursing sector (CHNC, 2009; Meagher-Stewart, Underwood, et al., 2009). Gathering evidence to identify challenges experienced by nurses practicing in this area is a critical first step in developing strategies to ensure the delivery and sustainability of quality Canadian public health services and programs (Meagher-Stewart, Underwood, et al., 2009).

Public Health Nursing in Canada

Established in 2004 and receiving Royal Assent in 2006, the Public Health Agency of Canada (PHAC) is the principal national body overseeing public health throughout the country (PHAC, 2008). Although shared nationally, provincially, and regionally, determination of the need for and delivery of specific public health programs is the responsibility of each province and municipality (Crea & Underwood, 2008). Utilizing a multi-disciplinary model of care, public health programs and services are delivered by a diverse group of professionals including inspectors, physicians, and epidemiologists. However, nurses represent the largest professional group within the Canadian public health enterprise and are integral to its functioning (CIHI, 2007_a; Marchildon, 2005; National Advisory Committee [NAC], 2003; PHAC). Discrepancies exist as to their exact numbers. Some have estimated that there are more than 30,000 PHNs in Canada, representing approximately 13% of the national registered nursing workforce (Best & Thurston, 2006) while others report the community health nursing cohort, in its entirety, constitutes 18% of nurses (Underwood, Deber, et al., 2009). Accurate estimates of the number of Canadian PHNs are difficult to determine due to differing provincial nomenclature, and varied roles and responsibilities across the country (Underwood, Mowat, et al., 2009).

The term 'community health nurse' (CHN) is a broad umbrella description used to define nurses working within the community, including PHNs and home health nurses (Community Health Nurses Association of Canada [CHNAC], 2008). Home health nurses provide medically oriented services, enabling individuals to stay in their own homes rather than requiring hospitalization or long-term healthcare services (Canadian Healthcare Association, 2009). Researchers have identified that CHNs are not a homogenous group,

especially in regard to their work-related concerns and job satisfaction (Armstrong-Stassen & Cameron, 2005). Some Canadian nursing history literature provides clear delineation between the roles of CHNs and PHNs, suggesting that early 20th century PHNs were one of the most respected and recognized groups in the nursing profession (Buhler-Wilkerson, 1984; McPherson, 1996; Ulrich, 2002; Young, 2004). Several studies within the last three decades have used the terms interchangeably causing a blurring in role differentiation (Buhler-Wilkerson; Underwood, et al., 2010). Nurse researchers have highlighted the necessity for future studies to delineate the roles and responsibilities of PHNs from other CHNs with respect to their unique role in Canadian healthcare, illustrating a shift from current trends that group all community nurses together (Armstrong-Stassen & Cameron).

The multi-faceted organizational systems within which Canadian PHNs practice may differ widely, both between and within provinces, creating considerable national variability (Meagher-Stewart, Underwood, et al. 2009). In most Canadian jurisdictions, public health responsibilities are delegated to regional health authorities or their equivalent. Governance and funding are integrated within the rest of the system, with the exception of Ontario (Mowat & Butler-Jones, 2007). In Ontario, each health unit is governed by a board of health which is an autonomous corporation under the Health Protection and Promotion Act, and is administered by an area medical officer of health (Ministry of Health and Long Term Care [MOHLTC], 2002). Ontario PHNs are required to comply with recently revised provincial public health standards as well as national public health core competencies, similar to other provinces and territories (CNO, 2008; MOHLTC, 2009; PHAC, 2007).

Public Health Core Competencies are a national initiative introduced by PHAC to outline and define the specialized nature of this sector of healthcare, transcending

professional boundaries (PHAC, 2007). Discipline-specific competencies are currently being developed to further define the unique role of the public health workforce (Community Health Nurses of Canada [CHNC], 2009). Public health nursing-specific competencies encompass the Public Health Core Competencies and the Canadian Community Health Nursing [CCHN] Standards of Practice (CHNC, 2008; CHNC, 2009). These standards and competencies are considered by many to frame public health nursing practice throughout Canada (CHNC, 2009; Underwood, Mowat, et al., 2009).

The overarching focus of Canadian PHNs' practice is the community as a whole; the purpose of individual intervention is for the overall health of the population (Stamler & Yiu, 2008). The simultaneity of their work necessitates expertise to constantly shift from individual- and family-level health concerns to the larger effects on the community or population (Hogan, 2008). Simultaneity of nursing practice refers to the capacity to effectively address multiple issues at one time (Kosta-Polston, 2008). This requires an in-depth understanding of the factors associated with health at each level (individual, family, community and population) as well as familiarity with the appropriate tools and theoretical frameworks required to address various multi-level healthcare issues (Hogan). Social determinants of health (SDOH) such as income inequality and job insecurity have a direct impact on the well-being of individuals and populations, and are considered the best predictors of health (Raphael, 2003; World Health Organization, 2008). Effective PHN practice necessitates an understanding of how the SDOH affect the health of individuals, families, communities, and the population at large. This requires knowledge that expands beyond traditional healthcare sector boundaries, including intersectoral and multiple systems-level awareness.

In their day-to-day work, PHNs observe the socio-political conditions which contribute to Canadian population health inequities and are in the unique position to provide valuable insider insight to inform policy development (Falk-Rafael, 2005). It is their moral/ethical and professional obligation to become involved in addressing the social conditions affecting the health of Canadians (Falk-Rafael). Bringing about social change is an integral component of PHNs' work (Cohen & Reutter, 2007). Additionally, this cohort of Canadian healthcare providers has the capacity to play a key role in building healthy public policy which requires an intimate understanding of resource availability, policy formulation processes, negotiation skills, and advocacy savvy (Hogan, 2008).

Healthcare reform that necessitates clients be moved quickly from acute care settings into the community, an aging population, higher prevalence of chronic disease, threats from infections, and public health emergencies are examples of increasing stresses and demands on the Canadian public health sector (Butler-Jones, 2007). Mounting scrutiny of the Canadian public health system as evidenced by high profile events in the last few years including the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003, the 2008 *Listeria monocytogenes* contamination at Maple Leaf Foods, and the 2009-10 H1N1 pandemic influenza outbreak have increased awareness of the role of public health, yet little is understood about the nurses working within this area of Canadian healthcare.

Statement of the Problem

A number of factors have been reported in the literature to impact nurses' work environment affecting their job satisfaction which, in the context of this study, raises questions about the professional practice environments of nurses who work within the Canadian public health sector: How do these nurses regard their work? Do Canadian PHNs have the required level of autonomy to make informed decisions based on their experience and knowledge? Do they feel they have control over their practice? Are PHNs provided the support and opportunities they require to meet their practice expectations and provide high-quality programs and services? Do they consider their workloads manageable? Can non-modifiable factors such as age and years working be addressed? Does the region in Canada where PHNs practice impact their job satisfaction?

The conceptual framework for this study was derived from the work of Kerr, Spence-Laschinger, Severin, Almost, and Shamian (2005). The original framework, a Model of Nurses' Health (Appendix A) was initially developed to explore the relationships between various workplace factors and the health of Canadian nurses (Kerr et al.). This model incorporated current research literature, consultation with content experts and the extensive experience of the research team (Kerr, et al.). Although this model has not been studied in the context of the work environment of PHNs specifically, several of the individual factors have been examined in relation to this sector of Canadian health human resources (Armstrong-Stassen & Cameron, 2005; Best & Thurston, 2006; Campbell, Fowles, & Weber, 2004; Henderson-Betkus & MacLeod, 2004; Underwood, et al., 2010).

For the current study, a conceptual framework was created to provide direction for critical appraisal of the literature related to the selected modifiable work environment variables and their effect on Canadian PHNs' job satisfaction. It depicts job satisfaction as

an outcome of autonomy, control-over-practice and workload. The study conceptual framework's evolution will be diagrammed and described in greater detail in chapter two.

The relationship between job satisfaction and the work environment has been studied extensively in different areas of employment and multiple business sectors (Society for Human Resource Management, 2009; Kanter, 1977). Job satisfaction has been examined in relation to sex, education, and income (Bender & Heywood, 2004) and characteristics of high-performance workplaces have been identified (Bauer, 2004). The nursing profession has also recognized the importance of a healthy work environment and its impact on job satisfaction (Armstrong & Laschinger, 2006; Health Canada, 2007; Lacey, Teasley, & Cox, 2009; MOHLTC, 2008). Several researchers have identified the particular importance of job satisfaction in a service industry such as public health (Haynie, Hartman, & Lundberg, 2007). The concepts and relationships have been studied and numerous strategies and interventions have been introduced (Bookey-Bassett, et al., 2008; Murphy, Birch, Alder, et al., 2009). Given the substantive evidence demonstrating the links between healthy workplaces and effective healthcare, it is important to continue to strive to achieve healthy workplaces for Canadian healthcare providers (Quality Worklife Quality Health Care [QWQH], 2010). This study will examine the work environment of Canadian PHNs.

Purpose and Research Questions

Examining the relationships between Canadian PHNs' job satisfaction and three selected modifiable work environment factors (autonomy, control-over-practice, and workload) may identify areas where managers and decision-makers can develop strategies for improvement based on evidence. The research questions for this study are:

- 1) What is the relationship between Canadian public health nurses' job satisfaction and their autonomy, control-over-practice, and workload?
- 2) How do sociodemographic factors such as nurses' age and years working in public health influence the association between the included workplace variables and nurses' job satisfaction?
- 3) Is there a difference in public health nurses' job satisfaction between different Canadian regions; Western, Northern, Central and Atlantic?

In summary, the work environment has been correlated with job satisfaction, it has been identified as the primary enabler of nurses working to the full scope of their practice and competencies (Ulrich, 2002; Underwood, Baumann, Akhtar-Danesh, et al., 2009), and is considered a predictor of nurses' intent to remain within the profession (Hayes, et al., 2006; Zeytinoglu, et al., 2007). Adding to the growing knowledge about PHNs' work environments could enhance the efficiency of healthcare dollars by providing evidence to support strategies that increase job satisfaction, potentially resulting in enhanced retention and, ultimately, improved prevention of illness and Canadian population health promotion.

CHAPTER TWO

Conceptual Framework and Literature Review

This chapter includes description of the conceptual framework of PHNs' job satisfaction and a literature review of the three selected modifiable workplace variables under study. Empirical factors which contribute to nurses' job satisfaction are presented and discussed.

This critical literature review is organized into five sections; conceptual framework, job satisfaction, autonomy, control-over-practice, and workload. Each section begins with a description of the factor involved and then review of the available literature as related to PHNs where possible. Other relevant studies related to each factor are included to provide further insight into the current state of knowledge where there is potential transfer into the domain of Canadian public health nursing.

Conceptual Framework: Public Health Nurses' Job Satisfaction

Selected variables from the Nurses' Health Model developed by Kerr, et al. (2005) (Appendix A) provided the framework for this study. The model was originally developed based on a descriptive qualitative inquiry, identifying work and health themes (Kerr, et al.). The original model depicts the workplace, job-level, and individual characteristics that affect nurses' health and job satisfaction (Kerr, et al.). In its development, interviews with 62 key nursing stakeholders from across Canada were transcribed, identifying 23 pertinent factors (Kerr, et al.). Descriptive content analysis permitted identification of common themes across interviews and development of a comprehensive list of potential indicators of nurses' health (Kerr, et al., 2005). Developed from their own research as well as a review of current literature, the framework guided discussion with stakeholders about the feasibility and utility of gathering knowledge on an on-going basis in order to monitor nurses' health over time (Kerr, et al.). The Nurses' Health Model highlights major constructs understood to

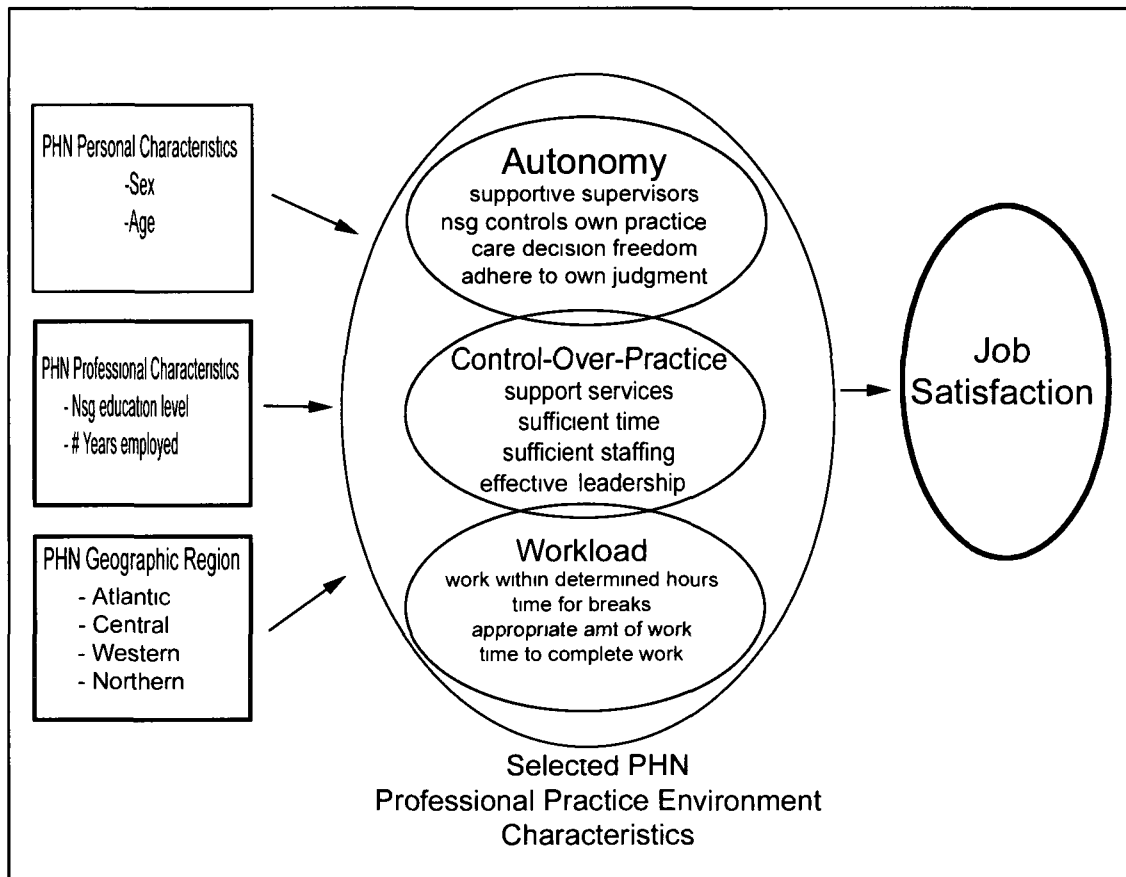
contribute to the physical and mental health of nurses and includes the healthcare system, workplace, job, and individual characteristics (Kerr, et al.).

Based on a pertinent subset of Kerr et al.'s 2005 model, the framework for this study, The Conceptual Framework of Canadian Public Health Nurses' Job Satisfaction, was developed using literature relevant to both job satisfaction and PHNs' practice (Figure 1). In this model, job satisfaction, as an employee outcome, is the dependent variable under examination. The framework provides a visual generalization of the review findings and organization for the study (Norwood, 2000). Previous research has examined job satisfaction as an independent variable and it has been correlated with numerous positive healthcare outcomes including reduced absenteeism, retention, fiscal efficiency, and improved client outcomes (Duffield, et al., 2009; Laschinger & Leiter, 2006; Tullai-McGuinness, 2008).

Modifiable workplace variables including autonomy, control-over-practice, and workload are the three selected independent variables associated with job satisfaction under study in this thesis research. Autonomy refers to nurses' freedom to make practice decisions based on knowledge, experience, and supervisor support (Laperrière, 2008). Control-over-practice refers to workplace support nurses receive to provide quality client services, including adequate staffing and time allowance to complete tasks (Lake, 2007). Workload refers to nurses' perceptions of the amount of work they do (Storey, et al., 2009).

Figure 1: Study Conceptual Framework

The Conceptual Framework of
Canadian Public Health Nurses' Job Satisfaction



Adapted from a Conceptual Model of Nurses' Health (Kerr, Spence-Laschinger, Severin, Almost, & Shamian, 2005)

Literature Review of Selected Job Satisfaction Factors

An initial broad search of bibliographic databases for journal articles included the Cumulative Index to Nursing Allied Health Literature (CINAHL), ProQuest, EMBASE, Medline, PsycINFO and the World Wide Web. The literature search included books, reports and journal articles. Additional strategies involved identification of relevant references from each article which were scanned for pertinent items and hand-searching of related journals seeking recently published studies. Finally, communication with researchers and decision-makers involved in current studies examining the work environment of nurses and, specifically, PHNs' practice provided access to knowledge and unpublished literature that may have otherwise gone undetected.

A limited portion of the titles, abstracts and articles related to nursing work environments were scanned to identify key terms determined to be important to this study (Appendix B). Key words and terms used for the search included, but were not limited to workplace, work environment, autonomy, control-over-practice, workload, and job satisfaction. Additionally, consultation with a University of Ottawa subject librarian whose expertise includes nursing literature ensured the identified variables were searched in-depth.

The review included both quantitative and qualitative research that examined the work environments of nurses working in all areas of healthcare. Studies focusing on public health nursing were particularly relevant to this review. The search strategy sought to locate studies and reports limited to the English language and included published works from 2000 or later. Attention was also given to earlier literature considered to contribute substantially to the theoretical or historical underpinnings of the nature of this work.

Job Satisfaction

Job satisfaction is considered to be the feelings individuals experience about facets of their job or the overall emotion associated with their work (Tullai-McGuinness, 2008). In an early study of American public health nurses, Cumbey and Alexander (1998) examined the relationships between organizational variables and job satisfaction. The professional practice environment was defined as the setting, background, and conditions that surround and encompass work situations as well as the systems influencing the nurse or organization (Cumbey & Alexander). The study sample was comprised of 838 PHNs, a 50.6% response rate, with data collection consisting of four tools combined into a questionnaire format.

Cumbey and Alexander (1998) classified various organizational systems 'dimensions of structure'. Modifiable factors positively correlated with study nurses' intention to remain in the public health work setting included structures of 'vertical participation' which was described as collaborative decision making between practitioners and management, and 'horizontal participation' which involves decision making between front-line practitioners. These dimensions of structure accounted for 41% of PHNs' job satisfaction variance in this study (Cumbey & Alexander). Cumbey and Alexander contend that expanded understanding of such organizational structures could better facilitate development of effective evidence-based policy and procedures which would contribute to PHNs' job satisfaction.

Cumbey and Alexander's (1998) research was one of the first studies looking specifically at PHNs' perception of their work environment and its correlation to job satisfaction. It presented several key recommendations including PHN involvement in policy formulation and decision-making, also identifying the need for additional research in this healthcare sector. Inclusion criteria requiring sample nurses to have been employed in public

health for a minimum of only one month is a potential study limitation. The length of time participants had been working within the domain was not identified.

Campbell, Fowles and Weber (2004) later studied organizational structure and its relationship to job satisfaction using a descriptive survey design. This study included 192 American PHNs, achieving a 55% response rate (Campbell, et al.). A significant relationship was reported between job satisfaction and the organizational structural dimensions of 'vertical participation' and 'horizontal decision making'; as vertical and horizontal factors increased, so did job satisfaction (Campbell, et al.). Vertical participation was considered the co-operation and consultation that occurred between supervisors and subordinates in job-related decisions (Campbell, et al.). Horizontal participation included collaborative peer efforts in work-related decision making processes (Campbell et al.). Of the respondents, 98% planned to remain working in public health but indicated their job satisfaction would improve with increased pay, increased autonomy, and better workload management (Campbell, et al.). Limitations included the self-reporting nature of this study as those nurses choosing to participate may have possessed characteristics different than those who refused, creating potential bias (Campbell, et al.). Despite this possibility, several quality measures were undertaken, including the use of a tested conceptual framework, a thorough literature review, and implementation of valid and reliable measures.

The relationship between job satisfaction and retention of PHNs has been examined in two Canadian studies (Armstrong-Stassen & Cameron, 2005; Best & Thurston, 2006). Best and Thurston used a repeated measures descriptive survey design in one unidentified urban Canadian public health organization, including a sample of 87 PHNs. Respondents reported pay and autonomy to be the most significantly correlated factors to job satisfaction

(Best & Thurston). A valid and reliable instrument was tested and recommended, the Index of Worklife Satisfaction (IWS), to determine PHN job satisfaction (Best & Thurston). The IWS was recommended for ongoing regional comparisons of urban PHNs (Best & Thurston). Although this instrumentation was reported to be a valid and reliable measure of urban PHN practice, discussion of its use among rural providers was not included. As the setting and populations differ widely between Canadian rural and urban public health organizations, this may present limitations for use of the IWS when examining the job satisfaction of PHNs practicing outside urban areas throughout Canada.

Armstrong-Stassen and Cameron (2005) used a cross-sectional descriptive field study with a convenience sample of 1,044 Ontario community health nurses working in both urban and rural regions. This study sought to compare the job satisfaction of three nursing sub-sectors working in the community, differentiating between the roles and responsibilities of each group. PHNs, home health nurses, and those working for Community Care Access Centers were included. Although all groups provide services within a wide range of settings, professional expectations and foci differ (Armstrong-Stassen & Cameron). While PHNs' practice encompasses health promotion and disease prevention with their clients who range from individuals to entire populations, other CHNs' work includes care of individuals and families, often more closely resembling the practice of hospital nurses however, many similarities between nursing groups were found (Armstrong-Stassen & Cameron).

Findings from Armstrong-Stassen and Cameron's (2005) research demonstrated a strong association between job dissatisfaction and CHNs' intention to leave the profession. Continual change and uncertainty in the programs provided were reported to be of concern for both PHNs and home health nurses (Armstrong-Stassen & Cameron). Several retention

factors were identified including such job features as autonomy to use skills and abilities, and adequate time to perform their jobs well. Organizational factors included adequate staffing and opportunities for career advancement (Armstrong-Stassen & Cameron). Despite these similarities, the magnitude of work-related concerns and their order varied considerably among the three groups for 15 of the 17 measured factors (Armstrong-Stassen & Cameron). These researchers suggest that it is not possible to examine CHNs as a homogenous group and that work settings must be taken into consideration when strategies are developed to address concerns of the various community sub-sectors. Although practice may be similar in many respects to the United States, these studies provided a Canadian perspective and valuable insight into role differentiation between PHNs and other CHNs.

An American university business administration study examined the effects of personality and job satisfaction in the public health sector using an exploratory survey design including 21 nurses and 26 administrators (Haynie, Hartman, & Lundberg, 2007). Utilizing a psychology-based theory of vocational choice, 5 principle domains of personality were identified; extroversion, agreeableness, conscientiousness, emotional stability, and openness to experience (Haynie, et al.). Researchers tested the hypothesis that individual career choice is based on anticipated satisfaction from working in that field (Haynie, et al.). Results demonstrated that, of the five identified domains, only emotional stability was positively correlated with job satisfaction (0.36; $P = 0.02$). This supports the theory that personality factors should not be the focus of organizational improvement strategies (Haynie, et al.; Kanter, 1997). Therefore, identifying workplace variables that can be modified may increase organizational success with positive change strategies, potentially increasing personnel job satisfaction. Sixty-seven percent of participants indicated that they

enjoyed their nursing role and believed they were making a difference to their community's health, yet many reported that their superiors were not receptive to the positive change strategies they had previously offered negatively influencing job satisfaction (Haynie, et al.).

Job satisfaction was a factor examined in the 2005 National Survey of the Work and Health of Nurses [NSWHN] (Shields & Wilkins, 2006). Conducted by Statistics Canada, in collaboration with Health Canada and the Canadian Institute of Health Information (CIHI), this national telephone survey sought to explore the work and health of over 18,000 Canadian nurses (Shields & Wilkins). It included registered nurses (RNs), licensed practical nurses (LPNs), and registered psychiatric nurses (RPNs), achieving a 79.7% response rate (Shields & Wilkins, 2009). Participants revealed their views on professional practice environments and their physical and mental health status (Statistics Canada, 2006). Factors strongly associated with a positive practice environment included nurses' perception of having the freedom to make important practice decisions (autonomy) and adequate support including sufficient time, qualified nurses, and support staff (control-over-practice). Results demonstrated a strong link between a positive professional practice environments and job satisfaction (Shields & Wilkins). Related variables were empirically identified and tested using measures with established psychometric properties including the Revised Nursing Work Index (NWI-R) originally developed by Lake (2002). Approximately 12% of all nurses indicated that they were 'somewhat' or 'very dissatisfied' with their work.

In a 2006 Ontario study conducted by the Nursing Health Services Research Unit (NHSRU), Baumann, Underwood, et al. identified the work environment as the most significant enabler for CHNs to work to their full scope of practice. Nurses who can fulfill the expectations of their jobs and provide quality services report higher levels of job

satisfaction (Wilkins & Shields, 2006). Using a descriptive correlational survey design, Baumann, Underwood, et al. (2006) sought to determine what factors enable CHNs to practice most effectively and efficiently. The questionnaire developed for this study was tested for reliability and validity prior to its distribution and internal consistency was established, demonstrating an excellent overall Cronbach's alpha reliability of 0.95. It was distributed to approximately 6,000 CHNs and senior managers with a response rate of 58.7% (Baumann, Underwood, et al., 2006).

Factors strongly correlated with a positive practice environment included support from leadership, autonomy, and adequate time allowance for delivery of services (Baumann, Underwood, et al., 2006). All eligible Ontario PHNs were surveyed in this study ($n=2,602$). A weighting calculation was implemented to adjust for oversampling to ensure equal sub-sector representation. Study investigator, Jane Underwood identified the purpose of this strategy was to achieve a more detailed analysis of PHNs however results of these analyses were not published (personal communication, September 2, 2009). Additionally, the response rate of surveyed PHNs was not included in this report.

Although Baumann, Underwood, et al. (2006) identified the professional practice environment as the primary enabler to nurses working to their full scope of practice, three additional themes were also indicated by participants including professional confidence, team relationships, and community context (Baumann, Underwood, et al., 2006). This research served as the foundation for several successive NHSRU studies examining the work and roles of community health nurses with the ultimate goal of improving Canadian healthcare capacity providing excellent insight into the Canadian community nursing sector (Meagher-Stewart, Underwood, et al., 2009; Schofield, et al., 2009; Underwood, Baumann,

Akhtar-Danesh, et al., 2009; Underwood, Baumann, Ciliska, et al., 2010; Underwood, Deber, et al., 2009; Underwood, Mowat, et al., 2009).

Strengthening the capacity of the public healthcare sector involves understanding the trends of its workforce (Schofield, et al., 2009). One such trend is age. Although a larger portion of CHNs are nearing retirement age, public health reported the highest proportion (23%) of nurses aged 18-34 in an earlier Ontario study (Baumann, Underwood, et al., 2006). In a recent study which examined multi-generational job satisfaction factors, a random sample of 6,541 nurses from acute care and teaching hospitals throughout Ontario was surveyed (Wilson, et al., 2008). Researchers reported statistically significant correlations between job dissatisfaction and younger nurses choosing to leave the profession (Lavoie-Tremblay, et al., 2008) similar to findings in the NSW HN (Shields & Wilkins, 2006). All nurses reported that organizational structures in their practice environment play a role in their decision to remain in the profession although the specific structures varied among generations (Wilson, et al.), reflective of other multi-generational research (Davis, 2009).

Nurses born between 1946 and 1964 (Baby Boomers) revealed higher job satisfaction in relation to professional opportunities, recognition, and control-over-practice compared to new-generation nurses born after 1980 (Generation Y) (Wilson, et al., 2008). Younger nurses placed higher value on self-directed recognition and professional opportunities while their more experienced colleagues relied on organizations to provide public recognition (Wilson, et al.). Several generations of nursing cohorts exist in all sectors of Canadian healthcare. Wilson et al. highlight the necessity of an improved understanding of this phenomenon as different generations have varied determinants of job satisfaction. Knowledge of these variations could facilitate effective change strategies (Davis, 2009).

In a secondary analysis, select nurses' data from the 2005 NSWHN were used to examine the relationship between nurses' job dissatisfaction and employer-provided support services including daycare and fitness facility availability (Wilkins & Shields, 2009).

Nurses included in this study ($n=2,993$) were weighted to represent 91,600 registered nurses in full-time, permanent positions who provide direct client-care in hospitals or long-term care facilities across Canada (Wilkins & Shields). A large proportion (73%) of the sample reported that they felt they had control over their practice while 85% perceived that they had the freedom to make important client-care decisions, indicative of an autonomous practice (Wilkins & Shields). Nurses over the age of 45 were twice as likely to reveal dissatisfaction compared to those 25-34 years, while 7% of nurses who had been in their job for less than 3 years were dissatisfied compared with 17% of those in the same job for over 16 years. Organizational work factors such as overtime and working shifts other than days were only significantly correlated with dissatisfaction when examined individually, whereas workplace environmental factors including excessive workload and staffing or resource inadequacy remained significant predictors of job dissatisfaction in multivariate modeling.

Autonomy

Autonomy is a measure of psychological empowerment that has been demonstrated to be positively correlated with nurses' job satisfaction and is a predictor of intent to leave (Hayes, et al., 2006). It is considered a rational individual's capacity to make an informed, un-coerced decision (Brudney, 2009). An autonomous practice is one where nurses make decisions based on their experience, knowledge, and support. Autonomy is a factor of empowerment. Literature examining the effects of empowerment on nurses' work environment purports that an empowered work environment is one where nurses perceive

they have access to opportunity, information, support, and the resources necessary to fulfil the expectations of their roles (Bradbury-Jones, Sambrook, & Irvine, 2008; Cho, Laschinger, & Wong, 2006; Nedd, 2006; Spence-Laschinger, 2008). Dissatisfaction with working conditions that limit autonomy or control-over-practice has been identified as a principle reason why many nurses choose to leave the profession (Spence-Laschinger).

Haugh and Spence-Laschinger (1996) examined the effect of autonomy, as a factor of empowerment, in the context of Canadian public health nursing during a time of dramatic change in practice - the move away from individual and family case management to present-day population health-based strategies. In an exploratory comparative survey, using a convenience sample of 46 PHNs and 10 nurse managers from three Ontario health units, Haugh and Spence-Laschinger achieved a 52.2% response rate. Autonomy and decision involvement were reported to be significantly related to perceived empowerment for both staff nurses ($r = 0.52$) and managers ($r = 0.64$) although neither group displayed high overall empowerment scores (staff $M = 11.77$, $SD=2.08$; manager $M = 13.71$, $SD=2.28$). Using the Conditions of Work Effectiveness Scale, a valid and reliable measure, items were ranked on a 5-point Likert-type scale including four subscales for a total potential score of 20; higher scores indicated increased perceived empowerment (Haugh & Spence-Laschinger).

Managers reported access to support as the least empowering element of their work; they describe support from upper-management as lacking, creating challenges for their decision-making capacity (Haugh & Spence-Laschinger, 1996). Alternatively, staff results suggested access to resources, such as direct channels to management when concerns arose or knowledge about budgets and corporate decision-making processes, constituted the least empowering component of their work (Haugh & Spence-Laschinger). Managers

demonstrated significantly higher empowerment scores than did staff nurses, $t(48) = 2.73, p < 0.01$ (Haugh & Spence-Laschinger). This study revealed that managers believed front-line PHNs experienced greater practice autonomy than was actually reported by these nurses, a similar misperception as has been revealed by others in more recent research (Baumann, Underwood, et al., 2006).

Oberle and Tenove (2000) reported that the autonomy associated with PHNs' practice is often rife with ethical issues. An exploratory descriptive design was used to conduct in-depth interviews with 22 western-Canadian PHNs, implementing a nominated sampling technique. Supervisors were asked to identify nurses who were reflective and capable of articulating ethical issues related to public health practice (Oberle & Tenove). This sampling strategy presented an opportunity for bias and a potential study limitation, although further insight was gained into the PHN role from a little-studied perspective. Respondents identified autonomy as a practice element that could potentially create stress and anxiety in certain situations (Oberle & Tenove). Nurses reported that not only are they required to share the profession's ethical responsibility of upholding the rights of the individual, but they must put these into the perspective of the health of the population, often resulting in ethical conundrums (Oberle & Tenove). For example, PHNs are expected to uphold the professional code of ethics of all Canadian registered nurses, the CNA's (2008) *Code of Ethics for Registered Nurses*, but this document is less clear when community or population health interests must take precedence (Hogan, 2008). Although autonomy is considered a positive worklife factor, the ethical conflict between the rights of individuals versus the rights of populations may create confusion and frustration for the PHN, potentially impacting practice decisions and job satisfaction.

Vaccination practices provide an example of an ethical dilemma PHNs may face (Ulrich, 2002). Despite statistics demonstrating the health benefits of vaccines to society, many parents refuse to vaccinate their children and others express doubts concerning vaccine safety (Gust, Darling, Kennedy, & Schwartz, 2008). PHNs routinely provide vaccinations and must consider the rights of the individual and their ultimate impact on the health of the community or vice versa. A PHN providing a vaccination may experience stress, for example, if a parent refuses to vaccinate a child where there has been an outbreak of an infectious disease, such as mumps, potentially putting the child and other community members at risk (Friederichs, Cameron, & Robertson, 2006).

In a recent large study of CHNs from across Canada including 10,358 registered nurses and 3,414 licensed practical nurses, researchers reported that respondents identified their ability to vary time spent with clients and to modify care plans based on their knowledge and experience enabled them to provide better services, yet revealed that this practice autonomy was often not achievable (Underwood, Baumann, Akhtar-Danesh, et al., 2009). Participants were questioned about their perceptions regarding enablers and barriers to practice to the full scope of their competencies. Four key enablers were identified in an earlier study including professional confidence, team relationships, community context, and workplace environment (Underwood, Baumann, Akhtar-Danesh, et al., 2009). Using a web-based program to deliver the survey, this study had a 56.9% response rate (Underwood, Baumann, Akhtar-Danesh, et al., 2009). Sixty-two percent of the respondents perceived the services they provided were less than adequate, reporting they lacked the authority to tailor interventions based on client needs (Underwood, Baumann, Akhtar-Danesh, et al., 2009).

Research suggests that involving CHNs in policy-planning pertinent to their practice would not only improve perceptions of autonomy and empowerment, increase job satisfaction and intent to stay, but it could provide vital insight into developing service strategies that ensure the community health workforce is used to its full potential (Underwood, Baumann, Akhtar-Danesh, et al., 2009). Few research studies are currently available that identify how CHNs perceive they could contribute to improving health system capacity (Underwood, Baumann, Akhtar-Danesh, et al., 2009). Researchers suggest that understanding where CHNs perceive they could contribute best to improve healthcare efficiency would provide decision-makers with valuable insider-insight (Underwood, Baumann, Akhtar-Danesh, et al., 2009). This approach may also have the added value of improving CHNs' job satisfaction as these nurses see their opinions sought and respected. Similar to an earlier study conducted by the NHSRU (Baumann, Underwood, et al., 2006), this study included all PHNs who consented to participate ($n = 1,756$), while only a random selection of other nursing sectors was included. Rationale for this sampling decision was not provided. Nevertheless, this research provided further foundational insight into nursing practice within the Canadian community health sector.

The 2005 NSWHN revealed a consistent pattern in response to questions measuring autonomy related to nurses' professional practice environments (Shields & Wilkins, 2006). The revised Nursing Work Index (NWI-R) was the instrumentation used to measure this variable (Shields & Wilkins). Perceptions of low autonomy varied for nurses across the country (Shields & Wilkins). Nurses who practice in the community reported a significantly higher perception of job-related autonomy (28%) than nurses in acute care areas (15%).

In a secondary analysis of the 2005 NSWHN data, researchers reported that nurses who describe adequate autonomy in their practice have fewer days absent from work (CIHI, 2008). Nurses who reported low satisfaction or lack of respect in the workplace or those who demonstrated lower autonomy scores reported the highest rate of absenteeism (CIHI). Those who reported dissatisfaction with their jobs were absent an average of 26 days per year in contrast to 13 days for those who did not (CIHI). Absenteeism results in added workload pressures for remaining nurses, compounding job dissatisfaction. Researchers suggest decreasing the current national average RN absenteeism rate of 14 days per year by half for three years would be the equivalent of 7,000 new full-time nurses entering the profession, resulting in financial implications for future healthcare delivery strategies (Murphy, et al., 2009). Additionally, several nurse researchers report that absenteeism is a symptom of eventual burnout and highly correlated with professional practice environments, providing supporting evidence to monitor absenteeism trends (Leiter & Spence-Laschinger, 2006; Rajbhandary & Basu, 2007; Taylor & Barling, 2004).

Authors of a recent CNA report provide recommendations for potentially eliminating the national RN shortage (Murphy, Birch, Alder, et al., 2009). Autonomy was identified as being positively correlated with intention to stay and nurses' productivity (Murphy, et al., 2009). This report suggests that by increasing RN productivity by only 1% per year, the predicted future nursing shortage of almost 60, 000 full-time nurses by 2022, could be cut by approximately 47% (Murphy, et al., 2009). Additionally, by reducing RN exit rates to 2% for nurses under the age of 60, and 10% for those 60 and over, the RN shortage could be cut by half, or 30,000 full-time RNs (Murphy, et al., 2009). Furthermore, reducing attrition rates in RN entry-to-practice education programs, from the current 28% to 15%, could cut the gap

by approximately 45,000 nurses (Murphy, et al., 2009). Murphy et al. purport that interventions must also be designed to reduce RN exit rates of senior personnel, increase retention of new RNs, and increase productivity of the current Canadian RN workforce (Murphy, et al., 2009). An improved understanding of the contributing factors to PHNs' job satisfaction is an important element of designing effective, evidence-informed interventions.

Researchers have also studied and recommended strategies to reduce RN exit rates (Storey, et al., 2009) and improve the workplace for new generation nurses (Lavoie-Tremblay, O'Brien-Pallas, et al., 2008; Lavoie-Tremblay, Wright, et al., 2008; Thomka, 2007). Recent initiatives within the Ontario public health nursing sector have used evidence-based knowledge to directly address these challenges. ANDSOOHA: Public Health Nursing Management is an Ontario based association providing a united voice for nursing managers who promote excellence in public health nursing (Simpson, Beynon, & Simpson, 2007). This group has led the development of several initiatives intended to increase retention and job satisfaction for new hires to public health nursing. These initiatives include a mentorship program as well as a structured orientation for new PHNs, including both graduates and experienced nurses entering the public health sector (Simpson, et al.).

Mentoring is recognized as an initiative which increases nurses' confidence resulting in increased autonomy and job satisfaction, and in retention of both new and experienced nurses (Thomka, 2007). Psychological distress is a phenomenon potentially caused by the stressful experience of being a new nurse and a factor measured by nurse researchers seeking to create a healthy workplace for new generation nurses (Lavoie-Tremblay, Wright, et al., 2008). Psychological distress may result because of new nurses' lack of confidence, expectations of clinical staff, and/or lack of support (Lavoie-Tremblay, Wright, et al., 2008).

The principle behind mentorship programs is to provide direction and support to new nurses and has been positively correlated with reduced job stress and increased job satisfaction (Lavoie-Tremblay, Wright, et al., 2008; Thomka).

Using instrumentation with established psychometric properties, researchers studied new nurses working in Québec ($n = 309$) for the presence of symptoms associated with psychological distress including anxiety, irritability, and cognitive difficulties (Lavoie-Tremblay, Wright, et al., 2008). The study participant mean was 25.90 ($SD = 16.80$) where individuals' scores ≥ 26.19 were classified as experiencing high levels of psychological distress. Cross tabulations using Chi-square tests demonstrated that psychological distress was negatively and significantly associated with social support ($r = -0.18, p < 0.01$).

Effectively implemented mentoring programs are designed to provide the social support new nurses require (Thomka, 2007). Structured orientation programs such as those developed by ANDSOOHA demonstrate benefits for new PHNs, providing a framework within which they can practice safely and effectively (Meagher-Stewart, Underwood, et al., 2009). Increased confidence in professional roles of mentees has been verbalized by PHN participants in mentorship initiatives (Thomka). New nurses are not the only ones who benefit as mid- and late-career nurses who serve as mentors have also asserted improved job satisfaction (Storey, et al., 2009). Additionally, organizations have reported enhanced recruitment and retention capacity, decreased staff turnover, and cost-savings (Simpson, 2007) offering a fiscal appeal to this initiative.

In their 2007 report, Simpson, et al. evaluated the effectiveness of the 'Nursing Mentorship Resource Guide'. Simpson, et al.'s abbreviated literature scan did not reveal articles specifically related to mentoring and PHN practice. Content validity for their study

was established and the mentor and mentee response rate to a mailed survey was excellent at 87% (Simpson, et al.). The results of the survey were reflective of the literature in that mentorship supports a positive professional practice environment. Numerous practice and future research recommendations resulted (Simpson, et al.). Recommendations included establishment of structured mentoring programs in organizations utilizing a collaborative philosophy which could increase the long-term sustainability of such initiatives, improve participants' organizational commitment, and ultimately result in healthier work environments and improved organizational outcomes (Simpson, et al.).

The role of mentorship and its association to the development of autonomy was highlighted in a qualitative study of school nurses' perceptions of their practice autonomy (Simmons, 2002). Simmons compared perceptions of experienced school nurses to those new to the field. School nurses practice as the sole healthcare professional, providing services to large numbers of students and school employees (Simmons). Combined semi-structured interviews and field notes were recorded in this American, grounded theory research (Simmons). A systematic qualitative methodology, grounded theory seeks to generate theory where none exists or provide new explanation to a phenomenon not captured by current theoretical frameworks (Moore, 2009). Using a constant comparative method of data analysis, concepts began to become evident from the data (Simmons). Five major categories emerged from interview transcriptions including the essence of autonomy, comfort with autonomy, nature of school nursing, role acquisition, and preparation for practice (Simmons). Results revealed role perception, comfort, and confidence between the two groups were in sharp contrast. The crucial role of support of the novice during the transitional period was emphasized to support development of confidence, autonomy and

job satisfaction (Simmons). Although school nursing is no longer a sub-specialty of Canadian PHNs, this study provides valuable insight into the role support plays in nurses' perception of autonomy and their job satisfaction.

Control-over-Practice

Control-over-practice in the context of this study is defined as the support and opportunity an individual receives so that they may meet their practice expectations in order to provide quality services (Lake, 2007). Supports include such factors as enough time to discuss client care, sufficient qualified staff, and an immediate supervisor who is a good manager and leader (Lake). These facets provide an environment where nurses are better able to manage the demands of their practice. Armstrong-Stassen and Cameron (2005) identified the top five concerns of the 313 PHNs in their study to include continual change and uncertainty in the programs being offered. These nurses perceived that they frequently had little control over their practice. In their 2009 study, Underwood, Baumann, Akhtar-Danesh, et al. report that nurses associate increased control-over-practice with improved delivery of services. This is further supported by Lake, who claims control-over-practice is recognized as an organizational characteristic which impacts nurses' job satisfaction and quality of care. As a concept included in the 2005 NSWHN, control-over-practice has been identified as a construct used to evaluate nurses' work environments in the widely used measure, the revised Nursing Work Index [NWI-R] (Lake, 2002).

Tullai-McGuinness (2008) used the NWI-R to examine the relationship of nurses' perceived control-over-practice with their job satisfaction in a convenience sample of 201 CHNs in Cleveland, Ohio. A two step hierarchical multiple regression analysis was utilized and after controlling for years of experience, control-over-practice and workplace setting

decisions were found to be the most significant predictors of job satisfaction for nurses in this study (Tullai-McGuinness). Years of experience explained approximately 6% of nurse satisfaction but control-over-practice factors increased the R^2 to approximately 32% with the change accounting for 27% of satisfaction (R^2 change = 0.27; $F = 37.3$, $p < 0.01$). This study provides evidence that variation in nurses' job satisfaction may be related to perceptions of their influence over practice settings and control-over-practice (Tullai-McGuinness). It also demonstrates the utility of the NWI-R to measure these work environment variables outside the acute care setting.

Nurses working within the community have reported the importance of control over their practice, suggesting that when consulted about potential change, their feelings of self-value and job satisfaction increase (Underwood, Baumann, Ciliska, et al., 2010).

Experienced community nurses nearing retirement have identified that they had a greater likelihood of leaving the profession earlier without this type of workplace support ($P = 0.03$) (Storey, et al., 2009).

Workplace support, a concept that includes adequate staffing and time to get work done, has been identified as a magnet hospital characteristic and studied as a predictor of nurses' job satisfaction (Spence-Laschinger, 2008). Magnet hospital status represents the highest level of recognition healthcare organizations can achieve (Morgan, 2009). These hospitals are purported to produce the highest quality healthcare in the most cost-efficient manner (Morgan). Nurses strive to work within these facilities because of the positive work environments and clients have reported higher standards of care (Morgan). The original NWI was developed based on magnet hospital characteristics and remains a valid and reliable measure for evaluation of these factors (Lake, 2007). Although Tullai-

McGuinness' (2008) research utilized the NWI, the study sample consisted of American PHNs whose practice varies somewhat due to a larger proportion of privately funded healthcare compared to the predominantly public healthcare systems found in Canada.

Canadian studies have also examined the qualities associated with magnet hospital designation and their relationship to job satisfaction, nurse retention, and improved client outcomes (Spence-Laschinger, Shamian, et al., 2001; Armstrong & Laschinger, 2006). Magnet hospital characteristics include nursing involvement in decision-making processes, effective leadership, access to information and resources, adequate staffing, and collegial interprofessional relationships (Armstrong & Laschinger). Canadian nurses, like their American counterparts, identify factors consistent with magnet hospital characteristics as positively correlated with job satisfaction and improved organizational outcomes.

To determine their control-over-practice, Canadian nurses responded to seven statements in the 2005 NSWHN related to the time they had to do their jobs, staffing levels, and work assignments (Shields & Wilkins, 2006). Only 57% described having adequate support services which permitted them to spend appropriate time with their clients, while 40% reported insufficient time to discuss client care (Shields & Wilkins). Providing the time for nurses to work to the full scope of their competencies supports provision of high quality client care, increases job satisfaction, and is positively correlated to retention (Murphy, et al., 2009; Underwood, Baumann, Akhtar-Danesh, et al., 2009). Nurses' perceptions of control-over-practice were workplace-dependent with nurses working in community health recording better scores than those working in the acute care sector (Wilkins & Shields). Yet, despite this, approximately 40% of CHN respondents felt staffing in their organizations was insufficient to get their work done and provide the level of quality care they desired.

Control-over-practice was measured in a 2004 prospective descriptive research design survey of Canadian oncology nurses, of whom a small percentage of respondents (5.7%, $n = 35$) provided their services within the community (Bakker, et al., 2010). The NWI-R instrumentation was utilized in this study and individual factors of control-over-practice were examined. Thirty-nine percent of respondents indicated that they did not have enough nurses on staff to provide high quality patient care, negatively impacting their control-over-practice, and 25% reported this resulted in deterioration of care (Bakker, et al., 2010). This study further demonstrates the viability of the NWI-R in different nursing sectors and provides added insight into nurses' perceptions of control over their practice. Direct transferability to the practice of PHNs is limited due to the fact that oncology nurses practicing within the community provide services more closely paralleling those of hospital nurses (Bakker, et al., 2010).

Recent strategies for building Canadian public health nursing capacity have been identified based on extensive research evidence (Meagher-Stewart, Underwood, et al., 2009). An appreciative inquiry process was implemented to conduct 23 focus groups, with 156 PHNs from both urban and rural/remote service areas in six Canadian geographic regions (Meagher-Stewart, Underwood, et al., 2009). Study findings were incorporated to develop current practice recommendations (Meagher-Stewart, Underwood, et al., 2009). Participants were asked to identify organizational attributes which support them to work to the full scope of their practice competencies using the 2003 CCHN Standards of Practice and the 2008 Public Health Core Competencies as the framework for PHNs' practice today (Meagher-Stewart, Underwood, et al., 2009). Three thematic areas of recommendations

were identified including government and system-level action (macro level), local organizational culture (meso level) and management practices (micro level).

At the micro level, PHNs reported the strongest link between middle management practices and the effectiveness of their own practice; consistent with other study findings, both within healthcare and the private business sector (Meagher-Stewart, Underwood, et al., 2009). Effective leadership was a critical factor at the meso level where motivating and empowering leadership supportive of PHNs' practice was imperative for working to a full scope of practice. Macro level themes included adequate funding and support of political 'champions' for public health. Numerous key recommendations were produced including continued collection and sharing of research evidence between academic researchers and local public health decision makers to further augment understanding of PHNs' roles (Meagher-Stewart, Underwood, et al., 2009). Additionally, the importance of shared responsibility, between public health decision-makers, managers, and practitioners, for evidence-informed healthy workplace practices was stressed.

Although the work of Meagher-Stewart, Underwood, et al. (2009) provides key recommendations specific to Canadian PHN practice, use of the CCHN Standards of Practice as an analytic framework may be considered a study limitation. The CCHN Standards of Practice are voluntary and not all public health organizations have adopted them as an organizational framework for nursing practice. In Ontario, for example, Algoma Public Health and ANDSOOHA (2008) surveyed senior nurse leaders about their intention to adopt the CCHN Standards of Practice within their organizations. Results revealed that not all public health nursing leaders intended to implement these standards. Lack of familiarity with the CCHN Standards of Practice could potentially influence participants'

responses, thereby creating a study bias. Despite this potential limitation, the work of these researchers has made a substantial contribution to highlighting nurses' roles in Canadian public health and other community health sectors.

Workload

Workload is defined as the relationship between an individual, or group, and their task demands (Storey, et al., 2009) and has been identified as a source of job strain (Lee & Wang, 2002; Spence-Laschinger, Finegan, et al., 2001). A consistently heavy workload increases nurses' stress level, negatively impacting job satisfaction and results in an increased likelihood of turnover (Hayes, et al., 2007). In their recent study examining older nurses employed in primary care and community health, Storey, et al. revealed that participants reported a greater likelihood of leaving the profession in response to heavier workloads ($P < 0.01$). Thirty-six percent identified workloads and staff shortages as the primary reason for leaving the profession early (Hayes, et al.). Other researchers report that work overload impacts the quality of client care provided and reduces the multi-tasking capacity required in coordinating multiple practice responsibilities (Kerr, et al., 2005).

Increased workload is a factor recognized to negatively impact client care (CNA, 2010; Murphy, et al., 2009). Nurses who describe an increased workload report a diminished ability to make optimal practice decisions (Underwood, Baumann, Akhtar-Danesh, et al., 2009). In their 2003 study examining the expanding roles of public health nurses, MacDonald and Schoenfeld revealed that participants felt there had been little change in their practice despite recent attention on health promotion and population health principles. Participants in this Saskatchewan survey reported they were overloaded with their current job responsibilities and new role expectations (MacDonald & Schoenfeld).

PHNs have direct contact with communities and an intimate understanding of their needs; they have seen the results of existing programs and can provide valuable input into program planning, implementation and evaluation (MacDonald & Schoenfeld, 2003). Respondents revealed they required increased flexibility, independence, and autonomy to enable them to appropriately determine and manage their workloads (MacDonald & Schoenfeld). In their replication-study of a 1992 Ontario PHN survey, MacDonald and Schoenfeld mailed questionnaires to 497 Saskatchewan nurses resulting in a 25% response rate, potentially impacting the generalizability of their findings. Despite a low response rate, this study revealed possible differences between Ontario and Saskatchewan nurses, suggestive of the diversity of PHN practice across Canada. MacDonald and Schoenfeld contend these differences may be attributed to the ten year span between surveys or healthcare reforms that occurred during that decade however different recruitment strategies were utilized by researchers in the two studies and the response rates varied greatly.

Chambers, Underwood, Halbert, Woodward, Heale, and Isaacs (1994) mailed 3,650 surveys to Ontario PHNs in 1992. Chambers et al. utilized several techniques described by Dillman (2007) intended to improve survey response rates. They included advanced notice of the impending survey in the Ontario Public Health Association newsletter, the Ontario PHN Directors' newsletter, and the CHN Interest Group of the RNAO (Chambers, et al.). In addition, researcher thank-you/reminder notes were mailed two weeks after the initial mailing and a second questionnaire was sent one month later to non-responders (Chambers, et al.). These strategies resulted in an 85.5% response rate (Chambers, et al.). Although there may have been health reform changes in public health over the ten year span, the main difference between the two surveys may be related to the rigor of the survey design

methodology. In achieving only a 25% response rate, Schoenfeld and MacDonald would have reduced statistical power with their small sample size and their study results' generalizability may be considered questionable.

International PHN studies have also reported negative associations with heavy workloads (Lee & Wang, 2002). In a Chinese survey conducted in Taipei City and Kaohsiung City, a convenience sample of 171 PHNs were invited to participate in a study examining perceived occupational stress and related factors (Lee & Wang). Over 97% of those invited responded to the mailed survey ($n = 167$), reporting that the major sources of occupational stress in their practice resulted from personal responsibility and workload (Lee & Wang). Respondents' workload had become increasingly heavy with the growing number of area health issues PHNs were expected to address (Lee & Wang). Although area demands and expectations had grown, staffing had not been increased at the same rate, resulting in increased workloads and job stress (Lee & Wang). Response rates varied greatly between nurses from China and MacDonald and Schoenfeld's (2003) Canadian study. Lee and Wang do not describe a more rigorous approach to recruitment than did MacDonald and Schoenfeld, yet managed to achieve a substantially higher response rate however a direct comparison is not possible as different measures were utilized in each study. Both studies revealed participants' perceptions of providing a decreased quality of services as correlated with their increased role expectations and workload.

Research has demonstrated that PHNs' perception of the quality of services they provide is associated with workload and time allocated for their various roles (Chambers, et al., 1994). In an exploratory investigation, including related literature and interviews, Baumann, Blythe and Underwood (2006) examined the effects that the severe acute

respiratory syndrome (SARS) outbreak had on different Canadian nursing sectors. An infection caused by a previously unknown coronavirus, SARS brought the health system in the Greater Toronto area and other parts of Ontario, Canada to its knees (MOLTC, 2006). Few public health crises have brought the world's attention to the Canadian healthcare system as SARS did. It highlighted system inefficiencies, resulting in frustration and miscommunication (National Advisory Committee on SARS [NAC], 2003). Outside Asia, Canada was the country most dramatically impacted by this deadly virus that emerged from the jungles of Central China, killing 44 in Ontario and afflicting more than 330 others (NAC). Nurses described the frustration and anxiety experienced during the SARS crisis (Baumann, Blythe, et al., 2006). Some suggested the public health sector demonstrated less capacity to meet the increased demands associated with SARS than did the acute care areas (Baumann, Blythe, et al., 2006).

Baumann, Blythe, et al. (2006) contend that the imbalance between acute care and public health capacity during SARS was a direct result of reduced provincial healthcare funding to the public health sector from 75% to 50% in 1999. Low surge capacity, or the inability to meet sudden, unanticipated demands in the community healthcare sector, increases the vulnerability of the entire Canadian healthcare system (Baumann, Blythe, et al., 2006; Naylor, Chantler, & Griffiths, 2004; Polivka, et al., 2008). Numerous reports have identified the importance of ensuring that there is adequate capacity to address health needs outside the hospital (Underwood, Baumann, Akhtar-Danesh, et al., 2009). One approach identified by researchers to support adequate public health capacity included workload evaluation. Identification and implementation of strategies that reduce nurses' high role overload could increase retention and improve productivity (Murphy, et al., 2009).

In their April, 2009 report, Underwood, Baumann, Akhtar-Danesh et al. (2009) compare enablers and barriers for nurses working within the community. A goal for this study was to obtain CHNs' insight, hypothesizing that this cohort of healthcare providers harboured valuable knowledge that could contribute to increasing the Canadian health system's capacity (Underwood, Baumann, Akhtar-Danesh, et al., 2009). Both RNs and LPNs were included in the study and a 56.9% response rate was achieved. All PHNs who consented to participate in research were surveyed ($n = 176$). Approximately 50% of respondents reported that provincially mandated policy had little effect in supporting them to manage their workloads (Underwood, Baumann, Akhtar-Danesh, et al., 2009). Researchers revealed that 45% of respondents felt they had inadequate access to opportunity in the form of time, money, and/or access to learning resources and 11% reported that their employer did not provide a safe working environment (Underwood, Baumann, Akhtar-Danesh et al., 2009). Although this report provides insight into CHNs' working conditions and their perceptions about what their role could be in improving Canadian health system capacity, no theoretical framework was identified and several inaccessible studies and reports were referenced making further clarification challenging.

Two western-Canadian studies, examining the work environment of PHNs, reported workload and the capacity to complete tasks as factors positively correlated to job satisfaction and nurse retention (Henderson-Betkus & MacLeod, 2004; Reutter & Ford, 1996). Using an exploratory descriptive research design including two practice scenarios, addressing the needs of clients with mental illness and those who are socially or economically disadvantaged, Reutter and Ford interviewed 28 PHNs from six health units serving both urban and rural populations in Alberta. Respondents identified workload as

becoming excessively demanding and difficult in these two scenarios. PHNs felt they were inadequately prepared to appropriately address the needs of clients, expressing a desire for continuing education opportunities (Reutter & Ford). Lack of knowledge subsequently resulted in heavier workloads and increased job stress (Reutter & Ford).

Henderson-Betkus and MacLeod (2004) surveyed 124 front-line PHNs in rural and small urban communities in northern British Columbia achieving a 76% response rate. Researchers examined professional correlates with nurses' intention to remain in the profession (Henderson-Betkus & MacLeod). PHNs reported that they were most satisfied with their professional status, interactions, and autonomy (Henderson-Betkus & MacLeod). They identified several 'filter factors' of retention that were not related to job-specific issues, including demographic determinants such as personal circumstances and spousal employment opportunities (Henderson-Betkus & MacLeod). Adding further insight into the role of the Canadian PHN, these studies parallel many concerns similar to acute care nurses' but also identify unique challenges to the public health sector. Reutter and Ford reveal that PHNs' perception of professional invisibility was an issue even in the 1990's, while Henderson-Betkus and MacLeod describe the satisfaction gleaned from community connections developed by nurses working in this sector.

A 2008 report funded by the Ontario MOHLTC examined variables which contribute to a healthy work environment for nurses outside the acute care sector (Bookey-Bassett, et al., 2008). PHNs reported busy programs and services, but identified that they have thus far been able to manage a positive work-life balance (Bookey-Bassett, et al., 2008) however themes of invisibility again resurfaced. PHNs perceived that little was known about their role in the Canadian healthcare system similar to other researchers' findings (Bookey-

Bassett, et al., 2008; Falk-Rafael, Fox, & Bewick, 2005). Perceived professional invisibility was also identified in earlier PHN literature (Kuss, Proulx-Girouard, Lovitt, & Kennelly, 1997; Leipert, 1996; Zerwekh, 1992, 1993). Respondents claimed they were not confident that the MOHLTC was fully aware of the services provided by frontline PHNs and expressed concern that recruitment and retention initiatives would not be directed to the public health sector because of this lack of awareness (Bookey-Bassett, et al., 2008).

Bookey-Bassett, et al. (2008) identified a need for further research examining work environment concerns and job satisfaction criteria specific to PHNs. They recommended enhanced funding for public health sector-specific initiatives. Although several positive findings resulted from Bookey-Bassett et al.'s report, only four Ontario public health organizations were included and the proportion of the 21 study participants which were PHNs was not identified. Nevertheless, it provided further evidence of issues specific to Canadian nurses working within the community, including PHNs.

Internationally, a study of Scottish community health nurses' perceptions of workload management and their job satisfaction was undertaken (Haycock-Stuart, Jarvis, & Daniel, 2008). Participants reported that a culture of long hours has developed in this nursing sector which has gone virtually unnoticed (Haycock-Stuart, et al., 2008). In a report of an earlier mixed methods study including a qualitative interpretive portion with 8 focus groups and 8 individual interviews ($n = 31$), nurses reported feeling overwhelmed with their workload, resulting in little control over their practice (Haycock-Stuart, et al.). A random sample of 716 Canadian women was recently used to study the importance of role overload relative to other known social determinants of women's health (Glynn, et al., 2009). As

94.5% of the Canadian nursing workforce is women (Shields & Wilkins, 2006), this study has potential transferability into the nursing domain.

Role overload is considered the extent to which an individual feels overwhelmed by her total responsibilities; in other words, workload in excess (Glynn, MacLean, Forte, Cohen, 2009). Overload was related to hours participants worked. Research participants' perceptions of role overload were associated with poor mental health ($p < 0.01$) for those working less than 35h/week ($p = 0.04$) and for those working between 35 and 40h/wk ($p < 0.01$). Work overload demonstrated a stronger association to mental health than other sociodemographic determinants including income, social support, and marital quality (Glynn, et al.). This research adds further insight into the importance of nurses' workload and its potential influence on their practice capacity and job satisfaction.

Over one quarter (27.8%) of participants in the 2005 NSW HN were classified as experiencing an excessive workload. Using a Likert-like scale with a range of 0 to 20, five items were measured (Shields & Wilkins, 2006). Respondents scoring 16 or higher were identified as having an excessive workload, or role overload (Shields & Wilkins). This cut point was selected to be as close as possible to the highest quartile of the weighted distribution of scores (Shields & Wilkins). More than half (56%) of the participating registered nurses revealed that they often arrived at work early or stayed late in order to get their work done and 64% reported working through breaks (Shields & Wilkins). This is correlated with nurses' perception of providing poorer quality services (Shields & Wilkins). Québec nurses' scores demonstrated a significantly higher incidence of arriving early and staying late (59%), compared to nurses working in other areas of the country. Québec nurses reported total workload scores of 16 or greater 34% of the time, while in Prince

Edward Island and Newfoundland only 18% of respondents' scores were calculated at this level (Shields & Wilkins), demonstrating diversity between Canadian regions.

In summary, the literature has clearly demonstrated a link between positive practice environments and nurses' job satisfaction. Autonomy, control-over-practice, and workload are elements of nurses' work environments that managers and decision-makers have the capacity to modify. Job satisfaction has been linked to reduced absenteeism, increased retention, and improved client outcomes - all desirable to Canadian healthcare decision-makers. Although recently, there have been more studies with resulting publication, researchers have identified the need for continued diligence in examining and understanding the work environment of Canadian public health nurses to aid in enabling them to work to the full scope of their competencies and practice, thereby facilitating the continued delivery of superior national public health programs and services.

CHAPTER THREE

Methods

This chapter describes the primary study, the 2005 National Survey of the Work and Health of Nurses (NSWHN) from which pertinent data were extracted for this thesis research secondary analysis. The primary study research design, setting, sampling procedure, and instrumentation are presented first. The research design, selected sample, study variables, and data analyses used in the current study are then described, including rationale for the methods used. This is followed by description of the final research component, an end-of-study Knowledge Translation (KT) Think-Tank. Finally, ethical considerations are provided.

Primary Study

Research Design and Study Setting

Data for the cross-sectional 2005 National Survey of the Work and Health of Nurses (NSWHN) were collected from a large sample of employed, regulated nurses from across Canada by Statistics Canada in collaboration with the Canadian Institute for Health Information (CIHI), Health Canada, and other organizations experienced in health human resource planning (Shields & Wilkins, 2006). The sampling strategy for the NSWHN was designed to provide an overarching national perspective of the work and health of the country's largest group of healthcare providers (Shields & Wilkins). Numerous variables were included, providing the opportunity to explore associations among a wide variety of factors reflecting the health and working conditions of Canada's regulated nurses.

Primary analysis of the NSWHN compared characteristics of nurses to the general population wherever possible by using data from earlier surveys including the Canadian Community Health Survey, the Workplace Employee Survey, and the Labour Force Survey (Wilkins & Shields, 2006). As 99% of nurses were at least 21 years of age, comparisons were based on employed Canadians aged 21 or older (Statistics Canada, 2006). This provided not only a national perspective of nurses' health but insight into the work and health of a large subset of the Canadian population.

Sampling Procedure

The NSWHN was based on a complex two-tiered stratified design of a random sample of nurses from across Canada (Statistics Canada, 2009b). The primary stratification included a separate stratum for each province of registration and type of nurse while the secondary stratification involved age groups, place of work, and employment status (Statistics Canada). Stratification was done at the provincial and national levels to provide representative estimates for each of the three nursing bodies and to ensure adequate sample sizes for each province and each of the three territories combined (Statistics Canada). The sampling frame was determined based on membership lists provided by all twenty-six provincial nursing organizations and regulating bodies across the country (Statistics Canada).

Regulated nurses including registered nurses (RNs), licensed practical nurses (LPNs), and registered psychiatric nurses (RPNs) had to be registered with a provincial nursing college, association, or council and be currently employed in Canada (Statistics Canada, 2009b). All included nurses had to be registered within the province in which they were employed (Shields & Wilkins, 2006). Those nurses who were retired, unemployed, or working in a non-nursing field were excluded (Statistics Canada). A total of 24,443 nurses were randomly selected. Of those initially selected, 5,767 were lost to non-contact, those who were out-of-scope, or refused to participate, resulting in a final sample of 18,676 nurses resulting in a 79.7% response rate (Shields & Wilkins). Data were weighted to represent the total population of regulated nurses in Canada in 2005 ($n = 314,900$). The weighting process was imperative to permit representative estimates of the three nursing bodies within each province and for the three territories (Statistics Canada).

Data Collection Measures

Data collection for the NSWHN occurred from October 3, 2005 to January 29, 2006 (Shields & Wilkins, 2006). Prior to this, an introductory letter was sent to the homes of the initial selected nurses based on the stratified design (Shields & Wilkins). A team of Statistics Canada examiners attempted to contact participants by telephone and allowed only those nurses originally selected to respond to the questionnaire; response by proxy was not permitted (Shields & Wilkins). For those who agreed, a 30 minute computer-directed questionnaire was implemented by interviewers (Shields & Wilkins). Nurses who were not employed in nursing at the time of the survey were excluded, thereby further reducing the original sample by 1, 015 (Shields & Wilkins).

Questions for the NSWHN underwent extensive quality assurance evaluation including qualitative testing in both official languages through focus groups in 2004. Computer-assisted interviewing (CAI) was used which facilitated the flow between questions and interviewer-prompting based on respondents' answers (Shields & Wilkins, 2006). Early in 2005 a pilot survey that included nurses within all study domains was conducted in both official languages to test survey content (Shields & Wilkins). Evaluation of the Statistics Canada interviewing team and collection operations occurred, further ensuring data quality.

The internal consistency of some scales in the NSWHN was measured using Cronbach's α , one of the most commonly used reliability coefficients (Shields & Wilkins). It is assumed that items are positively correlated with each other when they are measuring a common entity or construct (Tabachnick & Fidell, 2007). At a level of 0.8 or greater, correlations are affected very little by random measurement error (Tabachnick & Fidell). Some factors had

alpha reliabilities below 0.8 however these were computed using SAS software which typically produces scores lower than those calculated by SPSS (Shields & Wilkins).

Many precautions were taken in the primary study to reduce error and assure data quality (Shields & Wilkins, 2006). These included an initial in-depth analysis of survey variables by Statistics Canada for error detection, followed by external validation by CIHI and an expert advisory group composed of nurses, nursing managers and nurse decision-makers (Shields & Wilkins). High response rates improve data quality and were achieved in the NSWHN through comprehensive communication and structured interviewer training (Shields & Wilkins). As nurses can be registered in more than one province, records were screened for duplication and removed accordingly, effectively eliminating over-coverage (Shields & Wilkins). Missing contact information was actively sought and records with insufficient data were removed (Shields & Wilkins).

Data Analyses

For analyses, survey weights were produced by Statistics Canada so that the NSWHN sample data could be weighted to represent the three regulated bodies of nurses in Canada; 248, 063 registered nurses (RNs), 61, 978 licensed practical nurses (LPNs), and 4,889 registered psychiatric nurses (RPNs) (Shields & Wilkins, 2006). The weighting procedure is briefly described in the *Microdata User Guide* and involved a four-step procedure beginning with a theoretical sub-weight which involved sample strata and distribution (Statistics Canada, 2009b). Personal and sociodemographic characteristics were profiled using frequencies and cross-tabulations. Frequencies involved listing respondents' score values and determining how often they occurred (Shields & Wilkins).

Associations between respondents' health and specific aspects of their work were measured using multivariate logistic regression modeling (Shields & Wilkins, 2006). For the NSWHN, two models were used (Shields & Wilkins). The first separated health into three domains, examining it in relation to such tangible work factors as work hours, work setting and union membership. In the second set of models, nurses' health was examined in relation to psychosocial factors including autonomy, control-over-practice, respect, and workload (Shields & Wilkins). Potential confounders were controlled for by including such variables as sex, age, type of nurse and household income (Shields & Wilkins).

Secondary Analysis

Research Design and Study Setting

The current study was based on a secondary analysis of select data from the 2005 NSWHN. Advantages to this approach include access to clean data with many mechanical and technical aspects completed. As there is no publicly available file, access to these data was sought with a research proposal submitted October 14, 2009 concurrently to the adjudicating committee, operating under the auspices of the Social Sciences and Humanities Research Council (SSHRC), and Statistics Canada. The confidential version of the NSWHN is not available to the general public but can be accessed through the national Research Data Center (RDC) network by approved researchers (Statistics Canada, 2009). Approval was received from the SSHRC on October 29, 2009.

The NSWHN dataset has been used in several recent secondary analyses and reports, reflecting its versatility and current relevance. Other studies to use data from the NSWHN include an examination of associations between medication errors and select workplace factors of hospital nurses (Wilkins & Shields, 2008), an examination of employer-provided

support services in relation to nurses' job satisfaction (Wilkins & Shields, 2009), and recently, a publication of research using these data in the *Canadian Journal of Nursing Research* in June 2010 examines nurse-physician relations and the quality of nursing care (personal communication with Kathryn Wilkins, May 13, 2010). Finally, a study of the relationship between nurses' working conditions and absenteeism has been accepted for publication by *Health Policy* (personal communication with Sameer Rajbhandary, June 21, 2010). Although PHNs were included in the NSWHN, the data for this group had not previously been examined (personal communication with Kathryn Wilkins, July 9, 2009).

Study Variables

A data subset was selected from the original NSWHN questionnaire. The variables for this secondary analysis include job satisfaction, autonomy, control-over-practice, workload, age, education, and years working in public health. A list of the variables, type of variable, and level of measurement of each is provided in Appendix C.

As portrayed in the study conceptual framework (p. 21), job satisfaction served as the outcome, or dependent, variable. In the NSWHN, job satisfaction was measured using a single-item instrument (Shields & Wilkins, 2006). Recognized as a multi-dimensional construct including both personality traits and environmental factors, researchers have reported concerns about the use of single-item instruments for measurement of job satisfaction (Roelen, Koopmans, & Groothoff, 2008). Wanous, Reichers, and Hudy (1997) conducted a meta-analysis of research studies where single-item measures were correlated with scales measuring job satisfaction. Their study identified correlations between single-item measures and multiple-item scales, averaging 0.63 with the corrected mean correlation of 0.67, indicating convergent validity (Wanous, et al.). Nagy (2002) examined the job

satisfaction surveys of over 200 employees from different organizations, including both single and multiple-item scales. Single-item measures were significantly correlated with multiple-item instrumentation (Nagy). Other researchers have reported similar findings.

Roelan, et al. (2008) compared a multidimensional job satisfaction instrument originally developed for the social services sector, the Job Satisfaction Survey (JSS), with a single-item measure using a Likert-scale and found its internal consistency to be between $r = 0.73$ and $r = 0.90$ with its concurrent validity $\alpha = 0.92$, relative to the JSS with a construct validity of $\alpha = 0.91$. These researchers who have compared the two instruments recognize the value of well-constructed scales but suggest single-item measures of job satisfaction are easier, take less time than scale measures, and may have more face validity, making them the preferred measure in an otherwise lengthy questionnaire such as the NSW HN. Using a single-item, Likert-like scale, respondents of the NSW HN were asked; 'On the whole, how satisfied are you with this job?' Higher scores equated to increased dissatisfaction.

An initial step in the study analyses was to dichotomize the dependent variable, job satisfaction, to fulfill the selected analytical test assumptions. Multivariate logistic regression was determined to offer the best analytical approach for two of the research questions and although few typical parametric test assumptions are required for logistic regression, the outcome variable must be discrete (Worster, et al., 2007). Additionally, job satisfaction could not be treated as a continuous variable due to small cell counts with highly skewed positive data, further supporting the decision to dichotomize the outcome variable.

Initial efforts to dichotomize the dependent variable also created methodological challenges. Originally, respondents who answered either 'very satisfied' or 'somewhat satisfied' were combined and coded as 'Satisfied' and those who answered 'somewhat

dissatisfied' or 'very dissatisfied' were combined and coded as 'Dissatisfied'. Frequency tabulations were run on respondents who met study inclusion criteria ($n=271$). Of these, 89.6% identified themselves as 'Satisfied'. Based on the same classification scheme, similar percentages of community health nurses (93.4%) and all other types of registered nurses (88.4%) in the NSWHN identified themselves as 'Satisfied'.

Although a similar dichotomization process was implemented by Wilkins and Shields (2009) when examining Canadian registered nurses' job dissatisfaction and employer support services, the size of the sample was considerably larger ($n = 2,993$) and accordingly, the statistical power was greater than was the case for the current study. Because of the skewed distribution of the responses to nurse satisfaction and after consultation with thesis committee members, it was determined that responses of 'very satisfied' would be defined as one group ($n = 145$, 53.5%) and those 'other than very satisfied' ($n = 126$, 46.5%) would constitute the second group. Additionally, in consultation with Statistics Canada analyst, Dr. Billette, it was determined that reverse coding the outcome variable would facilitate ease of test interpretation. Interpretation of odds ratios is dependent on how the outcome is coded. Tabachnick and Fidell (2007) suggest care must be taken to ensure the outcome variable is coded in a direction reflective of the eventual desired interpretation. Therefore, 'very satisfied' was coded as '1' and 'other than very satisfied' as '0'.

Developed from job satisfaction and work value literature as well as recognized magnet hospital characteristics literature, the original NWI contained 65 items (Lake, 2007). In the subsequent revised measure, Nursing Work Index-Revised (NWI-R), items were categorized on a theoretical basis and grouped under three factors; autonomy, control-over-practice, and nurse-physician relationships (Aiken & Patrician, 2000). Lake undertook a systematic

evaluation of existing instrumentation measuring nurses' professional practice environments, identifying 'conceptual relevance' as the principle criterion. She examined seven instruments and 54 studies, finding that the NWI-R was the most widely used. Lake describes the primary distinction between the NWI and the NWI-R is that the latter focused on specific organizational traits such as leadership, adequate staffing, and time allowance rather than perceived productivity associated with these traits. Although originally developed for use in the hospital setting, researchers have utilized the NWI-R in community nursing settings (Flynn & Deatrack, 2003; Tullai-McGuinness, 2008).

The NSWHN implemented four components of the NWI-R and based on the conceptual framework, two of these, autonomy and control-over-practice, were selected for this secondary analysis. Both factors demonstrated excellent reliability with Cronbach α measured at 0.93 for autonomy and 0.91 for control-over-practice (Shields & Wilkins, 2006). Each related question involved a 4-point Likert scale with range from 1 'strongly agree' to 4 'strongly disagree'. Based on feedback from earlier pilot testing, the NSWHN included a fifth category, 'not applicable' (Statistics Canada, 2009b). For final calculations, responses were rescaled from 0 to 3, inverted, and summed (Statistics Canada). Higher scores were indicative of a more positive work environment (Statistics Canada, 2006). Based on a five item measure, autonomy scores ranged from 0 to 15, and with seven related questions, control-over-practice scores could range from 0 to 21 (Statistics Canada).

Not all NWI-R questions were applicable to every nursing situation in the primary study (Statistics Canada, 2009b). In order to maximize the number of respondents for whom scores were calculated, the NSWHN implemented an imputation process where scores were calculated based on items with responses which were then adjusted to compensate for non-

response items (Shields & Wilkins, 2006). Statistics Canada established a threshold where one non-response was permitted for autonomy and two for control-over-practice (Shields & Wilkins). The imputation process used by Statistics Canada in the calculation of the NWI-R score was advantageous for the current study as one factor of autonomy, and two of control-over-practice, were frequently identified as 'not applicable' by these Canadian PHNs.

The question related to autonomy, "I have a nurse manager or immediate supervisor who backs up nursing staff in decision-making, even if it is in conflict with a physician" (WI_Q12) was not applicable to 24.4% ($n = 66$) of the nurses in the current study sample. Two questions related to control-over-practice were problematic: only 23.2% ($n = 63$) responded to "I am given the opportunity to work on highly specialized patient care units" (WI_Q14) and 58.7% ($n = 159$) answered the question "I am given assignments that foster continuity of care" (WI_Q15). Other questions were also answered as 'not applicable' or 'don't know' by several respondents resulting in cases being excluded from some inferential analyses. Nearly all, 95.6% ($n = 259$), respondents included sufficient information to calculate autonomy scores. Fewer control-over-practice scores 86.3% ($n = 234$) included full responses, and questions related to nurses' workload resulted in 99.3% ($n = 269$) of respondents providing answers to all associated questions.

Workload was the third modifiable workplace variable to be included in the current study. It was measured in the NSWHN using a five-point Likert-like scale. Responses ranged from 1 'strongly agree' to 5 'strongly disagree'. These values were rescaled to range from 0-4, inverted, and the five item scores were summed. With a range of 0 to 20, higher scores were indicative of heavier workloads (Statistics Canada, 2009b). Cronbach α was measured at 0.785 which is slightly lower than the measures identified for autonomy and

control-over-practice. However, this value was determined to be acceptable given the fact that the SAS software, used in the original study, typically produces values lower than the software (SPSS) used for analyses in the current study (Statistics Canada, 2009b).

Additionally, the small number of items may reduce resulting Cronbach α values.

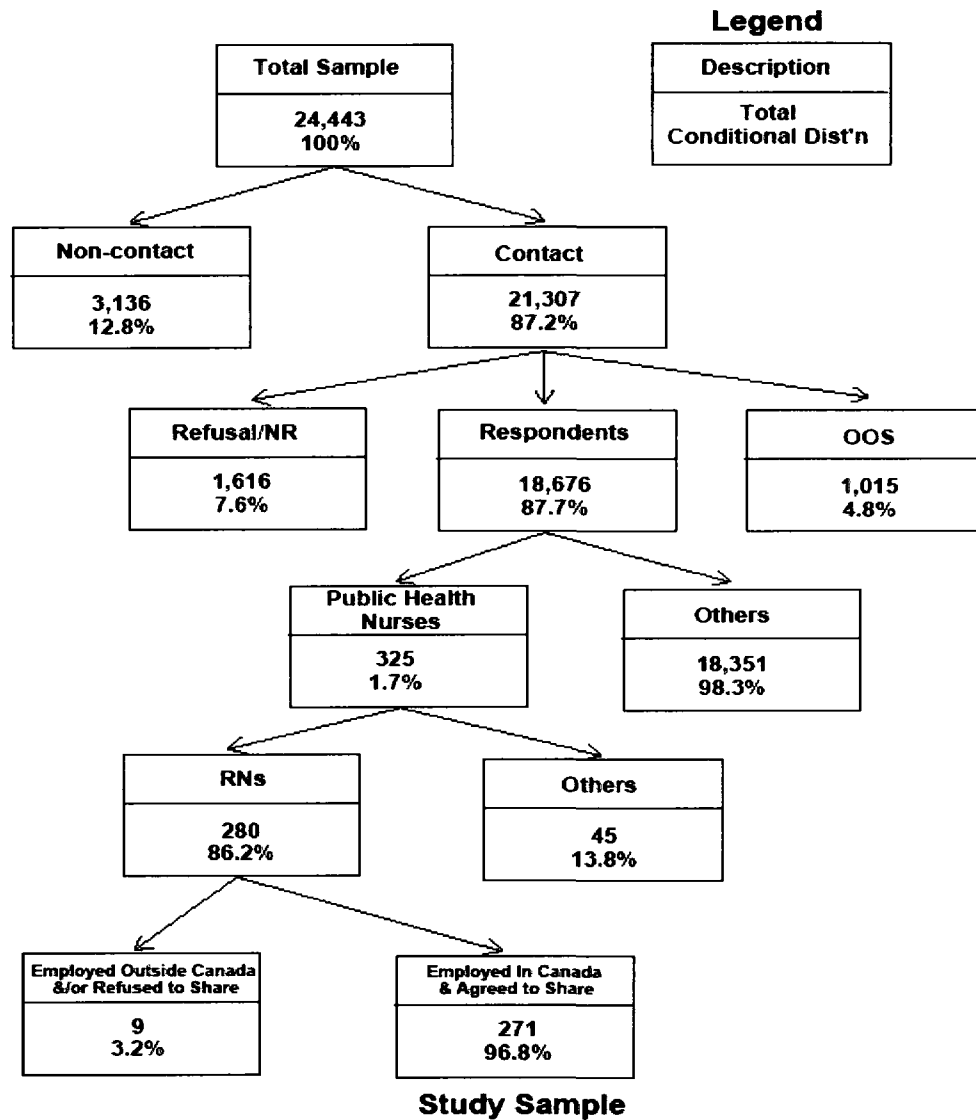
In the NSWHN, workload was titled 'role overload' (Shields & Wilkins, 2006) but for the current study, the term 'workload' was used. Review of the literature revealed the interchangeable nature of these terms, with 'role overload' being considered an excessive workload (Duxbury, Higgins, & Lyons, 2009; Wilson, 2005). Respondents to the NSWHN scoring 16 or higher were classified as having 'role overload' (Shields & Wilkins) therefore, scores below 16 were determined to be measures of a moderately heavy to normal workload. Appendix D includes study variables and their related questions.

Ultimately, non-responses resulted in only 223 cases where information was available on all three independent variables, thus reducing sample size and study power. Ordered logistic regression is an imputation approach which could be used to address this issue. After consultation with Dr. Billette and thesis committee members, it was determined that this approach would not be utilized as the missing cases do not reduce the sample size by a large margin and resulting imputations may not be representative of the population. Norman and Streiner (2008) also suggest that imputation may not be the best approach if a large percentage of the sample is not lost in missing data; 82.3% of the original sample remained. It was determined analyses would proceed with the valid $n = 223$ (listwise) data sub-sample.

Sampling Procedure

Figure 2 outlines breakdown of the total NSWHN sample and displays selection of the sub-sample for this secondary analysis. Prior to accessing the primary study dataset,

personal correspondence occurred on July 28, 2009 with Kathryn Wilkins, a principal investigator for the NSWHN. Ms Wilkins revealed that 278 respondents identified themselves as registered nurses with public health reported as their main area of employment. As this dataset had not been examined previously with a focus on PHNs, a decision was made in consultation with Ms Wilkins and thesis committee members to evaluate the job satisfaction of Canadian PHNs for this thesis research using the NSWHN dataset. Once the required conditions and approvals were achieved and access to the dataset granted, closer examination revealed that 271 nurses from the original study met study inclusion criteria. Those to be included were registered nurses, currently practicing in Canada who identified public health as their main occupation. Finally, only those respondents who agreed to share their information were included.

Figure 2: Study Sample Selection

(Adapted *National Survey of the Work and Health of Nurses, 2005 – User Guide*, p53: Statistics Canada, 2009)

Non-contact: Those nurses originally randomly selected for study who could not be contacted

Contact: Regulated nurses successfully reached based on information provided by regulatory authorities

Refusal/NR: In-scope nurses from whom a completed questionnaire was not obtained

Respondents: Nurses' questionnaires containing enough data to be considered complete

OOS: Nurses out-of-scope were not considered part of the target population – inclusion criteria not met

The sample size was initially determined to be adequate to test the relationships between the selected study variables using the Tabachnick and Fidell's (2007) conservative assumption that, with alpha at 0.05 and statistical power of 80%, only 10 cases are required for each variable, level of variable, or interaction term. Additionally, using a web-based computer software program for power calculations, G*Power, calculation of a sample size for a given effect size, alpha level, and power level was obtained. For example, using this program and a medium effect size of 0.3, it was determined that the sample for this study would result in 96% power when using Chi-square test to examine job satisfaction differences across the various geographical regions in Canada.

Analysis of these data provides a perspective generalizable to the whole nation because the 2005 NSWHN sample was distributed across Canada and application of the survey weights renders the sample representative of the target population. The NSWHN instructed participants to answer questions based on their main area of employment; nurses who identified public health in response to this question were included in this secondary analysis. Although the current definition of a PHN specifies baccalaureate preparation, this was not a requirement for the current study. Many RNs began working in public health before the present educational requirements were stipulated and fulfill the PHN role. Their inclusion adds valuable insight to this study as these nurses have been providing public health services and programs for decades and have witnessed organizational and system-level change.

Data Analyses

Data analyses for the current study were conducted at the University of Ottawa's Research Data Center network site, 65 University Street in Ottawa, Canada. The Carleton, Ottawa, Outaouais Local Research Data Center (COOL RDC) is an inter-university facility

where approved applicants can access Statistics Canada data to conduct their research. The COOL RDC provides access to a number of detailed longitudinal data files and complements Statistics Canada's Data Liberation Initiative (DLI). First established in 1996, the DLI permits public access to specialized electronic data through select university libraries for research and teaching purposes (Statistics Canada, 2009a). Prior to implementation of this program, these data may have been unavailable or prohibitively expensive for researchers wishing to conduct studies using these datasets.

After the required University of Ottawa Ethics Review Board (REB) and SSHRC approvals were obtained, the current study analyses were conducted on select 2005 NSWHN data using the Statistical Package for the Social Sciences (SPSS) version 18.0 for Windows, known as PASW- Predictive Analytic Software. Only COOL RDC analyst-approved output files were permitted to leave the center for later review and consultation with thesis committee members. All analyses occurred on-site at the COOL RDC as per Statistics Canada regulations. Consultation with committee members well-versed in statistical analyses occurred on an on-going basis and tests to be conducted were pre-determined as per an approved study analytic framework (Appendix E).

Use of survey weights with the NSWHN data increases the external validity of the study findings (personal communication with Kathryn Wilkins, September 9, 2009). Survey weights were produced by Statistics Canada methodologists when processing the NSWHN data, and were used in the current study. Although nurses in the primary study were largely randomly selected, some sectors of nurses and geographic regions were over-sampled in order to secure adequate numbers of participants to produce reliable estimates (Wilkins). The NSWHN sampling scheme was designed to include higher participant proportions in the

territories and in provinces with lower numbers of nurses to allow for reliable estimates for these areas (Wilkins). Using sampling weights accounts for unequal probabilities of selection and reduces bias potential that could result from unequal response rates found in the original study raw data (Wilkins). The sample weights were designed for use with the data according to the sampling strategy that was used by the NSWHN. In using these weights, estimates of the number of PHNs in Canada can be generated. When the survey weights were applied, the PHN sample ($n=325$) in the NSWHN represented 4,697 Canadian nurses practicing in public health in 2005 (Statistics Canada, 2008).

The exact number of practicing Canadian PHNs is unknown due to differing terminology, definitions, and classifications of roles across the country (personal communication with Jane Underwood, September 2, 2009). Despite the difficulties in determining the number of Canadian registered nurses currently practicing in the public health sector, the NSWHN estimate of 4,273 which resulted from weighting the study sample of nurses who identified themselves as working in public health, appeared somewhat low based on literature perused to date. Although there is currently no consistently accepted national public health human workforce enumeration strategy, Ontario has made strides in calculating these numbers provincially. The following calculations were considered:

In Ontario, 2004 (Baumann, Underwood, et al., 2006)

- Practicing registered nurses = 110,596
- 15.5% of RNs identified as community health nurses = 17,142 CHNs
- 20% of CHNs identified as public health nurses = 3,428 PHNs

The 2005 NSWHN reported (Statistics Canada, 2006)

- Ontario PHNs constituted 35.4% of the entire Canadian PHN workforce

Therefore,

- $100\% \text{ (Canadian PHNs)} = 35.4\% \text{ (ON PHNs)} + X \text{ (other provinces/territories)}$
 - $X = 64.6\% = ([3,428 \times 64.6] \div 35.4)$
 - $X = 6,256$ Canadian PHNs outside of Ontario
- Canadian RNs = 9,675
 - $3,428 \text{ (ON PHNs)} + 6,256 \text{ (PHNs from other provinces/territories)}$
- Consider possible under-sampling of PHNs in the 2005 NSWHN

These calculations were provided to Kathryn Wilkins for her opinion in a personal communication occurring January 5, 2010. Ms Wilkins stated she was confident the NSWHN did not under-sample PHNs, stating the sample was selected nearly at random from provincial nursing registration lists. Similar to other researchers (Diaz-Swearingen, 2009; personal communication with J. Underwood, September 2, 2009), Ms Wilkins identified that discrepancies exist in the differentiation of roles and classifications between public health and community health nurses across the country. These dissimilarities could create varied self-reporting of respondents' main job in the NSWHN however the methodological weighting procedure implemented by analysts at Statistics Canada resulted in reliable estimates of population counts (Wilkins).

Initial descriptive analyses were based on calculations of frequencies and bivariate tabulations. Rescaled sample survey weights were used in analyses because the strength of relationships between variables was to be assessed with the representative sample, not the entire population (personal communication with Dr. Billette, January 5, 2010). Failing to rescale the weights would have artificially inflated the significance of many relationships and potentially produced meaningful associations where none existed (Billette). SPSS calculations were utilized to rescale the sample weights prior to conducting all analyses.

The study conceptual framework (p. 21) illustrates the proposed relationship between the three selected modifiable work environment characteristics and Canadian PHNs' job satisfaction. Nurses' age and years working in public health are classified as non-modifiable variables in the context of this thesis. Statistical tests initially included descriptive analyses such as means, standard deviations, and frequencies for participant demographic characteristics. Frequencies and cross-tabulations were used to describe personal and socio-

demographic characteristics of PHNs. A list of research questions, related variables and their level of measurement, and statistical tests used are included in Appendices C, D, and E.

Consistent with the Study Analytic Framework, multivariate logistic regression analysis was used for research question #1 to study relationships between the independent variables of interest (autonomy, control-over-practice, and workload) and the dependent variable (job satisfaction). Multivariate logistic regression permits examination of the collective relationship or individual relationships between the independent variables and the dependent variable (Tabachnick & Fidell, 2007). The relative importance of several predictors considered simultaneously in relation to changes in the outcome can be estimated (Tabachnick & Fidell). As described earlier, job satisfaction was dichotomized for the purpose of testing relationships. The Wald statistic was used to evaluate the significance of individual predictors in the logistic regression equation. When a relationship between explanatory variables can be expressed as a statistical model with parameters to be estimated from a sample, the Wald test may be used to test the actual value of the parameter based on the sample estimate (Crichton, 2001). The final step in the modeling procedure was to test for the significance of interaction terms representing possible effect modifiers. Two way interaction terms were constructed using autonomy, control-over-practice, and workload and were entered into the logistic regression model.

Multivariate logistic regression analysis was also used for research question #2, to determine whether there were significant associations with PHN job satisfaction and interactions between age and years of work and the three selected work characteristics. Again, 'job satisfaction' was dichotomized in order to meet the test assumption of a nominal level dependent variable for this test. Researchers have reported a difference in levels of job

satisfaction between various generations of nurses (Lavoie-Tremblay, O'Brien-Pallas, et al., 2008); others have noted relationship between the numbers of years worked and job satisfaction (Wilson, et al., 2008). While these studies provide valuable insight into the relationship of these variables with job satisfaction, they focused predominantly on nurses employed in the acute care sector. No studies were located that examined these concepts within the domain of public health nursing. Two-way interaction terms were constructed with age, the number of years participants had worked, autonomy, control-over-practice, and workload using logistic regression models for analysis.

Finally, the Chi-square test was implemented for research question #3, to test whether observed values in a contingency table were statistically different from the expected ones, comparing job satisfaction between PHNs working in the Western, Northern, Central, and Atlantic regions of Canada. Once again, satisfaction was dichotomized for the purpose of conducting these comparisons. The Chi-square distribution is a theoretical probability distribution, used to compare samples or variables (Pett, 1997).

Many Chi-square test assumptions were met with the study sample. However, because of the minimal number of respondents from the northern regions of Canada including Yukon Territory, Northwest Territories, and Nunavut ($n = 4$), the test assumption requiring a minimum of an expected frequency in any one cell of the contingency table to be greater than 5 was not met. More stringent than even this Chi-square test assumption, COOL RDC data release criteria demands a minimum of 10 cases per cell for weighted data and 30 cases for un-weighted data. Based on these sample size requirements, it was determined that data for northern PHNs would have to be excluded for research question #3. Therefore, only Western, Central, and Atlantic Canadian PHNs were compared in this question.

Although some studies have examined the job satisfaction of Canadian PHNs, they have been conducted in individual provinces including British Columbia (Henderson-Betkus & MacLeod, 2004), Saskatchewan (Schoenfeld & MacDonald, 2002), Alberta (Reutter & Ford, 1996), and one unspecified Canadian regional health authority (Best & Thurston, 2006). Until recently, the literature revealed no studies examining the differences in PHNs' job satisfaction across Canada. In their foundational 2009 study from the Nursing Health Services Research Unit (NHSRU), 'Building Canadian Public Health Nursing Capacity: Implications for Action', Meagher-Stewart, Underwood, Schoenfeld, et al. examined many variables correlated with PHN satisfaction, dividing respondents into different Canadian regions (Atlantic, Quebec, Ontario, Prairies, British Columbia, and North). Neither the rationale for this division nor the results pertinent to it were reported. As the second largest country in the world, Canada's varied geography and climate presents unique challenges to delivery of healthcare for all sectors including public health (Marchildon, 2005). Given the clear links between job satisfaction and health system outcomes, a study aim was to produce an overview of regional PHN differences providing a national perspective of their work.

Statistically significant findings were examined to determine the cause of differences using the appropriate post hoc tests, implementing Bonferroni's principle as required; otherwise, a p -value of less than 0.05 was determined as the level of test significance. This same p -value was utilized in the NSWHN (Shields & Wilkins, 2006). As per Statistics Canada regulations (2009b), coefficient of variation was calculated on all statistically significant findings to determine quality of estimates.

Coefficient of variation (CV) is a data quality measure stipulated in Statistics Canada (2009b) *NSWHN Microdata User Guide* (p. 64): "For weighted estimates based on sample

sizes of 30 or more, users should determine the coefficient of variation of the estimate and follow the guidelines below.” CVs were calculated by dividing standard error of all statistically significant estimates by the estimates themselves; $(CV) = (SE \div B) \times 100\%$. Values are expressed as a percentage of the estimate and rated as ‘acceptable’ [sample size > 30 + low CV (0.01% - 16.5%)] where no warning is required, ‘marginal’ [sample size >30 + high CV (16.6% - 33.3%)] where the estimate is flagged, and ‘unacceptable’ [sample size <30 OR very high CV (>33.3%)]. All estimates are considered releasable but must be accompanied by CVs (Statistics Canada). Calculations of CVs for all significant estimates were conducted and have been documented in this study.

Analysis consultation and advice was provided from many members of both the University of Ottawa academic community, and private sector. Dr. Barbara Davies offered overarching advice and support throughout the entire process while specific analyses direction was provided by Dr. Kirsten Woodend, both faculty members at the University of Ottawa. Kathryn Wilkins, a primary investigator for the 2005 NSWHN and employee of Statistics Canada, answered queries regarding the study design and analysis. Thesis committee members Jane Simpson and Shannon Mantha provided content expertise. Finally, none of this could have been accomplished without the ongoing support, direction, and advice from Dr. Jean-Michel Billette, Statistics Canada analyst, COOL RDC.

Knowledge Translation

The final study component involved bringing together a diverse group of stakeholders from across Canada for a one-day Knowledge Translation (KT) ‘Think-Tank’, held on May 17, 2010 in Ottawa, Ontario. Participants came from five provinces and one territory, including PHNs from Prince Edward Island, Nova Scotia, Québec, Ontario, British

Columbia, and Nunavut (Appendix F). Objectives included providing an overview of the primary study and presenting the current study approach and findings to participants.

Determination of the relevance of study findings from PHNs' practice perspective was also a crucial objective of the day. Inclusion of practioners' opinions in the research process was integral to this study. Generation of recommendations was the final KT objective, integrating literature findings, study results, and knowledge users' perceptions.

Knowledge users are considered those likely to use the knowledge generated through research to make informed decisions (CIHR, 2009) such as those participants of the KT Think-Tank. "If research evidence is to be successfully applied, the people who will ultimately use the knowledge need to be meaningfully engaged in the research process itself" (CIHR, 2008, p. ii). Integrating KT Think-Tank participants' insight added depth otherwise not achievable through statistical analyses alone. A collaborative approach underpins PHNs' practice philosophy (CHNAC, 2008) and is also considered foundational for effective knowledge translation practice (Straus, Tetroe, & Graham, 2009).

The original objectives of the KT Think-Tank included providing an opportunity for PHNs to evaluate study findings' relevance to their practice and to integrate practioners' voices in into the research process, reflective of the Knowledge-to-Action framework adopted by CIHR (2008). This process was enhanced by the attendance of researchers, educators, and senior Canadian policy analysts. Participation of a principal investigator from the primary study also offered a unique KT dimension. In her presentation, Kathryn Wilkins outlined the NSWHN and then remained to participate in the day's discussion. Activities included dissemination of study results and a collaborative interpretation of findings. Interpretation and generation of recommendations were facilitated by synthesis of various

forms of available evidence including study results, literature, and KT Think-Tank participants' varied practices, backgrounds, and experience.

Ethical Considerations

Meticulous attention was given to protection of participants' rights and confidentiality in the NSWHN. Respondents were initially notified by mail of this national survey to determine their willingness to participate (Shields & Wilkins, 2006). Data were then collected by telephone interviews conducted by trained NSWHN team members. Participation was voluntary and data were collected directly from the survey respondents (Statistics Canada). Although no written consent was obtained, survey completion provided the required consent (The Interagency Advisory Panel on Research Ethics, 2008). Respondents were informed they could withdraw from the study at any time and provided opportunity to ask questions throughout the interview, satisfying 2008 Tri-Council Policy Statement (TCPS) general principles (The Interagency Advisory Panel on Research Ethics).

As the current study was considered a minimal risk project, a proposal was submitted September 30, 2009 to the University of Ottawa's Research Ethics Board (REB) requesting an expedited review. The study did not involve patient data and nurses are not considered a vulnerable population (TCPS, 2008). Precautions taken in the primary study to prevent direct or residual disclosure of identifiable data, ensuring protection of participants' rights and identities also protected those included in this secondary analysis. Processes stipulated by Statistics Canada required to access these data further prevented potential disclosure of any information deemed confidential. All output was submitted to COOL RDC analyst, Dr. Jean Michel Billette, for vetting and approval prior to center release and reporting.

Two confidential NSWHN microdata files are available; the 'master release file' held at Statistics Canada, and the 'share' file held by the Canadian Institute for Health Information (CIHI) and Health Canada (Shields & Wilkins, 2006). The principal difference between the two files is the amount of information they contain. The share file includes data from those participants who agreed to share their information with CIHI and Health Canada for statistical reasons whereas the master file contains all data. The national share rate was excellent at 98.2% (Statistics Canada, 2009b). Permission to use the master file was provided by Statistics Canada. However, only those PHNs who agreed to share their information were included in the current study as per the REB application. Study approval was received from the University of Ottawa REB October 19, 2009 (Appendix G).

Participation in the final study component, the KT Think-Tank, was voluntary and no remuneration other than for travel, accommodation, and meal expenses was paid, as per the submitted and approved University of Ottawa REB proposal. Lisa Ashley, nurse consultant, of the Canadian Nurses Association, assisted in contacting PHNs who had identified interest in participating in research by general email and informed of this KT opportunity. PHNs were provided with the email address of the student researcher to contact voluntarily if they were interested in attending. REB-approved letters of invitation were sent to the first seven practitioners from different provinces and one territory (Appendix H). Invitation was also extended to the Health Canada Office of Nursing Policy, the Canadian Nurses' Association, and the Public Health Agency of Canada. All those who were invited attended. In total, sixteen participants attended the KT Think-Tank as was determined by budget and space restrictions, with national representation as a foundational goal. Seven participants were currently practicing PHNs or PHN managers, and of the remaining nine

stakeholders, seven had worked as PHNs at one time. As per REB proposal, no audio-taping occurred, however meeting minutes and observations were recorded. All data produced will be held in a locked cabinet at the University of Ottawa, Nursing Best Practice Research Unit for a period of 5 years as per the REB application.

Summary

The purpose of this secondary analysis was to describe the sample of PHNs included in the 2005 NSWHN, and determine relationships between selected modifiable work environment variables (autonomy, control-over-practice, and workload) and job satisfaction. Secondary analyses of data collected from the primary study dataset were completed. To explore the relationship between work environment factors and job satisfaction, multivariate logistic regression analyses were completed and Chi-square tests performed. This study used high-quality, nationally representative data to examine the phenomenon of Canadian PHNs' job satisfaction, interpreting findings with KT Think-Tank participants' insight. Results may serve to provide decision-makers with information to facilitate design of new strategies to recruit and retain this vital subset of national health human resources.

CHAPTER FOUR

Secondary Analysis Results

This chapter presents results of the secondary analysis of data from the 2005 National Survey of the Work and Health of Nurses (NSWHN). The first section includes descriptive statistics of demographic factors related to the study sample, Canadian public health nurses (PHNs), and the selected work environment factors. The second section addresses the three research questions using multivariate logistic regression analysis and the Chi-square test.

The purpose of this study was to examine the relationships between Canadian public health nurses' job satisfaction and three selected modifiable work environment factors; autonomy, control-over-practice, and workload. The research questions were as follows:

- 1) What is the relationship between Canadian public health nurses' job satisfaction and their autonomy, control-over-practice, and workload?
- 2) How do sociodemographic factors such as nurses' age and years working in public health influence the association between the included workplace variables and nurses' job satisfaction?
- 3) Is there a difference in public health nurses' job satisfaction between different Canadian regions; Western, Central, and Atlantic?

Demographic Characteristics of the Sample Group of Canadian Public Health Nurses

The mean age of participants was 42.49 years (standard deviation, SD 10.68). In 2005, when the survey was done, the largest proportion (31%) of study PHNs were between 35 and 44, and 25% were under 35 years old. The smallest proportion of these nurses (15%) was over 55. Table 1 includes descriptive characteristics of the study sample PHNs.

A majority of respondents (68%) held a bachelor of science in nursing (BScN) and 28% held a diploma, while 4% possessed a nursing education other than a diploma or BScN, such as a masters or doctoral degree. Non-nursing educational qualifications were also considered with 10% reporting an associate baccalaureate degree.

Table 1
Select Demographic and Work Characteristics of Canadian Public Health Nurses Study Sample

Characteristics	Rescaled weighted sample (n=271)	Non-rescaled weighted sample (N=4,273)	Estimated %
Age:			
Mean	42.49		
Median	42.00		
SD	10.68		
Grouped Respondent Age:			
<35	68	1,066	24.9
35-44	84	1,322	30.9
45-54	78	1,236	28.9
>55	41	649	15.2
*Highest 'nursing' education:			
Diploma	75	1,178	27.6
BScN	185	2,924	68.4
RPN/MScN/PhD/Other	11	171	4.0
*Highest 'non-nursing' education:			
None	231	3,643	85.2
Bachelors	29	461	10.2
Certificate/Diploma/Masters	11	169	4.0
*Year began nursing:			
1955-1967	13	211	4.9
1968-1980	91	1,439	33.7
1981-1993	86	1,355	31.7
1994-2004	80	1,269	29.7
*Year started current job:			
1969-1978	12	196	4.6
1979-1988	25	396	9.3
1989-1998	97	1,526	35.7
1999-2004	137	2,154	50.4
Current working status:			
Permanent employee, full-time	141	2,223	52.0
Permanent employee, part-time	97	1,530	35.8
Non permanent employee, full-time	11	168	3.9
Non permanent employee, part-time	22	345	8.1
Immediate supervisor a nurse	235	3,699	86.6

*Recoded/collapsed data to meet COOL RDC minimum cell count requirement for output file release

Rescaled weighted sample: Raw sample data weighted to represent national PHN population, rescaled to sample size

Non-rescaled weighted sample: Representative of national PHN population

Over one third of PHNs (34%) reported that they began their nursing career between 1968 and 1980; this means they had been practicing between 26 and 38 years. Those practicing between 13 and 25 years constituted 32% of the sample and only 5% of these nurses had been practicing between 39 and 51 years (1955-1967). Most PHNs had begun their nursing careers outside of the public health sector.

The majority of nurses (51%) in this study had worked in public health for less than 7 years with the smallest proportion (5%) practicing for the longest period, more than 28 years. Approximately half (52%) of the PHNs identified that they held permanent, full-time positions while 36% reported permanent, part-time classification. The remaining 4% were non-permanent full-time, and 8% worked as non-permanent, part-time PHNs. A large majority of respondents (86.6%) revealed their immediate supervisor was a nurse.

Table 2 provides an overview of the study sample distribution across Canada and includes individual provincial populations and land areas for additional context. The NSWHN purposefully oversampled smaller provinces and territories in order to secure adequate response rates from those areas (Shields & Wilkins, 2006). Counts of PHNs generated by applying frequency weights are included, identified as 'Non-rescaled PHN Sample'. Survey weights are rescaled down to the sample size (Rescaled PHN Sample).

The highest proportion of study PHNs (46%) were from the central region (Ontario and Québec). Manitoba, Saskatchewan, Alberta, and British Columbia, constituted the second largest, western region (43%). Only 10% of PHNs were employed in the Atlantic region (Newfoundland, Prince Edward Island, Nova Scotia, and New Brunswick), and the smallest proportion (1.4%) of PHN respondents identified that they were employed in the northern region of Canada (Yukon Territory, Northwest Territories, and Nunavut).

Table 2
Distribution of Canadian Public Health Nurses Study Sample by Geographic Region

	Geographic Area km²	General Population	Rescaled PHN sample	Non- rescaled PHN sample	Estimated %
Atlantic					
Newfoundland	370,495	505,469	7	107	2.5
Prince Edward Island	5,684	135,851	3	41	1.0
Nova Scotia	52,917	913,462	9	149	3.5
New Brunswick	71,355	729,997	7	111	2.6
Total	500,451	2,284,779	26	408	9.6%
Central					
Ontario	907,574	12,160,282	96	1,514	35.4
Québec	1,356,367	7,546,131	28	438	10.2
Total	2,263,941	19,706,413	124	1,952	45.6%
Western					
Manitoba	552,370	1,148,401	17	267	6.2
Saskatchewan	588,276	968,157	18	291	6.8
Alberta	640,045	3,290,350	39	614	14.4
British Columbia	924,815	4,113,487	43	683	16
Total	2,705,506	9,520,395	117	1,855	43.4%
Northern					
Yukon Territory	474,711	30,372			
Northwest Territories	1,140,835	41,464			
Nunavut	1,932,255	29,474			
Total	3,547,801	101,310	4	60	1.4%
TOTAL 100%	9,017,699	31,612,897	271	4,273	

Population & Area data obtained from Statistics Canada Census (2006); Rescaled PHN sample: Raw sample data weighted to represent national PHN population and then rescaled to sample size; Non-rescaled PHN sample: Representative of national PHN population

Distribution of Autonomy, Control-Over-Practice, and Workload Scores

Table 3 includes descriptive characteristics of the selected study independent variables' cumulative scores; autonomy (range=0-15), control-over-practice (range=0-21), and workload (range=0-20). For study participants' who responded to all questions related to autonomy, the mean autonomy score was 11.57 with a SD of 3.04. The mean score for control-over-practice was 13.39, SD = 4.54 and for workload the mean was 10.94 with a SD of 5.12. A total of 82.3% of respondents provided complete data on all three variables.

Table 3
Work Environment Variables' Total Score Descriptives

Variable	Sample (<i>n</i>)	Range		Mean	Std. Deviation
		Min	Max		
Autonomy	259	0	15	11.57	3.04
Control-Over-Practice	234	0	21	13.39	4.54
Workload	269	0	20	10.94	5.12
Valid N (listwise)	223				

Individual Factor Descriptives

Table 4 displays the percentage rate of agreement that study PHNs reported with each of the independent variable factors. Five survey items were used to measure autonomy, seven for control-over-practice, and five for workload. Also included in this table is the distribution of the outcome, or dependent variable, job satisfaction.

Autonomy factor scores were generally favourable for these Canadian PHNs. A large proportion (91%) agreed they were not placed in a position of having to do things against their nursing judgement. Over three quarters (78%) reported that nursing controls its own practice and 83% described supervisory staff as supportive of nurses. A majority (92%) said they had the freedom to make important patient care and practice decisions.

Fewer respondents agreed with individual control-over-practice factors to such a high degree. Only 59% reported that there were adequate support services in their practice, permitting them to spend time with their clients and just 64% of respondents stated that there were enough nurses on staff to provide high quality care. The highest overall scoring factor for control-over-practice was related to leadership with 73% agreeing that they had a nurse manager or immediate supervisor who was a good leader.

Workload factors were used to measure respondents' perceptions of the amount of work overload expectations nurses experienced in their day-to-day practice. Over half (58%) of PHNs reported that they often had to work through their breaks to complete assigned tasks, while 44% agreed that they either arrived early or stayed late to get their work done. A total of 56% felt they had too much work for one person. Approximately one half (54%) of PHNs reported they were very satisfied with their job, while the remaining respondents reported that they were less than very satisfied.

Table 4
Public Health Nurses' Response to Study Variable Factors: Percentage Agreement

Variable	Rescaled weighted sample (<i>n</i>)	Estimated %
Total	271	100.0
Autonomy (<i>n</i> = 259)		
1. The supervisory staff is supportive of nurses.	220	83.2
2. Nursing controls its own practice.	206	77.5
3. I have the freedom to make important patient care and work decisions.	248	91.6
4. I am not placed in a position of having to do things that are against my nursing judgement.	247	91.4
5. I have a nurse manager or supervisor who backs up nursing staff in decision-making, even if in conflict with a physician (<i>n</i> =205/271).	165	80.8
Control-Over-Practice (<i>n</i> = 234)		
1. Adequate support services allow me to spend time with my patients.	160	59.0
2. There is enough time and opportunity to discuss patient care.	189	69.7
3. There are enough nurses on staff to provide quality patient care.	172	63.5
4. I have a nurse manager or immediate supervisor who is a good manager and leader.	197	72.7
5. There is enough staff to get the work done.	185	68.3
6. I am given the opportunity to work on highly specialized patient care units (<i>n</i> =63/271).	35	55.6
7. I am given assignments that foster continuity of care (<i>n</i> =159/271).	113	71.1
Workload (<i>n</i> = 269)		
1. I often have to arrive early or stay late to get my work done.	119	44.1
2. I often have to work through my breaks to complete my assigned workload.	156	57.6
3. It often seems like I have too much work for one person to do.	151	55.7
4. I am given enough time to do what is expected of me in my job.	116	42.8
5. I have too much to do to do everything well.	114	42.0
Job Satisfaction		
0. Other than Very Satisfied	126	46.5
1. Very Satisfied	145	53.5

Autonomy & Control-Over-Practice: Strongly Agree + Somewhat Agree = Agree
Workload: Strongly Agree + Agree = Agree

Research Question #1

The first question to be answered in this secondary analysis was: What is the relationship between Canadian public health nurses' job satisfaction, and their autonomy, control-over-practice, and workload?

Logistic regression analysis

A logistic regression analysis was performed on job satisfaction as the outcome, and the three work environment variable scores as predictors; autonomy, control-over-practice, and workload. Table 5_a shows regression coefficients, Wald statistics, degrees of freedom, odds ratios, generated p values, and 95% confidence intervals for the odds ratios for each of the three variables and interactions examined. The Wald test is one way to evaluate the contribution of individual predictors to a model (Tabachnick & Fidell, 2007). Significant results indicate a predictor that is reliably associated with outcome. This test is the squared logistic regression coefficient divided by its squared standard error and the resulting value is compared against a chi-square distribution (Tabachnick & Fidell).

Table 5_a: Interaction Model

Logistic regression analysis of job satisfaction by work environment variables including interactions

Variables	B	Wald Chi-Square	df	p value	Odds Ratio	95% Confidence Interval for Odds Ratio	
						Lower	Upper
AUT	0.49	15.82	1	<0.01	1.63	1.28	2.08
COP	0.03	6.39	1	0.01	1.03	1.01	1.06
WL	0.26	7.63	1	0.01	1.30	1.08	1.56
AUT*COP	<-0.01	3.57	1	0.06	0.10	0.10	1.00
AUT*WL	-0.03	15.87	1	<0.01	0.97	0.96	0.99
COP*WL	0.000	0.28	1	0.60	1.00	0.10	1.00
(Constant)	-5.15	10.81	1	<0.01	0.01		

AUT: Autonomy; COP: Control-over-Practice; WL: Workload

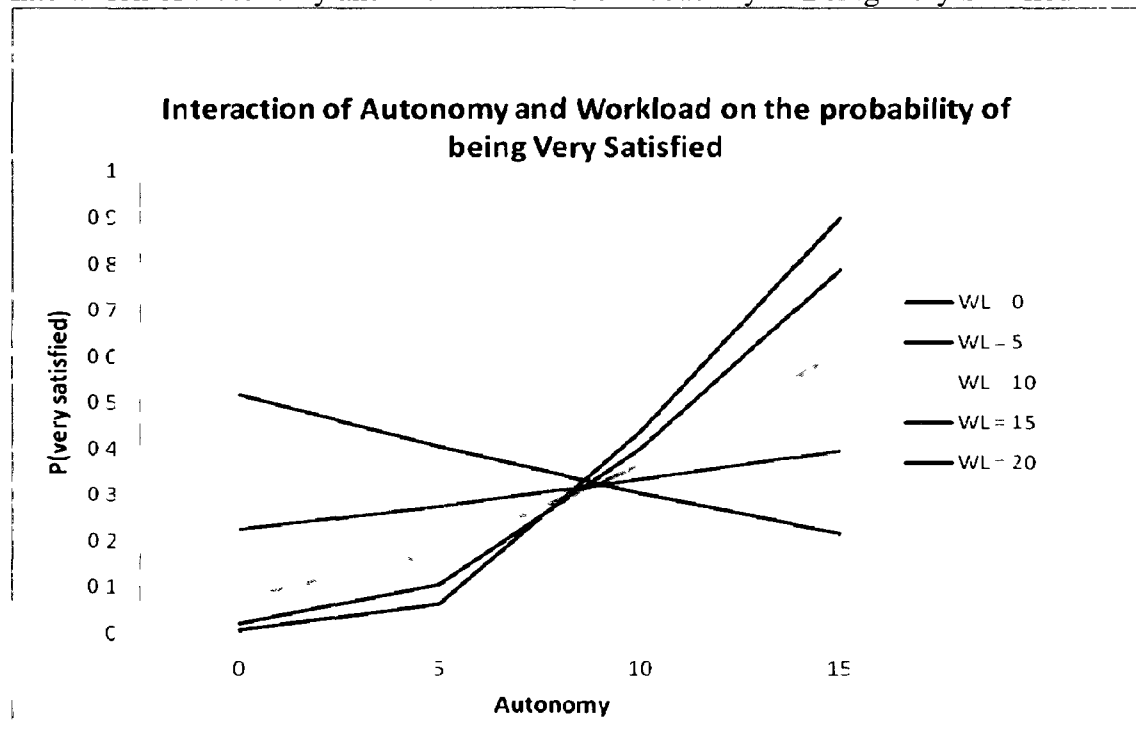
According to the Wald criterion, the interaction between autonomy and workload was a significant predictor of job satisfaction, $\chi^2(1, n = 271) = 15.87, p < 0.01$. Within this model each of the selected work environment variables reliably predict Canadian PHN job satisfaction; autonomy, $\chi^2(1, n = 271) = 15.82, p < 0.01$; control-over-practice, $\chi^2(1, n=271) = 6.39, p = 0.01$; workload, $\chi^2(1, n = 271) = 7.63, p = 0.01$.

A strategy often used to evaluate the importance of a model predictor in regression analyses is evaluation of the odds ratio (Tabachnick & Fidell, 2007). Statistically significant predictors that change the odds of an outcome to a greater degree can be interpreted as the most important; the further the odds ratio is from 1, the more influential the predictor (Tabachnick & Fidell). Table 5_a provides a challenging model to interpret as the interaction between autonomy and workload demonstrates an odds ratio of 0.03 below one, suggesting an inverse relationship with job satisfaction. All of the individual predictors in this model are significant with autonomy being the farthest from one (0.63), followed by workload (0.30), and control-over-practice being the nearest (0.03); all predicting a positive relationship to job satisfaction. Figure 3 includes a diagrammed plot of the interaction.

In Figure 3, five levels of workload are used to examine the interaction of autonomy and workload on the probability of study PHNs being very satisfied. The workload measure ranges between 0 and 20. Study participants who scored 0 were indicating that they had no role overload and believed their workload was appropriate, while those who scored 20 had excessive work overloads. There is a positive relationship between autonomy and p (very satisfied) at low levels of work overload but as work overload increases, the line begins to flatten and invert demonstrating that at excessive overload levels, there is an inverse relationship between autonomy and p (very satisfied).

Figure 3

Interaction of Autonomy and Workload on the Probability of Being Very Satisfied



Conversely, when examining the main effects model (Table 5_b) which excludes interaction terms and includes only the three modifiable work environment variables, control-over-practice, $\chi^2(1, n = 271) = 7.22$, $p = 0.01$ and workload, $\chi^2(1, n = 271) = 15.04$, $p < 0.01$ are the two study variables that predict whether or not Canadian PHNs were very satisfied with their jobs. The inverse relationship between workload and job satisfaction is evident – as work overload decreases, job satisfaction increases while increases in control-over-practice scores are positively related to increased job satisfaction. Evaluation of the OR in this model indicates that the significant predictors, control-over-practice (OR = 1.01, CI = 1.00-1.02) and workload (OR = 0.90, CI = 0.86-0.95) reliably predict job satisfaction with an inverse relationship supported for workload. In this model, the strongest association is between workload and job satisfaction: A one-unit increase on the work overload scale

decreases the odds of being very satisfied by nearly 10%, whereas a one-point increase on the control-over-practice scale increases the odds of reporting job satisfaction by only 1.4%.

Table 5_b: Main Effects Model

Logistic regression analysis of job satisfaction by work environment variables excluding interactions

Variables	B	Wald Chi-Square	df	p value	Odds Ratio	95% Confidence Interval for Odds Ratio	
						Lower	Upper
AUT	<0.01	0.24	1	0.63	1.00	0.99	1.02
COP	0.01	7.22	1	0.01	1.01	1.04	1.02
WL	-0.10	15.04	1	<0.01	0.90	0.86	0.95
(Constant)	0.94	6.99	1	0.01	2.55		

AUT: Autonomy; COP: Control-over-Practice; WL: Workload

Statistics Canada CV release guidelines stipulate the reporting of estimate quality levels. These estimates are calculated here based on the findings presented in the first model found in Table 5_a. Using these guidelines, the interaction between autonomy by workload is of marginal quality at 24% ($[0.01 \div 0.03] \times 100\%$) as is the individual predictor, autonomy at 25% ($[0.12 \div 0.49] \times 100\%$). Both workload at 36% ($[0.10 \div 0.26] \times 100\%$) and control-over-practice at 40% ($[0.01 \div 0.03] \times 100\%$) exhibit unacceptable quality level estimates. For findings from the second model provided in Table 5_b, the CVs are of unacceptable release quality for control-over-practice at 38% ($[0.01 \div 0.01] \times 100\%$), and of marginal quality for workload at 26% ($[0.03 \div 0.10] \times 100\%$). According to Dr. Jean-Michel Billette (personal communication, March 10, 2010) these guidelines are typically applied only to descriptive findings (totals and proportions). A coefficient can be significant at the 0.05 level with the CV close to 50% resulting in all significant values found to be within an acceptable range.

Research Question #2

Logistic regression analysis was again utilized to answer the second question in this study: How do sociodemographic factors such as age and years working in public health influence the association between the included workplace variables and PHNs' job satisfaction? For this question, two models were created, presented in Tables 6 and 7.

Table 6 includes the modifiable work environment predictors, autonomy, control-over-practice, and workload together with PHNs' age. Interactions between age and autonomy, age and control-over-practice, and age and workload were examined. Regression coefficients, Wald statistics, degrees of freedom, odds ratios, generated p values and 95% confidence intervals for odds ratios for each of the four predictors and interactions being examined are included.

Table 6

Logistic regression analysis of job satisfaction by work environment variables plus age

Variables	B	Wald Chi-Square	df	p value	Odds Ratio	95% Confidence Interval for Odds Ratio	
						Lower	Upper
AGE	-0.08	5.08	1	0.02	0.93	0.87	1.00
AUT	<-0.01	0.02	1	0.90	0.10	0.93	1.00
COP	0.01	0.18	1	0.70	1.01	0.97	1.05
WL	-0.43	12.28	1	<0.01	0.65	0.52	0.83
AGE*AUT	0.00	0.08	1	0.78	1.00	1.00	1.00
AGE*COP	0.00	0.06	1	0.81	1.00	1.00	1.00
AGE*WL	0.01	8.50	1	<0.01	1.01	1.00	1.01
(Constant)	4.18	7.53	1	0.01	63.34		

AUT: Autonomy; COP: Control-over-Practice; WL: Workload

According to the Wald criterion, the interaction between age and workload reliably predicts job satisfaction, $\chi^2(1, n = 271) = 8.49, p < 0.01$. Evaluation of the odds ratio for this interaction (OR = 1.01, CI = 1.00-1.01) reveals a weak positive association of 0.07%.

Within this model both age, $\chi^2(1, n = 271) = 5.08, p = 0.02$ and workload, $\chi^2(1, n = 271) = 12.28, p < 0.001$ reliably predict Canadian PHN job satisfaction. The odds ratios for age (OR = 0.93, CI = 0.87-0.99) and work overload (OR = 0.65, CI = 0.52-0.83) reveal the strongest association is again between workload and job satisfaction: A one-unit increase on the work overload scale decreases the odds of being very satisfied by 7%, whereas a one-unit increase in age decreases the odds of job satisfaction by only 1%.

In Figure 4, five levels of workload are plotted to examine the interaction of age and workload on the probability of being very satisfied. Middle range work overload scores at 10 indicate there is no relationship between age and satisfaction. At low levels of work overload, satisfaction declines with age, and at high levels of work overload, satisfaction increases with increased participant age.

Figure 4:

Interaction of Age and Workload on the Probability of Being Very Satisfied (A)

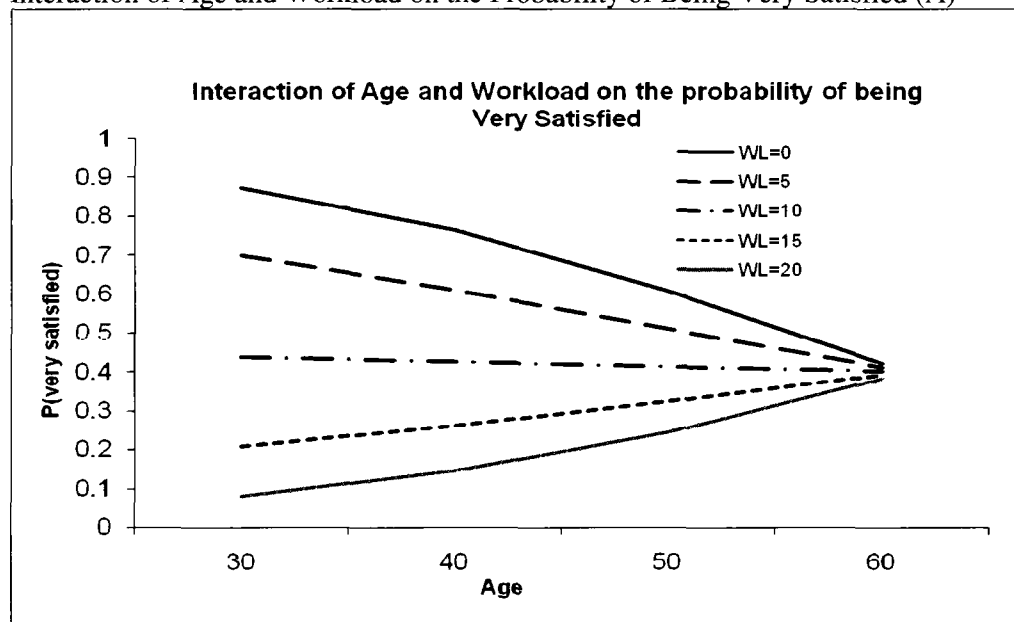
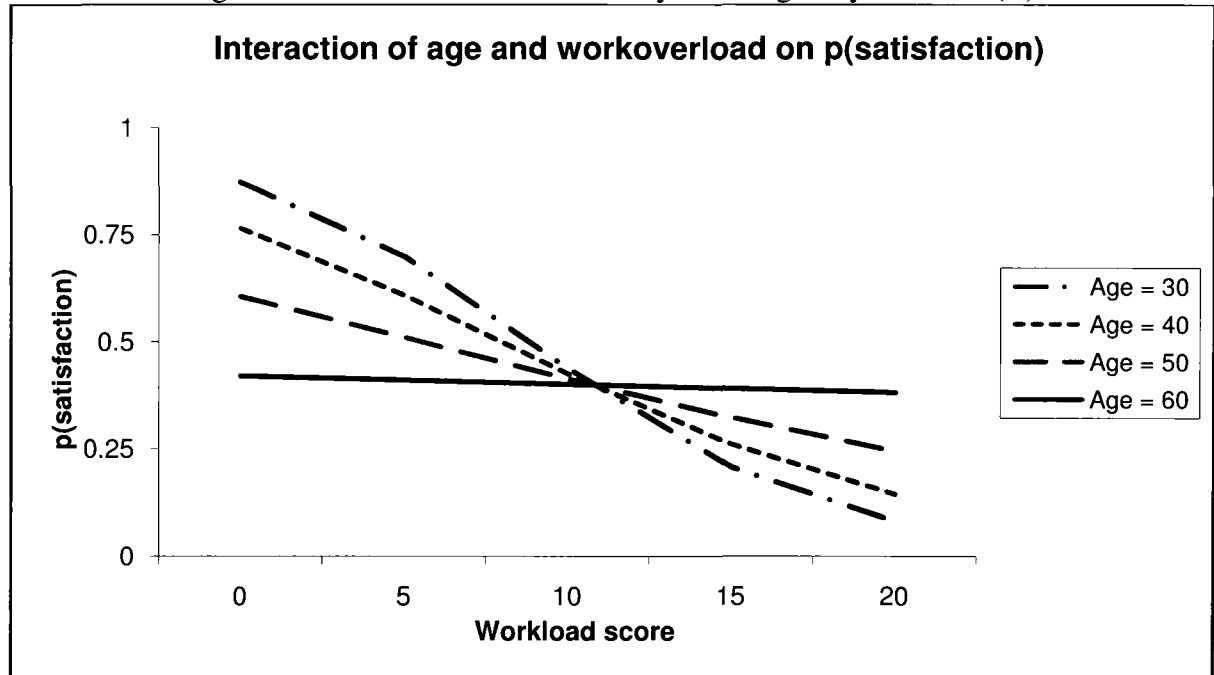


Figure 5 provides a graphic display of the interaction between age and workload from a different perspective, with workload scores plotted along the x-axis. PHNs at 30 years of age demonstrate the highest levels of job satisfaction when work overload scores of zero are reported, demonstrative of normal levels of workload. When very high scores of work overload (20/20) are recorded, PHNs at 30 years of age report very low levels of job satisfaction. Although satisfaction scores remain low, PHNs who were 40, 50, and 60 years of age respectively reported progressively higher levels of job satisfaction.

Figure 5:

Interaction of Age and Workload on the Probability of Being Very Satisfied (B)



Estimation of quality levels for significant findings as per Statistics Canada guidelines (2009b) reveals the interaction between age and workload to have a CV of 43% ($[0.003 \div 0.007] \times 100\%$). Individually, age demonstrates a CV of 44% ($[0.03 \div 0.08] \times 100\%$) and workload with one of 28% ($[0.12 \div 0.43] \times 100\%$). As per Dr. Billette's instruction, all values are within an acceptable range; workload is again the most reliable predictor.

In Table 7, years working in public health (YRSWKG) is the fourth predictor variable added to the second model for question #2. In this model, no interactions were statistically significant. Two individual predictors were statistically significant, reliable predictors of job satisfaction for study sample PHNs; control-over-practice, $\chi^2(1, n = 271) = 5.52$, $p = 0.02$ and workload, $\chi^2(1, n = 271) = 8.12$, $p < 0.01$. Odds ratios for these predictors reveal that workload (OR = 0.90, CI = 0.83-0.97) maintains the highest association with job satisfaction while control-over-practice demonstrates association to a lesser degree (OR = 1.02, CI = 1.00-1.03). A one unit-increase on the workload scale decreases the odds of being satisfied by 89.5%. A one-point increase on the control-over-practice scale increases the odds of reporting job satisfaction by 1.8%.

Calculation of the quality level of the statistically significant findings in Table 7 reveals CV values below the 50% acceptable range. Control-over-practice demonstrates a CV of 44% ($[0.01 \div 0.02] \times 100\%$) and workload 35% ($[0.04 \div 0.11] \times 100\%$).

Table 7

Logistic regression analysis of job satisfaction by work environment variables plus years working

Variables	B	Wald Chi-Square	df	p value	Odds Ratio	95% Confidence Interval for Odds Ratio	
						Lower	Upper
YRSWKG	<-0.01	<0.01	1	0.96	0.10	0.89	1.12
AUT	-0.02	0.95	1	0.33	0.99	0.95	1.02
COP	0.02	5.52	1	0.02	1.02	1.00	1.03
WL	-0.11	8.12	1	<0.01	0.90	0.83	0.97
YRSWKG*AUT	<0.01	1.68	1	0.20	1.00	0.10	1.01
YRSWKG*COP	<-0.01	0.63	1	0.43	0.10	0.10	1.00
YRSWKG*WL	0.00	<0.01	1	0.96	1.00	0.10	1.01
(Constant)	0.91	3.02	1	0.08	2.49		

AUT: Autonomy; COP: Control-over-Practice; WL: Workload; YRSWKG: Years Working

Research Question #3

The Chi-square test was used for the third question: Is there a difference in public health nurses' job satisfaction between different Canadian regions; Western, Central, and Atlantic? Because of the small number of PHN respondents from the Canadian north, no output could be released from the COOL RDC as per Statistics Canada data confidentiality stipulations. Therefore, this test was used to examine only the remaining three regions.

No statistically significant differences ($p = 0.43$) were found between PHN job satisfaction in the three Canadian regions therefore, calculation of CVs is not required.

Table 8 includes findings from this test.

Table 8

Comparing PHN job satisfaction between different Canadian regions

Region	Very Satisfied ($n = 145$)		Other than Very Satisfied ($n = 126$)		Significance
	Number	%	Number	%	
Atlantic	17	11.72%	9	7.14%	$\chi^2 = 1.71, df = 2, p = 0.43$
Central	66	45.52%	58	46.03%	
Western	60	41.38%	57	45.23%	

Knowledge Translation Think-Tank

A total of sixteen participants attended the end-of-study KT Think-Tank (Appendix I); seven PHNs, two educators/researchers, four senior policy analysts, one PHN consultant, one graduate student meeting recorder, and the principal investigator of this secondary analysis. Event evaluations were submitted by a total of ten participants. One participant left early, two were thesis committee members, and neither the student researcher nor the student recorder completed evaluations. Therefore, of the eleven potential evaluations, ten were submitted representing 91% of the possible evaluation completions. Four questions

were asked of participants (Appendix J) with three being open-ended and one on a Likert-scale to determine participants' perceptions of the KT Think-Tank's value, if event objectives were met, and if future KT activities were recommended.

On a Likert-scale (range of 1-5), participants were asked if the KT Think-Tank objectives were achieved. Higher scores were representative of agreement. All ten respondents replied with average score of 4.8/5. Participants appreciated varied components of the day including "being surrounded by such an enthusiastic group of people who share the same passion" and many reflected, "What I appreciated most was the opportunity to hear from PHNs from across the country." Seven respondents did not answer the question asking what was least appreciated about the day. Each of the three remaining indicated that more discussion time would have been valuable. The final evaluation question was in relation to recommendations for future KT activities. Five people did not respond. Of the remaining, one suggested "greater representation from other health professions could be an added benefit when developing recommendations", two recommended "workshops that address the practice implications from today" and two requested a KT workshop to "share the final paper and presentation from today".

In summary, the three research questions were examined specific to the outcome of Canadian PHNs' job satisfaction. Results revealed a significant interaction between workload and autonomy and between workload and nurses' age – both considered reliable predictors of PHN job satisfaction in this study. Independently, workload and control-over-practice were also found to be reliable predictors. Although no other statistically significant results were found between study variables, discussion among KT Think-Tank participants revealed the importance of not only the significant findings but several other study results.

CHAPTER FIVE

Discussion & Study Implications

This secondary analysis is the first study, based on nationally representative data from the 2005 NSWHN, to examine the correlates of Canadian public health nurses' (PHN) job satisfaction. The results of this study suggest that, although PHNs value their autonomy above all other practice factors, this autonomy may become problematic when combined with an excessively heavy workload. No formal measures of PHN workload were found in the literature suggesting that these nurses practice virtually unnoticed until a sudden surge in workload threatens their capacity to meet health system needs. Public health crises such as the 2003 Severe Acute Respiratory Syndrome (SARS) outbreak and the recent H1N1 pandemic have the potential to create excessively heavy workloads for PHNs. These events place international attention onto the roles and responsibilities of the Canadian public health sector (National Advisory Committee, 2003). The findings of this study have potential implications for leaders and policy makers regarding vital public health human resource issues. As nurses constitute the largest professional group within the public health sector, study results warrant consideration, evaluation, and further examination. Future research is recommended. Improved comprehension of PHNs' workload may enhance health system efficiency, thereby positively impacting the health of the Canadian population.

Public Health Nurses' Profile

The majority of study participants were female (99%) with a mean age of 43 years, similar to other studies examining PHNs (Henderson Betkus & MacLeod, 2004; Kulig, et al., 2009). One quarter were under the age of 35 years, consistent with the Nursing Health Services Research Unit's [NHSRU] (2006) report which claimed that public health had the highest proportion of nurses (23%) in this age category. However, researchers have recently

revealed that nurses working within the community sector are older than nurses working in other healthcare sectors. Underwood, Baumann, Ciliska et al. (2010) report that 28% of all community nurses are over the age of 55, up from 13% in 1996. They contend this proportion is significantly higher than the rest of the profession at 21% and urge caution regarding the implications of an aging community workforce such as loss of experienced providers and the associated challenges of replacing these nurses with new generations.

As a result of increasing numbers of nurses nearing retirement age, one end-of-study Knowledge Translation (KT) Think-Tank participant revealed that, at her organization, there are increasingly fewer qualified nurses available to prepare the next generation of PHNs. Similar to other healthcare sectors, strategies should be developed to address this trend within public health nursing. It may be logical to develop a strategy to find ways to more efficiently utilize existing resources. Senior nurses have a great deal to offer to new generation practitioners (Simpson, 2007). Initiatives, such as mentoring strategies, have been shown to increase job satisfaction not only for new nurses but also for experienced practitioners (Thomka, 2007). Perceptive leadership is required to recruit new nurses into public health and to retain and appropriately utilize the skills of experienced PHNs. Support in the form of sufficient funding allocation to enhance existing mentorship initiatives and to implement new programs in Canadian regions where none currently exist is recommended at organizational, provincial and federal levels. Additionally, continued organizational efforts to ensure appropriate staffing with qualified PHNs would augment mentorship strategies by facilitating improved distribution of workloads thereby providing mentors adequate time and support to offer high quality orientation and meaningful clinical experiences for new nurses while ensuring concurrent quality delivery of existing public health programs and services.

Public health and new nurses

Registered nurses entering the Canadian workforce are predominantly graduates of university programs as a result of current entry-to-practice regulations across most of the country (CNA, n.d.). The largest proportion of study participants were baccalaureate prepared (79%), similar to other research examining PHNs (Falk-Rafael, Fox, & Bewick, 2005; Tullai-McGuinness, 2008). Understanding educational trends is important to health human resource planning in public health because of the potential impact entry-to-practice requirements may have on this sector. These trends are particularly important in the context of the large proportion of PHNs nearing retirement age and the projected increase in future demand for nurses working in the community (CNA, 2009; Villeneuve & MacDonald, 2006). Historically, the public health sector has hired only those nurses who were baccalaureate prepared (Hogan, 2008). In 2005-06, when data for this secondary analysis were collected for the NSWHN, only 33% of registered nurses from hospital and long term care facilities and 49% of non-PHN community registered nurses held a baccalaureate degree compared with nearly 80% of study PHNs. As most new registered nurses will now hold university degrees, public health will be competing with other healthcare sectors to recruit new graduates. Understanding the needs of new generation nurses specific to the public health sector could provide leadership with the tools to improve recruitment capacity.

Unfortunately, research has revealed the lack of appeal public health has to some nursing students who feel their education and skills might be underutilized (Ryan, 2007). Nursing students in Ryan's study reported concern about a potential loss of critical thinking and assessment skills if they elected to work within public health rather than acute care areas after graduation. One PHN claims "there is a lack of intrigue to our work for young nurses"

(personal communication, March 31, 2010). Such perceptions may lead to serious future health human resource repercussions for the public health sector. KT Think-Tank participants agreed that part of the problem is the lack of meaningful clinical exposure in undergraduate programs, reflective of findings reported in the 2005 report, *Building the PH Workforce for the 21st Century*: “Students who are not exposed to the practice are not likely to choose a public health career” (The Joint Task Group on Public Health Human Resources, p. 2). The Canadian Association of Schools of Nursing (2010) recognizes the essential nature of high quality practicums in public health. It is recommended that senior leadership and policy makers evaluate the implications of these findings and develop strategies to provide new graduates with meaningful clinical placements in public health, in addition to ensuring that public health practice is embedded within nursing program curriculums.

A KT Think-Tank participant revealed that nursing students seldom receive meaningful clinical experiences at her organization because of personnel and workload issues. “A large number of our PHNs are about to retire and are mentoring new staff. This leaves the newer staff to take on students,” impacting the quality of their placements. Another Think-Tank participant recommended that organizations work collaboratively with educational institutions to address these challenges. Richard, Beaudet, and Gendron (2010) suggest that there have been shortcomings in some university programs under-emphasizing the role of public health practice and its relationship to the healthcare sector overall. It would be beneficial for organizations to foster improved relationships with universities, mutually identifying priority areas and facilitating improved quality public health practicums. For example, collaborative partnerships between public health and universities

may include cross-appointments of staff to enhance learning and inform curriculum development, and joint committees for planning and sharing information and resources.

Traditionally, PHNs have been required to have a minimum of two years acute care experience before a public health organization would consider hiring them (Hogan, 2008). Several Think-Tank participants also discussed the value of nurses having experience outside of the sector prior to working within public health. One KT Think-Tank PHN felt that her acute care experience was very valuable to her work in public health while another revealed that her organization is now considering hiring new graduates directly from university to fulfill personnel requirements. Another participant suggested that organizations might prefer to hire new graduates directly from university to 'groom' them for organizational needs. Future research examining the implications associated with employing new graduates directly from university programs versus those with acute care experience may be of value to leadership in addressing public health human resource issues.

Public health nursing leadership

A large proportion of the PHNs (87%) in the current study stated that they had a nurse as an immediate supervisor. Similarly, Falk-Rafael (2005) reported that 86% of front-line PHNs in her research identified having a nurse as a supervisor and that 59% of these managers also reported directly to nurses. Recently, Underwood, Baumann, Ciliska, et al. (2010) revealed that in 2007 fewer than 15% of registered nurses who held Chief Executive Officer positions or other such senior leadership roles worked in the community health sector which is proportionally fewer than has been recorded since 1996. Underwood, Mowat, et al., (2009) reported that 84% of nurses working in the community claimed that having nurses in key leadership positions supported their practice. Respondents believed

nursing leaders understood their work and upheld nursing standards. The current study findings reflect the work of Baumann, Underwood, et al. (2006) who identified the importance of having nurses in leadership positions within healthcare organizations, reporting a strong positive correlation to PHNs working to the their full practice scope.

A KT Think-Tank PHN revealed that her nurse manager has excellent “nurse sensitivity” and understands the intricacies of the nursing process as it relates to public health practice. She claimed that working for such a leader optimizes her practice. An example of the importance of nursing leadership occurred during the H1N1 pandemic in 2009. Two participants from different regions, whose upper management had no nursing background, were faced with challenges when managers perceived clients were being moved too slowly through the immunization process. Think-Tank PHNs claimed that non-nursing leadership did not understand what was involved in providing informed consent and adequate pre-immunization assessments suggesting that such an example demonstrates how “nurses continue to struggle with getting those at the top to understand nurses’ roles better.”

Several KT Think-Tank PHNs expressed frustration at continually needing to take valuable time to explain the nurse’s role to non-nursing leaders. Yet participants recognize that professional affiliation alone does not necessarily align with effective leadership capacity. As nurses constitute the largest professional group within the public health sector (PHAC, 2008) and effective nurse leaders facilitate optimal nursing practice (Underwood, et al., 2010), Think-Tank participants suggest that increased efforts be made by individuals, organizations, and governments to appoint and support nurses in public health leadership roles. Financial support for educational advancement such as graduate or post-graduate

studies for nurse leadership was also identified by Think-Tank participants as important to decrease the cost barriers associated with pursuing advanced educational opportunities.

Effective leadership has been shown to facilitate knowledge-to-action activities such as the KT Think-Tank (Straus, Tetroe, & Graham, 2009). Nurse researchers have identified relationships between leadership support and enhanced uptake of research evidence into clinical practice (Gifford, Davies, Edwards, Griffin, & Lybanon, 2007). The current study findings highlight the importance of leadership to PHN practice but, equally important, is the capacity of nurse leaders to appropriately utilize research results in an effort to enhance practice environments and improve PHN job satisfaction. Gifford et al. identify leadership qualities that facilitate research transfer and which can be utilized within public health, empowering nurse leaders in this sector to expedite the knowledge translation process. Managerial leadership includes a combination of facilitative and regulatory activities, determined based on extensive review of leadership literature (Gifford, et al.). As the ultimate goal of knowledge transfer is to improve clinical practice, research conducted by Gifford et al. identifies which leadership practices have been shown to most efficiently transfer research knowledge and could be of use for public health organizations striving to achieve and facilitate leadership excellence.

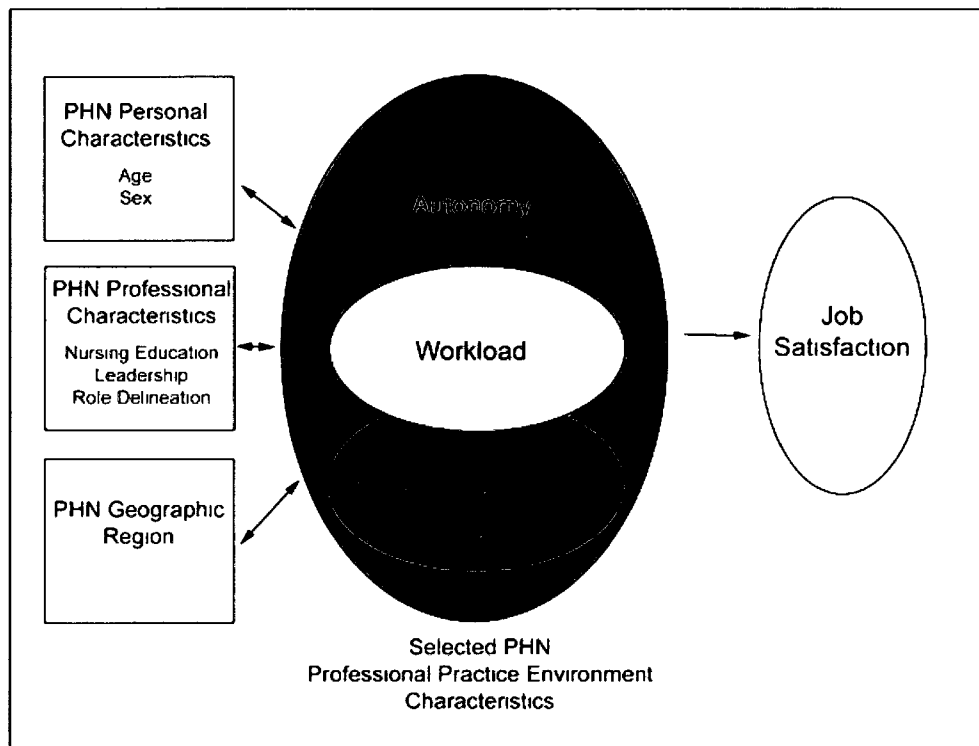
Conceptual Framework

The original conceptual framework provided focus and direction for the study research process and an overarching outline for the KT Think-Tank format. The framework, in conjunction with Think-Tank participants' insight, permitted linkage of the variables to the larger body of knowledge and facilitated the generalizability of results. Although many findings were consistent with the original framework, a revised version was developed

which better reflects study results and the issues that Think-Tank participants identified as most relevant to their current practice and important to the public health sector.

Figure 6: Revised Conceptual Framework

Canadian Public Health Nurses' Job Satisfaction – Revised



The adapted conceptual framework, Public Health Nurses' Job Satisfaction – Revised (Figure 6), diagrams the study's highlights and provides suggested direction for future research. The central oval continues to represent the general domain of PHNs' practice environment and contains the three selected workplace variables. Each of the study independent variables remain within the framework but their placement has changed based on study analyses and KT Think-Tank discussion. Workload has moved to a central, dominant position demonstrative of its significant relationship to PHNs' job satisfaction. Control-over-practice assumes a secondary position behind workload, indicating its

significant relationship to PHN job satisfaction, but to a lesser degree than that of workload. Finally, autonomy is moved from an oval of individual predictive capacity into the general PHN practice domain, displaying its confirmed presence and practice importance despite not being a significant predictor of PHN job satisfaction within this secondary analysis.

Study findings directed framework changes. For example, although the number of male PHNs in this study was too small to permit statistical analyses, sex remains within the revised conceptual framework. No PHN studies have identified significant differences between sexes. Other researchers may have experienced similar sample size limitations with too few male PHN participants to analyze. The paucity of data regarding male PHNs suggests a need for further qualitative research. Additionally, despite the lack of significant differences in PHN job satisfaction across the regions, geographic variation remains within the framework based on KT Think-Tank participant discussion. Finally, the direction of the relationship between characteristics was changed from unidirectional in the original framework to bi-directional in the revised version. For example, although sex and age may have an impact on PHNs' autonomy, workload, and control-over-practice, the bi-directional nature of the relationship suggests that these variables themselves may, in fact, influence who is initially attracted to work in the public health sector. Similarly, the region in which the PHN practices may impact each of the workplace variables. Nurses' autonomy, control-over-practice, and workloads may influence decision to practice in certain Canadian regions.

The Canadian Public Health Nurses' Job Satisfaction – Revised, illustrates the evolution of the conceptual framework based on findings in the literature, data analyses, and integration of KT Think-Tank suggestions. Future research may reveal that further evolution of the model is required yet the final study conceptual framework provides directions for

practice and future research congruent with the original framework's concepts and propositions, demonstrating its applicability to this study.

PHN Professional Practice Characteristics

Job Satisfaction

Forty-seven percent of PHNs were 'very satisfied' and 43% 'satisfied' with their jobs, similar to previous nursing research in the public health sector (Best & Thurston, 2006; Bookey-Bassett, Laporte, Hayes, et al., 2008; Johnson, 2004). No other studies were located that dichotomized the outcome variable into 'very satisfied' versus 'less than very satisfied' as was required in this thesis research, limiting direct comparisons with other studies. Additionally, comparison of results with other findings was further limited as job satisfaction has been measured by other researchers using various instruments.

Consideration, by organizations and public health leaders, should be given to the evaluation of differing measures of satisfaction to determine which might be most applicable to this sector of healthcare. There does not appear to be one consistently used measure of PHN job satisfaction nor were studies found that used a single item measure within this domain similar to this study. For example, Campbell, Fowles, and Weber (2004) and Cumbe and Alexander (1998) both used the McCloskey/Mueller Job Satisfaction Scale, a 31-item instrument identifying three dimensions of satisfaction. Tullai-McGuinness (2008) developed a measure to evaluate community nurses' job satisfaction and Armstrong-Stassen and Cameron (2005) adapted a measure from job satisfaction scales developed by Spector and Canmann, Fichman, Jenkins, and Klesh (as cited by Armstrong & Cameron, p. 184). Study results were reflective of the literature and KT Think-Tank PHNs' perceptions. The results of consistent and regular evaluation of job satisfaction levels could be useful tools for

management when developing effective recruitment and retention strategies to aid in addressing public health human resource challenges.

KT Think-Tank participants identified that it was the topic of job satisfaction which initially captured their attention when they heard about the knowledge translation opportunity to be held after the completion of the study analyses. “I am a firm believer that those who are happy in their work are not only much more productive but also much more effective as they have both the passion and support to give it 110 percent!” Responses such as this were common among those in attendance at the KT Think-Tank.

Despite study findings that a large percentage of PHNs are satisfied with their work (90%), similar to other nursing sectors (88%), Shields and Wilkins (2006) report job dissatisfaction was more prevalent among nurses overall (12%) than with other employed Canadians (8%). Knowledge of this comparison is useful for management who may be complacent with recorded high satisfaction levels of nursing staff across all sectors. Annual evaluation of PHN job satisfaction is suggested. Use of single-item versus multiple-item instrumentation could be determined by each organization however the tool should be a tested and shown to be a valid and reliable measure for use with PHNs. Given its positive associations, further research into effective measures of PHN job satisfaction is encouraged.

Autonomy

Positive associations between job satisfaction and autonomy have been previously observed in the literature. With the mean score of 12/15 in the current study, results suggest that participating PHNs perceived their practice to be autonomous, similar to recent research (Underwood, Baumann, Ciliska, et al., 2010). Canadian PHNs have previously reported

professional autonomy as the most important practice factor linked to their job satisfaction (Best & Thurston, 2006; Henderson-Betkus & MacLeod, 2004).

The vast majority of PHNs (83%) revealed that they have a supportive supervisor and over three quarters (78%) agreed that nursing controls its own practice. Most (92%) agreed they have freedom to make important practice decisions and that they do not have to do things against their nursing judgment (91%). One Think-Tank participant described being given full responsibility to develop an H1N1 clinic, including hiring and scheduling. Armstrong-Stassen and Cameron (2005) reported that PHNs in their study claimed that participation in program and practice decisions affecting their jobs were significantly more important to their job satisfaction than did home care nurses, indicative of differing determinants of job satisfaction between community nursing sub-sectors.

Approximately 80% of study PHNs responded positively to the question “management is supportive even when in conflict with a physician”. In a recent NHSRU report, only 68% of the community-based RNs reported effective relationships with physicians (Underwood, Baumann, Akhtar-Danesh, et al., 2009). Underwood et al. were evaluating nurses’ relationships with physicians while the NSWHN questioned management support of nurses even when in conflict with a physician. Although different constructs were being measured in each of these two studies, the potential for interprofessional conflict is suggested within each. Seventy-six percent of the current study PHNs elected to answer this question with 80% of these respondents identifying that management does support them even when in conflict with physicians. This response suggests that a large percentage of the study PHNs have experienced conflicts with physicians in the past.

Underwood, Baumann, Akhtar-Danesh, et al. (2009) revealed that PHNs reported the least positive relationships with physicians in their study, once again revealing differing community nursing sub-sector perceptions. Additionally, Medical Officers of Health (MOH) reported more respect for nurses than PHNs perceived receiving from them (Underwood, et al.). Such conflict and differences in interprofessional perceptions may have implications for the interdisciplinary work environment of the public health sector. Assessment of these variations and strategies to support positive interdisciplinary working relationships may enhance job satisfaction and improve organizational and health system outcomes. Given the collaborative nature of PHNs' work environment, more research is required to develop best practices regarding interprofessional collaboration.

Despite its importance, autonomy was not an independent predictor of PHN job satisfaction in this study. All the literature examined revealed that PHNs consistently consider their practice to be an autonomous one; this differs from other nursing sectors (Bookey-Bassett, et al., 2008; Underwood, Baumann, Ciliska, et al., 2009). PHNs have reported that autonomy is a critical factor in enabling them to practice to the full scope of their competencies (Underwood, Mowat, et al., 2009) and a feature many value most above all other work factors (Best & Thurston, 2006; Meagher-Stewart, Underwood, et al., 2009). It appears that autonomy may be a feature of PHN practice, so essential to the essence of public health nursing that, although appreciated and recognized, it is not a predictive factor of job satisfaction - it simply 'is'. One KT Think-Tank participant suggested that perhaps study PHN autonomy scores were so similar because there is nothing to explain.

Control-Over-Practice

The mean score for control-over-practice of study PHNs was 13/21, similar to other community nurses in the NSW HN. Both community nurses and PHNs scored slightly higher than registered nurses working in other sectors, suggesting that nurses who work within the community perceive more control over their practice (Shields & Wilkins, 2006). Despite recording higher mean scores, nearly one third of PHNs (30%) in the current study reported lacking sufficient time and more than one third (37%) felt there were too few nurses on staff to provide quality care; both factors measuring control-over-practice. In a recent report, Underwood, Baumann, Ciliska et al. (2010) reported that 55% of respondents in their study did not have sufficient time to meet the needs of their clients and 40% lacked the opportunity to discuss clinical program issues with colleagues or management. These reports were reflective of some KT Think-Tank participants' experiences. One PHN stated that "the only time you see colleagues is in the morning and at the end of the day."

Think-Tank PHNs expressed concern that their roles are beginning to be overtaken by other providers who do not necessarily possess the skills or critical thinking capacity developed through nursing education and years of experience. As one Think-Tank participant stated, "Organizations get more bang-for-their-buck when they hire nurses." By virtue of their training and education, nurses have the ability to assume many roles. This is supported in a post-SARS report from nearly a decade ago where committee chairman, Dr. David Naylor reported that although Canada required more public health workers, including nurses, increasing the supply alone would only be a half-measure (National Advisory Committee on SARS, 2003). PHNs serve diverse communities which require sufficient numbers of knowledgeable nurses to meet their needs (Underwood, Mowat, Meagher-

Stewart, et al., 2009). Organizations are encouraged to consider the value received when hiring registered nurses. Evaluation of the cost effectiveness of hiring PHNs compared to other healthcare providers to quantify this value is recommended.

Workload

PHNs recorded a mean score of 11/20 indicating a moderate level of work overload in their practice. A KT Think-Tank PHN stated, “There is no replacement if I am sick and there is nobody to cover for me if I’m gone for professional development.” Reutter and Ford (1996) reported that PHNs claimed that the most stressful aspects of their practice were primarily related to work overload due to inadequate time. This was reflected by one Think-Tank participant who stated, “The days are not predictable and the workload is high.”

Nearly 60% of PHNs in the current study reported that they were not given enough time to do what was expected of them; 44% often had to arrive early or stay late and 58% had to work through breaks to complete tasks. A lack of time and minimal flexibility impacts PHNs’ workloads. Underwood, Baumann, Akhtar-Danesh, et al. (2009) reported less than half of their participants agreed that they had adequate time, money, and/or access to learning resources to support practice. MacDonald and Schoenfeld (2003) identified that PHNs in their study were overloaded with their job responsibilities and role expectations as a result of heavy workloads. Workload also has an impact on research processes involving these nurses as Underwood, Mowat, Meagher-Stewart, et al. (2009) reported difficulties in recruiting PHNs for their study focus groups due to heavy workloads.

In a recent study, a PHN described her professional practice environment as ‘chaotic’, explaining that maintaining her mental health was a constant struggle, impacting not only her personal health but her work (Bookey-Bassett, et al., 2008). Although Shields

& Wilkins (2006) found that a lower proportion of registered nurses practicing in the community reported high role overload scores compared to those working in other sectors, study PHNs recorded scores in the upper half of the scale. The current study analyses revealed that work overload was a significant predictor of job satisfaction, both independently and in interactions with other study variables. Within each of the regression models, workload was a significant predictor of PHN job satisfaction, demonstrating an inverse relationship; as work overload increased, the probability of reporting being 'very satisfied' decreased. A one unit-unit increase on the work overload scale decreases the odds of being satisfied by nearly 10%. As job satisfaction has been linked to many positive client and organizational outcomes, further evaluation of PHN workload is warranted.

Research Questions

Relationship of Job Satisfaction with Autonomy, Control-Over-Practice, and Workload

The findings of this study suggest that PHNs were satisfied when they had low levels of work overload as long as they perceived that their practice was autonomous, but when workload becomes excessive, the relationship between autonomy and job satisfaction inverts. This implies that an autonomous practice may become detrimental to PHNs' job satisfaction when work loads are especially heavy and potentially explains why autonomy was not a significant factor when examined independently. Alternatively, autonomy may not independently be a significant predictor of job satisfaction because of the lack of variability in PHN autonomy scores in this study. Further examination of the interaction between nurses' workload and job satisfaction revealed the value of autonomy or its potential negative influence on the practice of participating PHNs.

KT Think-Tank PHNs generally agreed with the above interpretation, claiming it is reflective of their current practice. “You are so autonomous that you feel like you are the one who generated the workload.” Another described this phenomenon’s impact on surge capacity in public health. She claimed that PHNs were working 24/7 during the 2003 SARS outbreak, but non-nursing healthcare providers, assigned to complete some of the activities usually conducted by PHNs, were often nowhere to be seen after 4pm. “The PHNs felt overwhelmed and the workload was unmanageable. The result was fatigue.” This comment is reflective of current research which correlates excessive workloads with nurses’ fatigue (CNA, 2010). Flaws in public health infrastructure became evident during the SARS crisis (NAC, 2003). Many KT Think-Tank PHNs revealed that their own personal standards of ‘a job well done’, in addition to their practice autonomy, often results in additional workload which can become unmanageable. “I set a high standard for myself. It may be above what the organization expects of me. The organization might be happy with less, but at the end of the day, I feel that I could have done more.”

Integration of current study findings concerning workload and its interaction with autonomy, combined with other pertinent research, and environmental assessments should be considered when developing strategies to address the potential impact of this interaction on clinical practice, especially in emergency situations. Increasing public health management’s understanding of the interaction between practice autonomy and workloads, considered in advance of public health crises, may result in improved capacity to respond to emergency situations and potentially improve health system outcomes such as reduced nurse fatigue, reduced costs, and, most importantly, fewer negative health consequences. Understanding that PHNs have an autonomous practice, and that this autonomy supports the

management of heavy workloads to a certain degree, it may be beneficial in order for organizations to gain an understanding of what constitutes excessive workload for PHNs. Evaluation and development of workload measures to determine these parameters may facilitate PHNs working to the full scope of their practice competencies, reduce negative outcomes during surge capacity events, and improve PHN job satisfaction overall.

The findings of this study support the development of a PHN workload measure. Study results and participants of the subsequent KT Think-Tank suggested that further research into this relationship may provide valuable insight for public health practitioners and decision-makers, impacting nursing practice, the nursing profession, and Canadian health systems. Although previous research has revealed the negative impact of work overload and the importance of autonomy to PHN practice, no studies have previously demonstrated the significance of the interaction between these two variables specifically within the public health domain. Further research involving a larger sample of PHNs is recommended to determine whether these findings are accurate and to support forward movement in the development of workload measures specific to the practice of Canadian PHNs.

Interaction of Age with Workload and Job Satisfaction

The interaction between age and workload was a significant predictor of PHN job satisfaction in this sample however it was only a weak positive association. Both age and workload predicted job satisfaction, with the stronger association existing between workload and job satisfaction. A one-unit increase on the role overload scale decreases the odds of being very satisfied by 7% compared to only 1% for a one-unit increase in age.

Although the relationship between PHN job satisfaction and the interaction between age and workload was weak, KT Think-Tank participants perceived this

relationship to be important and worthy of further consideration. At a middle range role overload score of 10, no relationship existed between age and job satisfaction, but at low levels of work overload, satisfaction declined with age. Conversely, at high levels of work overload, satisfaction increased with age. One Think-Tank PHN suggested results may be related to nurses' life-stages, reflective of those who choose to remain in public health despite heavy workloads. Another suggested that increased years of experience could improve confidence and impact capacity to cope with heavier workloads.

It must be noted, however, the magnitude of the effect of nurses' age is not large. Although younger PHNs had the lowest level of job satisfaction at excessive levels of role overload, the probability of being very satisfied remained low with the same high workload scores for older PHNs. Despite this, Think-Tank participants perceived this finding to be relevant. One PHN claimed, "Boomers want to work longer hours". Baby-Boomers are considered those born between 1940 and 1959 (Wilson, Squires, et al., 2008). By using this definition, Baby-Boomers in this study represented the largest proportion (44%) of the sample, potentially skewing results. Nurses with fewer outside-of-work responsibilities may derive increased job satisfaction when they have heavier workloads, while younger PHNs are dissatisfied with low work overloads, possibly related to lifestyle choices or outside caregiving responsibilities. Another PHN suggested that the findings may be reflective of the number of children nurses have at home. Determining strategies to support PHNs with outside-of-work responsibilities may be an approach organizations should consider.

The interaction found in this study between age and workload may also represent differing generations' worklife expectations and values. A KT Think-Tank participant suggested that younger generations typically have a better worklife balance; they take

assigned breaks and leave their work at the end of the day reflective of recent multi-generational research (Davis, 2009). Many Think-Tank participants reported that it often is a personal choice to work through breaks and/or arrive early to complete their work. Younger generations may not derive the same rewards from their worklife as their more experienced colleagues. As one PHN claimed, “Young people today were given a great deal by their parents and their expectations are different than in previous generations. We felt if we worked harder and gave more, we would be recognized and rewarded.”

No studies were found that examined the phenomenon of generational differences among nurses practicing in public health however researchers have analyzed multi-generational workforce differences in other Canadian nursing sectors (Cho, Spence-Laschinger, & Wong, 2006; Lavoie-Tremblay et al., 2008). KT Think-Tank participants suggest that generational variation must also be addressed in the public health sector as they too have an aging workforce that will eventually require replacement. Leaders who recognize that different roles may call for different age levels and skill sets could potentially maximize multi-generational differences. Strategies informed by this knowledge could support nurses to better work to the full scope of their competencies throughout their career spectrums. Increased understanding of multi-generational workforce differences, as they apply to PHNs, may facilitate increased public health workforce efficiency.

Innovative approaches such as encouraging multi-generational partnerships involving recently retired PHNs may be feasible and warrant future evaluation. For example, a KT Think-Tank participant described an initiative recently implemented by Canadian public health inspectors who have established a ‘Wrinkle Club’ in an effort to deal with potential surge capacity events providing a catalogue of available expertise should the need

arise in an emergency. Another revealed that retired PHNs in Atlantic Canada have been approached to determine ways to engage retired or nearly-retired nurses. Encouraging generational partnerships and collaboration in this manner is reflective of mentorship programs described earlier and demonstrative of the multifaceted benefits adequately supported mentorship programs could offer Canadian public health organizations.

Regional Variation in National PHN Job Satisfaction

No statistically significant differences were found in PHN job satisfaction between the different Canadian regions examined in this study however these results are limited due to the small sample size, reduced even further by large regional groupings. Only three areas could be compared as there were too few PHN participants in the NSWHN from the Canadian Northern region. The Atlantic region reported the highest proportion of satisfaction (65%), while approximately half (53%) of Central region PHNs were very satisfied with slightly fewer (51%) from the Western region reporting the same.

Although there were no statistically significant differences in job satisfaction by region, KT Think-Tank participants agreed that the PHN role varies across Canada, claiming that “different jurisdictions have different qualifications”. Participants suggested that variations in job expectations should be further examined in order to better clarify PHN roles and responsibilities and practice variations across the country. Some regions have increased scopes of practice and titles do not match responsibilities (Hogan, 2008). Some have clearly defined role differentiation between PHNs and other community nurses while in other regions, the roles and responsibilities of community health nurses and PHNs have become blurred (Crea & Underwood, 2008).

Role Delineation

KT Think-Tank participants revealed that PHN roles are defined by the environment in which they work, a foundational concept for all nurses working within the community (Diem & Moyer, 2007). One suggested, “The roles are so different in the north. CHNs have an increased scope. The titles do not match what they actually do. There are no formal PHNs there.” This translates into a need for region-specific analysis as clinical implications will vary from location to location. KT Think-Tank participants’ perception of the lack of awareness of their roles lends itself to the concept of ‘invisibility’ reflected in the literature which may have clinical implications. Lack of awareness often extends to those in leadership roles resulting in negative outcomes. PHNs who perceive that leadership in their organization is not aware of the importance of their roles report diminished capacity to work to their full scope (Meagher-Stewart, Underwood, et al., 2009).

Think-Tank participants understood the challenges associated with delineating the difference in roles between PHNs and other nurses practicing within the community. Greater statistical power could have been achieved in this study if all community nurses were included in the sample, yet the purpose of this work was to contribute to the body of knowledge specific to PHN practice. Determining the number of PHNs in Canada is difficult with varying estimates found in the literature. Participants claimed that they understand what their role entails but the public and other healthcare sectors do not. One KT Think-Tank participant suggested that “decision-makers and politicians who fund programs need to understand the role and the details...what the role is capable of.” Think Tank participants agreed with one PHN who commented, “We first have to define what we do.” With this comes the necessity of classification and nomenclature that currently varies across

Canada. A specialized professional practice definition could be facilitated by highlighting the role of practioners within the public health sector to the population at large.

By promoting public health, increasing interest, and improving public health awareness, both within the healthcare and private sectors, political interest would ensue. This could have the added advantage of facilitating improved community awareness of population health initiatives (Last, 2010). If the public is made aware and their interest heightened, political attention would soon follow. Increased awareness may come as a result of media attention during public health crises, but PHN-positive contributions should be defined and highlighted outside such crises. A recent example in the Toronto Star highlighted the work of a PHN initiative focused on the most vulnerable young mothers not reached by the area 'Healthy Babies Healthy Children' program. The 'HARP' (Homeless At-Risk Prenatal) program brought the attention of Torontonians to city PHNs in a positive and powerful light (Ogilvie, 2010). Such positive attention is required to bring the role and practice of PHNs to the forefront well in advance of public health emergencies, potentially facilitating improved emergency preparedness by virtue of this heightened awareness.

In summary, the issue of nurses' job satisfaction in the complex environment of public health has similarities to other nursing sectors and yet it is also unique. The results of this secondary analysis reinforce and further clarify several work environment factors that PHNs perceive as important to their practice including autonomy, control-over-practice, manageable workloads, effective leadership, and role delineation. Key findings were highlighted and integrated with interpretations of KT Think-Tank participants involved in a unique, collaborative, end-of-study knowledge translation opportunity. Highlighted findings for which recommendations were generated at the KT Think-Tank include issues related to

the significance of workload, the importance of nursing leadership to PHN practice, the challenge of defining the role of PHNs, and the importance of generational differences to future recruitment and retention capacity of the public health sector. Recommendations will be presented at the end of this thesis work.

Study Limitations

A limitation of this study was the use of a single-item measure for the outcome or dependent variable, nurses' job satisfaction, and its required dichotomization. Not only did this measure create considerable methodological challenges related to skewed data but it must be questioned how reflective this measure is of PHNs' job satisfaction. Recognized as a multi-dimensional construct including both personality traits and environmental factors, researchers have reported concerns about the use of single-item instruments for measurement of job satisfaction (Roelen, Koopmans, & Groothoff, 2008). Conversely, several researchers support the use of single-item measures, reporting adequate correlation with multiple-item scales (Nagy, 2002; Wanous, Reichers, & Hudy, 1997). These researchers identify that single-item measures are easier, take less time and may be more appropriate for long surveys such as the NSWHN. This may be particularly appropriate in this instance as the primary focus of the original study was to examine the work and health of Canadian nurses and compare them to the rest of the population; evaluation of job satisfaction was one question in an otherwise very in-depth study examining a multitude of variables (Shields & Wilkins, 2006). For the current study the single-item measure was the only choice to evaluate nurses' satisfaction and therefore created study limitations.

A second limitation of the study is the relatively small sample size ($n = 271$). Although power analysis was performed prior to beginning statistical testing, several methodological challenges were encountered specific to sample size. Greater statistical power could have been achieved had a larger sample size been garnered. Increasing sample size using the NSWHN would have translated into combining other nurses with similar profiles to the study sample merely to obtain more robust results. Although this may have

provided more statistically significant findings, it would not have remained true to the foundational intent of this study; to better understand the work environment of PHNs.

Also related to sample size, potential multicollinearity may be considered a study limitation which can cause instability of item parameter estimates in multivariate modeling (Tabachnick & Fidell, 2007). Questionnaire surveys often contain correlated explanatory variables so that multicollinearity occurs frequently (Schroder, M., Lander, J., & Levine-Silverman, S., 1990) which can distort interpretation of regression models (Tabachnick & Fidell). Regression coefficients with large standard errors (SE) or results contrary to expectation are signs of potentially problematic multicollinearity (Schroder et al.).

Some suggest the simplest method to eliminate problematic multicollinearity is to delete at least one explanatory variable from the regression model. Because there were so few variables in this study and resultant regression models, it was determined this would be of little value. Removing 'age' in question two, for example, would merely reproduce the model from question one. An alternative approach is centering of explanatory variables (personal communication with K. Wilkins, April 22, 2010). However, centering the terms is not necessarily the best approach when the number of study cases is small as in this study (personal communication with Dr. J.M. Billette, April 27, 2010). Dr. Billette suggests that sample size is the main limitation of this study and believes that significant interaction terms would not be guaranteed with centering of the scales.

Finally, the age of the data could be considered a limitation as the last of the interviews in the primary study were collected in January 2006, making these data over four years old at the time of thesis deposition however this limitation was partially overcome by the end-of-study knowledge translation activity, the KT Think-Tank.

Study Strengths

Many study strengths are a direct result of the high quality data available from the primary dataset, the 2005 NSWHN. All mechanical and technical precautions taken to ensure quality of the original dataset were advantageous to this secondary analysis. For example, prior to implementing the survey, the NSWHN questions underwent extensive quality assurance evaluation, including qualitative testing in both official languages through focus groups ensuring factors were representative of nursing issues. The excellent response rate of 80% for the primary study provided nationally representative results, generalizable to PHNs across Canada. Additionally, the variables selected for this secondary analysis were measured using validated tools selected by experts in nursing health human resources in collaboration with Statistics Canada experts in research methodology.

The current study conceptual framework was an adapted version of the Nurses' Health Model which was also developed by a group of expert nurse-researchers in collaboration with nursing stakeholders from across Canada. The adapted conceptual framework used a pertinent subset of variables derived from the literature and provided a definitive direction for research processes. The end-of-study KT Think-Tank participants' perceptions provided valuable insights and subsequently the conceptual framework was modified to suggest direction for future research.

Bringing together practicing PHNs from across the country for the KT Think-Tank provided valuable study context. Knowledge exchange opportunities among such a diverse group of participants offered different perspectives about the variables and study results. Participants' enthusiasm exceeded all expectations and the day was exciting and informative. This was an important opportunity for knowledge exchange, sparking insights

between front-line practitioners, researchers, educators, and senior national decision-makers offering a wider range of future possibilities for practice, policy and research.

In conclusion, a quantitative methodological approach was used for this thesis research and content experts' insights were integrated into the final interpretation of study findings, providing valuable context and future recommendations for practice, policy, and research. The KT component validated the importance of some statistically significant findings demonstrating the valuable nature of including knowledge-users in research processes. This study remained focused on the work of PHNs and will add to the growing body of knowledge concerning this vital nursing sector. Despite constituting only a small proportion of the national nursing body, the work of PHNs is important to the future health of Canadians. This study provides an increased understanding of the determinants of Canadian PHNs' job satisfaction.

Recommendation Generation Process

Reflective of CIHR's (2009) KT framework, these recommendations evolved from a combination of findings in the literature, research results, and KT Think-Tank participant discussion. The Think-Tank component of this study could be described as reflective of the filtration stage of the Knowledge-to-Action process where knowledge users identify and filter those study findings considered most relevant and of greatest value to their practice (Graham, et al., 2006). A total of eleven study highlights were presented to KT Think-Tank participants for their consideration (Table 9).

Table 9: Study Highlights in Brief

Canadian Public Health Nurses' Professional Practice Environment Thesis Research Finding Highlights of Secondary Data Analysis from the 2005 NSWHN
1) Few male PHNs 2) Few northern PHNs 3) Generational differences 4) Permanent employment status 5) Difficulties in PHN role delineation 6) Value of nurses in leadership positions 7) Questionable measure of PHN job satisfaction 8) Autonomy does not independently predict job satisfaction 9) Control-Over-Practice independently predicts job satisfaction 10) Work Overload independently predicts job satisfaction 11) Workload + Autonomy interaction predicts job satisfaction

Recommendations were developed based on five key study findings selected by KT Think-Tank participants, considered to be most relevant to current PHN practice (Table 10). These included the importance of PHN workload, the value of nursing leadership, PHN role delineation, generational differences pertinent to nurses practicing in public health, and the importance of knowledge translation processes to transferring knowledge into action.

Table 10: KT Think-Tank Participants' Study Highlights Selection

Selected Study Highlight	Study Findings
PHN Workload	Work overload is a reliable predictor of and inversely related to PHN job satisfaction $\chi^2(1, n = 269) = 15.00, p < 0.01$ Interaction between autonomy and workload is a significant predictor of PHN job satisfaction. $\chi^2(1, n = 223) = 15.87, p < 0.01$
Nursing Leadership	A majority, 87% reported having a nurse as direct supervisor Nurse leaders comprehend PHN practice
PHN Role Delineation	Difficulties defining the role of public health nurses versus other nurses in community health sector potentially reducing statistical power
Multi-Generational Workforce	<35 years = 25% 35-54 years = 60% >55 years = 15% Interaction of age and workload significantly related to PHN job satisfaction $\chi^2(1, n = 271) = 8.49, p < 0.01$
Knowledge-Translation Processes	Valuable for determining importance of study findings – vital research component Validates practitioners' perceptions Excellent knowledge-exchange opportunity

Recommendations

The Importance of PHN Workload

1. Further research examining the importance of PHN workload.

In this study, workload was a significant predictor of PHN job satisfaction, both independently and in interaction with age and autonomy. The interaction with workload demonstrated the significance of PHN practice autonomy which was not independently significant. Workload issues were crucial to KT Think-Tank PHNs.

2. Development of measure of PHN workload.

A review of the literature and resultant KT Think-Tank discussion revealed that no formal measures of PHNs' workload are currently used consistently across public health organizations. Development of workload measures would be useful in identifying problem areas and aid in preparing more effectively for emergency situations. Given the significance of workload findings in this study, development of a valid and reliable measure of PHNs' workload is recommended.

The Value of Nursing Leadership

3. Mentorship programs for public health nursing leadership.

Think-Tank participants suggest that mentorship programs for nursing leaders are vital given the diminishing proportion of nurses in senior executive positions and that nursing leadership has been shown to facilitate PHNs working to their full scope. Mentorship programs are recommended for nurses in public health leadership roles.

4. Research evaluating outcomes of nursing leadership within public health.

KT Think-Tank participants recognize the value of providing evidence to organizations and policy makers to determine the importance of employing nurses in leadership roles in the public health sector. Quantitative and qualitative research with outcome evaluation specific to nursing leadership within this domain is recommended.

5. Collaborative, intersectoral, and interdisciplinary leadership development.

KT Think-Tank participants suggest that there is value in developing leadership in collaboration with other sectors and disciplines, congruent with the interdisciplinary environment of public health practice. Leadership workshops involving various disciplines are recommended. Intersectoral leadership opportunities could also be beneficial to PHN leadership.

*PHN Role Delineation***6. Development of widely used terminology to delineate PHN role.**

A limitation of this study involved the identification and enumeration of PHNs. Development of a widely used terminology to define the role of Canadian PHNs is recommended to aid in national definition and health human resource enumeration.

7. Increased public health content in undergraduate programs.

Participants suggest improved public health practicum experiences to address potential deficits in public health nursing baccalaureate programs. It is recommended that organizations work collaboratively with educational institutions to identify priority areas and facilitate quality public health clinical experiences for nursing students.

*Multi-Generational Workforce***8. Further research specific to multi-generational public health human resource issues.**

It is recommended that research be conducted to determine the multi-generational issues specific to the public health sector such as different generations' determinants of job satisfaction. Additionally, further research examining the interaction between age and workload using a larger sample is suggested to validate study findings.

9. Use of existing health human resources.

KT Think-Tank participants recognize the value of utilizing existing expertise and recommend continued efforts be made to implement such strategies as ANDSOOHA's (2008) mentorship initiative within public health. Additionally, utilization of research specific to multi-generational issues within this domain may identify the strengths of different nursing generations so that the public health workforce can be engaged most efficiently.

*Knowledge-Translation Activities***10. Future opportunities for KT activities specific to PHNs' practice**

Based on this study's findings, future KT events specific to the public health domain are recommended. By facilitating this knowledge-to-action, such events could serve to inform Canadian public health practice, policy, and research.

References

- Aiken, L.H. & Patrician, P.A. (2000). Measuring organizational traits of hospitals: The revised nursing work index. *Nursing Research*, 3(49), 146-153.
- Al-Enzi, N., Chowdhury, R.I., Shah, M.A., & Al-Otobi, M. (2009). Job satisfaction of nurses with multicultural backgrounds: A questionnaire survey in Kuwait. *Applied Nursing Research*, 22(2), 94-100.
- Algoma Public Health and ANDSOOHA: Public Health Nursing Management (2008). *Orientation: Transition to Public Health Nursing*. [Electronic version]. Ottawa: Author. Retrieved February 03, 2009, from <http://www.andsooha.org/uploads/assets/1/transitiontophnursing.pdf>
- Armstrong, P. (2009). The intersection of race and gender with occupational health and safety indicators: Canadian nurses compared with other women-dominated 'caring' professions. Unpublished research using 2005 NSWHN data. Retrieved July 29, 2009, from <http://www.yorku.ca/hschair/index.htm>
- Armstrong-Stassen, M., & Cameron, S.J. (2005). Concerns, satisfaction, and retention of Canadian community health nurses. *Journal of Community Health Nursing*, 22(4), 181-194.
- Armstrong, K. J., & Laschinger, H. (2006). Structural empowerment, magnet hospital characteristics, and patient safety culture: Making the link. *Journal of Nursing Care Quality*, 21(2), 124-134.
- Bakker, D., Conlon, M., Fitch, M., Green, E., Butler, L., Olson, K., & Cummings, G. (2010). Canadian oncology nurse work environments: Part I. *Canadian Journal of Nursing Leadership*, 22(4), 50-68.

- Bauer, T. (2004). *High performance workplace practices and job satisfaction: Evidence from Europe*. (Discussion paper 1265) [Electronic version]. Bonn, Germany: Institute for the Study of Labour. Retrieved August 15, 2009, from <ftp://ftp.iza.org/dps/dp1265.pdf>
- Baumann, A., Blythe, J., & Underwood, J. (2006). Surge capacity and casualization: human resource issues in the post-SARS system. *Canadian Journal of Public Health*, 97(3), 230-232.
- Baumann, A., Underwood, J., Blythe, J., Ciliska, D., Ehrlich, A., Akhtar-Danesh, N., et al. (2006). Better data: Better performance. Community health nursing in Ontario. *Health Human Resource Series: Number 7* [Electronic version]. London, Canada: Nursing Health Services Research Unit. Retrieved June 1, 2009, from <http://www.nhsru.com/documents/Series%207%20Community%20Health%20Nursing.pdf>
- Bender, K.A. & Heywood, J.S. (2004). *Job satisfaction of the highly educated: The role of gender, academic tenure, and comparison income* [Electronic version]. (JEL Publication No. J28, J44). Wisconsin, Milwaukee: University of Wisconsin-Milwaukee. Retrieved July 15, 2009, from <http://www.nber.org/~sewp/events/2004.05.28/Bender-Heywood-Jobsatofthehighlyeducated.pdf>
- Best, M. F., & Thurston, N.E. (2006). Canadian public health nurses' job satisfaction. *Public Health Nursing*, 23(3), 250-255.
- Bookey-Bassett, S., Laporte, D., Hayes, L., Etowa, J., Hiroz, J., Raqueno, et al. (2008). *Sector specific components that contribute to positive work environments and job*

- satisfaction for nurses (SCC): Interim report* [Electronic version]. Toronto, Canada. Retrieved March 7, 2008 from, <http://www.nhsru.com/documents/NHSRU%20Uof%20T%20SSC%20Study%20Interim%20Rpt%20-%20Final%20Jul%2008.pdf>
- Bradbury-Jones, C., Sambrook, S., & Irvine, F. (2008). Power and empowerment in nursing: A fourth theoretical approach. *Journal of Advanced Nursing*, 62(2), 258-266.
- Brudney, D. (2009). Choosing for another: Beyond autonomy and best interests. *Hastings Center Report*, 39(2), 31-37.
- Buchner, A., Erdfelder, E., & Faul, F. (1997). How to Use G*Power [WWW document]. Retrieved January 26, 2009, from http://www.pscho.uni-duesseldorf.de/aap/projects/gpower/how_to_use_gpower.html
- Buhler-Wilkerson, K. (1984). False dawn: The rise and decline of public health nursing, 1900-1930. (Doctoral dissertation, University of Pennsylvania, 1984). *Dissertation Abstracts International-A*, 45, 5 (p. 1487).
- Butler-Jones, D. (2007). The health of the public is the foundation of prosperity: The work of the public health agency of Canada at home and around the world. *CMAJ*, 177(9), 1063-1064.
- Campbell, S.L., Fowles, E.R., & Weber, B.J. (2004). Organizational structure and job satisfaction in public health nursing. *Public Health Nursing*, 21(6), 564-571.
- Canadian Association of Schools of Nursing (2010). *Guidelines for Quality Community Health Nursing Clinical Placements for Baccalaureate Nursing Students*. Retrieved June 24, 2010 from, <http://casn.ca/vm/newvisual/attachments/856/Media/CPGuidelinesFinalMarch.pdf>

- Canadian Healthcare Association. (2009). *Home Care in Canada: From the Margins to the Mainstream*. Ottawa, Ontario: Author. (ISBN Publication No. 978-1-896151-33-5).
- Canadian Institute for Health Information (2005). *Workforce Trends of Registered Nurses in Canada, 2005, Registered Nurses Database* [Electronic version]. Ottawa, Canada: Author. Retrieved May 4, 2009, from http://secure.cihi.ca/cihiweb/products/ndb_workforce_trends_registered_nurses_canada_2005_e.pdf
- Canadian Institute for Health Information. (2006). *Workforce trends of Registered Nurses in Canada, 2006: Health human resources database* [Electronic version]. Ottawa, Canada: Author. Retrieved October 06, 2009, from http://secure.cihi.ca/cihiweb/products/workforce_trends_of_rns_2006_e.pdf
- Canadian Institute for Health Information. (2007a). *Canada's health care providers, 2007* [Electronic version]. Ottawa, Canada: Author. Retrieved January 13, 2009, from http://secure.cihi.ca/cihiweb/products/HCPProviders_07_EN_final.pdf
- Canadian Institute for Health Information. (2007b). *List of data tables: Workforce trends of regulated nurses in Canada, 2007*. Ottawa, Canada: Author. Retrieved March 05, 2009, from http://secure.cihi.ca/cihiweb/en/statistics_nursing_2007_e.html
- Canadian Institute for Health Information. (2008, February 29). *Zoom in on the 2005 national survey of the work and health of nurses satisfaction and respect on the job: How do they relate to absenteeism of nurses?* Retrieved June 10, 2009, from http://secure.cihi.ca/cihiweb/en/zion_20080229_e.html

- Canadian Institute of Health Research (2008). *Knowledge to action: A knowledge translation casebook*. Retrieved June 24, 2010, from http://www.cihr-irsc.gc.ca/e/documents/kt_casebook_e.pdf
- Canadian Institute of Health Research (2009). *About knowledge translation*. Retrieved June 24, 2010, from <http://www.cihr-irsc.gc.ca/e/29418.html>
- Canadian Nurses Association (n.d.). *RN Education: Registered Nurses and Baccalaureate Education*. Retrieved October 25, 2009, from http://www.cna-aiic.ca/CNA/nursing/education/baccalaureate/default_e.aspx
- Canadian Nurses' Association. (2008). *Code of ethics*. [Electronic version] Retrieved August 27, 2009, from http://www.cna-aiic.ca/cna/documents/pdf/publications/Code_of_Ethics_2008_e.pdf
- Canadian Nurses Association (2009). *The Next Decade: CNA's Vision for Nursing and Health*, [Electronic version]. Ottawa, Canada: Author. Retrieved May 27, 2010, from http://www.cna-aiic.ca/CNA/documents/pdf/publications/Next_Decade_2009_e.pdf
- Canadian Nurses Association (2010). *Nurse Fatigue and Patient Safety: Research Report*, [Electronic version]. Ottawa, Canada: Author. Retrieved June 06, 2010, from http://www.cna-nurses.ca/CNA/practice/safety/full_report_e/files/fatigue_safety_2010_report_e.pdf
- Carleton, Ottawa, Outaouais Local Research Data Center (2009). Homepage. Retrieved July 27, 2009, from http://www.coolrdc-cldrcoo.ca/index_e.php
- Chambers, L.W., Underwood, J., Halbert, T., Woodward, C.A., Heale, J., & Isaacs, S. (1994). 1992 Ontario survey of public health nurses: Perceptions of roles and activities. *Canadian Journal of Public Health*, 88, 175-179.

- Chief Public Health Officer (2008). *Report on the state of public health in Canada: Helping Canadians achieve the best possible health* (Report At A Glance) [Electronic version]. Ottawa, Canada; Public Health Agency of Canada Retrieved July 07, 2009, from <http://www.phac-aspc.gc.ca/publicat/2008/cpho-aspc/pdf/report-eng.pdf>
- Cho, J., Laschinger, H.K.S., & Wong, C. (2006). Workplace empowerment, work engagement and organizational commitment of new graduate nurses. *Canadian Journal of Nursing Leadership*, 19(3), 43-60.
- Cohen, B.E. & Reutter, L. (2007). Development of the role in public health nurses addressing child and family poverty; a framework for action. *Journal of Advanced Nursing*, 60(1), 96-107.
- College of Nurses of Ontario (n.d.). *Professional Standards*. Retrieved July 06, 2009, from <http://www.cno.org/prac/profstandards.html>
- Community Health Nurses Association of Canada (2008). *Canadian community health nursing standards of practice* [Electronic version]. Toronto, Canada: Author. (Originally published in 2003). Retrieved October 12, 2008 from http://www.chnc.ca/documents/chn_standards_of_practice_mar08_english.pdf
- Community Health Nurses of Canada (2009). *Public health nursing discipline specific competencies 1.0*. [Electronic version]. Toronto, Canada: Author. Retrieved from http://www.chnc.ca/documents/competencies_june_2009_english.pdf
- Crea, M. & Underwood, J. (2008). *Community health nursing study. Organization structures of community health care systems in Canada: A review of provincial and territorial health care systems* [Electronic version]. Hamilton, Canada: Nursing Health Services Research Unit. Retrieved September 01, 2009, from

- <http://www.nhsru.com/documents/CHN%20study%20Organizational%20Structures%20of%20Health%20Care%20Systems%20in%20Canada%2001%2004%2008.pdf>
- Crichton, N. (2001). Information point: Wald test. *Journal of Clinical Nursing*, 10, 767-774.
- Cumbey, D. A., & Alexander, J. W. (1998). The relationship of job satisfaction with organizational variables in public health nursing. *Journal of Nursing Administration*, 28(5), 39-46.
- Davis, G. (2009). Managing a multi-generational workforce. *Managing Partner*. Retrieved August 21, 2009, from http://www.heidrick.com/NR/rdonlyres/6A26FD77-5B38-4825-8739-7019F42ED66C/0/HS_MultiGeneration.pdf
- deMoura, G.R., Abrams, D., Retter, C., Gunnarsdottir, S., & Ando, K. (2009). Identification as an organizational anchor: How identification and job satisfaction combine to predict turnover intention. *Journal of Social Psychology*, 39(4), 540-557.
- Diaz-Swearingen, C. (2009). Use of nursing perspectives to inform public health nursing workforce development. *Public Health Nursing*, 26(1), 79-87.
- Diem, E., & Moyer, A. (2007). *Canadian community health nursing standards of practice toolkit*. Ottawa: Author.
- Dillman, D. (2007). *Mail and internet surveys: The tailored design method* (2nd ed.). Canada: John Wiley & Sons.
- Duffield, C., Roche, M., O'Brien-Pallas, L., & Catling-Paull, C. (2009). The implications of staff 'churn' for managers, staff and patients. *Nursing Economics*, 27(2), 103-112.
- Duxbury, L., Higgins, H., & Lyons, S. (2009). *Executive Summary. The etiology and reduction of role overload in Canada's health care sector*. Ottawa, Canada: Retrieved

July 03, 2010 from <http://www.sprott.carleton.ca/news/2010/docs/executive-summary.pdf>

- Falk-Rafael, A. (2005). Speaking the truth to power: Nursing's legacy and moral imperative. *Advances in Nursing Science*, 28(3), 212-223.
- Falk-Rafael, A., Fox, J., & Bewick, D. (2005). Report of a 1999 survey of public health nurses: Is public health restructuring in Ontario, Canada moving toward primary health care? *Primary Health Care Research and Development*, 6, 172-183.
- Flynn, L. & Deatrick, J. (2003). Home care nurses' descriptions of important agency attributes. *Journal of Nursing Scholarship*, 35(4), 385-390.
- Friederichs, V., Cameron, J. C., & Robertson, C. (2006). Impact of adverse publicity on MMR vaccine uptake: A population based analysis of vaccine uptake records for one million children, born 1987-2004. *Archives of Disease in Childhood*, 91(6), 465-468.
- Gifford, W., Davies, B., Edwards, N., Griffin, P., & Lybanon, V. (2007). Managerial leadership for nurses' use of research evidence: An integrative review of the literature. *Worldviews on Evidence-Based Nursing*, 4(3), 126-145.
- Glynn, K., Maclean, H., Forte, T., Cohen, M. (2009). The association between role overload and women's mental health. *Journal of Women's Mental Health*, 18(2), 2009.
- Graham, I.D., Logan, J., Harrison, M.B., Straus, S.E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation? Time for a map? *The Journal of Continuing Education in the Health Professions*, 26(1), 13-24.
- Gust, D. A., Darling, N., Kennedy, A., & Schwartz (2008). Parents with doubts about vaccines; Which vaccines and reasons why. *Pediatrics*, 122, 718-725.

- Hansen, C., Carryer, J., & Budge, C. (2007). Public health nurses' views on their position within a changing health system. *Nursing Praxis in New Zealand*, 23(2), 14-26.
- Haycock-Stuart, E., Jarvis, A., & Daniel, K. (2008). A ward without walls? District nurses' perceptions of their workload management and job satisfaction. *Journal of Clinical Nursing*, 17, 3012-3020.
- Hayes, L., O'Brien-Pallas, L., Duffield, C., Shamian, J., Buchan, J., Hughes, F., et al. (2006). Nurse turnover: A literature review. *International Journal of Nursing Studies*, 43, 237-263.
- Haynie, J.J., Hartman, S.J., & Lundberg, O. (2007). Personality and job satisfaction in the public health sector. *The Health Care Manager*, 26(3), 240-245.
- Haugh, E.B., & Spence-Laschinger, H. (1996). Power and opportunity in public health nursing work environments. *Public Health Nursing*, 13(1), 42-49.
- Health Canada. (2007, February). The working conditions of nurses: Confronting the challenges [Electronic version]. *Health Policy Research Bulletin, Issue 13*. Ottawa, Canada: Author. Retrieved July 06, 2009 from http://www.hc-sc.gc.ca/sr-sr/alt_formats/hpb-dgps/pdf/pubs/hpr-rps/bull/2007-nurses-infirmieres/2007-nurses-infirmieres-eng.pdf
- Henderson-Betkus, M., & MacLeod, M.L. (2004). Retaining public health nurses in rural British Columbia. *Canadian Journal of Public Health*, 95(1), 54-58.
- Hogan, M. (2008). *Public health nursing in Canada: A review of the literature for the Community Health Nurses Association of Canada*. Retrieved August 14, 2009, by emailing infor@chnac.ca

Johnson, t. (2004). *Job satisfaction recruitment and retention of public health nurses*.

(Master thesis, D'Youville College, Buffalo, NY, Unite States, 2004. UMI Dissertation Publication No. 1425589.

Kanter, R. M. (1977). *Men and women of the corporation*. New York: Basic Books Inc.

Kerr, M.S., Spence-Laschinger, H.K., Severin, C.N., Almost, J.M., & Shamian, J. (2005)

New Strategies for monitoring the health of Canadian nurses: Results of collaborations with key stakeholders. *Nursing Leadership*, 18(1), 67-81.

Kosta-Polston, E. (2008). Practicing women's health with a simultaneity in a medical model world. *Nursing Science Quarterly*, 21(1), 32-36.

Kulig, J.C., Stewart, N., Penz, K., Forbes, D., Morgan, D. & Emerson, P. (2009). Work setting, community attachment, and satisfaction among rural and remote nurses. *Public Health Nursing*, 26(5), 430-439.

Kuss, T., Proulx-Girouard, L., Lovitt, S., & Kennelly, P. (1997). A public health nursing model. *Public Health Nursing*, 14(2), 81-91.

Lacey, S.R., Teasley, S.L., & Cox, K.S. (2009). Differences between pediatric registered nurses' perception of organizational support, intent to stay, workload, and overall satisfaction, and years employed as a nurse in magnet and non-magnet pediatric hospitals: Implications for administrators. *Nursing Administration Quarterly*, 33(1), 6-13.

Lake, E. (2002). Development of the practice environment scale of the nursing work index. *Research in Nursing & Health*, 25, 176-188.

Lake, E. (2007). The nursing practice environment: Measurement and evidence. *Medical Care Research and Review* (64)2, 105-125.

- Laperrière, H. (2008). Developing professional autonomy in advanced nursing practice: The critical analysis of sociopolitical variables. *International Journal of Nursing Practice* 14(5), 391-397.
- Laschinger, H. K. S., & Leiter, M. P. (2006). The impact of nursing work environments on patient safety outcomes: The mediating role of burnout/engagement. *Journal of Nursing Administration*, 36(5), 259-267.
- Last, J. (2010). Future challenges to health and public health services in Canada. *Canadian Journal of Public Health*, 101(1), 5.
- Lavoie-Tremblay, M., O'Brien-Pallas, L., Gelinas, C., Desforges, N., Marchionni, C. (2008). Addressing the turnover issue among new nurses from a generational viewpoint. *Journal of Nursing Management*, 16, 724-733.
- Lavoie-Tremblay, M., Wright, D., Desforges, N., Gelinas, C., Marchionni, C., & Drevniok, U. (2008). Creating a healthy workplace for new-generation nurses. *Journal of Nursing Scholarship*, 40(3), 290-297.
- Lee, I. & Wang, H.H. (2002). Perceived occupational stress and related factors in public health nurses. *Journal of Nursing Research*, 10(4), 253-260.
- Leipert, B.D. (1996). The value of community nursing: A phenomenological study of the perceptions of community health nurses. *Public Health Nursing*, 13(1), 50-57.
- Leiter, M. P., & Spence-Laschinger, H. K. (2006). Relationships of work and practice environment to professional burnout: Testing a causal model. *Nursing Research*, 55(2), 137-146.
- LoBiondo-Wood, G., & Haber, J. (2005). *Nursing research in Canada: Methods, critical appraisal and utilization*. Toronto: Mosby.

- MacDonald, M.B., & Schoenfeld, B. (2003). Expanding roles for public health nurses: Perceptions of roles and activities. *Canadian Nurse*, 99(7), 18-22.
- Marchildon, G. (2005). *Health systems in transition: Canada*. Toronto, ON: University of Toronto Press Incorporated.
- Meagher-Stewart, D., Edwards, N., Smith, D., Young, L., & Woodford, E. (2004). *The Study of Public Health Nurses Primary Health Care Practice*. Dalhousie University, School of Nursing Report.
- Meagher-Stewart, D., Underwood, J., Schoenfeld, B., Lavoie-Tremblay, M., Blythe, J., MacDonald, M., et al. (2009). *Building Canadian public health nursing capacity: Implications for action. Health Human Resource Series Number 15*. London, ON. Retrieved June 01, 2009, from http://www.nhsru.com/documents/Series%2015%20McMaster_BuildingCanadianPublicHealth.pdf
- Ministry of Health and Long-Term Care (2002). Public health units. *Section: Public Information*. Retrieved Oct 15, 2008, from http://www.health.gov.on.ca/english/public/contact/phu/phu_mn.html
- Ministry of Health and Long Term Care (2006). *SARS Commission final report: Spring of fear*. Toronto, Canada: Author. Retrieved September 23, 2009, from http://www.health.gov.on.ca/english/public/pub/ministry_reports/campbell06/campbell06.html
- Ministry of Health and Long Term Care (2008). *Sector specific components that contribute to positive work environments and job satisfaction for nurses*. Toronto, Canada: Author.

Ministry of Health and Long Term Care (2009). *Ontario public health standards:*

Introduction to the standards. Retrieved April 05, 2009, from

http://www.health.gov.on.ca/english/providers/program/pubhealth/oph_standards/ophs/intro.html

Moore, J. (2009). An exploration of the origin of classic grounded theory. *Nurse*

Researcher, 17(1), 8-14.

Morgan, S.H. (2009). The magnet model as a framework for excellence. *Journal of Nursing*

Care Quality, 24(2), 105-108.

Mowat, D.L. & Butler-Jones, D. (2007). Public health in Canada: A difficult history.

HealthcarePapers 7(3), 31-36.

Murphy, G. T., Birch, S., Alder, R., MacKenzie, A., Lethbridge, L., Little, L., & Cook, A.

(2009). *Tested solutions for eliminating Canada's registered nurse shortage. Final*

Report. Ottawa, Canada. Retrieved June 01, 2009, from [http://www.cna-](http://www.cna-aiic.ca/cna/documents/pdf/publications/RN_Highlights_e.pdf)

[aiic.ca/cna/documents/pdf/publications/RN_Highlights_e.pdf](http://www.cna-aiic.ca/cna/documents/pdf/publications/RN_Highlights_e.pdf)

Nagy, M. (2002). Using single-item approach to measure facet job satisfaction. *Journal of*

occupational and organizational psychology, 75(1), 77- 87.

National Advisory Committee on SARS & Public Health (2003). *Learning from SARS – A*

Renewal of Public Health in Canada [Electronic version]. Ottawa, Canada: Health

Canada. Retrieved October 05, 2009, from [http://www.phac-aspc.gc.ca/publicat/sars-](http://www.phac-aspc.gc.ca/publicat/sars-sras/pdf/sars-e.pdf)

[sras/pdf/sars-e.pdf](http://www.phac-aspc.gc.ca/publicat/sars-sras/pdf/sars-e.pdf)

Naylor, D., Chantler, C., & Griffiths, S. (2004). Learning from SARS in Hong Kong and

Toronto. *JAMA*, 291(20), 2483-87.

- Nedd, N. (2006). Perceptions of empowerment and intent to stay. *Nursing Economics*, 24, 13-18.
- Norman, G. R., & Streiner, D.L. (2008). *Biostatistics: the bare essentials* (3rd ed.). Hamilton ON: BC Decker.
- Norwood, S. L. (2000). *Research Strategies for Advanced Practice Nurses*. New Jersey: Prentice-Hall.
- Ogilvie, M. (2010, March 13). Pregnant, homeless and invisible in Toronto. *Toronto Star*. Retrieved May 05, 2010 from <http://www.thestar.com/news/gta/article/779450>
- Oberle, K. & Tenove, S. (2000). Ethical issues in public health nursing. *Nursing Ethics*, 7(5), 425-438.
- Pearson, A., Laschinger, H., Porritt, K., Jordan, Z., Tucker, D., & Long, L. (2007). Comprehensive systematic review of evidence on developing and sustaining nursing leadership that fosters a healthy work environment in healthcare. *International Journal of Evidence Based Healthcare*, 5, 208-253.
- Pett, M.A. (1997). *Nonparametric statistics for health care research: Statistics for small sample and unusual distributions*. Thousand Oaks, CA: Sage Publications.
- Polit, D. F., & Beck, C. T. (2008). *Nursing research: Generating and assessing evidence for nursing practice*. (8th ed.). Lippincott Williams & Wilkins: Philadelphia.
- Polivka, B., Stanley, S., Gordon, D., Taulbee, K., Kiefer, G., & McCorkle, S. (2008). Public Health Nursing competencies for public health surge events. *Public Health Nursing*, 25(2), 159-165.

Public Health Agency of Canada (2007). *Core competencies for public health in Canada:*

Release 1.0. Retrieved October 15, 2008, from <http://www.phac-aspc.gc.ca/ccph-cesp/pdfs/cc-manual-eng090407.pdf>

Public Health Agency of Canada (2008). *About the agency.* Retrieved October 15, 2008,

from http://www.phac-aspc.gc.ca/about_apropos/index-eng.php

Purdy, N. (2008). *The effects of work environments on teamwork and patient outcomes.*

Unpublished doctoral dissertation, University of Western Ontario. Presented at

RNAO's Healthy Work Environment conference, Markham ON, November 22, 2008.

Quality Worklife Quality Healthcare Collaborative (2007). *Indicators of Healthy*

Workplaces. Retrieved July 26, 2009, from <http://www.qwqhc.ca/indicators-healthy-workplaces.aspx>

Quality Worklife Quality Healthcare Collaborative (2010, February 25). Healthy work

environments: *Healthy workplaces in action: Working Together to Deliver Quality*

Care (Power Point Presentation from QWQHC's 2010 Summit). Retrieved April 08,

2010, from www2.cchsa.ca/qwqhc/documents/Day1-9am-R.Devitt.ppt

Rajbhandary, S., Basu, K., & Wang, (2007). Absenteeism: is there a causal relationship? An

empirical analysis of the national survey of the work and health of nurses. Retrieved

July 27, 2009, from

[http://www.cihiconferences.ca/en/HHR2007/download/sameer_rajbhandary_\(thursday_4e\).pdf](http://www.cihiconferences.ca/en/HHR2007/download/sameer_rajbhandary_(thursday_4e).pdf)

Raphael, D. (2003). Addressing the social determinants of health in Canada: Bridging the

gap between research findings and public policies. *Policy Options*, 3, 35-44.

- Registered Nurses' Association of Ontario (2009). *Health Work Environments Best Practice Guidelines*. Retrieved January 06, 2009, from http://www.rnao.org/Page.asp?PageID=861&SiteNodeID=241&BL_ExpandID=
- Reutter, L.I., & Ford, J.S. (1996). Perceptions of public health nursing: Views from the field. *Journal of Advanced Nursing*, 24, 7-15.
- Richard, L., Beaudet, N., & Gendron, S. (2010). Community and public health nursing practice: Two new studies sound the alarm. *Canadian Journal of Public Health*, 101(1), 106.
- Roelan, C.A.M., Koopmans, P.C., & Groothoff, J.W. (2008). Which work factors determine job satisfaction? *Work, IOS Press* 30, 433-439.
- Ryan, R.E. (2007). The public health nurse: Looking back and looking forward. (Masters of Public Health Dissertation, University of Kansas. Dissertation & Thesis Publication No. AAT 1442580.
- Schoenfeld, B., & MacDonald, M.B. (2002). Saskatchewan public health nursing survey: Perceptions of roles and activities. *Canadian Journal of Public Health*, 93(6), 452-456.
- Schofield, R., Valaitis, R., Akhtar-Danesh, N., Baumann, A., Martin-Misener, R., & Underwood, J. (2009). Phase 2: Strengthening the quality of community health nursing practice: A pan-Canadian survey of community health nurses' continuing education needs. *Health Human Resource Series Number 17*. London, Canada: Nursing health Services Research Unit. Retrieved June 17, 2009, from <http://www.nhsru.com/documents/Series%2017%20PHASE%202%20STRENGTHENING%20THE%20QUALITY%20OF.pdf>

- Schroeder, M., Lander, J., & Levine-Silverman, S. (1990). Diagnosing and dealing with multicollinearity. *Western Journal of Nursing Research*, 12(2), 175-84.
- Shields, M., & Wilkins, K. (2006). *Findings from the 2005 national survey of the work and health of nurses*. (Statistics Canada Catalogue no. 83-003-XPE). Ottawa, Canada: Statistics Canada.
- Simmons, D. (2002). Autonomy in practice: A qualitative study of school nurses' perceptions. *The Journal of School Nursing*, 18(2), 87-94.
- Simpson, J.L. (2007). *Caring, connecting, empowering: A resource guide for implementing nursing mentorship in public health units in Ontario*. [Electronic version]. Ottawa: ANDSOOHA & PHRED. Retrieved February 03, 2009, from http://www.phred-redsp.on.ca/Docs/nursing_mentorship_resource_guide.pdf
- Simpson, J., Beynon, C., & Simpson, M.A. (2007). *An evaluation of a public health nursing mentorship initiative*. London, Canada: Association of Public Health Nursing Management & Public Health Education, Research and Development.
- Society for Human Resource Management (2009). *Employee job satisfaction: Understanding the factors that make work gratifying*. [Electronic version]. Alexandria, VA: Author. Retrieved July 15, 2009 from http://www.shrm.org/Research/SurveyFindings/Articles/Documents/09-0282_Emp_Job_Sat_Survey_FINAL.pdf
- Spence-Laschinger, H.K. (2008). Effect of empowerment on professional practice environments, work satisfaction, and patient care quality. Further testing the nursing worklife model. *Journal of Nursing Care Quality*, 23(4), 322-330.

- Spence-Laschinger, H.K., Finegan, J., Shamian, J., & Wilk, P. (2001). Impact of structural and psychological empowerment on job strain in nursing work settings: Expanding on Kanter's model. *JONA*, 31(5), 260-272.
- Spence-Laschinger, H., Shamian, J., & Thomson, D. (2001). Impact of magnet hospital characteristics on nurses' perception of trust, burnout, quality of care, and work satisfaction. *Nursing Economics*, 19(5), 209-219.
- Stamler, L. & Yiu, L. (2008). *Community health nursing: A Canadian perspective (2nd ed)* Toronto: Pearson Education.
- Statistics Canada (2006). *Findings from the National Survey of the Work and Health of Nurses*. Author: Ottawa, ON.
- Statistics Canada (2007a). *Canadian community health survey*. Retrieved October 17, 2008, from <http://www.statcan.gc.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=3226&lang=en&db=IMDB&dbg=f&adm=8&dis=2>
- Statistics Canada (2007b). *Population and dwelling Counts for Canada; 2006 and 2001 censuses – 100% data*. Retrieved August 17, 2009, from <http://www12.statcan.gc.ca/census-recensement/2006/dp-pd/hlt/97-550/Index.cfm?TPL=P1C&Page=RETR&LANG=Eng&T=101>
- Statistics Canada (2008, March 18). *National survey of the work and health of nurses, 2005: Master file code book*. Retrieved August 18, 2009, from http://www.statcan.gc.ca/imdb-bmdi/document/5080_D3_T13_V1-eng.pdf

- Statistics Canada (2009a). *Data Liberation Initiative*. Retrieved August 10, 2009, from <http://www.statcan.gc.ca/dli-ild/dli-idd-eng.htm>
- Statistics Canada (2009b). *Microdata User Guide: National Survey of the Work and Health of Nurses 2005*. Ottawa, Canada: Author. Retrieved August 23, 2009 from http://www.statcan.gc.ca/imdb-bmdi/document/5080_D2_T1_V1-eng.pdf
- Storey, C., Cheater, F., Ford, J., & Leese, B. (2009). Retaining older nurses in primary care and the community. *Journal of Advanced Nursing*, 65(7), 1400-1400.
- Straus, S.E., Tetroe, J., & Graham, I. (2009). Defining knowledge translation. *Canadian Medical Association Journal*, 181(3-4), 165-168.
- Tabachnick, B. & Fidell, L. (2007). *Using multivariate statistics* (5th ed.). Boston: Pearson Education.
- Taylor, B., & Barling, J. (2004). Identifying sources and effects of career fatigue and burnout for mental health nurses: A qualitative approach. *International Journal of Mental Health Nursing*, 13(2), 117-125.
- The Interagency Advisory Panel on Research Ethics (2008). *Tri-council policy statement: Ethical conduct for research involving humans* (Draft 2nd ed.) [Electronic version]. Canada. Retrieved 20/08/09 from, <http://www.pre.ethics.gc.ca/policy-politique/docs/TCPS-Draft2-eng.pdf>
- The Joint Task Group on Public Health Human Resources (2005). *Building the Public Health Workforce for the 21st Century: A Pan-Canadian Framework for Public Health Human Resources Planning*. Ottawa, Canada: Author.
- Thomka, L. A. (2007). Mentoring and its impact on intellectual capital: Through the eyes of the mentee. *Nursing Administration Quarterly*, 31(1), 22-26.

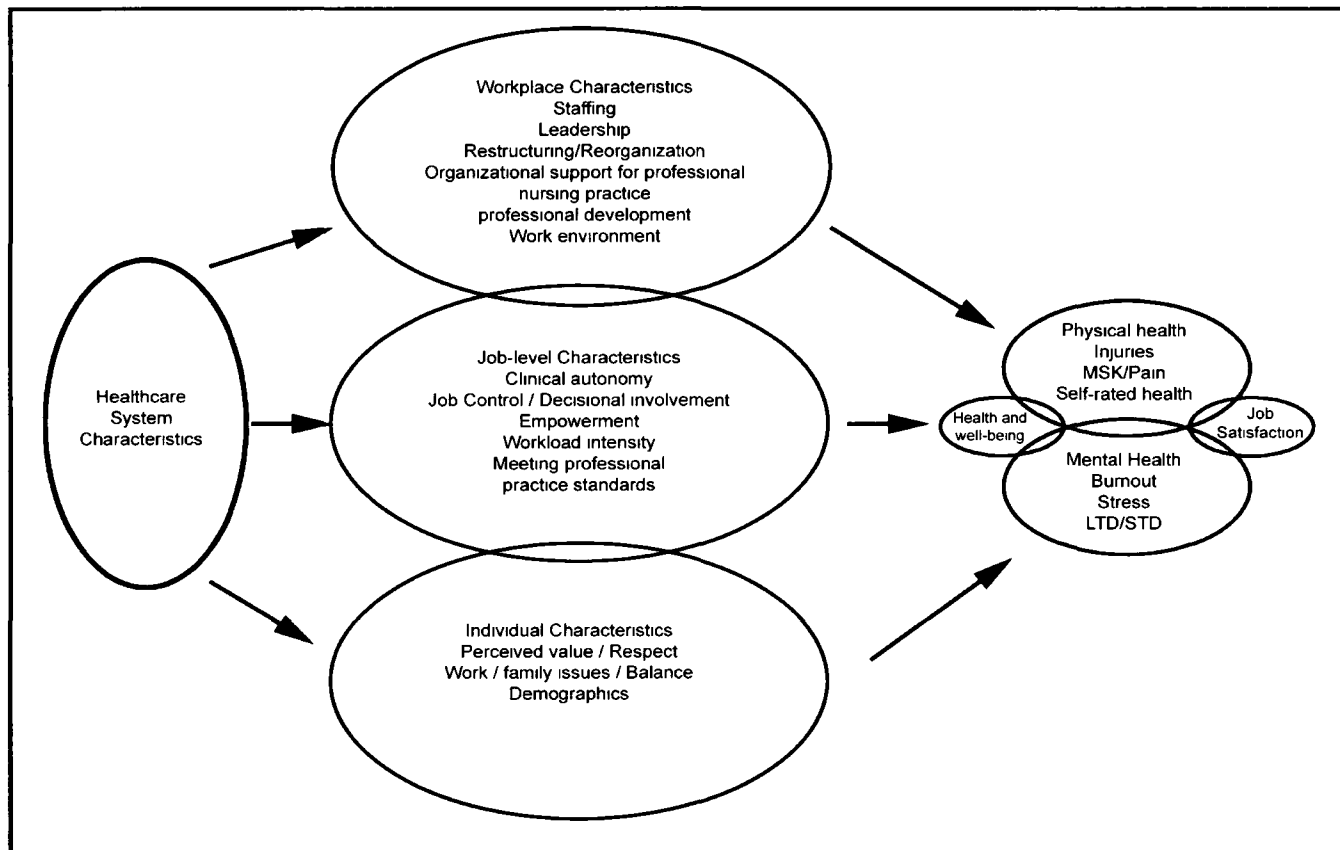
- Tourangeau, A.E., Coghlan, A.L., Shamian, J., & Evans, S. (2005). Registered nurses and registered practical nurse evaluations of their hospital practice environments and their response to these environments. *Canadian Journal of Nursing, 18*(4), 54-69.
- Tullai-McGuinness, S. (2008). Home healthcare practice environment: Predictors of RN satisfaction. *Research in Nursing & Health, 31*, 252-260.
- Ulrich, C. (2002). *The nature of public health nursing practice: Finding coherence in complexity*. (Master thesis, University of British Columbia, Prince George, British Columbia, Canada, 2002). UMI Dissertation Publication No. 0-612-80689-8.
- Underwood, J. (2007). *Competencies and standards: In a public health context, what is the difference?* (Discussion paper prepared for the Public Health Agency of Canada). Retrieved August 13, 2009, via email from info@chnac.ca.
- Underwood, J., Baumann, A., Akhtar-Danesh, N., MacDonald-Rencz, S., MacDonald, M., Matthews, et al. (2009, March). National community health nursing study: Comparison of enablers and barriers for nurses working in the community. *Health Human Resource Series Number 14*. Hamilton, Canada: Nursing Health Services Research Unit. Retrieved June 17, 2009, from http://www.nhsru.com/documents/Series%2014%20McMaster_NationalCommunityHealth_fullbook.pdf
- Underwood, J., Baumann, A., Ciliska, D., Meagher-Stewart, D., Deber, R., MacDonald, M., et al. (2010, February). *Maximizing community health nursing capacity in Canada: A research summary for decision makers*. Ottawa, Canada: Canadian Health Services Research Foundation. Retrieved March 15, 2010, from http://www.chsrf.ca/final_research/reiss/pdf/11510_Reiss_report_en_FINAL.pdf

- Underwood, J., Deber, R., Baumann, A., Dragan, A., Laporte, A., Alameddine, M., & Wall, R. (2009). Demographic profile of community health nurses in Canada 1996-2007. *Health Human Resource Series Number 13*. Hamilton, Canada. Retrieved June 17, 2009, from http://www.nhsru.com/documents/Series%2013%20McMaster_Demographic_Profile_of_Community.pdf
- Underwood, J.M., Mowat, D.L., Meagher-Stewart, D.M., Deber, R.B., Baumann, A.O., MacDonald, M.B., et. al. (2009). Building community and public health nursing capacity: A synthesis report of the national community health nursing study. *Canadian Journal of Public Health, (100)*, 5, 1-11.
- Upenieks, V. V. (2003). What constitutes effective leadership? Perceptions of magnet and nonmagnet nurse leaders. *Journal of Nursing Administration, 33*(9), 456-467.
- Villeneuve, M. & MacDonald, J. (2006). *Toward 2020 Visions for Nursing*. Ottawa. Canada: Canadian Nurses Association.
- Wanous, J.P. & Reichers, A.E., & Hudy, M.J. (1997). Overall job satisfaction: How good are single-item measures? *Journal of Applied Psychology, 82*(2), 247-252.
- Wilkins, K. & Shields, M. (2008). Correlates of medication error in hospitals. *Health Reports*, Ottawa, Canada: Statistics Canada. Retrieved October 08, 2009 from <http://www.statcan.gc.ca/pub/82-003-x/2008002/article/10565-eng.pdf>
- Wilkins, K. & Shields, M. (2009). Employer-provided support services and job dissatisfaction in Canadian registered nurses. *Nursing Research, 58*(4), 255-263.

- Wilson, G.B. (2005) Work overload. [Unpublished Term Paper]. Retrieved June 12, 2010 from <http://www.oppapers.com/essays/Work-Overload/51599>
- Wilson, B., Squires, M., Widger, K., Cranley, L., & Tourangeau, A. (2008). Job satisfaction around a multigenerational nursing workforce. *Journal of Nursing Management*, 16, 716-723.
- World Health Organization Commission on Social Determinants of Health. (2008). *Closing the gap in a generation: Health equity through action on social determinants of health*. Retrieved September 07, 2009, from http://whqlibdoc.who.int/publications/2008/9789241563703_eng.pdf
- Yildiz, Z., Ayhan, S., Erdogmus, S. (2009). The impact of nurses' motivation to work, job satisfaction, and sociodemographic characteristics on intention to quit their current job: An empirical study in Turkey. *Applied Nursing Research*, 22(2), 113-118.
- Zeytinoglu, I.U., Denton, M., Davies, S., Baumann, A., Blythe, J., & Boos, L. (2007). Deteriorated external work environment, heavy workload and nurses' job satisfaction and turnover intention. *Canadian Public Policy*. Retrieved July 30, 2009, from <http://economics.ca/cgi/jab?journal=cpp&view=v33s1/CPpv33s1p031.pdf>
- Zerwekh, J.V. (1992). Community health nurses – A population at risk? *Public Health Nursing*, 9(1), 1.
- Zerwekh, J.V. (1993). Commentary: Going to the people – public health nursing today and tomorrow. *American Journal of Public Health*, 83(12), 1676-1678.

Appendix A: Original Conceptual Model

A Conceptual Model of Nurses' Health



(Kerr, Spence-Laschinger, Severin, Almost, & Shamian, 2005)

Appendix B: Search Terms Utilized

- Workplace
- Work Environment
- Organizational culture
- Organizational systems
- Autonomy
- Job satisfaction
- Work engagement
- Control-over-practice
- Burnout
- Retention
- Recruitment

Appendix C: Study Definitions and Variable Description

Autonomy

A rational individual's capacity to make an informed un-coerced decision; an individual's capacity for self-determination, including not only their freedom for action but freedom for thought (Laperrière, 2008)

Control-over-Practice

The support and opportunity provided to an individual to meet the expectations of their practice in order to provide high quality services (Lake, 2007). Examples include time to get the required work done, adequate staffing, and the opportunity to work in different areas.

Workload:

An amount of labour; the hypothetical relationship between an individual (or group) and their task demands; total output of energy (Storey, et al., 2009)

Job Satisfaction

An individual affective feeling; a relative state, dependent of the interaction of employees, their personal characteristics, values, and expectations within the work environment and organization (Cumbey & Alexander, 1998). The feelings individuals experience about facets of their job or the overall feeling of their job; a global feeling (Tullai-McGuinness, 2008)

Variable	NSWHN Cronbach α reliability*	Level of Measurement	Study Measurement
(IV) Autonomy	0.909 5-Item Measure	Ordinal- Continuous	<u>4-point Likert Scale:</u> 1-Strongly agree 2-Somewhat agree 3-Somewhat disagree 4-Strongly disagree 5-Not applicable
(IV) Control- over-Practice	0.879 7-Item Measure	Ordinal- Continuous	<u>4-point Likert Scale:</u> 1-Strongly agree 2-Somewhat agree 3-Somewhat disagree 4-Strongly disagree 5-Not applicable
(IV) Workload	0.785 5-Item Measure	Ordinal- Continuous	<u>5-point Likert Scale:</u> 1-Strongly agree 2-Agree 3-Neither agree nor disagree 4-Disagree 5-Strongly disagree
(DV) Job Satisfaction	N/A Single Item Measure	Nominal	<u>4-point Likert Scale:</u> 0-Other than Very Satisfied 1-Very Satisfied

*Identified in the 2005 National Survey of the Work and Health of Nurses (Shields & Wilkins, 2006)

Competencies

Foundational knowledge, skills and abilities necessary for assessing professional capacity (Hogan, 2008)

Core Competencies for Public Health

The specific expertise, knowledge, and proficiencies required of the interdisciplinary personnel working within Canadian public health (Underwood, 2007)

Discipline-Specific Core Competencies for Public Health Nurses

Defined skills and activities required of public health nurses that permit them to fulfill the expectations of the unique role they play in the Canadian healthcare system (Hogan, 2008)

The integrated knowledge, skills, judgement and attributes required of a PHN to practice safely and ethically. Attributes include, but are not limited to attitudes, values, and beliefs (CNA, 2008)

Healthy Workplace

“A work setting that takes a strategic and comprehensive approach to providing the physical, cultural, psychosocial and work/job design conditions that maximize health and well-being of healthcare providers, quality of patient outcomes and organizational performance” (QWQHC, 2007)

Nursing Work Index

A set of measures developed to study the nursing practice environment that has been utilized in numerous research studies and found to be a valid and reliable instrument (Lake, 2007)

Positive Professional Practice Environment

An environment that supports nurses to function at the highest scope of clinical practice, to work effectively in an interdisciplinary team and to mobilize resources quickly (Lake, 2007)

Public Health Nurse

A university prepared nurse in the subset of community nursing who has been assigned to public health programs, has at least one academic year in public health nursing or a nursing degree that includes public health education (Baumann, Underwood, Blythe, et al., 2006)

Scope of Practice

Activities that registered nurses are educated and authorized to perform as set out in jurisdictional legislation (CNO, 2008)

Upstream Philosophy

An approach that supports the belief that the earlier the action taken along the spectrum of health, the better (Hogan, 2008)

Appendix D: Selected NSWHN Questions

Selected NSWHN Demographic Data

1. Main job – public health nursing.
2. Are you registered or licensed as a Registered Nurse?
3. Are you currently employed in nursing in Canada?
4. Main job province of work.
5. Respondent's age in years.
6. Highest educational qualification in nursing.
7. Years since started working at main nursing job.
8. In what month did you start working at this job – if less than 2 years?
9. Are you working full-time or part-time?
10. Is this position permanent, temporary, casual, or are you self-employed?
11. Is your immediate supervisor a nurse?

Selected NSWHN Questions

The Revised Nursing Work Index (NWI-R) is a set of measures with established psychometric properties which has been used in multiple studies to measure nurses' work environment (Lake, 2007). The NSWHN implemented four components of the NWI-R and two of these were selected for this secondary analysis; autonomy and control-over-practice.

Each question involves a 4-point Likert Scale with range from (1) 'Strongly Agree' to (4) 'Strongly Disagree'.

Autonomy

1. The supervisory staff is supportive of nurses.
2. Nursing controls its own practice.
3. I have the freedom to make important patient care and work decisions.
4. I am not placed in a position of having to do things that are against my nursing judgment.
5. I have a nurse manager or immediate supervisor who backs up the nursing staff in decision-making, even if it is in conflict with a physician.

Control-over-Practice

6. Adequate support services allow me to spend time with my patients.
7. There is enough time and opportunity to discuss patient care.
8. There are enough nurses on staff to provide quality client services.
9. I have a nurse manager or immediate supervisor who is a good manager and leader.
10. There is enough staff to get the work done.
11. I am given the opportunity to work on highly specialized patient care units.
12. I am given assignments that foster continuity of care, that is, I continue to care for the same patient from one day to the next.

The NSWHN asked participants to react to 5 statements concerning their workload. Each statement included a five-point scale ranging from (1) 'Strongly Agree' to (5) 'Strongly Disagree' (5).

Workload

13. I often have to arrive early or stay late to get my work done.
14. I often have to work through my breaks to complete my assigned workload.
15. It often seems like I have too much work for one person to do.
16. I am given enough time to do what is expected of me in my job.
17. I have too much to do, to do everything well.

Using 4-point Likert Scale with range from (1) 'very satisfied' to (4) 'very dissatisfied'.

Job Satisfaction

1. On the whole, how satisfied are you with this job?

Appendix E: Study Analytic Framework

Research Question	Variables	Level of Measurement	Analysis Planned	Sample size/Power
1) What is the relationship between Canadian public health nurses' job satisfaction and their autonomy, control-over-practice, and workload?	DV: Job Satisfaction (JS) IV: Autonomy (Aut) IV: Control-Over-Practice (COP) IV: Workload (WL) IV: (Aut) X (COP) IV: (Aut) X (WL) IV: (COP) X (WL)	Ordinal: 4 point scale Nominal: 1 or 2 = satisfied 3 or 4 = dissatisfied Ordinal - Continuous Ordinal - Continuous Ordinal - Continuous	Logistic Regression	$n = 271$ $7 \times 20 = 140$ Literature not specific about required sample size for adequate power (Tabachnick & Fidell, 2007). Some suggest 10 cases per variable sufficient (Norman & Streiner, 2008). Using a conservative assumption that, with an alpha of 0.05 and a desired statistical power of 80%, only 10 cases are required for each variable, level of variable, or interaction term (Darlington, 1990). It was determined that 20 cases per variable would be selected to ensure sufficient power.

Darlington, R (1990) *Regression and Linear Models* New York McGraw-Hill Publishing Company

Norman, G R , & Streiner, D L (2008) *Biostatistics The Bare Essentials* (3rd ed) Hamilton, ON BC Decker Inc

Tabachnick, B G , & Fidell, L S (2007) *Using Multivariate Statistics* (5th ed) Toronto, ON Pearson Education

Research Question	Variables	Level of Measurement	Analysis Planned	Sample size/Power
ii) How do sociodemographic factors such as nurses' age and years working in public health influence the association between the included workplace variables and nurses' job satisfaction?	IV: Age	Interval	Logistic Regression:	$n = 271$ $7 \times 20 = 140$
	IV: Years Working in Public Health (YW)	Interval - Ratio	Satisfaction = age + Aut + COP + WL + (age * Aut) + (a*COP) + (age*WL)	If interactions found between IVs in #1, then #variables will increase.
	IV: Autonomy (Aut)	Ordinal - Continuous		
	IV: Control-Over-Practice (COP)	Ordinal - Continuous	Satisfaction = YW + Aut + COP + WL + (YW * Aut) + (YW*COP) + (YW*WL)	
	IV: Workload (WL)	Ordinal - Continuous		
	DV: Satisfaction (Sat)	Nominal: 1 or 2 = satisfied 3 or 4 = dissatisfied		

Research Question	Variables	Level of Measurement	Analysis Planned	Sample size/Power
iii) Is there a difference in public health nurses' job satisfaction between different Canadian regions; Western, Northern, Central and Atlantic?	Job Satisfaction Region Employed	Ordinal Nominal	Chi-Square Goodness-of-Fit Test	Using the web-based software program for sample size calculation, G*Power, it was determined that with the study sample ($n = 271$) and a moderate effect size of 0.3, study power of 96% can be attained.

G*Power Available at <http://www.psychologie.uni-trier.de/8000/projects/gpower.html>

Appendix F: KT Think-Tank Participants

**Canadian Public Health Nurses' Work Environment Study
'PHN THINK-TANK'**



**May 17, 2010
8:30am-4:00pm**

Participants

Participant Name	Background
Lisa Ashley	Nurse Consultant, Nursing Policy Canadian Nurses Association Ottawa, ON
Barbara Davies	Thesis Supervisor Professor, School of Nursing University of Ottawa, ON
Christa Doherty	Senior Policy Analyst Office of Nursing Policy, Health Canada Ottawa, ON
Lorette Dupuis	Public Health Nurse Ottawa Public Health Ottawa, ON
Diana Gausden	Public Health Nurse Community Health Nursing Educator McGill University Montreal, Quebec
Karen Graham	Student Researcher Graduate Nursing Student School of Nursing, University of Ottawa ON
Monique Labelle	Public Health Nurse North Bay Parry Sound District Health Unit North Bay, ON
Sionnach Lukeman	Meeting Recorder Graduate Nursing Student School of Nursing, University of Ottawa ON

**Canadian Public Health Nurses' Work Environment Study
'PHN THINK-TANK'**



**May 17, 2010
8:30am-4:00pm**

Participants (cont'd)

Participant Name	Background
Bethany MacIsaac	Public Health Nurse Department of Health and Wellness Prince Edward Island
Janet MacKenzie	Public Health Nurse Amherst Public Health Services Cumberland Health Authority Nova Scotia
Jane Simpson	Thesis Committee Member Public Health Nursing Consultant Ottawa, ON
Margot Suttis	Public Health Nurse Department of Health & Social Services Iqaluit, Nunavut
Joan Reiter	Skills Enhancement for Public Health Professional Development Division Public Health Agency of Canada
Kathryn Wilkins	Primary Study Principal Investigator Conference Presenter Statistics Canada Ottawa, ON
Karen Wonders	Public Health Nurse Northern Interior Health Unit Prince George, British Columbia
Kirsten Woodend	Thesis Committee Member Director and Associate Dean School of Nursing, University of Ottawa

Appendix G: University of Ottawa Research Ethics Board Approval

Université d'Ottawa **University of Ottawa**
 Service de subventions de recherche et déontologie Research Grants and Ethics Services

Ethics Approval Notice

Health Sciences and Science REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
Barbara	Davies	Health Sciences / Nursing	Supervisor
Karen	Graham	Health Sciences / Nursing	Student Researcher

File Number: H09-09-16

Type of Project: Secondary use of data

Title: Examining the Relationship between Canadian Public Health Nurses' Job Satisfaction and their Autonomy, Control-over-Practice, and Workload: A Secondary Analysis of the 2005 National Survey of the Work and Health of Nurses (NSWHN)

Approval Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
10/19/2009	10/18/2010	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:

N/A



This is to confirm that the University of Ottawa Research Ethics Board identified above, which operates in accordance with the Tri-Council Policy Statement and other applicable laws and regulations in Ontario, has examined and approved the application for ethical approval for the above named research project as of the Ethics Approval Date indicated for the period above and subject to the conditions listed the section above entitled "Special Conditions / Comments".

During the course of the study the protocol may not be modified without prior written approval from the REB except when necessary to remove subjects from immediate endangerment or when the modification(s) pertain to only administrative or logistical components of the study (e.g. change of telephone number). Investigators must also promptly alert the REB of any changes which increase the risk to participant(s), any changes which considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project and safety of the participant(s). Modifications to the project, information/consent documentation, and/or recruitment documentation, should be submitted to this office for approval using the "Modification to research project" form available at:

http://www.rges.uottawa.ca/ethics/application_dwn.asp

Please submit an annual status report to the Protocol Officer 4 weeks before the above-referenced expiry date to either close the file or request a renewal of ethics approval. This document can be found at:

http://www.rges.uottawa.ca/ethics/application_dwn.asp

If you have any questions, please do not hesitate to contact the Ethics Office at extension 5841 or by e-mail at: ethics@uOttawa.ca.

Germain Zongo

Protocol Officer for Ethics in Research

For Dr. Daniel Lagarec, Chair of the Health Sciences and Sciences REB



uOttawa

Université d'Ottawa
Faculté des sciences
de la santé

École des sciences
infirmières

University of Ottawa
Faculty of Health
Sciences

School of Nursing

Appendix H: Letter of Invitation to Knowledge Exchange Participants

Attention: Public Health Nurse, manager, or administrator
Respective Health Unit
Street Address
City, Postal Code

March 22, 2010

RE: Invitation to participate in final Advisory Council meeting examining recent Canadian public health nursing study findings

Dear Ms Smith:

I am a full-time, thesis-stream MScN student at the University of Ottawa. My research involves examining the work environment of Canadian public health nurses. I am gathering a group of practicing public health nurses, managers, and administrators to discuss my study findings. I would like to invite you to participate in this one day 'Think Tank' to provide your current practice perspective and insight.

My study was a secondary analysis of select data from the 2005 National Survey of the Work and Health of Nurses (NSWHN). I was interested in determining the relationship between Canadian public health nurses' job satisfaction and their autonomy, control-over-practice, and workload.

Although these data are only four years old, insight from nurses such as yourself would add an invaluable element to the study findings and help to generate recommendations reflective of current practice.

Participation will consist of a one-day meeting in Ottawa on May 17, 2010 with other public health practitioners from across Canada. No remuneration will be provided however your travel, hotel, and meal expenses will be paid. Participation in this Advisory Council will entail discussion of the relevance of the study findings with respect to your current practice. No audio-recording will occur although meeting minutes will be taken. An executive summary of the meeting outcomes will be sent to you.

Health Canada, the Office of Nursing Policy is the primary funding agency for this study. They are very interested in the findings and your interpretation and recommendations. A final report will be published upon study completion with your contribution acknowledged if you are in agreement.

Should you be interested in participating in this final stage of my study, please feel free to contact me at your convenience. I will forward you a copy of my preliminary findings approximately one week in advance of the meeting.

Téléphone 562-5223

Fax 562-5114

151 St. John
Ottawa ON K1H 8M1 Canada

www.uottawa.ca

Thank you for taking the time to consider this request.

Sincerely, *Karen Graham*

Karen Graham, RN, BScN
cc Dr. Barbara Davies, RN, PhD

Contacts:

Researcher:

Karen Graham, RN, BScN
MScN Student
University of Ottawa
School of Nursing
Faculty of Health Sciences
451 Smyth Road
Ottawa, Ontario

Supervisor:

Dr. Barbara Davies, RN, PhD
Professor, School of Nursing
Faculty of Health Sciences
University of Ottawa
451 Smyth Road
Ottawa, Ontario

Appendix I: Knowledge Translation Think-Tank Participants



Photo from left to right: Christa Doherty (Health Canada Office of Nursing Policy), Sionnach Lukeman (University of Ottawa graduate nursing student, meeting recorder), Bethany MacIsaac (PHN, Dept of Health and Wellness, PEI), Karen Wonders (PHN, Northern Interior Health Unit, British Columbia), Joan Reiter (Public Health Agency of Canada), Kathryn Wilkins (Statistics Canada, NSWHN principal investigator), Monique Labelle (PHN, North Bay Parry Sound District Health Unit, Ontario), Dr. Barbara Davies (University of Ottawa professor, thesis supervisor), Lisa Ashley (Canadian Nurses Association), Lorette Dupuis (PHN, Ottawa Public Health, Ontario), Karen Graham (University of Ottawa graduate nursing student, student researcher), Diana Gausden (PHN, McGill University, Quebec), Margot Suttis (PHN, Dept of Health & Social Services, Nunavut), Jane Simpson (PHN Consultant, thesis committee member), Janet MacKenzie (PHN, Amherst Public Health Services, Cumberland Health Services, Nova Scotia). Absent from photograph: Dr. Kirsten Woodend (University of Ottawa professor, thesis committee).

Appendix J: KT Think-Tank Evaluation

PHN THINK-TANK



May 17, 2010
8:30am-4:00pm

Participant Feedback

Knowledge Exchange Objectives

1. Gather Canadian public health nurses, managers, researchers, educators, and senior policy analysts, promoting collaboration and a unique opportunity for knowledge exchange
2. Provide primary study overview – ‘2005 National Survey of the Work and Health of Nurses’ (NSWHN): Presented by Principal Investigator, Kathryn Wilkins
3. Present secondary analysis study overview – ‘Examining the Relationship between Canadian Public Health Nurses’ Job Satisfaction and their Autonomy, Control-over-Practice, and Workload’: Presented by graduate student researcher, Karen Graham
4. Determine relevance of current study findings from PHNs’ practice perspective
5. Generate recommendations for practice, policy, and research

A) How successful were we in achieving the objectives for this gathering?

(Please circle one.)

Unsuccessful

Successful

1

2

3

4

5

B) What I appreciated most about this meeting was:

C) What I appreciated least about this meeting was:

D) Suggestions for future knowledge exchange activities :