NURSE OVERTIME IN CRITICAL CARE: QUALITATIVE & QUANTITATIVE VIEWS

NURSING OVERTIME WORK IN CRITICAL CARE: QUALITATIVE AND QUANTITATIVE PERSPECTIVES

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Lay Abstract

This study explores critical care nurses' perceptions of the outcomes of working overtime, their reasons for working or not working overtime, and the relationship between nursing overtime and specific nurse and patient outcomes. Qualitative and quantitative methods were used involving 28 nurses on 11 units in three tertiary care academic health science centers. The four original contributions to nursing knowledge are: (a) physical effects overtime has on nurses, (b) feelings of disrespect overtime engenders, (c) loss of patient-centered care that results from overtime, and, (d) the positive relationship between nursing overtime and nursing sick time. Quantitative findings revealed that for every 10 hours of nursing overtime, sick time increased by 3.3 hours ($p<0.0001$), which participants attested to qualitatively. It will be important to track both paid and unpaid overtime hours per individual nurse to enhance future research, ensure institutional accountability and staff well-being.

ABSTRACT

Background: Nursing overtime is being integrated into the normal landscape of practice to ensure optimal staffing levels and address variations in patient volume and acuity. This is particularly true in critical care where fluctuations in either are difficult to predict. Research exploring nurses' perceptions of the outcomes of overtime has not been conducted, and studies exploring the relationship between nursing overtime and patient outcomes have produced conflicting results.

Objectives: This study aims to explore critical care nurses' perceptions of the outcomes of overtime, their reasons for working or not working it, and to determine the relationship between critical care nursing overtime and specific nurse (sick time) and patient (infections/mortality) outcomes.

Methods: This thesis is comprised of two discrete components. Thorne's interpretive description guided the qualitative component and multilevel regression models tested relationships in the quantitative portion. Qualitative and quantitative methods were selected because of their complementarity and ability to explore both perceptions of overtime in addition to the relationship between nursing overtime and outcomes for nursing staff and their patients.

Results: Participants' reasons for working overtime included: (a) financial gain, (b) helping and being with colleagues, (c) continuity for nurses and patients, and (d) accelerated career development. Their reasons for not working overtime were: (a) tired and tired of being there, (b) established plans, and (c) not enough notice. Major themes highlighting the perceived outcomes of overtime included: (a)

physical effects, (b) impact on patient centered care, (c) the issue of respect, (d) balancing family and work, (e) the issue of guilt, (f) financial gain, and (g) safety is jeopardized. Regression analysis revealed that for every 10 hours of nursing overtime, sick time increased by 3.3 hours ($p<0.0001$). Overtime was not associated with patient outcomes (infections and mortality).

Conclusion: There are negative and positive consequences of nursing overtime for nurses and patients. Future research needs to focus on the collection of accurate patient level data, as well as tracking and exploring the effects of unpaid overtime (missed breaks/staying late). Nurses should work to proactively lobby governments to fund adequate staffing in order to reduce the need for overtime and provide safer patient care.

Acknowledgements

I have been infinitely blessed to have worked under the supervision of two of the most caring, brilliant and encouraging people I've met. I owe the joy and richness of my graduate school experience to Dr. Anita Fisher and Dr. Jenny Ploeg. Thank you for your support and interest in developing me as a person beyond this degree. Dr. Gladys Peachey and Dr. Noori Akhtar-Danesh, you have pushed me and challenged my thinking. The final products of this journey (both myself and this dissertation) are better for it. Thank you for choosing to donate so many hours of your time to my learning and success. I also wish to thank the nurses who graciously gave of their time to be a part of this study, and the ICU managers at each organization for their assistance and support.

To my parents, this thesis belongs almost equally to you. I couldn't have cared for a newborn and completed this work without your generous support. Thank you for investing your time, treasure and heart into my career, and my character. My parents-in-law, you have always treated me as if I were your own daughter. Thank you for your prayers, encouragement, and home-cooked meals.

My sweet son, Jeremiah. You have made this home stretch a delight and reminded me often of why I'm doing this. Finally and foremost, I share this achievement with my loving husband, Ray. You are an inspiration and a model of trust and patience for me. You have been a tireless supporter of everything that I deem important and you have committed yourself to making all of my dreams come true. Let's check this one off the list!

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LIST OF ABBREVIATIONS

C. Diffificile:	Clostridium Difficile
CFNU:	Canadian Federation of Nurses' Unions
CI:	Confidence interval
CNA:	Canadian Nurses' Association
CNO:	College of Nurses' of Ontario
ED:	Emergency Department
ICN:	International Council of Nurses
ICU:	Intensive care unit
IV:	Intravenous
MODS:	Multiple Organ Dysfunction Score
MRSA:	Methicillin-resistant Staphylococcus Aureus
ONA:	Ontario Nurses' Association
OR:	Odds ratio
PDF:	Portable document file
RN:	Registered Nurse
RR:	Relative risk
S1, P1:	Site 1, participant 1
SE:	Standard error
TLC:	Tender loving care
VAP:	Ventilator associated pneumonia
VRE:	Vancomycin-resistant enterococci

GLOSSARY

Critical Care:	A unit that cares for patients who have a critical illness or injury that acutely impairs one or more vital organ systems such that there is a high probability of imminent or life threatening deterioration in the patient's condition. (American College of Emergency Physicians, 2014)
Ethical Distress:	Ethical distress involves situations in which nurses cannot fulfill their ethical obligations and commitments, or they fail to pursue what they believe to be the right course of action, or fail to live up to their own expectations of ethical practice. (Webster & Baylis, 2000)
Nurse Fatigue:	Nurse fatigue is a subjective feeling of tiredness (experienced by nurses) that is physically and mentally penetrative. It ranges from tiredness to exhaustion, creating an unrelenting overall condition that interferes with the individual's physical and cognitive ability to function in their normal capacity. It is multidimensional in both its causes and manifestations; it is influenced by many factors: physiological (e.g., circadian rhythms), psychological (e.g., stress, alertness, sleepiness), behavioral (e.g., pattern of work, sleep habits) and environmental (e.g.; work demand). Its experience involves some combination of features, physical (e.g., sleepiness) and psychological (e.g., compassion fatigue, emotional exhaustion). It may significantly interfere with functioning and may persist despite periods of rest. (Canadian Nurses' Association, 2010)
Level II Critical Care Units:	Critical care units that provide service to meet the needs of patients who require more detailed observation or intervention including support for a single failed organ system, short-term ventilation, post-operative care, or patients 'stepping down' from higher levels of care. (Bell & Robinson, 2005, p.7)

Level Critical Care Units:	Critical care units that are capable of providing service to meet the needs of patients who require advanced or prolonged respiratory meet the needs support, or basic respiratory support together with the support of at least two organ systems. (Bell & Robinson, 2005, p. 7)
Mandatory Overtime:	Mandatory overtime is a largely American phenomenon. It is a way that hospitals and health care institutions maintain adequate numbers of staff nurses through forced overtime, usually with a total of twelve to sixteen hours worked, with as little as one hour's notice. With mandatory overtime nurses are unable to refuse the required extra hours due to fatigue or feeling that she/he would be unable to deliver adequate, safe patient care. This does not include overtime mandated in an unforeseen emergency, such as a mass casualty situation, or a sudden snowstorm. (American Association of Critical Care Nurses, 2003)
Multiple Organ Dysfunction Score (MODS):	Multiple Organ Dysfunction Scores were designed to be a simple and reliable measure of organ system dysfunction to quantify a risk factor for death, a point measure of the severity of illness or a composite measure of ICU morbidity over time. Each of the following systems are scored at least daily: respiratory, renal, hepatic, cardiovascular, hematologic, neurologic (Glasgow Coma Scale). The higher the score, the worse the prognosis, with a maximum score of 24. (Marshall, 1997)
Overtime:	Overtime is defined as the hours worked in excess of an agreed upon, predetermined, regularly established work schedule, as identified by contract; usual scheduling practices; policies or procedures. (American Nurses Association, 2014)

Declaration of Academic Achievement

This dissertation represents original research that I have conducted under the guidance of my supervisory committee. The project was conceived and drafted into a proposal by primarily by myself with the help of my original thesis supervisor, Dr. Anita Fisher (as a result of a project she was engaged in at the time). My supervisory committee, which also included Dr. Jenny Ploeg, Dr. Noori Akhtar-Danesh and Dr. Gladys Peachey offered input and expertise at many steps along the way.

Following the literature review and research proposal, which I drafted, I prepared applications for, and obtained research ethics board approval in collaboration with personnel at each of the three organizations included. The committee provided feedback to strengthen my initial proposal that was included in each ethics application. I worked with managers at each of the sites to recruit participants, and I myself conducted each of the interviews and manually transcribed them prior to analysis. I also worked with information services at each organization to obtain quantitative data. I conducted both the qualitative and quantitative analysis, with oversight from Dr. Jenny Ploeg regarding the qualitative data and input from Dr. Noori Akhtar-Danesh for the quantitative methods. Upon completion of data analysis, I developed this manuscript with the editorial advice and content recommendations of my supervisory committee.

CHAPTER ONE

Overview

Introduction

Nurses, as the largest, most visible segment of the healthcare workforce in Canada, make up one-third of all health care providers and often serve as the first line of defense against patient error and oversight (Elliott, Rutty & Villeneuve, 2013; Joy, 2009). Typically working eight to 12 hour shifts at the bedside, nurses pick up on the little changes that save lives (Canadian Nurses' Association [CNA], 2004). They act as the liaison between members of the interdisciplinary team, advocating for their patients and ensuring complete and cohesive care (Hall & Weaver, 2001; Siow, Wypij, Berry, Hickey, & Curley, 2013). Their life-saving and sustaining functions are best performed under optimal staffing conditions that include adequate qualified nursing personnel who are both rested and focused on the tasks at hand (Bae, 2012; Rogers, 2008). These staffing conditions may prove difficult to fulfill in contemporary acute care working environments that often employ significant overtime (Berney, Needleman & Kovner, 2005; Drebit, Ngan, Hay & Alamgir, 2010). Critical care units are often beset with staff shortages (due to their need for specialized skills), in addition to elevated and unpredictable patient volume and acuity (Fallis, McMillan, & Edwards, 2011; Fisher, Baumann, & Blythe, 2007). These issues in combination make overtime a unique challenge for critical care settings.

Economic instability over the past two decades has restricted healthcare budgets and resulted in hospital restructuring aimed at reducing costs (Kane, Shamliyan, Mueller, Duval, & Wilt, 2007; Royal College of Nursing 2012). Representing between 50-60% of most hospital budgets, nurse labor costs are often targeted as organizations resort to alternative staffing strategies including the use of overtime, agency nurses, part-time and casual workers in lieu of hiring more full-time staff to fill emerging vacancies (Canadian Institute for Health Information [CIHI], 2013; Fisher et al., 2007). Alternative staffing strategies are employed with the goal of decreasing the costs of employee benefits and reducing the possibility of over-staffing (Berney & Needleman, 2006; Huston, 2014).

Canada's Labour Force Survey revealed that in 2012, Registered Nurses and nurse supervisors worked well over 21.5 million hours of overtime, or the equivalent of 11,900 full-time positions (Canadian Federation of Nurses' Unions [CFNU], 2013). The survey results also showed that nearly a third of Canadian nurses worked paid overtime each week, at an average of 7.3 hours each (CFNU, 2013). While these figures remained virtually unchanged from 2010, the cost of these overtime hours had increased from $660.3 million to nearly $746.5 million in 2012 (CFNU, 2013). In addition to these measureable hours, nearly half of Canadian nurses continue to work overtime without pay at a fiscal value that is estimated to exceed $200 million (CFNU, 2013; Canadian Institute for Health Information, 2006).

Despite its widespread use, the effect of overtime on both patients and

nurses remains largely unknown. Studies exploring the relationship between nursing overtime and patient outcomes are limited in number, concentrated in the United States of America and have conflicting findings to date (Arnow et al., 1982; Berney & Needleman, 2006; Bobay, Yakusheva & Weiss, 2011; Olds & Clarke, 2010; Rogers, Hwang, Scott, Aiken & Dinges, 2004; Russell, Ehrankranz, Hyams & Gribble, 1983; Scott, Rogers, Hwang & Zhang, 2006; Stone et al., 2007; Trinkoff et al., 2011). Only one of these studies involves critical care nurses (Scott et al., 2006). While some studies related overtime to poorer patient outcomes (Olds & Clarke, 2010; Scott et al., 2006; Trinkoff et al., 2011), Berney and Needleman (2006) found it to be associated with *decreased* mortality. Furthermore, Stone et al. (2007) linked overtime to slightly lower rates of central line infections. Even less study has been done with regards to nurses' preferences and perceptions of overtime work. However, because overtime has been integrated into the regular landscape of nursing practice, it is an important strategy to understand clinically in terms of its implications for patient well-being, nurse health, satisfaction and retention.

Research has suggested that nursing overtime is most often employed to combat chronic understaffing (Berney, Needleman & Kovner, 2005). This is a concern as the Canadian Nurses' Association (CNA, 2009) projected a shortage of 60,000 nurses working in direct patient care by 2022, and Ontario's number of nurses dropped from 718 to 699 per 10000 people between 2008 and 2012 (Koroll, 2013). This shortage is amplified in intensive care units (ICUs) where

elevated nurse-patient ratios and the use of advanced technologies require greater numbers of specialized nurses to care for more unstable patients (Fisher, Baumann, Hunsberger, Blythe & Fitzpatrick, 2008). As a result, critical care units tend to be more reliant on overtime hours in order to maintain adequate staffing (Buerhaus, Staiger, Auerbach, 2000; Stone et al., 2007). The current aging population (of nurses who will retire and patients who will require care) makes the use of nursing overtime an issue of significance that merits increasing exploration and action to reduce the potential staff, patient and fiscal burdens going forward.

This thesis is comprised of two discrete components: a qualitative exploration of critical care nurses' reasons for working or not working overtime as well as their perceptions of the outcomes of overtime work, and a quantitative analysis of nursing overtime data as it relates to nurse and patient outcomes. Qualitative inquiry was used to explore critical care nurses' perceptions and preferences related to overtime work. This understanding will be valuable so that staffing can be accomplished in a way that promotes nurse satisfaction, health and retention as well as patient well-being. The quantitative component of this study examined the relationship between nurse overtime and patient and nurse outcomes, which, in conjunction with existing literature, can be used to shape health human resources policies going forward.

Statement of the Problem

Nursing overtime is a growing concern as the workforce and patient population age, alongside increases in patient acuity further straining currently overextended healthcare budgets. To date, very little research has been conducted about overtime within critical care units and none of it within the unique publically-funded Canadian health care system. Existing literature highlights the possibility of negative patient outcomes associated with nursing overtime, however it remains poorly understood as a result of limited research based on secondary and aggregate data (Lobo, Fisher, Peachey, Ploeg & Akhtar-Danesh, 2015). There is a dearth of information and understanding surrounding whether or not nurses actually want to work the additional hours and how they feel it affects themselves and the patients they care for. Quantitative evidence related to the impact of overtime on patient outcomes is simultaneously weak and sparse limiting the ability of policy makers to use it as the basis for staffing decision-making.

Purpose of the Study

The purpose of this study is two-fold. This study aims to: (a) explore critical care nurses' perceptions of the outcomes of overtime and their reasons for working or not working overtime; and (b) determine if a relationship exists between critical care nursing overtime and specific nurse and patient outcomes. The study has been designed to answer the following research questions:

- What are critical care nurses' perceptions of the outcomes of overtime work and their reasons for working overtime?
- Is there a relationship between nursing overtime and patient infection rates, patient mortality and nurse sick time in critical care?

Both qualitative and quantitative methods were selected because of their complementarity and ability to explore perceptions in addition to the relationships between nursing overtime and outcomes for nursing staff and the patients in their care. The statistical analysis of quantitative data reveals relationships between overtime and nurse as well as patient outcomes, the types of "hard evidence" that must necessarily support arguments for policy change. The additional use of qualitative data concerning nurses' perceptions of overtime and its effect on patient outcomes allows for a holistic understanding of the nurses behind the numbers and their experiences that contribute to the quantitative findings.

Thorne, Kirkham and O'Flynn-Magee's qualitative interpretive description (ID) (2004) approach was used as it recognizes the constructed and circumstantial nature of human experience that simultaneously allows for shared realities. These methods prescribe the incorporation of every kind of data from anecdotal evidence to peer reviewed publications as a testing ground and springboard from which to launch emerging insights (Thorne, Kirkham & MacDonald-Emes, 1997). Interpretive description was ultimately applied in order to go beyond description alone (Thorne et al., 2004) and explore meanings and underlying explanations for

nurses' decisions to work overtime, so that they can be more effectively and efficiently deployed.

The literature gap with regards to nurses' perceptions of the outcomes of overtime work obscures the effect that these hours may have on them, their families and ultimately, the patients they care for. Overtime has been found to be a driver of nurse turnover in the past **(**Cline, Reilly, & Moore, 2004; Drebit et al., 2010). Therefore, insights into their perceptions may help to reduce nurse turnover in critical care areas and equip the healthcare industry to develop more appropriate, practical and fiscally responsible staffing strategies. Quantitative study results have the potential to guide practice and policy decisions related to ensuring responsible and safe nurse schedules that protect frontline nurses and their patients, as well as better fiscally position healthcare institutions.

Situating this Study

This study arose out of my interest in nurse well-being and my desire to see a sustainable Canadian health care system for decades to come. My Master's thesis addressed nursing retention strategies for mid-career critical care nurses and overtime was an issue that came up repeatedly (as both a positive and a negative reality). Simultaneously, as I spent time with nursing friends - many of whom had just married, were having children, and buying homes – they spoke of picking up large amounts of overtime in order to stay afloat financially. With some sense of the cost to the healthcare system and Canadian taxpayers, this worried me and

made me wonder what effects, other than financial ones, nurse overtime might be generating. Through involvement in other research projects I also found that nurse overtime was an issue of interest to healthcare administrators, and these things in combination were ultimately the impetus for this study.

Content of Thesis

This thesis is comprised of seven chapters. This chapter provides an overview of the rationale for conducting this study, the study purpose and research questions, along with rationale for using qualitative and quantitative research approaches.

The second chapter is a review of the literature related to nurses' perceptions of overtime work and the relationship between nursing overtime and both nurse and patient outcomes. The chapter details the issue and extent of overtime, how it manifests itself in critical care environments, the effects of overtime on nurses and patient outcomes and issues associated with overtime data. This chapter concludes by summarizing findings and substantiating the literature gap that gave rise to this study.

Chapter three details both the qualitative and quantitative methodologies that were used to answer the research questions. This chapter consists of an overview of both research designs and rationale for their selection. Sampling, data collection and analysis procedures are presented followed by related ethical considerations.

Chapters four and five present findings from the qualitative component of this study. Chapter four contains a description of the sample characteristics as well as the themes that emerged surrounding nurses' reasons for working or not working overtime. Chapter five consists of the seven major themes and their related subthemes that clarify participants' perceptions of the outcomes of nursing overtime in critical care settings.

The sixth chapter presents findings from the quantitative component of this study. It begins with a description of the data obtained as well as demographic information about participating sites. Tables presented outline the output from statistical models, and associations between nursing overtime and both nurse and patient outcomes are explained.

Chapter seven is the discussion and conclusion chapter where study contributions are outlined and findings are compared and presented alongside existing literature. Strengths and limitations of this research are delineated and followed by implications for practice, policy, education and research.

CHAPTER TWO

Background and Literature Review

Introduction

Nursing overtime has demonstrated a steady upward trend in Canada since the 1980's (CFNU, 2011). While it is challenging to isolate any one event or exact time when this trend began, it is clear that overtime continues to increase and become ever more integrated into the "normal" landscape of nursing work in recent years (Drebit et al., 2010). It is an increasing global phenomenon employed to reduce the impact of a critical nursing personnel shortage and the downsizing of nursing departments despite static or increasing patient volume and acuity (International Council of Nurses [ICN], 2009; Kane et al., 2007). In 2012, Canadian nurses worked an average of 7.3 hours of paid overtime *per week* alongside an additional 4.1 hours of unpaid overtime – the equivalent of another full shift per nurse per week (CFNU, 2013). As the incidence and cost of nursing overtime rise, to nearly $746.5 million annually, the need for understanding and action intensifies (CFNU, 2013).

The purpose of this chapter is to review both the qualitative and quantitative literature related to nursing overtime, patient outcomes and nurses' perceptions. Findings from these studies are presented along with analyses of their methodological imitations.

Defining Overtime

The concept of overtime is used indiscriminately in nursing literature to refer to break times which are missed as a result of outstanding patient responsibilities (Pinkham, 2011), working on a scheduled day off (Ontario Nurses' Association [ONA], 2014; Ontario Public Service Employees Union, 2012; Trinkoff et al., 2011), staying at work beyond the prescribed length of a shift (Garrett, 2008; ONA, 2014), or coming in to work on a designated holiday (Canadian Labour and Business Centre, 2002; ONA 2014). Existing studies use the term to refer to time beyond 8.5 and 12.5 hours, as well as any shift that is scheduled overtime (Rogers et al., 2004; Scott et al., 2006). A number of sources also define overtime by way of pay periods, such as anything above 80 hours in two weeks (Bobay et al., 2011), more than 60 hours in a two week period averaged over the scheduling period determined by the local parties (ONA, 2014), or all hours over 40 within one week (Berney et al., 2005; Drebit et al., 2010).

The term overtime is frequently used in conjunction with a number of qualifiers that serve to categorize and describe it. Bae and Brewer (2010) state that nurse overtime encompasses mandatory or unscheduled overtime, voluntary overtime, and paid on-call hours. Along with the notions of mandatory and voluntary overtime, Steinbrook (2002) explains the concept of coerced overtime wherein nurses are not forbidden to refuse an overtime shift, however, while it is technically voluntary, nurses are pressured or bullied into feeling it is required. Callaghan (2003) also describes the concept of unpaid overtime where nurses stay

beyond the conclusion of a regularly scheduled shift for ten minutes to a full additional 12 hours without pay. Existing literature uses the term vaguely which has led to imprecise measurement of overtime and somewhat incomparable findings across studies. For the purposes of this study, overtime was defined as "the hours worked in excess of an agreed upon, predetermined regularly established work schedule, as identified by contract, usual scheduling practices, policies or procedures" (American Nurses Association, 2014, para. 2).

Nursing Overtime in Critical Care

The issue of nursing overtime is compounded in critical care, which emerged as a specialty in the 1950's and 1960's in North America, Australia, Asia, Europe and South Africa (Aitken, Chaboyer & Elliott, 2013). Since then, like many other countries, Canada, has noticed a progressive demand for critical care beds, and anticipates a dramatic further increase in demand over the next few decades (Needham, Bronskill, Sibbald, Pronovost & Laupacis, 2004; Wax, 2013). Approximately 13% of Canadian nurses work in environments that regularly or primarily provide services for critically ill patients (Fallis et al., 2011). The unique challenges that exist in these environments require specialized assessments skills, rapid decision making, as well as enhanced organizational and motor skills – increasing the demands beyond those of many other nursing roles (Fallis et al., 2011). Moreover, because these critical care services are provided around the clock for patients who are largely unstable, nurses are counted upon to provide accurate assessments while remaining particularly vigilant and attuned to subtle

changes in their patient's condition (Scott et al., 2006). These patients are not only exposed to more treatments and medications than many, but they are also seriously ill with reduced resilience to aid in recovery in the event of nursing errors or oversight (Scott et al., 2006). Any additional nurse stressors, including the effects of overtime, may jeopardize patient care and resultant outcomes.

Nursing overtime is often the result of an interplay of factors including staff shortages, elevated patient volume and acuity, staff hiring freezes and fiscal constraints resulting in lower base staffing levels (Berney et al., 2005). Fisher et al. (2007) note that these underlying issues tend to be more prevalent in critical care units, due to unpredictable and rapid fluctuations in patient volume and acuity. The issue of overtime in critical care environments is therefore a unique one that brings with it potentially serious consequences and the need for further investigation. This literature review is presented in two sections beginning with literature related to nurses' perceptions of the outcomes of overtime as well as nurses' reasons for working overtime. This is followed by a review of literature which quantitatively explores the relationship between nursing overtime and specific patient outcomes.

Search Strategy for Literature Related to Nurses' Perceptions of Overtime

A comprehensive, explicit literature search strategy is foundational for rigorous research, as deficient searches can result in inadequate findings (Cooper, 1998). The sample of studies included in this review was therefore generated

according to Conn and Rantz's (2003) proposal that a minimum of two strategies be used in tandem to retrieve the maximum number of eligible primary sources. Electronic indexes examined included CINAHL, Medline, PubMED, EMBASE, and PsychInfo. Terms searched in their full and truncated forms included 'overtime', 'nurs*', 'work hours', 'scheduling', 'shift length', 'extended hours', ''patient outcomes', 'outcomes', perceptions', 'effects', 'reasons', 'rationale'. Articles were assessed for inclusion based on the following criteria: (a) English language; (b) published between 1980-2015 (due to the paucity of research in this area); and (c) qualitative or quantitative studies exploring nurses' perceptions of overtime, outcomes of overtime, and/or reasons for working or not working it. Reference lists were also used to reveal relevant sources and specific journals that merited hand searching, in addition to a Google search for unpublished reports (See Appendix A for qualitative search strategy diagram).

Only three peer-reviewed quantitative studies that were related to nurses' perceptions of overtime were found, none of which were specific to critical care environments. Bae (2012) explored nurses' reasons for working overtime. Kunaviktikul et al. (2015) explored the effects of nurses' extended work hours on patient, nurse and organizational outcomes. Finally, Griffiths et al. (2014) explored nurses' perception of the association between overtime, quality of care, patient safety and patient care left undone. All of the studies employed cross-sectional quantitative approaches to data collection and analysis.

Why Nurses Work Overtime

A basic understanding of nurses' preferences related to overtime is important because if left unchecked, it may lead to burnout and attrition - further aggravating the issue (Drebit et al., 2010). Studies have shown that overtime contributes to nurses' intention to leave a position, and this is of particular importance in critical care areas where nurse attrition has been found to be particularly high (Hayes et al., 2012; O'Brien-Pallas, Tomblin Murphy, Shamian, Li & Hayes, 2010; Shader, Broome, Broome, West, & Nash, 2001). Literature to date does little more than surmise the rationale that underlies nurses' decisions of whether or not to work additional hours, but it is a valuable starting point. One of the most publicized reasons for working overtime is undoubtedly the pressure at work that arises out of heavier workloads and fewer staff (ICN, 2009). These increased demands may create an environment in which organization and order become difficult. In some cases, especially those of junior staff, lack of prioritization and individual inefficiencies can further increase workloads, and result in lengthened shifts to accommodate outstanding tasks and documentation (ICN). An American study carried out by Bae (2012) found this to be the case for 57% of nurses working voluntary overtime.

Another motive for choosing to work overtime can stem from a nurses' unit or organizational culture. If managers and peers set an example of working long hours, or a nurse feels any lack of job security, he or she may begin to feel that his/her presence at work is essential to the organization and achieving its

mission (ICN, 2009). This can also manifest itself as a strong commitment to work, colleagues and clients (ICN). Bae (2012) found that 75% of nurses worked overtime so as to avoid letting down their colleagues, despite being fatigued. A facilitator of nursing overtime in these cases may arise out of the ethical responsibility nurses bear to provide appropriate care for their clients (CNA, 2000). The Canadian Nurses' Association (1998) speaks to the psychological impact that feelings of guilt and anxiety can have on nurses – known as ethical distress – when they feel that their ability to provide high quality care is compromised. This most frequently occurs when nurses accept overtime to reduce the burden on their coworkers and improve patient care while feeling guilty for spending additional hours at work and away from their loved ones (CFNU, 2009). A final important reason that a nurse may choose to work overtime is to increase their take-home pay. Bae's (2012) American sample found that was true for up to 64% of nurses surveyed.

Perceptions of the Effect of Overtime on Outcomes

Only two studies explored nurses' perceptions of the outcomes of overtime. Griffiths et al. (2014) studied perceived quality of care, care left undone, and patient safety. Kunaviktikul et al. (2015) examined the effects of extended nursing work hours on nurse, patient and organizational outcomes. In their cross-sectional study of 31, 627 nurses working in 12 European countries, Griffiths et al. (2014) found that working overtime was associated with poor or

fair quality of patient care (OR = 1.32; CI=1.23-1.42). Nurses were asked to evaluate the quality of care on their unit in its entirety as poor, fair, good or excellent and this was analyzed according to data they provided about the hours they had worked personally. Thai nurses in Kunaviktikul et al.'s study (2015) perceived increases in communication errors (OR = 1.38, CI = 1.00-1.92, $p<0.05$) and patient complaints (OR = 1.68, CI =1.18-2.38, $p<0.05$) were more likely in situations of extended work hours.

In Griffiths et al.'s study (2014), perceived patient safety was assessed via a ranking of poor, failing, acceptable, very good or excellent. Poor and failing patient safety on the unit was found to be significantly related to nurse overtime (OR = 1.67; CI=1.51-1.86). Kunaviktikul et al. (2015) found that nurses perceived higher incidences of pressure ulcers (OR = 1.51, CI = 1.03-2.21, $p<0.05$) and patient identification errors (OR = 1.76, CI = 1.24-2.49, $p<0.001$) when extended work hours were high. Griffiths et al. (2014) explored nurses perceptions of the amount of care that they left undone, and found that when nurses reported working overtime, there was significantly more care that was not completed (RR = 1.29; CI=1.27-1.31). The options respondents were given for tasks left undone included: patient surveillance, documentation, administering medications, comforting/talking to patients and pain management.

Nurses' self-reported outcomes of extended work hours which were found to be significant included emotional exhaustion ($r = 0.085$, $p = 0.001$) and depersonalization ($r = 0.080$, $p = 0.002$) (Kunaviktikul et al., 2015). Significant

negative correlations were found in the same study to exist between extended work hours and job satisfaction (r = -0.084p = 0.001) and intent to stay (r = -0.052, p = 0.042). Study findings also revealed a negative correlation between high extended work hours and organizational productivity (r = -0.063, p = 0.014). While these data do address facets of the outcomes of overtime work, quantitative methods limit the depth of understanding that qualitative data collection and analysis can elicit.

Quality of Studies Related to Perceptions of Overtime

The study of nurses' reasons for working overtime conducted by Bae (2012) employed a cross-sectional design wherein a random sample of 1000 nurses from North Carolina and West Virginia were mailed a questionnaire. This convenience sample generated a response rate of only 23%, raising the potential issue of self-selection bias**.** Self-selection bias occurs because respondents who choose to participate in a study may have a particular interest in the topic, and as a result, the sample is less likely to be representative of the population to which the quantitative results are to be applied (Zobac, Spears, & Barker, 2014). Nurses were asked about paid, unpaid, mandatory, and voluntary overtime (did they work it and how many hours). Participants were then given the following options from the British Workplace Employee Relations: "it's required as part of my job" "I need the money", "when overtime is needed, I like to work it", "I don't want to let down the people I work with", and "so that I can get all of my work done".

Quantitatively eliciting this data, while a helpful starting point – only allows for predetermined responses which may not capture a number of other reasons that nurses choose to work overtime. Self-reported data are also subject to errors due to recall and socially desirable responses (Donaldson & Grant-Vallone, 2002). Analytic methods employed accounted for a wide variety of potential confounding variables, however the small response rate and number of reasons that participants could select from, render the findings little more than a springboard for future research.

Griffiths et al. (2014) used a prospective cross-sectional survey design to determine nurses' perceptions of the effects of overtime on their patients. With full knowledge of the purpose of the study, self-report bias in either direction may have crept into responses from nurses who either feared penalization, or wanted to highlight the risks of the overtime they were working for their patients. This study employed a random sample of 33,659 nurses from 12 European countries – a strong sample due to its size and diversity with a response rate of 62%. The validated International Hospital Outcomes study questionnaire they used was translated from English into 10 other languages and then found to have "good" content validity and translation quality. Outcome data regarding errors and adverse events were collected from nurses themselves and the authors used multilevel analysis to nest units within hospital and countries while controlling for shift type, ward type, staffing levels, nurses' ages, job status, hospital size, high-technology hospitals, and teaching status. The strong design is limited by their

association between individual nurse overtime and perceived quality of care on the unit as a whole. This study provides insight into nurses' perceptions of the outcomes of overtime (for patients only), and as a result of pre-selected survey options, findings may be less comprehensive.

The study conducted by Kunaviktikul et al. (2015) sampled 1524 nurses (a strong 85.09% response rate) from 90 hospitals across Thailand who were asked to complete demographic forms, a nurses' extended work hours form, a patient, nurse and organizational outcomes form, an organizational productivity questionnaire and the Maslach Burnout Inventory. Although the first four tools were developed by the researchers, they were then validated by six experts and pilot tested prior to data collection. The authors unfortunately do not include samples of what comprised these tools so that the reader can comprehend what nurses were asked, and how. The data that were returned were analyzed by way of descriptive statistics, Spearman's rank correlation and logistic regression. Their methods and diverse sample that span the country add strength to study findings, however they may prove less applicable in the publically funded Canadian system, or within critical care environments.

The literature regarding nursing perceptions of the outcomes of overtime and their reasons for working it is very limited. None of the studies identified reflect Canadian nurses' perspectives, nor do they concern critical care environments. The only research related to these issues to date has been of a quantitative nature which can only capture very limited "perceptions." There is a

need for qualitative research in order to gain a more in-depth understanding of why nurses' choose to work overtime and what the implications of that choice might be.

Nursing Overtime and Patient Outcomes

Studies have shown that overtime hours result in nurse fatigue and irritability (Baldwin, Daugherty, Tsai, & Scott, 2003; Dean, Scott & Rogers, 2006; Scott et al., 2006). It has been suggested that fatigue has negative consequences for patients cared for by these nurses (Dean et al., 2006; Stone et al., 2007). The International Council of Nurses (2009) cites extensive overtime as a risk factor for decreased nurse vigilance, decreased nurse reaction time, medication errors, adverse drug events, errors in clinical judgment, increases in nosocomial infections and increased decubiti. Primary studies have explored this association between overtime hours and patient outcomes with conflicting results. While some studies related overtime to poorer patient outcomes (Olds & Clarke, 2010; Scott et al., 2006; Trinkoff et al., 2011), Berney and Needleman (2006) found it to be associated with *decreased* mortality and Stone et al. (2007) linked overtime to slightly lower rates of central line infections.

These divergent findings highlight the inconsistencies in nursing research related to the measurement of patient outcomes as they relate to overtime hours. Although the effects of increasing nurse overtime have important implications for healthcare provision, many of the policies driving staffing decisions are not evidence-based because of "an insufficient body of credible evidence linking

changes in the hospital nurse work force to potentially adverse effects on patient outcomes" (Buerhaus & Needleman, 2000, p. 5). To be able to synthesize the results of individual studies to inform policy, methodological rigor in patient outcome studies is essential. A pressing need exists for a unified appraisal of the existing literature to enhance future research and the evidence on which to base staffing practices and policies that can improve patient outcomes.

The purpose of the remainder of this chapter is to describe studies that explore the relationship between nursing overtime hours and patient outcomes within acute care hospital settings, to determine their methodological limitations, and propose strategies to strengthen future research.

Search Strategy

Electronic indexes examined included CINAHL, Medline, PubMED, EMBASE, and PsychInfo. Terms searched in their full and truncated forms included 'overtime', 'work hours', 'scheduling', 'shift length', 'extended hours', 'patient outcomes', 'adverse events', 'errors', 'infection', 'near misses', and 'failure to rescue'. Articles were assessed for inclusion based on the following criteria: (a) English language; (b) published between 1980-2015 (due to the paucity of research in this area); and (c) exploration of nursing overtime as it related to patient outcomes. Reference lists were also used to reveal relevant sources and specific journals that merited hand searching, in addition to a Google search for unpublished reports. This strategy resulted in the initial scanning of 677

articles for inclusion (See Appendix B). A more detailed review of the abstracts and articles resulted in a final sample of 9 articles eligible for analysis.

Description of the Studies

The majority of publications on nursing overtime and patient outcomes were published over the past 12 years (2004-2015), with two articles dating back to the early 1980's. All nine studies included were conducted in the United States of America (Arnow et al., 1982; Berney & Needleman, 2006; Bobay, Yakusheva & Weiss, 2011; Olds & Clarke, 2010; Rogers et al., 2004; Russell et al., 1983; Scott et al., 2006; Stone et al., 2007; Trinkoff et al., 2011), Study sample sites ranged in size from a single unit (Arnow et al., 1982; Russell et al., 1983) to 188 separate state hospitals (Olds & Clarke.). Numbers of nurses from whom data were collected, where stated, varied from 313 nurses (Rogers et al., 2004) to 11,516 nurses (Olds & Clarke). Patient numbers, where listed, ranged from 65 burn patients (Arnow et al.) to 15,864 Medicare recipients (Stone et al., 2007).

Studies included employed a variety of methods including retrospective data collection, secondary data analyses, and prospective research designs. Overtime and outcome data were collected through log-books, surveys and administrative sources, and only one of the studies is specific to critical care environments (Scott et al., 2006).

Studies Findings

Based on the studies included in this review, there appears to be a positive association between nursing overtime and poorer patient outcomes. The magnitude of this association is difficult to conclude based on the small number of outcomes studied and the conflicting results. Russell et al. (1983) did not explore the relationship between surgical wound infections and nursing overtime but presented descriptive statistics only to indicate that nursing overtime hours had been higher during the retrospective outbreak studied. Arnow et al. (1982) studied infection rates and found the association between new MRSA cases and nursing overtime was significant ($r = 0.531$; $p = 0.001$). Another similarly weak study found that patient deaths from pneumonia were significantly more likely in facilities where nurses worked long hours (OR = 1.42; 95% confidence interval [CI] = 1.17-1.73, $p<0.01$) (Trinkoff et al., 2011). Other adverse events significantly associated with extended hours in this study included abdominal aortic aneurysm (OR = 1.39; CI=1.11-1.73, $p<0.01$) and acute myocardial infarctions (OR = 1.33; CI = 1.09-1.63, $p<0.01$) (Trinkoff et al., 2011).

Medication errors were found to be significantly increased with increasing overtime in three studies (Olds & Clarke, 2010; Rogers et al., 2004; Scott et al., 2006). Olds and Clarke found that nurses who worked four or more hours of paid voluntary overtime were 30% more likely to report occasional/frequent wrong medication or dose administration (OR = 1.30, CI=1.11-1.53, $p<0.01$). Rogers et al. report that nurses working overtime had increased odds of making an error,

regardless of scheduled shift length (OR = 2.06, p = 0.0005, with no confidence interval specified). This likelihood was three times higher when nurses worked 12.5 hours or more (OR = 3.29; p = 0.001) (Rogers et al.). Scott et al. found similar increases in risk for error when overtime increased – it nearly doubled when nurses worked 12.5 or more consecutive hours (OR = 1.94; p = 0.03; no confidence interval resported). These errors and oversights can lead to unplanned related ED visits, which Bobay et al. (2011) found increased by 36% with an increase in 0.08 hours of overtime (OR = 1.36; standard error [SE] = 0.22, $p<0.06$). Berney and Needleman (2006) found that a 2.8% increase in overtime was associated with a 2.9% decrease in medical patient mortality ($p<0.05$), and a 4.7% decrease in surgical patient mortality ($p<0.01$).

While methods employed in these studies were found to be fairly weak their conclusions largely mimic those found in the moderate quality studies included. Stone et al. (2007) found that where nurses worked less overtime, patients experienced less central line associated blood stream infection (OR = 0.33; CI = 0.15-0.72, $p< 0.05$). When nurses worked more overtime, patients had increased risk of acquiring catheter associated urinary tract infections (OR = 4.72; CI = 2.21-10.05, $p<0.0001$) and higher rates of decubiti (OR = 1.91; CI = 1.17-3.11, $p<0.01$). The following section provides a methodological critique of the studies.

Study design limitations. Methods used to explore the relationship between nurse overtime and patient outcomes included a variety quantitative

designs that collectively lacked detail. This was most prominently noted in the earliest studies included (Arnow et al., 1982; Russell et al., 1983). Russell et al. selected surgical patients and followed them prospectively for the remainder of their hospital stay, while Arnow et al. retrospectively matched study patients to control cases. In addition to Arnow et al., two other studies used retrospective chart reviews as their primary methodology (Berney & Needleman, 2006; Bobay et al., 2011). Although cost-effective and useful in studies with rare outcomes, the rigor of these study designs depends entirely upon the accuracy of the medical records being used (Hess, 2004). Vague or inconsistent records can hinder the development of factual conclusions and make it difficult to establish cause and effect. These issues are further compounded by the inability to control for important confounders.

The method employed by Olds and Clarke (2010), Stone et al. (2007), and Trinkoff et al. (2011), was a secondary data analysis. The large sample sizes (11,516 nurses, 633 nurses and 1095 nurses respectively) make the use of previously collected data an attractive solution in the quest for generalizabity. Despite this advantage, limitations inherent in this study design concern the quality of primary data, and the possibility of incomplete, obsolete, or inaccurate information (Boslaugh, 2007). Users of secondary data are limited to the information collected, which may have poorly defined or measured variables, failing to capture potential confounders. Specific sources of data and their limitations will be discussed further in relation to data collection.

Rogers et al. (2004) and Scott et al. (2006) sent two-week logbooks to participants who were asked to complete a questionnaire each day concerning the hours they worked, time of day worked, overtime, days off, sleep patterns, and errors or near errors. With full knowledge of the purpose of the study, self-report bias in either direction may have crept into responses from nurses who either feared penalization, or wanted to highlight the risks of the overtime they were working.

Sample limitations. The goal of quantitative research is the ability to generalize the "truth" found in a sample to the population it represents. This goal is best achieved by a random, representative sample (Johnson & Onwuegbuzie, 2004). Three of the studies included selected random samples ranging in size from 393 to 11,51 nurses (Olds & Clarke, 2010; Rogers et al., 2004; Scott et al., 2006). This strong sampling strategy is limited by low response rates (less than 62%). Low response rates can skew findings as a result of non-response or voluntary response biases. The former exists if non-respondents differ meaningfully from respondents, while the latter may over-represent the strongly opinionated (Sax, Gilmartin, & Bryant, 2003). None of the articles described non-respondents to reduce those possibilities.

Rogers et al. (2004) and Scott et al. (2006) had response rates of 40% and 43% respectively. Their study design required nurses to respond to between 17 and 40 questions daily for 28 days, placing a sizeable burden upon participants, possibly attracting those who were more invested in the topic area (Rogers et al.).

Another threat to the representativeness of their sample may be the $140 incentive offered to participants for completing the logbooks. This incentive may have attracted nurses who regularly worked overtime as a result of financial need, thereby inflating reported overtime. As such overtime associated with financial struggles may be a confounder that could affect patient outcomes (i.e., working more than one job, fatigue).

Strong sampling strategies attempt to enroll individuals from a variety of geographical locations and types of organizations (Teddlie & Yu, 2007). Where obtaining a random nationwide sample proved impractical, Berney and Needleman (2006) included all non-profit acute care hospitals in New York State that filed Institutional Cost Reports [ICR] over the study period. Bobay et al. (2011) reviewed data from "a four-hospital Magnet-designated healthcare system in the Midwestern United States" (p. 71). As Magnet-designated facilities boast of superior staffing and satisfaction (Trinkoff et al., 2010) transferability of their findings may be limited. Stone et al. (2007) recruited hospitals which participated in the Centers for Disease Control and Prevention's Nosocomial Infections Surveillance System. Trinkoff et al. (2011) opted to collect data from 71 acute care non-federal hospitals in Illinois and North Carolina. It is possible that institutions completing the ICR and the Infections Surveillance System did so with motives that were absent from hospitals in the same regions that did not, limiting generalizability.

Single units were sampled in two studies to understand the factors contributing to confined outbreaks of methicillin-resistant Staphylococcus aureus (MRSA) (Arnow et al., 1982; Russell et al., 1983). Although consistent with the study goals, these samples are unlikely to be representative of other settings, and accordingly have limited generalizability (Golafshani, 2003).

Data collection limitations. What perhaps contributes most directly to the lack of comparability among published studies in this area are their conflicting definitions of overtime. While three studies fail to define what constituted overtime at all (Arnow et al., 1982; Russell et al., 1983; Stone et al., 2007), Berney and Needleman (2006) calculated hours based on overtime payroll data (with no definition used by administrators). Rogers et al. (2004) and Scott et al. (2006) used cut-off points of 8.5 and 12.5 hours per shift as well as any shift that constituted scheduled overtime. Bobay et al. (2011) defined nursing overtime as anything over 80 hours in a two-week pay period, or more than 12.5 hours in 24-hours. Olds and Clarke (2010) counted hours as overtime if they surpassed those scheduled for a specific shift or week. They also counted hours exceeding the standard 40-hour workweek. Finally, participants in Trinkoff et al.'s study (2011) were asked about hours worked per day, per week, number of breaks over 10 minutes, 13 or more hours worked at a time, less than 10 hours off between shifts, working on a scheduled day off or vacation, required on call, and mandatory overtime. What constituted overtime is not specified, but the authors state that it

was derived from those responses. In the absence of consistent measurement, findings can be challenging to synthesize across studies in any meaningful way.

Overtime data collected and analyzed by authors of the nine studies were derived from a variety of sources. The decision of how to collect data is of the highest importance, as Rose and Fischer (2011) assert: "garbage in, garbage out". If the data on which conclusions are based is flawed, accurate findings are unlikely. For the collection of overtime data, Russell et al. (1983) do not describe their methods, stating only: "details of individual work records are not available" (p.65).

Two of the nine studies used secondary sources (Olds & Clarke, 2010; Trinkoff et al., 2011). Olds and Clarke estimated nursing overtime hours via the questions "In the past year, how many hours per week did you work on average" and "In the past year… how many hours per week did you work the following types of overtime… (Mandatory, other paid and unpaid overtime)" (p. 155). These questions are a consequence of analyzing secondary data, where researchers have no control over the specificity of questions posed, and here, those selected are subject to recall and self-report biases. Another limitation of the dataset used in this study is its age. Collected in 1999 (11 years prior to publication), overtime figures may be less relevant as a result of the recent economic downturn prompting nurses to work additional hours (Olds & Clarke). The secondary data set employed by Trinkoff et al. (2011) is subject to the same biases, although collected from the validated Nurses Worklife and Health Study.

Nurses who completed it in 2004 (seven years prior to publication) were asked to answer questions regarding average overtime hours over the previous six months. Recall and self-report biases could again affect the results.

Three studies used administrative data to measure overtime hours (Berney & Needleman, 2006; Bobay et al., 2011; Stone et al., 2007). Originally collected for reasons other than research, this data may suffer from different definitions and measurement across organizations (Stone et al.), across hospitals within one organization (Bobay et al.) or over a six-year period of time (Berney & Needleman). This lack of standardization may be compounded by errors in the abstraction process or financial incentives that encourage over or underreporting (Rubenfeld et al., 1999).

Three studies used surveys to gauge the hours nurses were working (Arnow et al., 1982; Rogers et al., 2004; Scott et al., 2006). Arnow et al. tabulated staffing data from "culture surveys" (p. 954), with no indication of what nurses were asked regarding overtime. Rogers et al. (2004) and Scott et al. (2006) used logbooks to collect data from nurses over two weeks. This method has been validated for "ascertaining the nature and prevalence of nursing errors" (p. 204) and was pilot tested prior to study initiation. Daily completion may serve to mitigate recall bias, and the simultaneous collection of outcome data allows for correlations per individual nurse.

Outcome data regarding errors and adverse events were collected from nurses themselves in three studies (Olds & Clarke, 2010; Rogers et al., 2004;

Scott et al., 2006). This data is subject to self-report bias (in either direction) if nurses were aware of the purpose of the study they were involved in. Medical records (Arnow et al., 1982; Bobay et al., 2001; Stone et al., 2007) and discharge abstracts (Berney & Needleman, 2006; Trinkoff et al., 2011) are burdened with the same limitations as administrative data (detailed above). Finally, Russell et al. (1983) chose infection control nurse surveillance to assess and track surgical wound infections in addition to medical record reviews.

Limitations in outcomes selected. With an understanding of how outcome data were collected, it is also important to ensure that outcomes explored are sensitive to nursing care, sensible in number, and aptly verified. Two studies used methicillin-resistant Staphylococcus aureus infections as their outcome of interest because it was surmised that the key mode of transmission during their outbreaks was nursing overtime and hand hygiene neglect due to fatigue and volume of work (Arnow et al., 1982; Russell et al., 1983).

Berney and Needleman (2006) related overtime hours to patient complications that had previously been correlated with nurse staffing. Outcomes selected were related to issues inherent in the structure and organization of nurses' work, or the quality of their communication (Berney & Needleman). These outcomes included urinary tract infections, cardiac arrest, pneumonia, shock, sepsis and failure to rescue. The authors identify the possibility that findings may be attributable to random variation rather than true association on account of the large number of variables tested (Berney & Needleman). This may be the case in

two other studies that tested large numbers of variables (Stone et al., 2007; Trinkoff et al., 2011). Stone et al. studied central line associated bloodstream infections, ventilator associated pneumonia, urinary tract infections, decubiti, and mortality. The authors selected these because they were "thought to be sensitive to nursing care" (Stone et al., 2007, p. 572). Similarly, Trinkoff et al. selected outcomes (pneumonia, congestive heart failure and craniotomies) that "have been shown to be related conceptually to nursing care" (p. 3).

Bobay et al. (2011) investigated the relationship of nursing overtime to emergency department (ED) visits and readmissions 30-days following patient discharge. The authors state that returning patients are indicative of poor quality patient care. Rogers et al. (2004) and Scott et al. (2006) hypothesized that decreased alertness of nurses during prolonged shifts results in errors and patient risk. Olds and Clarke (2010) explored patient *and* nurse outcomes including: sharps injuries, work-related injuries, patient falls with injury and nosocomial infections. No rationale was given for the outcomes selected, however those chosen have been shown to be sensitive to nursing care in the Canadian Health Outcomes for Better Information and Care project (2010).

Verification of outcomes was adequately completed in four of the nine studies by way of clinical assessments, air samples, and lab reports (Arnow et al., 1982; Berney & Needleman, 2006; Russell et al., 1983; Stone et al., 2007). The ED visits measured by Bobay et al. (2011) through financial databases were not corroborated with other sources, however, a waiting period prior to data

abstraction was adhered to in order to increase the likelihood of reimbursement completion, and in turn data accuracy. Three studies (Olds & Clarke, 2010; Rogers et al., 2004; Scott et al., 2006) all related overtime hours to nurse errors and near errors through self-report alone, which may have resulted in underreporting for fear of penalization (Mayo & Duncan, 2004). Trinkoff et al. (2011) fail to disclose if any methods were used to validate outcome diagnoses.

Data analysis limitations. Data analysis techniques were fairly uniform across all studies with the oldest studies using poorly described analytic techniques (Arnow et al., 1982; Russell et al., 1983), and the remaining seven articles employing variations of regression analysis. Arnow et al. used standard Pearson correlations to calculate the association of individual variables with the risk of infection. Russell and colleagues' prospective design used Poisson's tests that may not be as appropriate since the use of this technique demands independence of measured events (Daniel, 2005). The very title of this study implies an "outbreak" which suggests interdependent events leading to an elevated transmission rate. Berney and Needleman (2006) regressed each adverse event on the yearly derivations of overtime in a pooled analysis across six years of data. This annualized, hospital-aggregated data makes it difficult to link adverse outcomes to specific units, or even shifts. As such, associations discovered may be misleading and unsubstantiated.

With the goal of investigating the impact on outcomes of variation within units and overtime, Bobay et al. (2011) appropriately used multi-variable fixed-

effects panel regression analysis. This data was aggregated monthly at the unit level. Olds and Clarke (2010) employed both bivariate and multivariate analyses to obtain odds ratios for nurse-reported outcomes in the previous year in relation to work hours (p. 155). This hospital level data was annualized, again rendering causal relationships impossible to discern. Rogers et al. (2004) and Scott et al. (2006) both chose to use multivariate regressions to examine the adjusted relationship between errors, near errors, and overtime, while controlling for related variables. The unit of analysis selected for each was the individual work shift. Stone et al. (2007) computed variables on a monthly basis and constructed multivariate logistic regression models for each outcome. These were clustered at the hospital level and underwent sensitivity testing by way of other random fixed effects models. Finally, Trinkoff et al. (2011) generated binomial logistic regression models for each outcome with additional variables added to each model as potentially confounding variables.

Levels of aggregation are an important concept in study design and execution because the more aggregated the data, the more invisible the people, and the more difficult it is to draw meaningful conclusions (McCaston, 2005). Rogers et al. (2004) and Scott et al. (2006) selected the most accurate unit of analysis – individual work shifts. Arnow et al. (1982), Bobay et al. (2011) and Stone et al. (2007) aggregated data at the unit level while the remaining four studies aggregated data at the hospital level where associations between these

highly aggregated values may be less reflective of the true relationships between the data at the individual level.

Confounder control limitations. Biases can be introduced into studies through flawed design methods, or through failure to account for confounding factors that may affect the results. The goal of identifying and controlling for confounders is to substantiate the claim that "all things being equal, patients with exposure 'x' [e.g. exposure to nursing overtime] are y% more likely to have the 'outcome'" (Rubenfeld et al., 1999, p.363). Randomization of exposure is the ultimate method of controlling for these unknown confounders, however, when it is not feasible, or not ethical, study design and analytical methods can be helpful (Wunsch, Linde-Zwirble, & Angus, 2006). Arnow et al. (1983) selected a case control design in which patients colonized with MRSA were matched with the non-colonized 'control' patient admitted immediately before or after that patient with an overlapping hospital stay. The authors used this comparison to identify host factors associated with MRSA acquisition and do not provide detail about any participant matching or analytical control of confounders. Russell et al. (1983) also do not discuss any methods used for confounder control in their prospective study.

Berney and Needleman (2006) use a logistic regression model to predict each patient's probability of experiencing each adverse outcome. They regressed each outcome on the risk in the patient's Diagnostic Related Group, and categorical variables for age, payer, race, 11 chronic diseases, and whether the

admission was an emergency. Bobay et al. (2011) used a similar strategy controlling for patient's age, type of insurance, Major Diagnostic Category, type of admission, gender, nurse's level of experience, education and type of patients in their multivariable fixed effects panel regression analysis. In failing to account for socioeconomic status, living alone, transition support services and/or case management, these authors potentially limit the accuracy of their data concerning subsequent ED visits. Olds and Clarke (2010) used multivariate regression to adjust for the following nurse characteristics: sex, age, unit, years of experience, level of education, education obtained in the Unites States, presence of dependents at home, permanent employment, representation by a collective bargaining unit, and type of specialty unit. Authors do not consider comorbidities that may contribute to patient's risks of falls or nosocomial infection.

Rogers et al. (2004) and Scott et al. (2006) stratified shifts by their expected duration and used multivariate analysis to control for age, hospital size and type of unit. Information about nurse's workloads and complexity of patient care was not considered. Trinkoff et al. (2011) also accounted for few potential confounders, including only state and hospital teaching status in their regression models. Of the nine studies included, Stone et al. (2007) used the most comprehensive methods to control for potential confounders. Authors used the diagnostic cost group hierarchical coexisting conditions (DCG/HCC) risk adjustment method based on each patient's hospitalizations over the 12-month time period. To control for comorbid conditions, they also used the Elixhauser,

Steiner, Harris and Coffey method (1998) that is based on the primary and secondary diagnoses of the index hospitalization. Other variables controlled for included: patient gender, age, socioeconomic status, hospital size and teaching status. ICU-level variables controlled for included nursing case mix and unit type. Adjustment for confounding is achieved during the data analysis stage of observational studies, and as such, some confounders may be inherent in the study design. Ultimately, despite the most comprehensive strategies, there may yet be an observed effect that is the result of failure to completely account for a confounder (Wunsch et al., 2006).

Discussion

There is an insufficient repository of literature that addresses the relationship between nursing overtime and patient outcomes. The small collection of nine articles found through a comprehensive literature search make evident the need for more rigorous studies to advance nursing science, practice, and policy in this area. With the exception of Stone et al. (2007), study designs are wrought with limitations that may jeopardize the accuracy of their findings. While randomized controlled trials are considered the gold standard for judging the effect of an intervention on patient outcomes, studies of this sort are unethical (Wunsch et al., 2006). Retrospective studies are likely the least resource-intensive and most ethical option for resolving the research problem. A strong retrospective study will require consistent collection of detailed data at the unit or shift level

across organizations. It would be important to include both patient data (severity of illness, comorbidities, age, gender, socioeconomic status) and nurse staffing data (sex, age, years of experience, education, presence of dependents, workload, staff mix) in these records. Nurse staffing data might also be collected prospectively, recorded per shift by individual nurses in order to capture both paid and unpaid overtime as well as workload issues. Hospital characteristics including size, type, and unit designations also merit analysis. These potential confounders should be considered alongside a consistent definition of overtime to ensure comparability of future studies. The collection of standardized individual level data is, and will likely continue to be, one of the most important challenges for researchers and clinicians alike.

Sampling would be strengthened by way of random selection wherein investigators might consider using alternative strategies such as those delineated by Dillman (2007) to enhance response rates. The use of geographically diverse hospital units along with different types of facilities (teaching, community and rural hospitals) would enhance the generalizability of study findings as finances permit (Glasgow & Emmons, 2007). All of the studies included selected outcomes that were sensitive to nursing care. Future studies would profit from the same approach, and might consider narrowing those outcomes to those most frequently observed to enhance the strength of the associations (Berney & Needleman, 2006).

With respect to data analysis, data collection at the individual nurse level is of the utmost importance because data aggregated annually or monthly at the hospital or unit level obscures the many confounders that are specific to individual nurses and particular workloads. Confounders in studies of this nature are complex, as overtime may be only one in a large number of variables affecting patient outcomes (i.e.: agency staff, unit culture, stress, patient transfers, other care providers, severity of illness). Simply abstracting overtime hours from administrative data such as Berney and Needleman (2006) and Stone et al. (2007) did, masks how many nurses worked those hours (whether all nurses worked some overtime or a few nurses worked it all) or whether those nurses frequently stayed for a short time, versus occasionally picking up full overtime shifts. Each of these possibilities has unique implications for patient outcomes. If nursing science in this area is to advance, it will be incumbent upon authors to provide more methodological detail in their manuscripts to allow for replication and comparability of results.

Summary and Literature Gap

The goal of nursing research is the development of nursing science that is trusted to contribute to the advancement of the profession and ultimately better patient outcomes (Kirkevold, 1997). This progression is contingent upon a reliable research base that produces accurate and valuable conclusions. This literature review has shown this is not the case in the area of research related to

nursing overtime hours and its effect on patient outcomes. Future researchers should be intentional about avoiding or limiting the biases that emerged in the studies examined. Researchers should advocate for the ongoing systematic collection of detailed staffing and outcome data at the unit and nurse level to enhance future studies.

Available evidence suggests the possibility that increased overtime leads to poorer patient outcomes, but this cannot be concluded with any degree of certainty based on the methodological review detailed above. While employing a number of innovative methods to explore a topic that is not easily accessible, existing literature does not provide a strong base of evidence to support decision making around nurse overtime utilization, much less in critical care environments. Meticulous attention to methodology is required in studies that explore the relationship of nursing overtime with patient outcomes.

The limitations that characterize these nine studies make it challenging to discern whether or not a true relationship exists, and if so, of what magnitude. Authors need to ensure explicit details of their sampling, data collection and analysis techniques in order to promote reproducibility and rigor in their investigations. A crucial step will involve the development of a standardized definition of overtime that can become entrenched in the nursing research lexicon, and be used to measure its extent on the frontlines. This should be accomplished alongside a renewed commitment to develop a detailed tracking system of worked hours and patient outcomes at the bedside. Additional funding and attention needs

to be directed to this topic area to mitigate the negative patient outcomes that may be a result of nursing overtime.

There is a literature gap regarding the relationship between nursing overtime and patient outcomes, as well as nurses' perceptions of overtime work and their reasons for working it (particularly within critical care environments). These areas merit attention as Canadian and international demographics continue to increase the demand for healthcare and reduce the numbers of those available to provide it. There is currently no in-depth qualitative research that is able to elucidate nurses' perceptions of overtime. Further, existing quantitative data exploring the relationship between overtime and patient outcomes is both limited and generally of poor quality.

This study fills a gap in the existing literature by focusing on Canadian critical care environments. It is the first qualitative study of nurses' perceptions surrounding overtime work, and adds to the repository of quantitative data that reveals trending of the association between nursing overtime and nurse and patient outcomes.

CHAPTER THREE

Research Methodology

Overview

Although some studies have been conducted to explore the relationship between nursing overtime and patient outcomes, the dearth of accurate individual level data and large number of potential confounding factors continue to be barriers to full implementation of their findings. The concurrent lack of understanding regarding nurses' perceptions of overtime work and its effect on outcomes at every level makes the effective deployment of nursing staff a challenge. Currently, there are no Canadian studies that explore these two facets of overtime work and are specific to critical care environments. Therefore, the purposes of this study are to: (a) explore critical care nurses' perceptions regarding the outcomes of overtime work, (b) explore critical care nurses' reasons for working or not working overtime, and (c) determine if an association exists between critical care nursing overtime and specific nurse and patient outcomes.

This chapter explores the methods, processes and theoretical frameworks that underpin this study. It is divided into a qualitative component followed by the quantitative portion whose findings, while discrete, are synergistic. Each component responds to a different research question and together they provide a deeper understanding of the effects of nursing overtime on patient outcomes and nursing sick time. Both qualitative and quantitative data were collected and analyzed concurrently.

The first part of the chapter includes a brief summary of the evolution of the study and methods as well as its theoretical basis and nature of qualitative research. This is followed by a description of the qualitative methods used including sampling, data collection and analytic strategies. This section concludes with ethical considerations and an account of the process used to ensure trustworthiness and rigor of the study. The second part of this chapter provides a description of the quantitative study methods used including sampling and analytic strategies. This section also concludes with ethical considerations and processes used to increase rigor of the findings.

Evolution of the Study and Methods

At the outset of this project, a mixed methods study following a parallel convergent approach was designed to address the research questions (Creswell & Clark, 2011). Through discussion amongst the research committee and in consultation with mixed-methods experts, the research questions were further refined and the decision was made to develop two related but discrete studies exploring different topics. The mixed methods approach was set aside in order to more appropriately respond to new and different questions while ensuring that findings would not be integrated by force of design, but rather presented alongside one another, and integrated only if it proved appropriate.

Theoretical Underpinnings

The Health Human Resources framework developed by O'Brien-Pallas, Tomblin-Murphy, Birch and Baumann (2001) in combination with Bae, Brewer and Kovner's conceptual approach to overtime (2012) frame and form the basis of inquiry for this study. They informed the questions that elicited qualitative data, and served to contextualize the discussion of the findings.

The Health Human Resources conceptual framework developed by O'Brien-Pallas, Tomblin-Murphy et al. (2001) offers a wide lens through which to explore the contributors to, and effects of, overtime on patient, nurse and system outcomes (See Figure 1 below). It was employed in this study in the development of qualitative probes regarding different stakeholders (patient health, provider, and system) who might be affected by nursing overtime as well as the factors that motivate them to work overtime (social, political, economic and geographic).

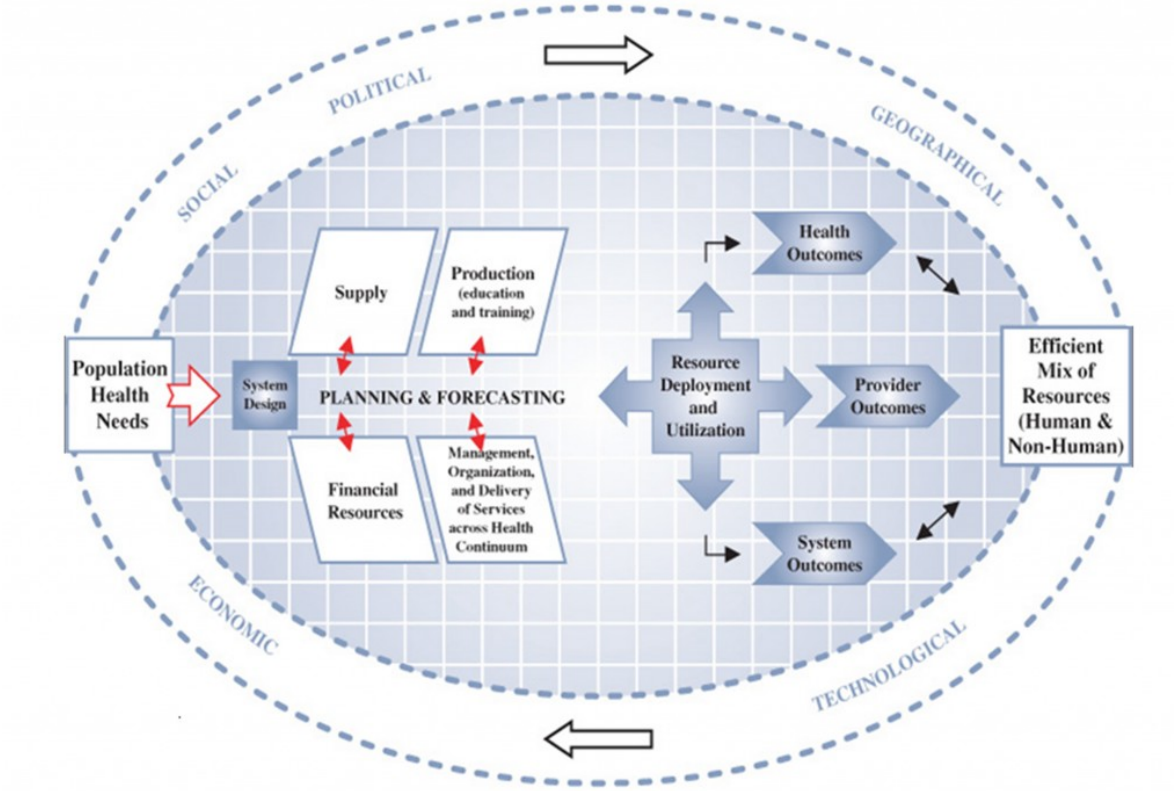

Figure 1: Health Human Resources Framework. Reprinted from *Framework for Analyzing Health Human Resources* (p. 6), by L. O'Brien-Pallas, G. Tomblin-Murphy, S. Birch and A. Baumann, 2001, Ottawa, ON: CIHI. Copyright 2001 by the Canadian Institute for Health Information. Reprinted with permission.

This framework highlights the role of both the health and demographics of a population that may influence the need (demand) for health services. As aging baby boomers begin to increase demand, the already-strained Canadian healthcare system will be forced to accommodate greater numbers of increasingly sicker patients. Planning and forecasting how the system responds to this challenge will be dictated by the supply of healthcare professionals, financial resources as well

as the management, organization and delivery of services. Optimization of this dynamic interplay of related factors will result in effective and efficient resource (nurse) deployment and utilization. Overtime is one method of deploying and utilizing nursing staff which may draw on additional financial resources and ultimately affect service delivery. Nurses who choose to work those hours are themselves influenced by social, political and economic factors. The framework provides a macro level view of factors that are qualitatively explored, and ultimately provokes thought about the outcomes of resource utilization for the system, providers (nurses) and the patients (health outcomes).

A more specific conceptual approach to nursing overtime has been developed by Bae et al. (2012) based on a review of business and nursing literature (See Figure 2 below). Their model was developed for an exploration of mandatory overtime, and although not the aim of this study – the basic predictors of overtime merit consideration. Each of these predictors was used as a qualitative probe (where necessary) to help participants thoroughly think through their rationale for working overtime.

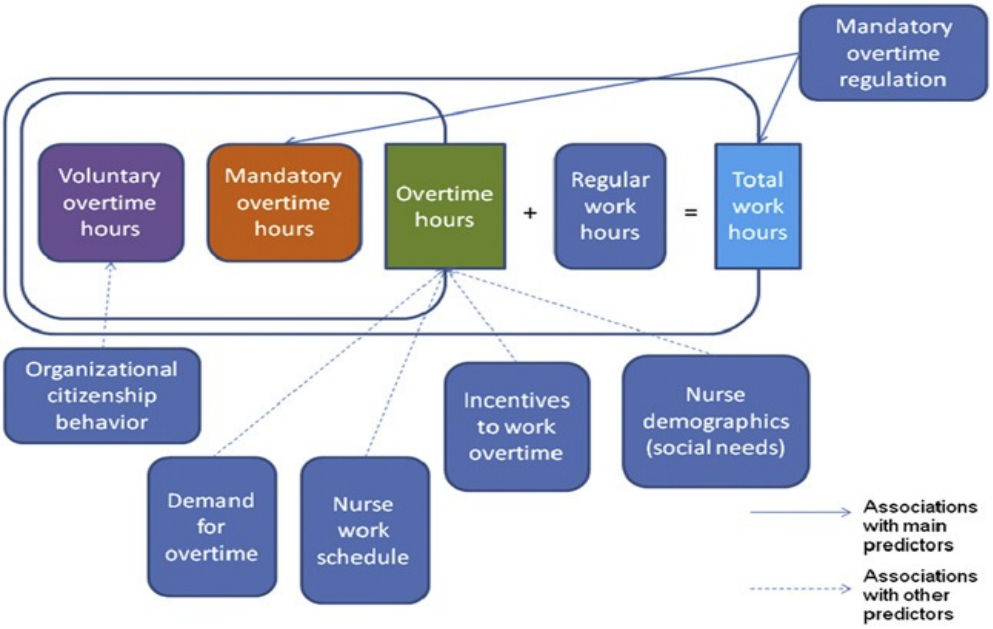

Figure 2: Overtime Conceptual Framework. Reprinted from "State Mandatory Overtime Regulations and Newly Licensed Nurses' Mandatory and Voluntary Overtime and Total Work Hours", by S. H. Bae, C. S. Brewer and C. T. Kovner, 2012, *Nursing Outlook*, 60(2), p. 61. Copyright 2011 by Elsevier Ine. Reprinted with permission.

Bae et al. (2012) begin with the understanding that total work hours are comprised of regular hours and overtime hours. This total however is limited by a nurse's physiological (i.e.: rest, nourishment) and social needs (i.e.: leisure and relationships). Their following conjecture asserts that value ascribed to a nurse's personal needs versus organizational needs will determine individual willingness to work increased total hours (Bae et al., 2012). Where overtime is not mandated, Bae et al. outline five predictors associated with overtime: (a) demand for overtime, (b) nurse work schedule, (c) incentives to work overtime, (d) nurse demographics and (e) organizational citizenship behavior.

The demand for overtime (workloads) is of particular importance in clinical units including ICUs and emergency departments where unexpected fluctuations in patient census and acuity are more likely (Golden & Wiens-Tuers, 2005). Bae et al. (2012) also state that demand for overtime may increase as a result of chronic understaffing due to shortages, high turnover or under-budgeting. Nurses' work schedules can either promote or discourage overtime hours, as those with shorter shifts (eight to ten hours) or individuals employed part-time may have more time available to work additional hours (Berney et al., 2005). Incentives to work overtime are of course a predictor and these may include: wages, fringe benefits, unionization of hospitals and family obligations (Bae et al., 2012). Wages in and of themselves however can either encourage overtime (due to the higher rate of pay), or act as a disincentive as a result of increased satisfaction with regular earnings (Golden & Wiens-Tuers, 2005).

The next factor considered in this model is nurse demographics, which, the authors surmise may serve as proxies for other social needs (Bae et al.). The final predictor of overtime that this model suggests is organizational citizenship behavior. Vegt, Vliert and Oosterhof (2003) propose that commitment to a position or organization engenders helpful and loyal behaviors including volunteering to work overtime when it is needed. The data collected in this study reflected each of these factors and expanded upon them through the specification of motivators comprising each category. Having both been used in the

development of interview probes, these models also helped to organize the discussion of the findings in a logical fashion.

The Nature of Qualitative Research

Prior to the contemporary idea of research, philosophers used "logical reasoning" to achieve the same ends (Trochim, 2006). In its broadest sense, research began to be known as inductive or deductive and subsequently, quantitative versus qualitative. Since its advent in the mid twentieth century, qualitative research has been evolving in order to meet the changing needs of unique disciplines (Creswell, 2003). Over time and through a philosophical lens, it began to be viewed epistemologically where three major schools of research were identified: the empiricist/realist school, the interpretive school and the critical/feminist school (Creswell). Within the interpretive line of inquiry (comprised of phenomenology, ethnography and grounded theory) further refinements are beginning to challenge the divisions that currently exist between methods in order to integrate them and produce richer, increasingly useful findings (Thorne, 2008). In contrast to the "truth" sought through empirical methods, contemporary nursing science aims to uncover ideas with application potential that remain open to revision according to alternative contexts, concepts and meaning (Thorne et al., 1997).

Qualitative Interpretive Description

The qualitative component of this study was conducted according to Sally Thorne's (2008) interpretive description (ID) approach. This methodology is well suited to nursing research which aims to respond to complex social and healthcare questions resulting in actionable findings (Thorne et al., 1997). Alongside theoretical information, the nursing profession relies on practical knowledge which makes the individual visible, but can also apply to the wider population (Sandelowski, 2008). With these goals as its aim, interpretive description has accordingly been widely used in nursing (Cioffi, 2003; Dmytryshyn, Jack, Ballantyne, Wahoush & MacMillan, 2015; Gibson, Henderson, Jillings & Kaan, 2013; Stajduhar et al., 2000)

Qualitative data is particularly valuable for understanding the meaning that individuals ascribe to their experience. It is uniquely suited to advance the nursing profession which relies on reason, philosophy, science and theoretical literature in equal measure (Thorne, 2008). This type of data serves to generate insights rather than uncovering "truth" and can play an important role by interpreting, describing, clarifying and validating quantitative results (Milne & Oberle, 2005). To be able to appropriately utilize nursing personnel in a way that is acceptable to nurses, financially viable for institutions, and in the best interest of the patients being cared for, it is essential to understand nurses preferences related to working overtime, and how they perceive it affects the care they provide.

Interpretive description was developed out of a desire to discover the "so what" that drives applied disciplines, and to relieve the tension between theoretical integrity and utility (Thorne, 2008). This method recognizes the constructed and circumstantial nature of human experience that simultaneously allows for shared realities (Thorne et al., 1997). As such, ID aligns with the constructivist and naturalistic orientation to inquiry (Thorne, 2004). Lincoln and Guba (1985) describe this epistemological foundation as one in which the researcher and the subject of study interact and influence each other, becoming inseparable in the description of multiple, complex and contextual realities. Thorne (2008) explains that ID methods have the potential to deconstruct prior knowledge and generate insights that shape future research and have application potential. It is ultimately being applied in order to extend beyond qualitative description (Thorne et al., 2004) and explore meanings and underlying explanations for nurses' decisions to work overtime, so that they can be effectively and efficiently deployed.

Participant recruitment, setting and sampling

Frontline nurses from critical care units within three tertiary care organizations (all teaching hospitals) in Southern Ontario were recruited for this study. Organization A is the largest employer in its city with between 10,000 and 15,000 employees, and more than 1,000 operational beds, over 60 of which are level II and III (described below) in adult critical care units. The corporation sees

more than 150,000 emergency visits a year and serves more than 2 million residents of the surrounding areas. Organization B has a total of over 4,000 staff with more than 700 staffed, operational beds. The corporation sees over 100,000 emergency visits a year. And finally Organization C is another large facility with over 11,000 employees and a total of over 1,200 beds. The corporation sees nearly 110,000 emergency visits per year. The ICUs in these organizations service long-term, post-operative and step down patients in specialty therapeutic units for cardiovascular, medical, surgical, trauma and neurological ailments.

In order to gain access to the group of eligible respondents, nurse managers from each of the Level II and III adult ICU's within the three organizations were contacted and informed of this study at its outset. Units were designated as Level II facilities if they provided "service to meet the needs of patients who require more detailed observation or intervention including support for a single failed organ system, short-term ventilation, post-operative care, or patients 'stepping down' from higher levels of care" (Bell & Robinson, 2005, p.7). Units designated as Level III were those capable of providing "service to meet the needs of patients who require advanced or prolonged respiratory support, or basic respiratory support together with the support of at least two organ systems" (Bell & Robinson, 2005, p. 7).

The first contact with the nursing managers informed them of the study and served to determine the most effective way to approach their nursing staff regarding participation. Managers responded with enthusiasm and volunteered to

distribute study information and consent forms via e-mail to their staff in order to solicit volunteers. These e-mails requested that interested nurses respond to the researcher directly (rather than the nurse manager) with their availability and any questions, so as to safeguard their anonymity and avoid any potential coercion.

Thorne (2008) underscores the importance of selecting respondents who are theoretically relevant to the topic of study and who will be able to express clear and distinct viewpoints regarding the issue of nursing overtime. Therefore, sampling of this group was purposive, according to the following inclusion criteria: (a) a Registered Nurse; (b) employed in an ICU setting for at least one year; and (c) employed full or part-time.

Nurses who worked casual hours, or had not been employed in an adult critical care setting for at least one year, were excluded from this study because of their potentially limited perception of issues on the unit and different career interests, level of investment and expectations. Registered practical nurses, clinical nurse specialists, nurse educators and nurse practitioners were also excluded because of their different roles and involvement on the units.

On each unit, two to four nurses were recruited using maximum variation sampling to facilitate the identification of individuals who worked little, moderate or large amounts of overtime (Patton, 2002). Using snowball sampling, nurses who responded to the electronic participation invitation were asked to recommend colleagues who would have interesting perspectives to share and suggest that they contact the researcher directly. Approximately half of the participants became a

part of this study at the recommendation of a colleague. Those efforts, combined with two reminder e-mails sent out by unit managers resulted in the recruitment of 28 eligible participants for the qualitative arm of this study - a number that falls at the upper end of the sample size range that Thorne (2004) recommends.

Data Collection

Qualitative interview data were collected from 28 frontline nurses through semi-structured face-to-face individual interviews from July of 2013 to December of 2014. Data collection was an evolutionary process that adapted (interview questions) to: (a) accommodate emerging findings, trends, variations and hunches, (b) ensure accurate findings (member checking), and (c) achieve data saturation (Milne & Oberle, 2005). In order to achieve maximum variation in this exploratory study, nurses of particular interest initially included those who worked more overtime hours than average, those who worked moderate amounts and those who worked closer to none – each of these were varied across age and gender as much as possible. Nurse participants included male and female respondents, those who work only days and only night shifts, those with and without children and some nurses who had diplomas while others had completed a Bachelors, or a Masters degree (see Tables 1 and 2 for respondent demographics).

Interviews took place in a secluded area within, or adjacent to, the critical care units where each participant was informed of the purpose of the study, as well as the risks and benefits, before signing two copies of the consent form (see

Appendix C). The interviews lasted from 20 to 75 minutes and were digitally recorded to allow for verbatim transcription and thorough analysis. Interviews continued until data saturation became apparent with no new understanding emerging, and the relationships between existing categories were determined (Morse & Singleton, 2001). Nurses were interviewed using a flexible topic guide based on the frameworks developed by O'Brien-Pallas, Tomblin-Murphy et al. (2001) as well as Bae et al. (2012) (See Appendix D).

Studies accomplished according to the tenets of interpretive description are typically smaller scale qualitative investigations that aim to uncover actionable findings that can directly inform clinical understanding and practices (Thorne et al., 2004). These studies tend to build upon relatively small samples that are selected by way of theoretical sampling (Thorne et al., 1997). Theoretical sampling encourages participant selection from the most predictable variations within the theme under scrutiny (Morse, 1995). For this study this meant interviewing nurses who worked differing amounts of overtime, those who worked only nights and those who worked days and nights, novice and senior nurses, part-time and full time nurses as well as males and females. Each of these groups were expected to have different motivations and perceptions that would be important to include. Because participant experiences and perceptions related to overtime work were largely unknown prior to data collection initiation, the sampling strategy remained flexible despite being purposeful and systematic.

Semi-structured interviews are the most common type of interview wherein questions emerge from pre-developed topic areas which are adapted to accommodate the content and direction of the actual interview (Bryman, 2004; Robson, 2002). Robson (2002) suggests that the strength of this type of interview lies in its flexibility that affords the researcher the ability to adapt questions to suit the mood and pace of the participant. Being face-to-face allowed for assessment of non-verbal cues (such as embarrassment) and seemed to allow participants the freedom to respond to questions while moving beyond them to discuss related issues (such as moving from reasons for working overtime into their frustration with the way overtime was assigned). This type of interview ensured that participants were able to tell their own stories, while probing questions promoted depth of responses (Milne & Oberle, 2005).

Thorne et al. (1997) suggest that the inclusion of lay print, media, nursing and clinical papers can serve as a support for qualitative nursing inquiries. The authors propose that at minimum, these sources can provide a testing matrix for emerging insights during data analysis (Thorne et al., 1997). As they suggest, these print and media sources were reviewed at the outset of this study in order to understand the current state of knowledge. They were also subsequently incorporated into the discussion alongside findings from participant interviews in order to strengthen conclusions and generate useful nursing knowledge.

Data Analysis

Studies that employ interpretive description offer a conceptual portrait that highlights thematic patterns characterizing the phenomenon under study, while accounting for internal variations (Thorne et al., 2004). Qualitative analysis was conducted inductively. Coding was allowed to unfold naturally so as not to force data into preconceived categories and give rise to more thoughtful conclusions as per Thorne et al.'s approach (1997). Repeated immersion in the data facilitated the abstraction of relevant themes from specific cases which could be developed into a set of knowledge that can ultimately be applied back to individuals (Thorne et al., 1997).

Rather than simply sorting or coding data, interpretive descriptive methodology prescribes synthesis, theorization and recontextualization (Morse, 1994). These processes helped to remove the investigator from tiny units of text and remain grounded in the wider landscape of "what is happening here", "why is this here? why not something else?", and "what does this mean?" (Thorne et al., 2004). Broad thematic analysis took place alongside continued data collection, which allowed for reflection on emerging themes and the opportunity to clarify and test developing ideas in subsequent interviews. One example of this was an early realization that participants were giving examples of deteriorating patient care as a result of other nurses' overtime hours. In order to discern whether or not there was a viable negative effect on patient care, the question was rephrased to

ask nurses how working overtime affected the care that they found *themselves* providing.

One component of the data collection and data analysis phase is a critical analysis of existing literature in order to integrate the relevant aspects, and move beyond them to develop new understanding (Thorne et al., 2004). This interface with previous research serves as a prototype that stands to be challenged, rather than reinforced, along with each finding that emerges. Kearney (2001) posits that if study findings too closely resemble the theoretical scaffolding that existed prior to the study in question, they may reflect an attempt to "fit" data in, rather than generate valuable, applied knowledge.

This thematic analysis was guided by the following two questions: 1) What are the reasons that nurses choose to work or not work overtime? 2) What are critical care nurses' perceptions of the outcomes of overtime? Responding to these questions involved identifying outcomes for different stakeholders as well as general overarching thoughts regarding overtime work. The Health Human Resources (O'Brien-Pallas, Tomblin-Murphy et al., 2001) and Nursing Overtime (Bae et al., 2012) models were referenced in order to situate the problem within the wider context of healthcare delivery while also acknowledging the different facets of overtime that Bae et al's (2012) model highlights. While these models were set aside during analysis so as to allow findings to be discovered organically, both models were employed to aid in contextualizing the data and discussion of findings. Throughout the process, Thorne et al. (2008) suggest reflecting on why

certain phrases stand out and keeping track of those that succinctly or eloquently summarize important ideas. This was done by way of a "quotable quotes" folder within NVIVO 10 and frequent reflection on both emerging and taken-for-granted ideas such as who "the patient" is with regards to the outcomes of overtime. A research journal was created and contributed to regularly in order to track emerging ideas and enhance trustworthiness.

Template analysis. Thorne et al. (2004) advocate a flexible approach to data analysis, which was accomplished in this study and others, by way of template analysis (Burns, 2009; King, 1998; Olsen, Bradley, Lomborg & Nortvedt, 2013; Sandelowski, 2000). Template analysis is a useful tool developed by King (1998) as a branch of thematic analysis that involves the development of a hierarchical coding template. The initial template is often conceived by way of *a priori* codes that draw out themes which are highly expected to be manifest in the data (King, 2014). These initial codes are used to organize some of the data as decisions are made regarding whether to keep, modify or discard them according to relevance (King, 1998). In terms of its philosophical alignment, template analysis falls within the middle ground of qualitative analysis which King (1998) suggests range from almost entirely *a priori* codes in a realist orientation to a largely emergent set of codes with a relativist/constructivist bent.

The process began with the creation of open headings (e.g.: nurse health, family effects) and broad questions (e.g.: what are the outcomes of overtime?) for the first set of interviews which emerged out of existing literature and the research

problem. These headings served as the initial template, as per King's (1998) belief that the questions, probes and prompts used by the interviewer typically form its basis. Analysis began immediately following the initial four interviews as the author transcribed, read and re-read the data in order to increase familiarization and comprehend the whole. Thorne (2008) touts the importance of this being done by the researcher herself in order to "hear the full stories, words, sounds and silent spaces" (pg. 144). A basic analysis of these interviews was performed using NVivo for Mac version 10.1.1 where transcripts were coded under existing headings and new ones were added as themes began to emerge. This developing template then served to guide the next set of 12 interviews. A similar process was followed upon completion of the second set of interviews wherein the questions were amended once again with some additional probes (e.g.: 'How do you think overtime affects you personally and professionally?' As opposed to 'How does overtime affect you?') There was a simultaneous amassing of existing related literature which was reviewed but not coded in order to again develop familiarity without getting entangled in the details and subsequently attempting to "fit" new data into existing scaffolding.

Once all 28 interviews had been completed the transcripts were re-read in their entirety to look for additional, more subtle themes and subthemes that would comprise the template moving forward. Immersion in transcript data deepened with further reviews, creation of memos, extraction of broad "bucket" themes, and transcript summaries that served to shift the focus from details and wording back

to the big picture and research questions (King, 1998; Thorne et al., 2008). As the list began to grow, so did frustration with the software at the lack of visualization it afforded. It was at this point that a table of themes and subthemes began to be drafted in Microsoft Word.

This template was created on landscape paper and had three columns to incorporate major themes in column one, subthemes in column two and supporting participant quotes in column three. These were each grouped according to the major headings used during interview sessions. Having created a descriptive map of nurses' perceptions, the next step was to develop some of the main themes that had emerged and explore their interpretive meaning with greater abstraction. This is in line with King's approach (1998) to template analysis which assumes that the final template does not signal the conclusion of analysis but rather the beginning of the next phase. This process of interpretation is one that he leaves open to development according to the aims and content of the particular study, stating that it is in fact inappropriate to dictate rules for interpreting coded data (King, 1998).

Interpretation of descriptions. Initial interpretive processes involved much reflection on the part of the researcher. Reading through the themes, subthemes and particularly the participant perceptions, the goal was firstly to allow oneself to react to it, to be drawn into specific verbiage or ideas and, following that, to discern why that has occurred with a specific piece of data (Thorne, 2008). This was done repeatedly while reading the templates, research

journal, memos and sometimes entire original transcripts in a free-flowing manner. Thorne (2008) recommends returning to source material regularly to confirm that the original context is understood and transmitted. As this process advanced a number of different thematic groupings were created as patterns and linkages began to emerge. These remained as simple devices by which to organize ideas until a number of Thorne's questions had been explored, including: "what happens if I group what I have in this way versus this other?" and "in what ways are these groupings different and why would that matter?" (pg. 168).

Large sheets of blank paper served as canvases on which anything of interest was scrawled, words, thoughts and additional or more subtle themes. During this process, connections between ideas were explored and refined. For example, initially, the outcomes of overtime were grouped according to affected stakeholders (e.g., nurses, patients, units and organizations). Safety was a factor for nurses (driving home, injuries), and patients (errors and oversights), while both were, in essence, issues of nursing fatigue from being overworked. Upon further consideration it became apparent that the effects were all on nurses, which in turn affected others (e.g., patient care suffers because the nurse is "not as good at doing things"). Themes were then reorganized in order to highlight the different ways that overtime affects nurses personally (work-life balance), physically, professionally (performance with regards to patient care), financially and emotionally (respect).

Establishing Trustworthiness

Since its inception and uptake, the "rigor" of qualitative research has been a subject of interest and debate due to the lack of consensus regarding its quality indicators (Rolfe, 2006; Sandelowski, 2000). One of the most widely used approaches to establishing credibility in qualitative research has been Lincoln and Guba's (1985) notion of trustworthiness (as an alternative to the reliability and validity assumed in empirical studies). While Thorne (2008) appreciates the procedures offered by Lincoln and Guba (1985) as well as Sandelowski (1986), she asserts that establishing attributes like trustworthiness are less important because credibility arises primarily out of the way that analytical decisions are presented and explained. These decisions and procedures have been detailed in this chapter. To further the case for rigorous work, criteria laid out by Lincoln and Guba (1985) have also been incorporated.

The first of their four criteria is *credibility* which ensures that the subject of inquiry is accurately identified and described (Lincoln & Guba, 1985). This can be achieved in myriad ways such as data and investigator triangulation as the assessment of previous research findings. In this study, a critical analysis of existing literature served as a scaffolding against which findings were compared in order to confirm, challenge and strengthen them. Another source of triangulated data that helped to shape this study were informal conversations with managers at its outset. Without being interviewed in any way, many managers shared their opinions, perceptions and ideas that were echoed by many nurses

thereafter. Finally, within the research committee, transcripts were reviewed by multiple individuals to ensure consistent findings.

Shenton (2004) states that a second way to enhance credibility is to employ tactics that ensure informant honesty. Participation in the study was entirely voluntary and prior to each interview nurses were informed that this was independent research that would not affect their professional status. Nurses were encouraged to be honest by being assured that their data would be anonymous and untraceable to them, and they were all given the choice to withdraw from the study without explanation at any point. Another way to enhance credibility is through iterative questioning (Shenton, 2004). This was done by way of probes and by rephrasing questions within the interview in order to elicit similar information. Frequent debriefing sessions with the research committee enhanced the credibility of this study by testing ideas with content and method experts. Committee meetings served as sounding boards for ideas and interpretations that were tested and refined.

The second of Lincoln and Guba's (1985) criteria is *transferability* which details how transferable the findings are to other situations. This can be a serious challenge in qualitative research as small, typically localized samples produce observations that are defined by the context in which they occur (Shenton, 2004). A primary method of increasing transferability is by way of 'thick description' that gives readers a comprehensive understanding which enables them to compare findings with those that emerge in their own situations (Shenton). The author of

this study has made every attempt to include sufficiently thick descriptions of the settings, participants, data and analytic procedures to enable these comparisons. While disagreements persist around how much contextual background is necessary, Shenton summarizes the key points that merit inclusion to enhance transferability, all of which are included above: (a) the number and location of organizations included; (b) any restrictions on participants included; (c) the number of participants involved in fieldwork; (d) data collection methods; (e) the number and length of data collection sessions; and (f) the time period over which data was collected (pg. 70). Ultimately although these steps have been taken, Shenton (2004) agrees that the notion of truly transferrable findings should be questioned as a realistic goal because of its propensity to disregard the importance of the context that underlies qualitative research.

Lincoln and Guba's (1985) third criterion is *dependability* which is concerned with the transparency of research that allows others to replicate it. Dependability has been achieved by way of a detailed discussion of research methodology. Members of the research committee also spent time independently reviewing a selection of the interview transcripts to ensure that there was some level of agreement regarding initial themes.

The fourth and final criterion that Lincoln and Guba (1985) posit is *confirmability*. Confirmability relates to the researcher ensuring that findings are less related to his/her characteristics and preferences than the experiences and ideas of participants (Bryman, 2004). Here again, triangulation has a role to play

in reducing the effect of investigator bias, along with detailed methodological accounts (Shenton, 2004). The study has also been scrutinized by individuals outside of the research committee, through the peer review ethics approval process, to ensure appropriate safeguards and methods. Finally, clinical expertise within the research committee and verification with nurses throughout the data collection process served to guide clinical application of the findings.

Ethical Considerations

Research Ethics Board approval was obtained prior to the initiation of data collection from each organization, and this began with the researcher's own University (project number 13-337, see Appendix E). In any study involving human beings, voluntary participation, informed consent, freedom from harm and confidentiality of data are crucial ethical considerations. It was essential to ensure that nurses felt no coercion from their managers or administrators to participate in this study. This was achieved by requesting that all interested nurses contact the researcher directly in response to the study invitation sent out by their managers. The idea of informed consent is defined by a respondent's decision to participate in a study following the assimilation of essential information (Burns & Grove, 2005). To that end, all participants received an information letter that summarized their role, benefits, risks and researcher contact information. In order to ensure that nurses were adequately informed, appropriate written and oral language was used, and nurses were all given the opportunity to ask any questions prior to signing an informed consent document and beginning data collection. Every

participant was given a signed copy of the form for their own records (Appendix C). Unit managers were not informed which of their staff members chose to participate so that nurses were free to share their genuine perceptions without fear of repercussions.

Prospective participants were also informed that they were free to abstain from any questions and withdraw from the study at any time without consequence, still receiving a gift card for a local coffee shop as a small token of appreciation for their participation. Confidentiality of participant's responses was maintained by ensuring that participant identifiers were removed so that none of the data could be traced back to any particular respondent. All electronic data were stored on a password-protected computer, and paper files were locked in a filing cabinet.

Quantitative Methods: Introduction

To date, the quantitative evidence regarding nursing overtime and patient outcomes is conflicting and inconclusive. All of the studies reviewed in chapter two are American, few are related to critical care, and they are based on differing definitions of "overtime" itself. As a result, these studies may not be applicable in Canadian settings and are difficult to synthesize in any meaningful way.

The aim of the quantitative component of this study was to test the association between nursing overtime and nursing sick time, patient mortality as well as the following patient infection incidents: Clostridium Difficile (C. Diff),

methicillin-resistant Staphylococcus aureus (MRSA), central line infection (CLI), Vancomycin-resistant Enterococci (VRE), and ventilator associated pneumonia (VAP). Multilevel model regression analysis was selected and the following methods were used in conjunction with the unit-level data available to add to the repository of findings on this topic in a Canadian, critical care context.

Setting, Recruitment and Data Collection

Data for the quantitative arm of this study were collected from 11 separate Level II and III adult critical care units nestled within three major health science centers. These units correspond to those on which nurses were interviewed for the qualitative component of this study and served as a convenience sample. A convenience sample was selected for this study as a result of budget and time constraints, however, the organizations involved are some of the largest academic health science centers in the province. Recruitment of these units was accomplished when each of the managers were approached at the outset of the study. They were informed about both the qualitative and quantitative components and consented to their unit's participation in both.

The sample involved in this study includes the population of all critical care patients in three major organizations in southern Ontario over a 24-month period from September 2011 to August of 2013. Because the entire population of those units is included, a sample size calculation was not completed.

Following Research Ethics Board approval at each site, information services were contacted, sent a copy of the approval and data requests were completed. Retrospective data were collected on a monthly basis over the 24 months in order to increase the number of data points and in turn the representativeness of the findings. Data were typically received within a few weeks, and were then entered into Microsoft Excel in long format to be reviewed, exported and analyzed.

Data Set

The quantitative overtime analysis used data from two datasets within each organization - human resources and infection control (unit records). Human resources data (nursing worked hours, overtime, and sick time) were typically acquired through payroll departments, while patient outcome data (including infections rates, disease severity scores, and mortality rates) were extracted from unit records and infection control departments. These were provided in a single table from each organization either as a portable document file (PDF) or a Microsoft Excel table. Files received were ordered according to month and by unit. The variables entered into the final data set to be analyzed included: nursing worked hours (excluding overtime), nurse overtime hours, nursing sick hours, number of patients, multiple organ dysfunction score (MODS), number of patient deaths, C. Diff incidents, MRSA incidents, CLI incidents, number of central line days, VRE incidents, number of days on mechanical ventilation, and VAP

incidents. One organization was unable to supply infection rate data for two of its units, and one organization supplied data regarding additional infection rates that were subsequently dropped from the analysis when the other two organizations did not supply them. See Appendix F for complete list of variables obtained.

Data Analysis

The unit of analysis employed was adult critical care units, from which data were collected retrospectively over 24 months. The major advantage of using panel data is the longitudinal nature of the information collected, as opposed to a snapshot of a single point in time afforded by cross-sectional studies (Hsiao, 2003). The large number of data points increase statistical degrees of freedom while reducing the collinearity among explanatory variables (Hsiao).

Descriptive statistics were calculated for each variable at the outset, as data were checked for any missing or improbable values. Variables supplied by payroll were largely continuous and produced overall means, minimum and maximum values, medians, and standard deviations. Infection rate counts were tabulated by quarter. Multilevel mixed effects linear regressions were used to explore the relationships between continuous variables, while multilevel mixed effects Poisson regressions were used to analyze relationships that included count variables (Aiken, Mistler, Coxe & West, 2015)

Multilevel Modeling. In this study, adult ICU units were nested within organizations and each unit consists of 24 repeated measures. To account for

potential correlations between measures within units and organizations, multilevel models were used since the correlation of observations in the same cluster violates the assumptions inherent in traditional linear regression (Cohen & Cohen, 2002). Multilevel models are a way of defining statistical models that account for clustered observations in which the pattern of clustering is known (Rabe-Hesketh & Skrondal, 2102). Using this type of model produces a compromise between noisy within-group estimates (especially for regressions with groups bearing small sample sizes), and the oversimplified regression estimates produced when group effects are ignored (Karlsson, 2012). By integrating cluster information, multilevel analyses provide accurate standard errors which are generally more conservative than those that emerge from models which ignore cluster effects (Goldstein, 2003). Each level within the model can be viewed as an independent regression with its own set of assumptions around linearity, independence, equal variance and normality (Gelman & Hill, 2007). Multilevel modeling was also selected for this analysis because it can accommodate unequal sample sizes within clusters as well as missing data within repeated measures (Tabachnick & Fidell, 1996).

In the specification of multilevel models, another important delineation revolves around which explanatory variables might give random effects and which are fixed. When an effect is modeled as random, this essentially allows for inferences to be made about the population from which the units studied were drawn, rather than about those specific units themselves (Snijders, 2005). Rather

than being estimated directly, they are summarized in terms of their estimated variance and covariances (Baum, 2013). Random effects are unobserved latent variables (Rabe-Hesketh, & Skrondal, 2012). In this case, the critical care units and organizations to which they belong were considered as random effects, while the independent (or fixed) variables that were estimated directly include overtime hours, nursing worked hours, nursing sick hours, patient outcomes, as well as patient severity (MODS) and numbers of patients per unit.

All included variables were tested for congruency with the assumptions of multivariate linear mixed regression. Variables were assessed for normality, outliers and multicollinearity (Williams, Grajales, Kurkiewicz, 2013). Normality refers to the assumption that errors are normally distributed for any combination of values on the predictor variables – not that the distribution of the dependent variable values themselves are necessarily normal (Williams et al., 2013). The Shapiro-Wilk test of normality was used alongside visual reviews of histogram distributions (Bell, Schoeneberger & Morgan, 2010). Both of these initially displayed residuals that were not normally distributed, however including nursing worked hours as a covariate rendered the outcome variable residual distributions normal, and was subsequently used in every model.

Outliers were identified by way of visual inspection using histograms, frequency distributions and box plots (Aylin, 2013; Bell et al., 2010). Where detected, outliers were explored, corrected or deleted. Managers were emailed to check the accuracy of values that appeared to be outliers, and if they were able to

verify then, they were retained. If managers had a different value on record, it was amended, and if they (or infection control personnel) were uncertain, the value was deleted and counted as "missing" in analysis. Finally, multicollinearity signifies a high correlation between any number of independent variables included, and it can cause the significance of the regression coefficients to fail and failure of the model to converge (Tabachnick & Fidell, 1996). Multicollinearity between variables was therefore assessed by examining the correlation between independent variables. Where it was found to be high (e.g., between number of patients and nursing worked hours) one of the variables was removed from the model.

In order to run Poisson regression analyses, continuous variables used therein had to be recoded into ordinal variables (Coxe, West & Aiken, 2009). Nursing worked hours were grouped into three categories: less than 1000 hours, 1000-1499 hours and over 1500 hours. Nursing overtime hours were divided into those under 500 hours and those over 500 hours. Unstructured covariance matrices were used on account of the random effects included in the model in order not to impose constraints on the measures and utilize unique covariance estimates for the best fit (Sweet & Grace-Martin, 2012). These models yielded incidence rate ratios as results in place of the coefficients generated by the mixed multilevel models. Other output produced for evaluation included standard errors of estimates, residuals, p-values and 95% confidence intervals.

Assessment of the predictors for each outcome variable was accomplished using the stepwise forward approach (Streiner, 1994). The original model began with three independent variables: number of patients, illness severity (MODS), and worked hours (excluding overtime). The number of patients served as an exposure variable within the Poisson models, because each patient had the opportunity to be exposed to death or infections (Hamilton, 2009). The exposure variable was slightly different for VAP and CLI because only those patients who were on ventilators or who had central lines were able to acquire those infections. For these analyses, the number of vented days and number of central line days served as exposure variables. Data analysis was completed using a combination of IBM SPSS version 21 and STATA/IC version 13.0 for Mac.

Rigor

Rigor in quantitative studies is determined by evaluating cause and effect as well as generalizability. Because the goal of this study was to uncover associations between variables rather than causal relationships, internal validity is a less relevant measure than conclusion validity **(**Petrocelli, 2010**).** Conclusion validity was assessed as a measure of how reasonable the relationships between study data are which give rise to the conclusions presented (Trochim, 2006). This characteristic essentially seeks to make sense of the data logically as well as in terms of prior research and adequate analysis (Garcia-Perez, 2012). The discussion chapter of this thesis draws parallels between the findings of this study

and those that exist in the literature. The outcomes that were found to be related to overtime are logical and can be explained at least in part by some of the findings from the qualitative arm of this study. The logic through which those outcomes can be related to overtime and have been found to be in previous studies bolsters the conclusion validity of the results.

In the quest for generalizability the concept of external validity merits consideration. External validity refers to the degree to which the findings from this study can be generalized to the wider population (Shuttleworth, 2009). In this case the population to which the findings are intended to apply are tertiary adult care level II and III critical care environments in Ontario, Canada and potentially other parts of the country or continent. Major threats to external validity can emerge from sampling issues (particular people who participate), specific locations that differ in some important ways from others, and timing of the data gathering that could be influenced by an outside factor. For the purpose of this study, units were considered in their entirety (not individual people), and while not randomly sampled, were pulled from three different organizations, and consisted of 11 different units. Taken together this increases the variety of the sample and spans a larger geographical region consisting of different internal environments, policies and practices. Data were also collected over a span of 24 months to increase the number of data points and to mitigate the potential effects of any new policies around overtime that might have been implemented just before or during the period from which data were pulled.

Ethical Considerations

Prior to initiation of data collection, Research Ethics Board approval was obtained at each organization. Clinical managers consented to the use of their data on behalf of their staff and patients, where data aggregation rendered individual consent unnecessary. None of the organizations or critical care units were described by name or with precision. The collection and analysis of nursing and patient data required the use of confidential data, which had to be protected and anonymized. This was accomplished by way of data aggregation at the hospital unit level (so that individual nurse or patient data is not identifiable), file storage in locked cabinets and encrypted and password protected electronic documents. Finally, at the completion of the project, findings from the study will be shared with organizations, managers, and the nurses themselves so that the findings can be used as appropriate to enhance nursing work and patient outcomes.

CHAPTER FOUR

Qualitative Findings: Nurses' Reasons for Working /Not Working Overtime

Findings from this study are divided into three separate chapters that highlight: (a) nurses' reasons for working or not working overtime; (b) nurses' perceptions of the outcomes of overtime, and (c) the quantitative findings regarding the relationship between nursing overtime and nurse and patient outcomes. The qualitative findings chapters begin with a summary of participant demographics followed by the major themes that highlight why nurses choose to work, or not work overtime and participants' perceptions of the outcomes of overtime work.

Participant Demographics

Participants in this study were all full or part-time frontline Registered Nurses who had worked in critical care environments for a minimum of one year. These nurses were interviewed over the course of one and half years, from July 2013 to December 2014. A total of 28 nurses volunteered to be interviewed about their perceptions of overtime, five of whom were male, while the remaining 23 were female. Participants had an average age of 39.4 years (from 24 to 57). They had an average of 16.8 years of nursing experience and 11.7 years in critical care. Most participants were full-time (85.7%), and were married (57.1%). A large portion of the sample had no children (46.4%), while the remaining 53.6% had anywhere from one to four children (with 10 stating that they had two children)

(See Tables 1 and 2 for more complete demographic information). The diversity of the sample in relation to age, family situations, work status and experience was reflected in the reasons participants cited for working or not working overtime hours.

Table 1

Participant Demographics 1

	Number (%)
TOTAL	**28 (100)**
Gender	
Male	5 (17.9)
Female	23 (82.1)
Education Level	
Diploma	12 (42.8)
BScN	15 (53.6)
Masters	1 (3.6)
Employment Status	
Full-Time	24 (85.7)
Part-Time	4 (14.3)
Relationship Status	
Single	9 (32.2)
Married	16 (57.1)
Separated	3 (10.7)
Children	
No Children	13 (46.4)
Children	15 (53.6)

Table 2

Participants Demographics 2

	Min	**Max**	**Mean**	**Median**	**Std. Deviation**
Age	24	57	39.4	39.0	11.3
Yrs of Experience	3	36	16.8	16.0	11.5
Yrs in Critical Care	2	34	11.7	10.8	9.4

The Definition of Overtime

The definition of nursing overtime is an elusive one that Lobo, Fisher, Ploeg, Peachey and Akhtar-Danesh (2013) propose merits concerted attention. An important and unanticipated finding from this study surrounds the definition that participants in this study spoke of. Within the first four interviews it became clear that the definition of overtime required expansion in order to specify the term and more precisely capture nurses' reasons and perceptions of the additional hours. When asked to explain why they did or did not work overtime, participants in the current study raised the issues of coming in for full shifts or working consecutive weekends versus staying beyond the defined end of a shift, or working through their breaks. The latter two were grouped together as a type of (largely) unpaid overtime and the former two became the paid options for overtime work. Each of these types of overtime were discussed at every subsequent interview.

Overview of Nurses Reasons for Working or Not Working Overtime

This remainder of this chapter presents findings related to nurses' reasons for working and not working overtime. Four themes were identified in relation to choosing to work overtime: (a) Financial gain: Money is one, money is two, money is three, (b) Helping and being with colleagues: I'd do it for my coworkers (c) Continuity for nurses and patients: I know what I'm going into, and (d) Accelerated career development: I feel like I racked up a lot more experience. Three themes were identified related to reasons for not working overtime: (a)

Feeling tired and tired of being there: You're there too often and you just get too tired (b) Established plans: I wouldn't change my plans for overtime, and (c) Not enough notice: It depends on the timing of the calls (See Table 3 for list of themes and subthemes). While these themes are presented separately below, nurses often gave multiple, multifaceted reasons for working overtime.

Table 3

Reasons for Working or Not Working Overtime: Themes and Subthemes

Major Themes	**Subthemes**
Reasons for Working Overtime	
1. Financial Gain: Money is one, money is two, money is three	(a) You get paid one and a half times the money
	(b) It helps to fill in some of my shorter pays
	(c) I'll just grab an OT shift and pad that bill
2. Helping and being with colleagues: I'd do it for my coworkers	(a) I was there for my colleagues.
	(b) There's a big social component to working for me
3. Continuity for nurses and patients: I know what I'm going into	No subthemes
4. Accelerated career development: I feel like I racked up a lot more experience	No subthemes
Reasons for Not Working Overtime	
1. Feeling tired and tired of being there: You're there too often and you just get too tired	No subthemes
2. Established plans: I wouldn't change my plans for overtime	No subthemes
3. Not enough notice: It depends on the timing of the calls	No subthemes

Financial gain: Money is one, money is two, money is three

By far, the most prevalent reason that participants cited for choosing to work overtime was the financial gain it afforded them. The three subthemes related to financial gain highlight the uses that respondents had for the extra funds they acquired by working additional hours. The most common reason was simply that participants wanted a larger paycheck with no specific end in mind, stating - "you get paid one and half times the money." For some nurses "it help[ed] to fill in some of [their] shorter pays" which were typically uneven as a result of the four days on, five days off schedule. For others, bills, vacations, renovations and other expenses drove their decision to seek out overtime, as they expressed "I'll just grab an OT shift and pad that bill." A total of 27 out of 28 participants listed finances as a primary driver for working overtime. Participant quotes are identified by site and participant number; for example, S1, P1 refers to Site 1, Participant 1.

You get paid one and a half times the money. For some participants, overtime was a planned and sought after perk that helped them achieve a specific financial goal. For others, it was a nice privilege when it happened for the simple notion of earning more money. When they were asked to work additional hours, these participants cited rationale like "…the only reason I do take overtime is the money really" (S1, P1) and "I really don't know any other reason than the money" (S1, P7). They also chose to work overtime because they could make more money by working less time overall. As one part-time nurse explained, she could choose

to pick up overtime shifts on weekends where she would be paid a premium, plus overtime, plus have the potential for consecutive weekend pay: "It's easier to be home during the week, then pick up the overtime on the weekend, work less, make more money" (S1, P8). Participants voiced their delight over getting paid one and a half times their normal amount for doing the same work they would otherwise do for less: "Well again, to an extent, you're doing the exact same thing as what you would in a normal shift, but instead of getting paid forty bucks an hour you're getting paid sixty!" (S1, P7). Even when probed, there were about 10 nurses who explained that they worked overtime only for the money.

It helps to fill in some of my shorter pays. Nurses also explained that it was helpful for them to receive more even paychecks. Most participants worked what is known as the 4/5 schedule where they worked a block of four shifts (two days and two nights) followed by five days off. Regardless of where these shifts fall, they are paid bimonthly, resulting in some payroll deposits that are considerably smaller than others. In order to supplement those leaner paychecks, four nurses spoke of picking up overtime hours intentionally during those periods:

> *I like to pick up some overtime – it helps to fill in some of my shorter pays. So when I say that, I do a schedule many of us do here where we do two days, followed by two nights, they're all twelve hours and then five[days] off. So it's a nice schedule…but pay periods are two weeks so … sometimes there only four shifts, five shifts, six shifts, sometimes there's eight shifts in a pay period. So it kind of fills in some of those shorter pays – you can do some overtime. (S3, P22)*

Nurses liked the consistency in income so that they could appropriately budget their finances. Participants indicated that it made things a little bit easier at

home: "It just works a bit better to sort of offset some of the shorter pay checks" (S1, P12). One nurse indicated that when his upcoming paycheque was going to be lighter than he liked, he would seek out overtime hours and ask other units if it was not available in his. It was a combination of financial need and the desire to avoid small paycheques that gave rise to this reason for working overtime.

I'll just grab an OT shift and pad that bill. The financial gain that overtime affords was used by many participants for very specific goals. Some of the most commonly cited goals included things like vacations, renovations, products, mortgages and other bills. For some nurses it was a change in life status, like marriage, which drove them to work additional overtime in order to meet new financial demands:

> *I recently got married a couple of years ago – bought a house, lot of changes, just life changes that have happened since I graduated and started nursing... paying off student debt.. and just changes in lifestyle from a student to kind of an adult with all of the responsibilities associated with that.... (S1, P9).*

For this nurse, and some of the other younger participants, the sudden barrage of "adult" expenses was a bit of a shock, and nurses felt they needed the overtime to keep on top of everything. Others relied on overtime during periods of change in household income, such as spousal layoffs. A small number of nurses explained that they calculated how many overtime shifts they would need to work in order to fund specific expenses.

> *If I want to go on a vacation –just life, kind of things that are going on in my life, so vacations, recently we did quite a big renovation on our house – so trying to work enough to pay for that – ... if I have something I want*

> *to pay for – the holidays coming up – then I plan for that and, my mind works kind of weird. I think 'well, we want to go on a vacation, then it's going to cost this many shifts in overtime.' My husband's a nurse as well so we sort of divide that out and say we've each got to work three shifts or whatever. (S1, P10)*

Overall, nurses working overtime for financial gain did so on a scale from "nice to have" to "counted on for specific expenses" to "important for my financial well-being."

Helping and being with colleagues: I'd do it for my coworkers

The second most commonly cited reason participants in this study gave for picking up overtime hours was to help out and be with their colleagues. A total of 19 nurses stated this, with about half of them claiming that it was their primary motivation. It seemed like most of them genuinely cared for their colleagues and did not want their day to be harder than it needed to be. The two subthemes related to colleague support firstly involved a sense of obligation and concern for one another, as nurses chose to work overtime in order to be "there for [their] colleagues." The second subtheme centered around collegiality with "a big social component to working" cited as their motivation. In a caring profession like nursing, these participants had appropriate concern for both their colleagues and their patients.

I was there for my colleagues. Nurses were partially motivated to work overtime because of the feelings they incurred as a result. Helping their colleagues made them feel good, filled them with additional satisfaction at work and had

some "benefit to [their] psyche." One nurse stated: "Sometimes when you can help out, when it works – it feels good to contribute. It's a nice feeling to know that you're helping your coworkers when you come in" (S2, P16). They realized that coming in for overtime made the unit more "livable" for the other nurses and reduced the burden on them. Ultimately, they wanted to help their colleagues not only out of a sense of professional responsibility, but also because on a personal level, these nurses were friends.

When units were short staffed for any reason, if administration was unable to find a replacement they had two options: they could either simply work with fewer staff or call in agency personnel. There were four nurses who spoke strongly about the latter option. Each of those participants stated that having outside (agency) staff on their units actually created more work for the staff because of how much help they needed with finding things, checking orders or test results, and especially in emergency situations. Regular staff felt that they had to "babysit" these nurses and give them access to any electronic orders and documentation because the agency staff lacked permission. With regards to working short-staffed, nurses alluded to knowing what it was like to work with inadequate personnel, and out of sympathy, they would often accept an overtime shift so that others would not be overworked. "I do like the feeling of being able to help out the team. Because … I really value it when other people come in just because it's so hard to work short" (S1, P11). This example illustrates their

concern and empathy for the team and their desire to do what they could to improve the work environment for others.

There's a big social component to working for me. Coming in to work overtime for their colleagues meant two different things to participants. On the one hand it involved being there to support them and reduce their workload, but on the other it meant coming in to spend time with them socially. Full-time nurse schedules generally involved working with one team of individuals fairly consistently, while many of them had friends on other "lines" or shifts. Some nurses indicated that they came in to work with other teams, and were much more likely to accept overtime shifts where they knew and liked the people who would be working. Many nurses explained they came in for overtime for the reason of "working with the other teams." One participant stated: "Honestly the best part about working overtime is that you get to work with the other line. You work with people you don't normally get to work with. That's the best part" (S1, P3).

Nurses expressed fondness toward their colleagues, and some of them explained that work, for them, comprised the bulk of their social life. There were two young mothers who described coming in to work overtime as an "escape from home." That was not to say that they lacked love for their children, but they explained a need for adult socialization and a break from the specific needs that existed in their homes:

> *I love my children to pieces, but it's the adult stimulation, it's the coming to work and gratification from taking care of a patient… providing potentially life saving measures, interacting with others – catching up*

with friends, there's a big social component to working for me. (S1, P4)

For others, rather than escaping from children to be with colleagues at work, participants, again younger nurses, chose to work overtime to escape boredom at home. They reasoned that if they were going to be sitting around at home doing nothing, they might as well be at work because they liked the people they worked with and thought it a better use of their time:

> *At home I'm pretty bored and I like what I do here and I like coming in, I like the people I work with so...there's times where I'll put myself down [on the list to work overtime] just because I know I'm not going to be doing anything that day...and sitting around doing nothing – I figure I might as well be making money that day. (S3, P25)*

This response was more typical of younger nurses who had fewer family commitments and were looking to finance new homes and student loans they had accumulated.

Continuity for nurses and patients: I know what I'm going into

The third main reason that participants cited for working overtime was their desire for predictability and continuity for both themselves and their patients. This theme was addressed by 11 nurses who were glad to have some sense of how busy or chaotic their shift was likely to be when they committed to it. They recognized that working overtime sometimes allowed them to provide a greater sense of continuity and familiarity for patients, families and themselves. In some cases, that was enough to drive them to pick up additional overtime shifts. Achieving this continuity meant working overtime shifts immediately following

their regularly scheduled block so that things would be as they left them. In these cases, most often they would return to the same patient as they had just the day before:

> *Sometimes, an overtime shift can be just icing on the cake, when you've already been there for three and you come back for four, you have the same patient, you have the routine – everything is smooth – versus picking up a overtime shift in the middle of a span off. Where you're going in completely unknowing … – you could get the sickest patient in the unit, ..., I prefer to go in and work an overtime shift when I know what I'm going into. (S1, P4)*

Working overtime did not consistently ensure being assigned the same patients. Four nurses explained that when they picked up an overtime shift they tended to be given one of the more challenging and complex patient assignments for the day. Participants articulated that the patient assignment was related to a common perception, that working overtime involved earning more money, which was equated with a heavier workload.

Despite that, nurses interviewed spoke of the win-win situation that overtime created wherein their day tended to be more routine and patients enjoyed seeing a familiar face who was well acquainted with them and their history. One nurse stated, "…because that way I would have a consistency of having the patient back that I had. So it's good for the patient and for me" (S3, P27). Even for overtime within the shift, participants indicated that missing breaks to care for patients afforded them greater continuity because they were more familiar with their patient and would be quicker to catch a change in status than the nurse who covered their breaks for the day.

Accelerated career development: I feel like I racked up a lot more experience

A fourth and final prominent reason that nurses shared for choosing to work overtime was the effect of the additional hours on their professional growth and seniority. A total of 11 nurses spoke to this - both novice and experienced – who had used overtime to advance their personal development as well as career growth in an attempt to accrue full-time status.

Participants perceived that the more time they spent on the unit, the faster they would climb up the steep critical care learning curve. This reason for working overtime pertained largely to the novice nurses interviewed. They explained that coming into a critical care environment was a challenge because of the time is takes to develop the necessary skills, and especially the confidence they need to provide excellent patient care. Working extra hours afforded through overtime provided the opportunity to increase and reinforce learning.

> *I think when you're beginning, because when you're starting off and you're a young part-time person, it takes you a long time to develop the skills, the knowledge, the confidence, all those things that you need to do. So the more shifts you work, the more you can really reinforce the learning that you're doing on each shift. The more you begin to feel like you're a part of the team you start to understand how patterns happen. (S1, P2)*

More experienced nurses noted the time it took them initially to notice patterns and feel like part of the team and how much they too wanted to be on the units at the beginning of their careers. Although certainly not all newer nurse participants enjoyed picking up overtime, one of them felt like it had

afforded him much more experience than those who chose not to, stating: "I get more experience….I definitely feel like I racked up a lot more experience in the seven years I've been working compared to anyone else who was just working regularly scheduled shifts basically" (S3, P25). Nurses old and young stated that there was just so much to learn and experience that overtime was invaluable early on in their careers in order to develop confidence and provide competent patient care.

Two of the more junior nurses mentioned their struggle to secure full-time employment and then explained that the overtime hours they worked became part of their total hours which gave them increased seniority among staff. "I try to get most of my hours here for seniority purposes too –that helps for trying to get full-time here. The more seniority you have, the better your chances [of securing full-time employment]" (S1, P8). These participants mentioned that they had moved ahead of some of their colleagues by intentionally working overtime and were closer to the top of the list for full-time positions when they became available because of it.

Nurses' Reasons for Not Working Overtime

Participants' reasons for not working overtime converged into three major themes. For nearly all of the nurses interviewed, it was an issue of fatigue as they stated: "You're there too often and you just get too tired." They thought it unsafe to continue providing care while exhausted and also often had things in their

personal life that required that attention. When it came to family and social commitments, most participants insisted that "[they] wouldn't change [their] plans for overtime." They were happy to work overtime if it fit nicely into their previously laid plans and obligations, but sometimes last minute requests were impossible for them to work. The final major theme that participants identified was that "it depend[ed] on the timing of the calls" in order to be adequately rested and ensure the well-being of dependent family members.

Tired and tired of being there: You're there too often and you just get too tired

While most participants highly valued the option to work overtime and often accepted shifts they were offered, one of the primary reasons that they would decline a shift was due to fatigue as a result of simply being there too much. A total of 14 nurses spoke to this first major theme. Participants described needing time off to "get their head out" of work and how important that was for enabling them to provide excellent patient care. One nurse strongly exclaimed that she needed a certain number of days off in order to "keep [her] sanity," and many others echoed similar sentiments. Nurses needed "spare time," time away from the unit, down time, a chance to leave work behind and recuperate from the stress.

> *[I need to] stay at home with the kids and get caught up with everything that goes on in the household. And revitalize oneself so you can come back to work and be effective and not be tired and grumpy. (S2, P21)*

Two nurses mentioned their judicious selection of overtime shifts in an attempt to maintain a love for their work that they had previously felt slipping away when they worked too much. Participants also chose not to work overtime shifts when they were fatigued in order to safeguard their own well-being along with patient safety. After assessing her mental and physical capacity for overtime work, one nurse stated: "I'm just like tired, or you know, have other things going on, but mostly it's just tired and you can't do it and you really shouldn't do the job if you're tired right" (S1, P1).

Nurses shared that it was often a case of switching from days to nights and vice versa that left them too tired and in need of a few days to transition. They would typically decline overtime if it was within the next 48 hours and not the same hours as their previous shift due to fatigue. Participants also considered their upcoming regularly scheduled shifts to ensure that they would not be too tired by not having enough time off.

Established plans: I wouldn't change my plans for overtime

The second theme related to why participants chose not to work overtime was a result of previously laid plans. The majority of participants indicated that their personal life took priority over work, and as a result said things like "I will not affect my family life for overtime" (S2, P17). These nurses would not consider cancelling plans to take on an overtime shift. Having any type of family

event planned, or an event they promised a child they would attend would be just cause for declining overtime, as one nurse stated:

> *I think if I have stuff going on with the kids, that comes first, right? So it'd be family commitments, if I had something that I already said to the kids 'yes we're going there' – or my husband and I had something … then no – it's not worth the money. (S1, P7)*

Participants noted that extended family and volunteer commitments as well as appointments would prevent them from taking an overtime shift. Some nurses, particularly those who were younger and unmarried, spoke of busy social calendars that influenced their willingness to sacrifice their free time for overtime. One nurse stated, "…obviously, if I have plans I wouldn't change my plans to come in for overtime" (S3, P20). This statement fit well with the general sentiment echoed by participants that they would not come in for overtime unless it "worked perfectly" for them. Some nurses spoke of planning their days off in advance and noting at the beginning of a stretch off where they might be willing to work an additional shift. If they were asked to work overtime, they were mentally prepared and willing to work – on most other days, they were much more apt to decline. A small number of nurses stated that they would willingly cancel plans to work overtime shifts, and those were out of financial need and family expectation related to hard work.

Not enough notice: It depends on the timing of the calls

The third and final prominent reason that nurses gave for not being willing to work an overtime shift was related to the timing of the request. Participants with children tended to have less flexibility in accepting an overtime shift on short notice. Ensuring care for their children was a priority and not always a possibility. Some nurses spoke of working more than one job and indicated that last minute calls for overtime were typically impossible to accept because they were already scheduled to work somewhere else, or else it was a much needed day of rest for them. As previously mentioned, the idea of mentally committing to be available for overtime in advance was a common notion as one nurse stated:

> *I almost never do. If I'm cold called, I almost never do because if I'm thinking about overtime I usually plan it out in my head and decide, you know I think that's a spot where I might not mind getting an extra shift (S3, P22)*

Many nurses were only willing to work overtime on their own terms – and preferred to "make themselves available" by writing their names in scheduling books for specific shifts so that they could appropriately plan the rest of their time around it. This way they kept the day or night free and ensured adequate sleep prior to coming in so that they could provide safe patient care. These issues were brought to light as one nurse shared:

> *It depends on the timing of the calls as well, sometimes they'll call you just a few hours before your shift, and I'm not in any mood to come in… I'm already about to do something else. Or, if it's coming in for a night shift and I haven't slept all day and I was planning on going to bed at*

> *night, I don't think I'd be able to stay awake all night to working overtime shift [through the] night. (S3, P26)*

This was especially true of night shifts in critical care where nurses explained that they had to be more alert than on other units. Without advance notice they were rarely rested enough to feel comfortable accepting a shift and the responsibility for safety that accompanied it.

CHAPTER FIVE
Qualitative Findings: Nurses' Perceptions of the Outcomes of Overtime

Overview

Seven themes were identified related to nurses' perceptions of the outcomes of working overtime (See Table 4): (a) Physical effects: You feel it in your body; (b) Impact on patient centered care: I'm not so personal with my patients; (3) Issues of respect: It just doesn't show that nursing is valued; (4) Balancing family and work: For work-life balance…it's difficult; (5) The issue of guilt: I'm ethically torn; (6) Financial gain: It's a good thing for my pocketbook; and (7) Safety is jeopardized: When you're tired, you're not as alert. These are presented along with the subthemes that comprise them below.

Table 4

Outcomes of Overtime: Themes and Subthemes

Major Theme	Subthemes
1. Physical Effects: You feel it in your body	(a) My body parts hurt (b) I'm exhausted. Pure exhaustion (c) You're just hungry and dehydrated (d) If you spread yourself thin...you're going to get sick
2. Impact on Patient Centered Care: I'm just not so personal with my patients	(a) You always feel like you have to get things done (b) I can feel my patience diminish
3. The issue of respect: It just doesn't show that nursing is valued	(a) There's a lack of respect for the workload (b) It helps the organization, but it doesn't help the individual (c) It affects the unit because it affects the morale
4. Balancing family and work: For work-life balance… it's difficult	(a) That's 12 hours of personal time that you miss (b) You can't take it out on patients, so you have to take it out at home
5. The issue of guilt: I'm ethically torn	No subthemes
6. Financial Gain: It's a good thing for my pocketbook	No subthemes
7. Safety is jeopardized: When you're tired, you're not as alert	(a) If I haven't had a good stretch off… I'm still tired (b) I'm not as good at doing things (c) When you're tired it's easy to make a mistake

Physical Effects: You feel it in your body

Participant's perceptions of the outcomes of overtime begin with a nearly unanimous understanding that working additional hours has physical

consequences for nurses. A total of 27 of the 28 nurses interviewed addressed at least one of the four subthemes below, with many claiming that they felt multiple physical consequences when they worked overtime hours. Participants stated that "[their] body parts hurt," and they were often able to pinpoint exactly which ones tended to feel it most. Exhaustion, "pure exhaustion" was another common perception that participants highlighted as it led to a host of other outcomes, along with being "hungry and dehydrated." Taken together, nurses interviewed recognized that "if you spread yourself thin… you're going to get sick."

My body parts hurt. Almost all participants explained that working overtime, especially in terms of missing breaks and staying beyond the expected duration of a shift, took a toll on their physical bodies. This outcome was manifested in myriad ways, with some commonalities based on age. Many older nurses commented that the pain they felt in their bodies was a function of their age. The younger participants often recognized that although they were young and "able-bodied" they would likely be less so as they aged:

> ***I'm young*** *so I know that when I look at my other staff that I'm working with, I'm sure that they're feeling it more than I am. Just the turns, your back hurts, your shoulders hurt and you know it does physically hurt you, and so I can imagine what they're feeling… (S1, P1)*

Older nurses recognized their need for adequate time off (days off and breaks during shifts), attributing this to their experience and knowing their own limits. They noted that they experienced more immediate physical consequences for not having adequate time off, citing symptoms such as pain in their backs, necks,

shoulders, wrists, feet, knees, and hips as well as headaches, swollen ankles and chronic pain. As one participant stated: "I have sore shoulders from lifting people. When I work overtime I do suffer from a bit of neck and shoulder pain. I can tell the difference there" (S2, P16). Participants explained that they were seeing more obese patients who weighed 200-400 pounds leading to serious bodily pain especially following 60-hour workweeks. They suggested that this was even more so in critical care environments where patients tend to be less mobile and require more physical care. Participants mentioned a number of work-related activities (e.g., pushing beds, rushing, and poor body mechanics) leading to pain that were exacerbated by the additional overtime hours. Many of the nurses stated that they could pick up overtime in the short term without doing their body any serious harm beyond some temporary "soreness." They noted that continuing to work many additional hours in the coming years or decades would result in their bodies "falling apart."

I'm exhausted. Pure exhaustion. The second type of physical effect related to working overtime was fatigue – mentioned by 24 of the 28 nurse participants. Males and females, full and part-time staff all suggested that coming in for additional shifts, missing breaks and staying late resulted in increased fatigue. They used a variety of terms to describe the feeling including: tired, drained, not rested, worn down and exhausted. Participants suggested that while missing breaks and staying late often resulted in fatigue during the shift in question, picking up full overtime shifts might result in fatigue during subsequent

regularly scheduled shifts as well. Typically, days where breaks were being missed were particularly busy to begin with, and one nurse described how it could conceivably wear an individual down over time:

> *If you're having a busy day where it's crisis after crisis after crisis and you're not getting your breaks you get to the point where you can't keep it straight in your head. You can only do so much, you're only human – it just gets to be too much. And to do that long-term, just wears you down. (S1, P5)*

Another nurse added that they already work 12-hour days, which alone can be daunting especially on busier shifts. When breaks are missed or nurses end up staying beyond the end of their shift, they can easily turn into 14-hour days with little or no rest – that would likely exhaust even the most energetic of nurses. On the other hand, where full shifts are being picked up, often times there is a disruption in the nurses' expected "down time" and many of them stated that when they return to begin a new block of work shifts they find themselves still tired and not well rested. "I'm exhausted. Pure exhaustion, like coming back another day I would cry…your body hurts, you're drained, you can't come in and do another shift" (S1, P5). Nurses suggested that one possible reason for this extreme sense of fatigue is because most overtime shifts are night shifts. As such, nurses must "flip" from days to nights and then back again over the course of 48 hours or less. This can make that additional shift even more of a drain on their leisure and rest time leaving nurses more fatigued and increasingly prone to sickness.

You're just hungry and dehydrated. The third subtheme of the physical impact of overtime was related to hunger and dehydration. These symptoms were mentioned repeatedly during discussions surrounding missed breaks (most often the second and third breaks of a shift) and staying beyond the end of a shift. Participants spoke of running around with food in every pocket – which some were able to demonstrate during the interview – pulling out granola bars and bananas as proof. Many nurses insisted that not having time to eat was a major concern for them because of some of the related physical symptoms that they (and others) would experience. They cited things like being snappy with others, increased fatigue, migraines, becoming shaky, and stomach problems that would arise if they went too long without food. Four nurses mentioned that they had to keep a close eye on their blood sugar levels, and many more referenced the need for frequent meals while they were pregnant in the past.

Many of the nurses interviewed seemed cautious about overstating their needs, having a more focused gaze on patient care. One participant stated that it was important to "take care of yourself a little bit so that [she] can go take care of her patient" (S3, P23). She recounted a time where she was sipping tea at her station outside a patient's room and the patient later stated: "you know I [was] watching you drink and I was so thirsty" (S3, P23). There seemed to be a sense of trepidation about really pushing for meeting their own basic needs including food, water and time to use the facilities out of deference to patients' needs:

> *Negative wise when we work and miss our breaks it can be stressful when you haven't eaten for certain amount of hours, you haven't gone to the*

washroom in eight hours, you haven't drank anything. So that can be a little bit testing. (S2, P16)

Some nurses suggested that although they may be hungry, thirsty and unable to use the washroom, when they spend a whole day resuscitating a patient or are involved in other life saving measures in an ICU setting, their adrenaline levels are high so they often do not realize it until things settle down much later. One nurse spoke to the silver lining of working overtime stating:

It's great for weight loss [laughs] – no I'm serious! When my husband was out of work, I'd work five days in a row and I would drop ten pounds…just cuz you're running, and often you don't get your breaks – You're not eating right, you're dehydrated if you've had a busy day…and you put five of them together…(S1, P5)

Many of the units from which nurses were interviewed have stopped reimbursing nurses for missing their evening breaks – which many nurses admitted leaves them often with nearly seven hours between their lunch break and their return home for dinner. Participants found themselves hungry and three of them voiced their desire for recognition of their humanity, stating things like "we're human too" and asking for nothing but courtesy to encourage their own well-being to enable them to more generously care for their patients.

If you spread yourself thin… you're going to get sick. The fourth subtheme of the physical impact of overtime was related to increased vulnerability to illness. More than half of the participants held the perception that working overtime leads to personal sickness. They recognized that while working in acute care settings, they are exposed to diseases and "superbugs" all the time, increasing

their susceptibility with increased working hours. Participants also cited stress on the unit as one of the culprits for increased sickness. They explained that when they are chronically short staffed (which is generally a clustered event for a few weeks at a time), the stress levels on the unit increase due to the patient load and decreased number of nurses, while overtime hours increase in an attempt to meet the demand. In these situations, the nurses who step in to work the necessary overtime find themselves working challenging hours and more likely to become sick:

> *I think that the more people take the overtime shifts, I think they're more inclined to call in sick. You see certain staff do that – and when we have less staff as well, when we're running short, people will start to call in sick more too – because they're just working extra hard, they're doing so much extra….(S1, P1)*

Much of this is attributable to the staffing practices of the unit that result in the availability of much more overtime. Not only are nurses picking up many additional shifts during these times, but also once on the unit, they often miss breaks to meet patient needs with fewer staff. In some cases however, nurses were quick to blame themselves and their colleagues for working too hard and not giving their bodies the rest they require.

> *It's a grind, it depends on the shifts you're working, but most of the time, it's a very grinding day in here, and you can almost see it when I take the sick calls in - you can see the patterns some of them… they just worked all these [shifts]… [and now] they're calling in sick. Because they're exhausted! (S1, P2)*

They admitted that they would sometimes push themselves too hard and get rundown, or become overtired and fall sick a day later. They cited a lack of sleep in addition to eating poorly and not drinking enough fluids as components of working overtime that made them more prone to illness. While many of them saw a relationship between overall unit nursing hours and nursing sick time, six of the nurses did not think that working overtime would increase their own sick time. These participants reasoned that nurses care for others, and cognizant of their limits, they know that they need to take care of themselves

Impact on patient centered care: I'm not so personal with my patients

The second major theme related to the outcomes of overtime describes the negative impact on patient centered care that nurses perceived. This theme was spoken of by 13 nurses who noticed that when they were tired from working overtime hours, or rushing around and working through breaks – they were no longer providing the personalized patient care they wished they could. For participants, this was a disappointing reality. This theme was comprised of two subthemes including participants "always feel[ing] like [they] have to get things done" and those who stated "I can feel my patience diminish."

You always feel like you have to get things done. Participants explained that one of the negative impacts of overtime on patient centered care was that the amount of emotional support and comprehensive care (especially related to hygiene) they were able to provide for their patients diminished. They described

that they were either more "task oriented" with their work, or that the amount of "TLC (tender loving care)" they could offer patients decreased. Where it related to missing breaks and staying late, nurses felt that the busyness of the day left them feeling flustered and often overwhelmed by a to-do list longer than their shift. In that situation they realized the need to prioritize their actions and would create a mental list and set to work checking things off. They would try to get through the most necessary orders as efficiently as possible, holding on to the hope that they might be able to get away for a few minutes for a quick meal and to put their legs up:

> *You get things done, you're very task oriented in that environment when you're stressed and there's not a lot of support. You don't have time to just sit and talk to your patients… get a feel for how they're doing…(S2, P16)*

Participants frequently alluded to the decreased personal connection they were able to sustain with their patients when they found themselves in overtime situations where the amount of rest they themselves were afforded was compromised.

> *I'm just more task oriented and not so personal with my patients. I [am] like "okay, let me just do this, this and that" and I don't have enough strength to give emotional support. I feel a lot of times to give emotional support or TLC or anything like that – I think you need to be rested, as a nurse and as a person. And if I'm overworked, or feel like I'm working more than usual then I'm just task oriented, I'm just like "do this, this, this, that, give meds, turn this" – I don't have time to – or I cannot physically or mentally get attached. I cannot give that extra mile nurses do. (S3, P23)*

The "extra mile" that this nurse referenced was referred to under different

names by many of the participants. Some called it the "TLC of nursing," others "fluffing and puffing," "extra care" and "beyond basic care." These terms were often used to denote hygiene care including bathing, mouth care, and changing bedding and clothes. In the words of one nurse: "We sometimes get away from what I called the TLC of nursing – so being able to sit and talk to patients, being able to provide maybe a little extra of hygiene care" (S2, P16). Other participants suggested that perhaps patients would not get turned as much, they might not be assisted as frequently with ambulation or have their dressings changed as often as they otherwise would.

Participants stated that while they would never miss giving a medication or something critical, in overtime situations it was easier to postpone or rationalize away some of the undocumented care they were accustomed to providing. Two nurses admitted to leaving patients who needed baths for the next shift because they were too tired from having worked overtime. A few participants specifically stated that when overtime is a factor, often times chronic patients get only the most basic of care out of deference to the more acute.

I can feel my patience diminish. Another facet of decreased patient-centered care as a result of working overtime was a reduction in patience with both clients and their families. Participants admitted getting to the point where they were no longer willing to deal with questions from patients, but more commonly, family members. They would either delay responding to them, delegate it to someone

else, be less kind in reply, or not respond at all by restricting their entry and access to loved ones:

> *Sometimes families want to come in and they're worried about their loved one, they want to come in and visit and [nurses will] just make sure every little hair is in place and not let them in and say you know, I'm tired of talking to that family member, they're asking me a million questions so I'm not letting them in. (S3, P22)*

Participants expressed frustration with the barrage of questions they were sometimes faced with stating things like "I'll be there when I can" and thinking to themselves "oh why are you asking me this question – I just want to go have a break." One nurse spoke of not wanting to interact with family members in her 50 or 55th hour of working and a number of others indicated that when they worked overtime they would sometimes become short tempered. This is the example one nurse offered:

> *I think you might be a bit more irritable and yeah, might not be as tolerant or maybe even as kind to your patients as you normally would be. Like quite often when you're well rested you can easily just say multiple times, over and over, don't put your legs out of the bed, don't pull your IV out, keep your wires on – and I think when you're tired and you've worked overtime your tolerance for that is less – you won't be quite as cheery about it. (S2, P14)*

Other participants spoke of not having the patience to help slower clients ambulate or even being able to give them time to take medications. Encouraging patients to find the drive and energy to engage in their own care was another issue raised as nurses became impatient and were anxious to step off the unit for a break. Participants stated that they had sometimes said things in a less

professional or less kind manner out of impatience, which left them disappointed because they were not providing the holistic, compassionate care that exemplifies the profession.

The issue of respect: It just doesn't show that nursing is valued

The third major theme that participants cited as an outcome of overtime was the sense of disrespect that it engendered when nurses felt like they were being used and the organization had no interest in their well being. A total of 12 nurses voiced this issue, most often as a result of a "lack of respect for the workload" that they perceived when staffing was not appropriately managed. By working overtime through their breaks to make up for scheduling oversights or failures, participants felt like they were being used as they recognized that "it helps the organization, but it doesn't help the individual." When those negative perceptions built up related to overtime, participants indicated that "it affects the unit because it affects the morale."

There's a lack of respect for the workload. Participants as a group perceived the need for large amounts of overtime as a lack of respect for the nursing profession from both direct and upper management. The underlying sentiment in their responses indicated that units were chronically understaffed and management did not seem to care, as they knew of it, and expected that their staff could manage without support. Many nurses mentioned budget constraints that had resulted in cuts to staffing, stating that they felt like safety was becoming an

issue and their licenses could be in jeopardy. One nurse questioned: "When we're short staffed – well why isn't the unit properly staffed?" (S3, P26). Participants were confused more than anything about why staffing was so poorly done, and many of them internalized this as a lack of respect for what they had to work with.

> *People are quite tired and fatigued, irritable and sometimes when we miss breaks routinely it's perceived as a lack of support. From even upper management. If we are missing breaks and it's due to patient load, we often ask for a personal support worker to float for that kind of thing. When it gets denied ... because of budget –, then that can sometimes leave a sour taste in peoples' mouths. And so it makes for a different environment to work in. (S2, P16)*

Participants not only voiced concerns about management's "deaf ear" to their workload, but went on to give examples of how they were challenged on their own efficiency at work when they brought concerns forward.

> *We were challenged on how long it takes us to give report at the end of the day, you've given report on a lot of patients, it's a lot of information that's passing through – what's the content of your report? So suddenly after twenty years, the content of my report is a concern? It's never been a concern before. Right, so those are the things that become disrespectful, it's very disrespectful. So I personally resent that I have to justify that I'm doing my job and that I'm doing my job correctly. (S1, P2)*

Participants who worked the charge nurse role shared that they were asked to justify their need for additional overtime staff more than ever before. They stated how they wished their unit's needs would simply be respected and honored. Nurses from 10 of the 11 units talked about the importance of breaks for their health and their patient's well-being, but felt like their needs were not reinforced or respected.

> *I think that affects everyone because everyone is overworked, we're tired, burnt out, and it just doesn't show that nursing is valued. You think that you can just walk all over us and we're going to work as if we're machines? You know we all need breaks...and I think it just doesn't value nursing as a profession where [we] can contribute something more than just work as machines, like robots. So it changes morale because if people are overworked and overtired and in a bad mood, then the whole morale of the unit goes down. (S3, P24)*

The impact of lack of respect for the workload that critical care nurses have to carry reaches from offense to the individual, to unit morale, and culminates in bitterness directed toward the organization for budgetary constraints that limit available solutions.

It helps the organization, but it doesn't help the individual. The lack of respect that participants felt as a result of the high demand for overtime work was largely an issue of free labor – particularly with regards to missing breaks and staying beyond the end of a shift. Many participants felt that they worked around the clock, missed breaks, stayed late almost every shift, and were never compensated in any way for it.

> *So what does the hospital get out of that? They get free overtime because I didn't put in for my missed break, but the patient got that care. So the hospital benefits hugely, but it is just not recognized. (S3, P23)*

They offered various explanations for their passivity towards compensation stating that it was a hassle to get it paid out, many simply forgot that they could, some nurses did not feel entitled to the pay, and their claims were subject to approval. In order to secure approval nurses were expected to justify their claims,

and often times at the end of a day where they had missed breaks or stayed long past the end of a shift, the last thing participants wanted was to sit down and type up their situation. The fact that overtime approval had been made more challenging for them of late was perceived by many as disrespectful of them and the workloads they carry:

> *They happened to map out exactly what the data collection had proved - that the highest amount of patient activity happened after 3 o'clock in the afternoon and before 9 o'clock at night. People were always putting in for missed suppers because they didn't get any supper break, but that's when the highest amount of activity is. So the hospital said 'well, we're not paying the suppers now, we'll pay if you miss your breakfast. (S1, P2)*

As a result of this, participants described feeling slighted. There were only two nurses who would occasionally claim overtime pay for breaks they had missed or for routinely getting off the unit late. Administration knew there was an issue and instead of helping to resolve it by increasing staffing (even just around those hours) – they took away the option of compensation for nurses who were working overtime.

> *I think it just makes people grumpy and resentful. It's taking away from their personal time so I think that it doesn't make for happy people. I mean it helps the organization but it doesn't help the individual. It benefits the organization by you're staying late and you're giving them extra hours and you're typically not paid for those extra hours and so you're helping them out – but it's not benefitting you in any way. (S3, P20)*

This sentiment was echoed by many participants who said that it not only stirred up hurt feelings in themselves, but also affected the overall attitude and environment on the unit as a whole.

It affects the unit because it affects the morale. Overtime also seemed to affect the morale of the unit in a largely negative way which participants suggested in turn affected employee satisfaction with the organization as a whole. Negative morale was related to issues of respect and not feeling valued. Nurses stated that when they were overworked (most often in the case of missed breaks) they were unhappy because they felt like doormats that the corporation was walking all over and taking advantage of.

> *I think the morale goes down definitely. People are just not happy, and not only because you're tired and overworked –because you feel like you're not valued. You know, you think they can walk all over you and tell you "do this" you just do it you know.(S3, P25)*

Being overworked also rendered individuals more tired, grumpy and snappy with one another, which affected the team atmosphere and, as nurses explained, also reduced overall morale with the group. Most of the nurses interviewed perceived increased unit cohesion when breaks were gently enforced, but when they were not, overall morale was negatively impacted.

> *I think people become a little bit angry and they get upset with the fact that we keep missing breaks and you tell people and you tell them about the workload and it just seems to fall on deaf ears, so I think it makes the morale go down. (S3, P21)*

When nurses noted influxes in overtime shifts and missed breaks they perceived a lack of support from management in dealing with the situation appropriately.

Balancing family and work: For work-life balance… it's difficult

The fourth major theme that participants perceived as an outcome of

overtime related to their difficulty in achieving a fulfilling work-life balance. The 17 nurses who spoke of this issue recognized the importance of time with their loved ones, and had to be increasingly efficient to complete all of the tasks related to their home/personal lives in less time off. They realized that additional time at the bedside resulted in "another 12 hours of personal time that you miss." Simultaneously, more work in both the professional and personal spheres of their lives resulted in higher stress levels. With a strong sense of professional responsibility, participants realized that "you can't take it out on patients, so you have to take it out at home." Their families were bearing the brunt of their frustration as a result.

That's another 12-hours of personal time that you miss. Participants, especially those with children were very cognizant that when they chose to pick up an overtime shift, it represented an additional 12 hours that they would miss out on being with their families or being able to do other things in their personal lives. It was time that took away from the days they would otherwise be resting and running the errands it took to maintain a home. While many nurses refused to, some spoke of cancelling previously booked engagements in order to pick up an overtime shift. For others it meant squeezing more into less time off and often missing the office hours for doctor's appointments and car maintenance. As one nurse stated:

> *For work-life balance it's difficult to just plan things that you need to get done – so when you come in for overtime that's another full 12-hour day that you can't–you miss all the office hours. So if you have scheduled*

> *appointments or if you have children you're taking them around and you just miss the office hours of the regular world because you get out at seven at night. And that affects me because then I'm unable to make appointments or things that I would've liked to have done during the day shift. (S2, P18)*

For some nurses overtime entailed doing everything with less sleep or less time. Participants described the coordination it took to organize their home life around a more impromptu schedule. Some explained feeling more flustered because they did not feel "caught up" at home before coming back for another shift. One nurse said: "I have to organize my time so that I get the things that I would normally get done in five days in less time" (S3, P20). Sometimes those things involved more chore-like tasks, other times it was visiting extended family or larger gatherings and occasionally nurses alluded to missing a well-needed quiet evening at home with their spouse. A major sentiment was the issue of missing precious time with children who were so often in school, sleeping or growing up too fast. Many nurses echoed some variety of: "it's one less day I get to spend with my kids" (S3, P24), highlighting that weekend shifts were the biggest culprits. Finally on days where they accepted an overtime shift, their young children still required care which they missed out on and sometimes had trouble securing, "With two children, I need to make sure that they're provided for, someone to take care of them" (S1, P4). A few nurses indicated that this was a difficult decision to make – to stay home and spend time with their little ones, or relinquish their care to others.

You can't take it out on patients so you have to take it out at home.

Another outcome related to work-life balance that participants described, was having less patience and energy for their families at the end of the day or in the reduced time they did have at home. They found that at work they were often giving so much of themselves emotionally in order to deal with the stress of high acuity and anxious families, that they came home drained and in need of solitude and relaxation. Many nurses described the need to "turn off" when they got home, to get away from the incessant beeping of alarms and chattering of colleagues:

> *I feel like it probably makes me tired more – when I go home I just want to turn off, I don't want to talk to anybody. I just want to lay down and watch TV and don't communicate. So I think in that sense a lot of times my family wants to talk or interact and I'm like "No I don't like to." I can't – I cannot give anymore. I have to do nothing. (S3, P23).*

Some nurses admitted to losing their patience with their families, being more irritable and less positive. One nurse shared an example of a time she came home after a particularly intense overtime shift and yelled at her children for having the television on so loudly in their small home. She needed a break from the constant stimulation in the working environment and her family had to be accommodating of that. Another nurse explained that it was unfair and unprofessional to bring negativity and irritability into a working environment with vulnerable patients. As a result, nurses have to get out their frustrations somewhere –and that somewhere, often, is at home with the people they love the most. Other nurses verbalized "using up" a lot of their patience at work, and finding that once home, their

tolerance for the issues that other members of their families were struggling with was much lower. One nurse in this study shared: "In my personal life I'm probably grouchier. My husband definitely notices it when I work more overtime…he's not as happy because I'm not as happy" (S1, P11).

The other component of this lack of patience was a decrease in energy for their children after having worked overtime. Participants shared that the learning curve of balancing their work and home lives was challenging enough without adding in the spontaneity that generally accompanies overtime work. They had to recognize that after working those additional hours they were sometimes coming home to young children who were equally as needy at those they had left in the hospital. One nurse described making excuses to not take her kids swimming:

> *After working overtime, increased fatigue for sure, shorter patience and I'm very aware and attuned to how I am at home in relationship to my children and my husband and just the general stress that you're under on a day to day basis to begin with. Compounded by, you know an extra night shift …so I feel guilty if I lose my patience that much more quickly, or I don't have as much energy to take the kids out and go swimming, you know what I mean? Making excuses … things like that. (S1, P3)*

It was not simply a matter of being away from their families, but also of not being fully present with them after overtime shifts despite being there physically. For many nurses this situation resulted in feelings of guilt, which are described below.

The issue of guilt: I'm ethically torn

As nurses spoke, a more subtle fifth theme began to emerge and was validated repeatedly. A total of 11 participants expressed a sense of guilt around working or not working overtime, and it was related to both the personal and professional spheres of their lives. Their sense of compassion and responsibility were the characteristics that underpinned this sentiment and created some conflict within them about their decision. Upon being asked to pick up an overtime shift, participants spoke of how they first considered their family. Some participants described feeling guilty because they would not get to visit older parents that day and others mentioned missing out on time with their partners (married, engaged and even those in dating relationships). By far the most common root of their guilt was children and having to leave them under someone else's care, missing precious time with them or missing special events in their lives as one nurse stated: "But it's summertime – so my two small children are home and there's guilt associated with working overtime absolutely" (S1, P4). This nurse highlights what many others spoke of - that particular times of the year are associated with greater guilt including summertime and holidays.

The second major consideration that generated guilt in participants was the possibility that if they declined overtime shifts they would be letting down their colleagues. Many of them spoke about how their units were frequently short-staffed and they were well acquainted with the additional stress that incurred. As

a result, they did not want their colleagues and often times, friends, to work through that reality when they could do something to help.

> *You also feel a little bit of guilt if you say no – because you know that you're leaving your coworkers in a tough situation when you're short staffed so sometimes that's a bit of pressure for me to say yes because I know what it's like to work short. (S2, P17)*

This was especially true for two distinctive groups of participants. Firstly, those who had worked in the charge nurse role knew how difficult it could be to get staff to come in for overtime shifts. When they were asked to come in for additional hours they would immediately flash back to those frustrations and have a very difficult time declining a shift because of a sense of guilt. The second group, those who were single and had fewer obligations, recognized that many of their colleagues had families who were dependent upon them and their time. Nurses in this group felt that if they could take a shift, they should, and they felt guilty for wishing to decline:

> *I feel bad, like if I don't come then I feel like I'm abandoning my unit or leaving them hanging … I just want to help! And if I'm free, I'm single, I don't have any attachments, I don't have a dog or anything like that – so I feel like I can do that – it's just that obligation I feel towards my unit kind of thing. (S3, P23)*

For many participants, this sense of obligation included both colleagues and patients. When nurses considered declining an overtime shift that they had been offered one of their primary concerns was patient care being compromised:

> *…[if I don't come in] they'd be short staffed and everybody would be tired and somebody might miss a break, or whatever would happen – or*

there's doubles [nurses having two patients instead of one] – then patient care might be compromised that way (S1, P8)

Participants mentioned that when staffing is inadequate there is potential for a negative impact on patient care and this made them feel both nervous and guilty. With regards to working overtime within a shift - particularly by working through breaks – nurses felt a more immediate sense of guilt. They shared stories of full day resuscitations, patients lying in pools of blood or excrement and other situations wherein their patients depended on them and they in turn felt the absolute need to come through for them. One nurse explained: "I'm ethically torn between my need to fuel myself or my need to look after that person who is vulnerable and under my care" (S1, P2)

Participants would ask themselves questions about how they would feel in a similar situation and generally tried their best to provide good care to their patients. The issue of guilt surfaced again when they simultaneously recognized their need to nourish and care for themselves in order to be fully available to their patients. Participants felt guilty if they made their own well being a priority and resolved to take a much needed break instead of first completing another patient care task.

A final factor discussed by eight nurses was the guilt associated with the cost of overtime. Many nurses mentioned the financial burden of overtime for their units or organizations. While some nurses said this financial impact did not bother them at all, a small number felt some guilt for the money they were being paid when someone could have worked the shift at straight time at a lower rate of

pay. Participants felt that they were already earning good, fair wages, and if the unit could just be properly staffed, they would not have to pay them so much money in overtime.

There was also a small group of participants who stated things like "What do I dislike about it…well, it makes me sick that the taxpayers are paying for that" (S1, P5). These nurses looked at the wider landscape and realized that the healthcare dollars paying for nursing overtime may not be sustainable and felt that it was unfair for Canadian taxpayers to be funding something so wasteful. One nurse stated:

> *I guess whenever I do pick up overtime I feel…I don't want to say guilty – but maybe guilty … that people's tax dollars and stuff…So when I think about my own overtime and then I know how much other people work overtime and then thinking about how much cumulatively the profession works overtime – and how much Ontario gets billed for that, I think about that and it worries me. (S1, P7)*

Be that as it may, the guilt over financial worries was not enough to keep any nurses from actually picking up those overtime shifts. One of the primary outcomes of overtime work for participants was the financial gain.

Financial gain: It's a good thing for my pocketbook

The sixth major theme that participants highlighted as an outcome of overtime work was the increased earnings it generated. Nearly unanimously, 27 out of 28 nurses spoke to the fact that working overtime afforded them financial gain and for many, that was the most obvious outcome of working it. When asked what they liked about working overtime, many of the participants laughed and

said a single word - "money." One nurse went on to clarify: "Money…and the fact that you get paid one and a half times the money for just as much of the work. So that's pretty much the main thing" (S1, P9).

Nurses recognized the flexibility that this afforded them and how it was a unique opportunity that others do not enjoy in their professional areas.

> *I have friends that don't have the opportunity to do overtime and I think that we're very lucky to have the opportunity to do overtime and to make extra money. A couple of my friends are teachers and they don't have the opportunity to do overtime and they often have to do summer school and work through the summer …we're very lucky to be in the profession that we're in where there's such a demand…(S2, P19)*

Nurses were grateful that the option was there if their family fell on tough times, or they simply wanted some extra cash for a renovation project or an exciting vacation. Some of the nurses who had previously worked overtime and then reduced or eliminated it altogether did so because taxation was reducing their overtime pay to so little that they no longer thought it worth the trouble. Others (only at one organization) were allowed to bank overtime hours to use as future vacation days. Those given that opportunity all seemed to think it was a better investment than having it paid out only to evaporate in taxes.

The financial benefit of working overtime was made even sweeter in the "consecutive weekend" clause, which many nurses were willing to cancel anything in their personal lives to take. Full and part-time nurses explained that if they were offered an overtime shift on a weekend off, they would be paid double time and a half for that shift, and their subsequent regularly scheduled weekend

shifts would also be paid out at the regular overtime rate. One nurse stated:

> *Usually the schedule that I try to work if I can [is to] work any part of a shift of a weekend that is not part of my regularly scheduled weekend then I get overtime for it and my consecutive weekend would be overtime. (S1, P10)*

Even in the organization that did not offer double time and a half, nurses were still anxious to pick up overtime shifts on their weekends off in order to secure overtime pay for the following Friday to Sunday. While financial gain was a prominent outcome of overtime work for nurses, it had to be tempered with good sense in order not to affect patient and nurse safety. Perceptions related to both are explored below.

Safety is jeopardized: When you're tired, you're not as alert

The seventh major theme that emerged as an outcome of overtime work revolved around nurse as well as patient safety and potentially deteriorating nursing efficacy. Participants spoke of the cumulative lack of sleep in addition to increased busyness that overtime produced, which left them fatigued even following time off. The effects of this fatigue are highlighted by three subthemes beginning with the simple notion that if "I haven't had a good stretch off…I'm still tired" (S2, P17). In the wake of that fatigue, participants found that they were "not as good at doing things" (S3, P25) because "when you're tired it's easy to make a mistake" (S2, P14). A total of 24 nurses perceived this potentially unsafe effect on patient care as a result of working additional hours.

If I haven't had a good stretch off…I'm still tired. A final outcome of working overtime that participants identified was an increase in fatigue and resultant decrease in alertness. They spoke of how that might impair their judgment and reaction time, compromising the safety of patients and nurses alike. The issue of nurse safety was raised repeatedly by participants who described rushing around and missing breaks on days when they were working overtime. During those shifts nurses found themselves hurrying to complete patient care activities and in their haste would sometimes fail to use proper technique, resulting in harm to themselves.

> *We're often running into a room and helping moving someone up in the bed, so proper form would dictate – their head down put them in Trendelenburg – feet up head down – with the bed up so that it meets everyone's height requirements, stabilize your feet. So it's quite the process of how to do it properly, and to be honest I think it's rarely done that way because it takes too long…So I think a lot of nurses here suffer from shoulder and wrist injuries that are attributed to boosting and lifting patients. (S2, P16)*

Other participants mentioned that when nurses became tired they were "less likely to comply with infection prevention and contact precautions" (S2, P19). This could have negative implications for the nurse herself and also other patients on the unit. Similarly on days where participants picked up overtime in the middle of a stretch of days off they would come back less rested and recovered as one nurse stated:

> *I know when we have that random day in the middle and I pick that up, I'm dying because I haven't had a good stretch off, I start my next set and*

> *I'm still tired, I haven't recovered yet. And that's why I think people have more injuries too – because you're not recovered, and nursing's a physically demanding job right? (S2, P17)*

When those physical demands are coupled with fatigue due to a lack of days off or missed breaks, nurses are not only more likely to get hurt on the job – but their safety continues to be in jeopardy as they travel to and from work. Four participants referenced the increased risk associated with driving home when they were working overtime hours. One nurse gave this more extreme example:

> *I worked one night where I didn't get any break at all and I fell asleep driving home. I was five minutes from home and I fell asleep driving up the escarpment – like where it's like – the mountain this way and guardrail that way. I drove into the guardrail … yeah… and like I don't know, I must have had somebody watching over me because I hit the guardrail, bounced off of it and it woke me up – and went right back… I just kept driving. I didn't even stop. (S1, P8)*

This nurse went on to explain that she also had other close calls when driving home from overtime shifts where she was unable to get in a single break. Other participants shared that many nurses travel quite a distance to get to work and when they miss breaks and also end up staying at the end of the shift they still have that 30-40 minute drive ahead of them. Nurses who shared this spoke on behalf of colleagues stating: "…a lot of people have said that they kind of drift off while driving and that's dangerous, or just feel too tired to even drive home and have to stay somewhere, like locally. So that's kind of an issue like driving" (S2, P16). Still other participants questioned nurses' attentiveness while driving to work following less than a 12-hour break

between shifts after staying late. Even more than injury to themselves, nurses' concern was far greater for safety of the patients under their care.

I'm not as good at doing things. Participants also voiced concern about the impact of overtime on their skills, reaction time and level of attentiveness that they posited could detract from patient safety. They spoke of days when they came in to work overtime and saw a noticeable difference in skills such as patient assessments, intravenous insertions, mental calculations and even handwriting. Nurses spoke of how fatigue from working overtime decreased their alertness and one nurse described how missing breaks (and consequently, meals) left her physically shaky:

> *Well I think that I'm not as good at doing things. Because when my blood sugar is low I get a bit shaky…and like I wouldn't want to start an IV if I felt like that… I mean giving a medication is probably okay because it's pretty straightforward – but starting an IV when I'm shaky… I do physically shake like that …if I haven't eaten. (S3, P20)*

Nurses also mentioned a sort of mental fog that might impair their judgment and the feeling of being flustered and less proactive. One nurse mentioned feeling like she had a million things going on and although she stated that she was unsure if she would actually miss things, she felt like she would not be "on [her] game." Another nurse spoke to a decrease in response time that was a result of the fatigue which so often accompanies overtime: "I noticed my alarm was beeping – my ventilator – and it took me a little bit to tune in to realize "ok,

that's my alarm." Because sometimes I just feel like you're not as quick…[when you're working overtime]" (S3, P23).

At the same time, some nurses felt the drain on their mental acuity, were cognizant of it, and used it to drive their performance. These participants were more cautious than normal, double and triple checking orders and insisting that others verify their actions as well. They described going over care plans with other staff, checking orders on paper and electronically and repeating procedures to help focus their minds:

> *I remember one time I was really tired and I was working …it was one of those sixteen hour shifts and I was consciously telling myself "okay, I'm giving this med through the NG [naso gastric] tube" just to remember not to make a mistake – because I realized I'm tired and my mind is just not focusing…. "okay, , this is what I'm doing, this is the NG tube, I'm giving a med" – you know I don't want to push it through something else – so I remember that happened once or twice maybe where I was really paying attention so cautiously. (S3, P22)*

There was also a group of participants who consistently felt that overtime within a shift (missing breaks and staying late) was their choice and they chose it in order to be even more thorough with their patients. They were largely younger nurses and they felt that they were better able to keep organized and care for their patients the way they wanted to if they skipped or shortened their breaks.

When you're tired it's easy to make a mistake. The notion of overtime work compromising patient care in the way of errors and near misses was substantiated by more than two thirds of the participants. Nurses were quick to propose that working overtime could result in errors on their part – and while they

would often suggest that it happened with their colleagues, only two of them were able to cite incidences where they made, or narrowly missed making an error themselves. Some nurses suggested that fatigue due to overtime would decrease their patience, proactivity, and reactivity, which could lead to different types of errors and adverse outcomes for patients as well. One nurse spoke of having to 'poke' patients numerous times unnecessarily for blood when she was tired because she lacked the patience to really seek out a strong site for withdrawing blood. Another nurse stated:

> *At the end of the day, maybe you're just not taking things as seriously as they need to be taken – I've seen a drop in blood pressure and thought "oh God, if I have to call the doctor, I'll have to get the IV and all that - maybe it'll just get better if I just watch it for a little while" – so you tend to maybe not be as proactive as you would be otherwise. Nursing to me has got to be very proactive – I'd rather catch it before you get really sick, instead of watch you get really sick and then …[having to deal with the consequences] (S1, P12)*

Many nurses used the word "easy" to describe the likelihood of making mistakes when they were tired, and the most common errors that participants posited as a result of overtime work were overwhelmingly related to medications (dose, route, medication itself or timing). Participants stated repeatedly that when nurses are fatigued from overtime hours they might be less likely to catch a mistake and give a patient the wrong dosage, or get distracted and forget to administer something altogether. A more generic statement from one of the nurses sums up the issue:

> *You're tired and hungry [laughs], right? And I think it's been shown that when you are tired and hungry you are more prone to mistakes and your… whole thought process isn't as clear as when you're well rested and fed. (S2, P14)*

By contrast there were a small number of nurses who felt that working overtime had no effect on the care they provided and in some cases even felt that overtime work had positive benefits for patient care as a result of the increased continuity.

CHAPTER SIX

Quantitative Findings

Introduction to Quantitative Data Set

Data were collected retrospectively over a 24-month period from 11 separate critical care units within three tertiary care organizations. Microsoft Excel tables displayed human resources and infection rate data from September of 2011 to August of 2013. Files provided were returned in nearly identical format from each of the three organizations with minor tabulations (i.e.: rate calculations) performed in order to achieve standardization. Where data were missing within a unit, cases were not deleted in order to preserve the sample size and allow for the data that was provided to be included in the analysis. The original models began with three independent variables: number of patients, illness severity (MOD) score, and worked hours (excluding overtime). The final models ultimately contained only one predictor in addition to overtime – nursing worked hours, which had significant effects on outcome variables. Overtime values were extracted from payroll records, and consequently captured hours paid at an overtime rate with no information regarding unpaid overtime hours.

As a result of restructuring, one of the units was unable to provide data for three of the infection rates requested: C. Difficile, MRSA and VRE. This unit was located within an organization which had not collected MRSA or VRE data at all during the time period studied, therefore, this information was missing from the other two units in that organization as well. One other organization had not begun

collecting infection data for C. Difficile, MRS and VRE until the beginning of January 2012, and so they were unable to supply data regarding those variables for the first four months analyzed.

Sample Characteristics

In order to safeguard the anonymity of organizations involved in this study, demographic information was aggregated across units. Sample characteristics are displayed in Table 5, and all three of the organizations included are unionized environments. Worked hours and number of patients served as proxies for determining unit sizes in statistical modeling. The average number of nursing hours worked on the 11 units included was 9720 per month with a minimum of 4147.6 and a maximum of 23736.8 hours. At the same time, these units had an average of 91.3 patients per month, with 23 on the lowest end and 163 patients in a single month as the largest number. Over the 24 months some units had zero patient deaths, while one unit had 29 in a month and the average mortality count showed 8.3 deaths per month.

The average amount of nursing overtime being worked across units was 345.1 hours per month with a minimum of only 3.8 hours and a maximum of 2042.3 hours. The average amount of nursing sick time claimed per month was considerably larger at 601 hours per unit, ranging between 2.7 hours and 1951.2 hours maximum. The relationship between nursing overtime and nursing sick time follows below.

Table 5

Unit Demographics

	N*	Mean	Std.Dev	Min	Max	Median
Worked Hours (Excl. OT)	264	9720.0	4305.7	4147.6	23763.8	8691.6
Nursing Sick Hours	264	601.0	411.6	2.7	1951.2	513.5
Nursing Overtime	263	345.1	364.2	3.8	2042.3	226.0
Deaths	264	8.3	6.2	0.0	29.0	7.0
Number of Patients	260	91.3	31.5	23.0	163.0	90.0

*N = the total number of months (from all 11 units) included in in calculation
Calculated values include data from 11 units and 24 months each.

Table 6

Number of Patients

	Average Number of Patients					
	Sept-Dec '11	**Jan-Apr '12**	**May-Aug '12**	**Sept-Dec '12**	**Jan-Apr '13**	**May-Aug '13**
Unit 1	33.3	36.0	32.8	37.5	32.5	33.5
Unit 2	51.0	57.3	57.0	62.8	60.5	61.5
Unit 3	144.0	143.0	140.5	142.5	149.5	149.8
Unit 4	107.7	107.0	108.5	109.3	108.8	108.5
Unit 5	56.5	71.3	72.8	69.8	78.0	74.5
Unit 6	86.3	97.5	101.5	102.8	95.5	95.8
Unit 7	97.0	98.3	100.5	107.0	105.3	102.5
Unit 8	80.5	81.8	82.0	81.8	85.8	78.8
Unit 9	140.3	132.3	128.3	144.5	133.0	134.3
Unit 10	80.3	83.0	74.3	74.0	72.3	84.8
Unit 11	94.5	91.3	93.0	98.0	88.5	98.8

Average number of patients for each month within four-month periods noted

Table 7

Patient MOD Scores

	Mean	Min	Max
Unit 1	3.30	0	17
Unit 2	4.29	0	17
Unit 3	5.48	0	17
Unit 4	4.45	0	19
Unit 5	5.41	0	17
Unit 6	0.40	0	10
Unit 7	1.89	0	11
Unit 8	1.89	0	16
Unit 9	5.71	0	17
Unit 10	6.22	0	19
Unit 11	2.02	0	19

Average, minimum and maximum MOD score per unit over 24 months

Nursing sick time

Findings from this study reveal that for every 10 hours of overtime that nurses worked, sick time increased by 3.3 hours ($p<0.0001$) with a 95% confidence interval of 2.0 to 4.6. This was determined by conducting a multilevel regression analysis where clinical units nested within organizations were accounted for as random effects. Table 8 below displays the coefficient of the relationship between nursing overtime nursing sick hours as 3.296 with a standard error of 0.659. Because overtime hours were divided by 10 (in order to increase utility of the findings), the coefficient value indicates that every increase of 10 hours of nursing overtime increased nurse sick time by 3.3 hours. The standard error value of 0.659 indicates that the sample employed in this study may deviate from the population by nearly 0.7 hours of sick time.

The same model also reveals that for every 10 additional nursing hours worked (excluding overtime), nursing sick hours increase by 0.3 ($p<0.0001$) with a 95% confidence interval of 0.134 to 0.455. Therefore, there was a significant relationship between nursing sick hours and both nursing worked hours (excluding overtime) and nursing overtime hours. The relationship between nursing worked hours and sick time is depicted by the coefficient 0.295 (an increase of 0.3 hours of sick time for every 10 hours worked) with a standard error of 0.082 (this sample may differ from the population by 0.08 hours of sick time). Random effects parameters also revealed that there were significant differences attributable to units and organizations within this model.

Table 8

Multilevel Regression Model – Nursig Sick Hours

Nursing Sick Hours	Coefficient	Standard Error	P >|z|	95% Confidence Interval	
Overtime*	3.296	0.659	<0.001	2.004	4.589
Worked Hrs.*	0.295	0.082	<0.001	0.134	0.455
Constant	192.794	102.960	0.061	-9.005	394.593

*Overtime and worked hrs. were divided by 10 to increase utility of the findings

Patient mortality

Overtime was not found to have a statistically significant relationship with the number of deaths in the critical care units studied**.** The incident rate ratio seen in Table 9 below was nearly equal to one with an associated p-value of 0.536. This relationship was explored using Poisson regression analysis because the outcome is a count variable.

Table 9

Multilevel Regresson Model – Patient Mortality

Deaths	IRR	Standard Error	P > |z|	95% Confidence Interval	
Overtime*	0.999	0.001	0.536	0.998	1.001
Worked Hrs.*	0.999	0.000	0.566	0.999	1.000
Constant	0.078	0.028	<0.001	0.038	0.158

*Overtime and worked hours were divided by 10 to increase utility of the findings

Infection Rates

The association between overtime and five different infection incidents was also explored using Poisson regression analyses. The infections analyzed included: Clostridium Difficile (C. Diff, Table 10), Methicillin-resistant Staphylococcus Aureus (MRSA, Table 11), central line infection (CLI, Table 12), vancomycin-resistant Enterococci (VRE, Table 13), and ventilator associated pneumonia (VAP, Table 14). Tables of infection counts are presented below:

Table 10

Number of Clostridium Difficile Infections

	Sept-Dec '11	Jan-Apr '12	May-Aug '12	Sept-Dec '12	Jan-Apr '13	May-Aug '13
Unit 1	missing	0	0	0	1	0
Unit 2	missing	2	2	0	1	2
Unit 3	missing	1	1	1	0	0
Unit 4	missing	0	5	3	4	2
Unit 5	1	2	3	0	2	2
Unit 6	missing	missing	missing	missing	missing	missing
Unit 7	3	2	1	2	1	4
Unit 8	8	8	4	8	3	4
Unit 9	2	3	2	4	4	4
Unit 10	7	6	5	4	5	1
Unit 11	2	1	1	0	1	1

Summed total of infection incidents per four-month period noted

Table 11

Number of Methicillin-Resistant Staphylococcus Aureus Nosocomial Infections

	Sept-Dec '11	Jan-Apr '12	May-Aug '12	Sept-Dec '12	Jan-Apr '13	May-Aug '13
Unit 1	missing	0	0	0	0	1
Unit 2	missing	0	0	1	0	1
Unit 3	missing	1	2	0	1	0
Unit 4	missing	2	5	1	1	1
Unit 5	missing	missing	missing	missing	missing	missing
Unit 6	missing	missing	missing	missing	missing	missing
Unit 7	missing	missing	missing	missing	missing	missing
Unit 8	0	1	4	3	0	1
Unit 9	1	1	0	0	0	0
Unit 10	0	1	0	1	0	1
Unit 11	0	0	0	0	0	0

Summed total of infection incidents per four-month period noted

Table 12

Number of Central Line Infections

	Sept-Dec '11	Jan-Apr '12	May-Aug '12	Sept-Dec '12	Jan-Apr '13	May-Aug '13
Unit 1	0	0	0	0	0	0
Unit 2	1	3	1	1	0	3
Unit 3	1	0	0	0	2	0
Unit 4	6	2	3	7	7	4
Unit 5	0	4	0	3	1	1
Unit 6	0	0	1	1	0	0
Unit 7	0	0	0	0	0	0
Unit 8	2	1	2	3	3	6
Unit 9	1	0	0	1	1	0
Unit 10	1	1	1	3	4	5
Unit 11	0	0	0	1	1	0

Summed total of infection incidents per four-month period

Table 13

Number of Vancomycin-resistant Enterococci Infections

	Sept-Dec '11	Jan-Apr '12	May-Aug '12	Sept-Dec '12	Jan-Apr '13	May-Aug '13
Unit 1	missing	4	3	0	0	0
Unit 2	missing	9	2	7	2	1
Unit 3	missing	5	0	4	2	1
Unit 4	missing	3	4	5	4	8
Unit 5	missing	missing	missing	missing	missing	missing
Unit 6	missing	missing	missing	missing	missing	missing
Unit 7	missing	missing	missing	missing	missing	missing
Unit 8	4	2	0	0	0	0
Unit 9	0	0	0	0	0	0
Unit 10	0	0	1	0	0	0
Unit 11	0	0	0	0	0	0

Summed total of infection incidents per four-month period

Table 14

Number of Ventilator Associated Pneumonia Infections

	Sept-Dec '11	Jan-Apr '12	May-Aug '12	Sept-Dec '12	Jan-Apr '13	May-Aug '13
Unit 1	1	0	1	0	0	1
Unit 2	2	1	0	1	3	1
Unit 3	1	0	3	0	0	0
Unit 4	12	5	5	2	6	1
Unit 5	3	3	2	3	1	2
Unit 6	0	0	0	0	0	0
Unit 7	0	0	0	0	0	0
Unit 8	0	3	4	5	2	2
Unit 9	2	2	2	2	4	2
Unit 10	5	1	3	7	2	3
Unit 11	4	2	2	3	2	1

Summed total of infection incidents per four-month period

The relationships between overtime and all five infection incidences proved statistically non-significant. However nursing worked hours (excluding overtime) showed a significant relationship with both CLI incidents and nosocomial MRSA infections. For every 10 additional hours worked on a unit, the risk of CLI incidents increased by 0.1% ($p = 0.013$).

The relationship between nursing worked hours and nosocomial MRSA infections revealed an IRR is 1.002 with a standard error of 0.0006. This means that for every 10 additional nursing hours worked, the risk of MRSA infections increased by 0.2% ($p = 0.005$) with a 95% confidence interval of 1.001 to 1.003. These results will be explored in greater depth in relation to existing literature and the qualitative findings in the following chapter.

CHAPTER SEVEN

DISCUSSION

Introduction

The current study offers a Canadian critical care perspective of an understudied area. An understanding of the relationship between overtime and patient outcomes is yet in its infancy, and there is currently no published qualitative literature regarding nurses' perceptions of the outcomes of overtime or their reasons for working it. This final chapter summarizes the findings of this study in conjunction with existing literature. The original contributions are outlined first, followed by results that are well supported by prior research. The strengths and limitations of this study are then detailed, followed finally by implications and recommendations for practice, policy, education and research.

This study makes important original contributions to the understanding of nursing overtime in critical care settings in four key areas: (a) overtime and feelings of disrespect; (b) the impact of overtime on patient centered care; (c) the physical effects of overtime on nurses, and (d) the effect of nursing overtime on nursing sick time. Each of these themes highlights new knowledge that extends the literature and will be explored below.

Overtime and feelings of disrespect

The most common issue raised by participants in the current study was that of workload and the "blind eye" that their managers seemed to turn toward it.

This is the first time that critical care nurses in Canada have specified where their feelings of disrespect originate with regards to overtime work. They identified three specific practices which, to them, demonstrated a lack of respect. Firstly, rather than ignoring their unmanageable workload, participants in this study wanted to know that their direct manager was willing to speak up on their behalf and rectify situations that were unsafe or unfair. This involves showing concern, explaining and justifying decisions, being truthful and kind (Laschinger, 2004). Laschinger's (2004) study found a significant relationship between heavy workloads and nurses' perceptions of disrespect, which Nicklin (2000) had earlier described, in an attempt to supply nurses with the supports and resources they needed to accomplish their work effectively.

Secondly, when participants in the current study were consistently expected to provide the same standard of care with fewer staff and less equipment at their disposal they explained feeling "used" or "taken advantage of" by the organization. Milazzo (2014) found that nurses perceived these unrealistic expectations as disrespectful because they had the potential to jeopardize nurses' licenses as a result of corporate mismanagement. Participants attributed poor morale to their inability to deliver quality care for patients combined with feeling as if they were being taken advantage of by working unpaid overtime and missing breaks (McFadzean & McFadzean, 2005; Nicklin, 2000). Overtime in the way of missed breaks is a particularly risky endeavor because, according to participants in this study, it was almost exclusively unpaid and Schulz et al. (2009) describe

how the imbalance between effort and reward can decrease morale and lead to burnout.

Over a decade ago, Laschinger (2004) had warned administrators that "nurses interpret the unwillingness of management to allocate the resources necessary to provide high-quality professional nursing care as a lack of respect for, or value of, their work" (p.354). Her model proposed that respect was the mediating factor between work related stress and the attitudes (about job satisfaction, trust and intention to leave), mental health and effectiveness of practitioners (Laschinger, 2004). This has now been found to be an issue amongst Canadian critical care nurses as well.

The final practice that made participants in the current study feel disrespected was being asked to justify their practice in order to be reimbursed for overtime work. Nurses in this study described being expected to explain in great detail why they were unable to take their allotted breaks. Frequently, the content of their report was challenged because they filed for overtime at the conclusion of a shift. Also, when working the charge nurse role, study participants were expected to justify their request to call in additional staff. Administration in some organizations rationalize these measures calling it a "time management" issue for nurses and expecting them to be better organized (Milazzo, 2014; Sodeify, Vanaki, & Mohammadi, 2013). Here again, the ultimate outcome was participants being blamed and feeling as if they were not trusted or respected by management who did not understand their workload and as a result did not care to resolve it.

This outcome of overtime is a system-level outcome as described by O'Brien-Pallas, Tomblin-Murphy et al. (2001) because it originates at the top of the organizational hierarchy and can result in further shortages and spending in the wake of dissatisfied nurses who leave their positions (Laschinger, 2004). A recent study that explored nurses' sources of stress found that 84% did not feel respected or appreciated at work (Milazzo, 2014). The nursing literature has long advocated greater respect for nurses and the current study confirms and furthers this by illuminating some of the sentiments which underlie that desire (Faulkner & Laschinger, 2008; Klug, 2009; Laschinger, 2004; Sodeify et al., 2013).

The Effect of Overtime on Patient Centered Care

In critical care settings, patients are typically wholly dependent upon vigilant nursing care, as they can do little for themselves. Canadian critical care nurses in this study have now made clear the fact that when they work overtime, they are more likely to be careless and hurried in their care. There are many things nurses do to safeguard and comfort their patients, some of which, if left undone can contribute to poorer outcomes further down the line, or affect patients' satisfaction with their care. Participants in this study spoke of becoming intensely task oriented in overtime situations and losing the "patient-centered" focus of their care. For many of them, this was unsettling because they spoke of wanting to provide "holistic" care. The literature is replete with examples of increased intent to leave (positions as well as the profession) when nurses are unable to follow

through with that level of care (Albaugh, 2003; Cline et al., 2004; Flinkman, Laine, Leino-Kilpi, Hasselhorn, Salantera, 2008; Hall & Kiesners, 2005; Kunaviktikul et al., 2015; Kushner & Ruffin, 2015). In their study of nurse staffing and patient outcomes, Duffield et al. (2011) found that where overtime hours were higher, nurses left tasks undone, particularly comforting and teaching. Similarly, Ramsay et al. (2006) found that the emotional exhaustion nurses spoke of ultimately resulted in nurses treating patients in an uncaring manner. A more severe description of the outcomes of nurse exhaustion and burnout in critical care by Bakker, Le Blanc and Schaufeli (2005) showed that it resulted in patient neglect. This lack of attention to the small touches that demonstrated care for patients was being trumped in the current study by the 'critical' and the 'urgent' which Hall and Kiesners (2005) found in turn rendered nurses less satisfied with their work. These smaller, undocumented, aspects of missed care could prove to be more problematic in ICU environments with critically ill, vulnerable patients.

The Physical Effects of Nursing Overtime

The physical implications for nurses working overtime are one of the major findings from this study as participants proposed a litany of effects they feel from working beyond their regular schedule - most often by missing breaks. These are the first Canadian critical care findings which implicate overtime as the root cause. Nurses in this study described skipping breaks (typically the second and third breaks) with the hopes of "getting out on time." In these situations

participants spoke of running around endlessly with no chance to sit down or get off their units for a break. In order to fuel themselves, participants in the current study would eat quickly at their nursing station in order to be available to their patients – a reality that Stefancyk (2009) found anecdotally to be the norm on many other units as well. A survey of 3,500 nurses from the United Kingdom found that 60% of respondents implicated workplace stress as a driver of their poor diet, while 79% specifically cited a lack of breaks (Keogh, 2014). The American Nurses' Association saw 35% of their 13,515 respondents indicate that they rarely or never took meal breaks (As cited in Witkoski & Dickson, 2010).

Another related consequence of missed breaks that nurses in the current study cited was the issue of dehydration. Brady (2003) found this to be a serious issue among the 50 nurses she polled in various units of two hospitals. Her results revealed that nurses fluid intake was low because they were too busy, not getting breaks, and some went as far as intentionally avoiding fluid so that they would not need to waste time in the washroom (Brady, 2003). While the academic literature on this topic is limited, nurses recognize it to be a serious issue and they discuss work related dehydration on a popular nursing website stating:

> *"I…ended up with pyelonephritis. The doc told me it was my own fault, he laughed and said that nurses do this to themselves by not drinking and not peeing for 12 hours. He was right too, I was lucky to pee once for a 12 hour shift"* (Allnurses, 2009*).*

Hunger and thirst were highlighted in relation to missed breaks and when participants worked a number of those busy shifts in succession the physical effects were further compounded. Frontline nurses tend to work long hours with

inadequate meal and rest periods, resulting in fatigue and pain (Rogers et al., 2004; Scott et al., 2006; Trinkoff et al., 2011). This becomes increasingly prevalent with the addition of overtime hours. All of these physical consequences are the causes of, or precursors to, nursing sick time.

The Effect of Nursing Overtime on Nursing Sick Time

A fourth important contribution is the positive association between nursing overtime and nursing sick time that was found in both the qualitative and quantitative arms of this study. Participants in this study are the first Canadian critical care nurses to speak of getting "run down" and falling sick when they worked more than they were scheduled to, an association which was found to be statistically significant quantitatively. For every 10 hours of overtime worked, nursing sick time increased by 3.3 hours ($p<0.0001$). This compares with findings from O'Brien-Pallas, Thomson et al. (2001) which show a nearly perfect correlation between overtime and sick time ($r = 0.928$, $p < 0.01$).

Although quantitative literature has shown a strong relationship to exist between the two, until now the direction of that relationship has been uncertain (Bae & Fabry, 2014; O'Brien-Pallas, Thomson et al., 2001). While it is well understood that when nurses call in sick more frequently, administration will generally need to resort to overtime to meet their staffing requirements – the effect of increased overtime on sick time is less straightforward. The statistically

significant relationship between the two in this study is explained by the qualitative findings.

Sick time can be the result of physical injury, temporary illness or chronic disease (Health Canada, 2004). The physical demands of bedside nursing, especially in critical care environments with the lifting and turning of increasingly heavier patients can result in joint and muscular pain and injuries (Witkoski & Dickson, 2010). A recent study found that working more than 60 hours a week was associated with a 23% higher injury hazard rate, and working a job that involved overtime hours was associated with a 61% higher injury hazard rate (Dembe, Erickson, Delbos & Banks, 2005). For healthcare workers musculoskeletal disorders have been found to be related to hours of work per day and per week (Caruso, Hitchcock, Dick, Russo & Schmit, 2004; Lipscomb, Trinkoff, Geiger-Brown & Brady, 2002; Trinkoff, Le, Geiger-Brown, Lipscomb & Lang, 2006).

Similar to the participants in the current study, the literature shows neck, shoulder and back issues as results of nursing overtime (Lipscomb et al., 2002; Trinkoff et al., 2006; Trinkoff et al., 2011). This can also prove to be a costly burden for hospitals as an American study found that treatment of these musculoskeletal injuries ranged from $50,000 to $100,000 per nurse (Nelson et al., 2006). Beyond musculoskeletal injuries, Ramsay et al. (2006) found the emotional exhaustion that often accompanies overtime hours to be related to decreased immune function, hypertension, cardiovascular problems, physical

exhaustion and insomnia. In a report prepared for the U.S. Department of Health and Human Services, overtime hours were associated with poorer perceived general health, increased injury rates, greater illness and even increased mortality in 16 of the 22 studies reviewed (Caruso et al., 2004). Perhaps some of these issues were the culprits behind the feelings of being "drained," "worn down" and calling in sick in the current study. While the data employed in this study cannot indicate whether overtime results in sick time or vice versa, the qualitative results in combination with existing literature seem to substantiate the former.

The six participants in the current study who felt that overtime did not contribute to nursing sick time felt that nurses were able to self-regulate and would not work beyond what their minds and bodies could handle. This notion still merits consideration as a result of the difficulty in determining the true effect of work week hours on errors and injuries. While it may well be the case that working overtime hours fatigues the body (rendering it more susceptible to disease) and results in poorer standards of care and body mechanics, it may also be that nurses who work additional hours are more likely to injure themselves or be exposed to super bugs by virtue of their increased time at the bedside (Olds & Clark, 2010). Self-regulation and increased continuity may lead to good, safe patient care – however, the extended work hours and increased exposure in combination with limited recovery time makes overtime a potentially risky option for nurses. Other important findings are discussed below in relation to existing literature.

Nurses' Reasons for Working or Not Working Overtime

The current study also contributes to a new understanding of critical care nurses' reasons for working and not working overtime hours, which generally parallel the predictors of overtime proposed by Bae et al. (2012) while increasing their specificity (See Figure 2, page 47). These predictors include: (a) the availability of overtime, (b) nurses' work schedules, (c) incentives to work overtime, (d) nurse demographics (as indicators of social needs), and (e) organizational citizenship behaviors. Data from the current study related to each of these areas is discussed in greater detail below.

Availability of Overtime. With regards to availability, in 10 of the 11 ICU clinical units where data collection occurred, participants explained that overtime hours were offered to them on nearly every day off so that it was a common practice. Bae et al. (2012) attribute the availability of overtime to unpredictable fluctuations in patient census and chronic understaffing due to turnover and under budgeting. These issues are known to plague ICUs and tend to accompany the higher workloads in academic teaching centers (Berney et al., 2005; Buerhaus, Staiger & Auerbach, 2000; Fisher et al., 2008). Its consistent availability in the current study rendered overtime more likely to be worked and also allowed participants more freedom not to work it, as it would be available at a future time that better accommodated their schedules.

Nurses' Work Schedules. Nurses' work schedules comprise the second predictor of overtime, which Bae et al. (2012) believe pertains more to those who

typically work fewer hours and are thus more willing to pick up additional time. Part-time participants in the current study who desired full time work certainly echoed those sentiments, while those who *chose* to work part-time hours were often uninterested in overtime work due to commitments in their personal life. Full-time participants with more predictable schedules indicated that they were able to plan out when they might like to pick up overtime hours in advance, although some of them had no desire to work beyond their scheduled hours.

Participant's work schedules were identified unanimously as the impetus for *not* working overtime. The impromptu nature of most overtime hours left nurses unprepared to work it as a result of lack of food or rest (Golden & Wiens-Tuers, 2005). Last minute requests for picking up overtime shifts as well as unanticipated shift extensions resulted in variable hours, which McCrate (2012) agrees, can also disrupt the ability to plan for childcare. This unpreparedness along with the fatigue that accompanied erratic overtime work schedules made nurses less likely to work it (Bae, 2012; Beckers et al., 2008; Smith-Miller, Shaw-Kokot, Curro & Jones, 2014).

In addition to the issue of last minute requests for overtime hours, nurses in the current study spoke of needing time away from work, outside of the hectic and emotionally charged ICU environment. Both full and part-time participants indicated a need for time away from the bedside as a reason they would not work overtime. This was their way of highlighting their need for, what Binnewies, Sonnentag, and Mojza (2009) call "recovery time." This need for time away from

work is qualified in the literature as important for rest and recuperation (Drach-Zahavy & Marquz, 2012; Trinkoff et al., 2011) as well as the maintenance of appropriate work-life balance (Lembrechts, Dekocker, Zanoni & Pulignano, 2014; Yildirim & Aycan, 2008). Particularly in a demanding field like nursing, this time off is important for the "replenishing of psychological and physical resources that have been depleted by meeting effortful demands" (Ragsdale, Beehr, Grebner, & Han, 2011, p. 154). Without sufficient amounts of recovery time built into their work schedules, nurses would find themselves too fatigued to work additional hours and would consequently choose not to work overtime.

Incentives to Work Overtime. Bae et al.'s (2012) third predictor of overtime is incentives, which proved to be an important reason participants in the current study chose overtime work. The three major incentives that study participants cited were financial gain, seniority, and predictability or continuity. Bae's recent study (2012) of nurses' reasons for working overtime found that on average, 64% of nurses who worked overtime did so because they needed the money, and 50% of them worked it in order to earn additional income (not out of necessity). Motivated by financial uncertainty and investment losses, nurses may be more willing to work overtime during an economic recession in order to stay afloat financially (Cheung, 2015; Staiger, Auerbach, & Buerhaus, 2012). Unpredictable financial climates may encourage some nurses to work overtime, while for others it may be simply a means of financing vacations, mortgages, cars, consumables and bolstering savings (Steinbrook, 2002). While perhaps not

everyone's *primary* motivation for working overtime, participants in the current study were enthusiastic about the "fatter paycheck" they would receive as a result.

The Ontario Human Rights Commission (2008) addresses the potential importance of seniority when it comes to layoffs, promotions and other work-related perks (according to union contracts). Study participants who cited seniority as a reason for working overtime were more junior nurses who worked part-time but desired full-time positions. This issue may be an important consideration going forward because of the brain drain to the United States which became the solution for nurses in previous studies, in order to secure full-time employment (McGillis-Hall et al., 2009). In 2010, 42% of RNs in Canada worked in part-time or casual positions, a much higher percentage than the 30% recommended in order to have 70% full-time staff (CFNU, 2010). In Ontario, seniority for part-time nurses is based upon accumulated worked hours, where 1500 hours equals one full year of seniority (ONA, 2014). Participants in this study hoped that working overtime would increase their worked hours and thus their seniority, in turn affording them a better chance of securing full-time employment when it became available.

The final incentive that participants in the current study identified as a motivator for working overtime was the predictability or continuity that it afforded them. Consistent with Faller's findings (2008), nurses in this study would cheerfully work additional hours when they knew they would be coming in to a familiar patient, and that, in all likelihood it would be a peaceful shift. In

critical care environments where patients can be very unstable and care is demanding, nurses in this study enjoyed coming in to work with a patient whose history they were well acquainted with, and where rapport had already been developed. Existing literature clearly shows that this desire is mutual, as a familiar face engenders trust and confidence for patients and care is enhanced as a result of prior knowledge (Bayliss et al., 2015; Waibel, Henao, Aller, Vargas & Vazquez, 2011).

Nurse Demographics. Demographics also influence nurses' decisions of whether or not to work overtime (Bae et al., 2012). Looking back on their careers, more experienced participants in the current study echoed younger nurses' responses that overtime was a way to accelerate career development by enabling them to more quickly overcome the steep intensive care learning curve. The anxiety and apprehension that accompany the transition from student to ICU nurse is addressed primarily by experience (O'Kane, 2011). One nurse in this study (who worked a considerable amount of overtime) compared his experience over seven years to those who began at the same time as him, but took longer to adjust and thrive in the environment by working only their regularly scheduled hours. Overtime hours afforded these participants more time on the units which facilitated their transition into confident, autonomous critical care practitioners (Duchscher, 2008).

Participant demographics also capture life stages and associated family obligations. Nurses with young children may be more likely to experience financial need, while simultaneously being less able to participate in irregularly scheduled overtime (Bae et al., 2012). For most participants in the current study, the need to care for their young overrode financial aspirations (with the exception of serious financial need). Maher, Lindsay, Bardoel and Advocat (2008) support this finding, as they too discovered that many nurses continued to work fewer hours even once their children began attending school as the pressures of managing family schedules intensified. As their children became increasingly independent and moved out or went away to college, participants spoke of being both more willing and able to work more overtime. Bae et al. (2012) propose that in addition to fewer family obligations, more senior nurses may have longer employment tenure and organizational commitment, which drives them to work more overtime. Simultaneously however, senior nurses in this study were the ones who reported the most musculoskeletal injuries and Fitzgerald (2007) found that rotating shifts combined with additional overtime hours decrease job satisfaction among older nurse. Where overtime decreases job satisfaction, these older nurses may be less willing to work it, particularly as the physical limitations and conditions associated with aging intensify.

Organizational Citizenship Behavior. A final predictor of nursing overtime according to Bae et al. (2012) is organizational citizenship behavior. While not an "enforceable requirement of the job" (Bae et al., 2012, pp. 4) it

entails commitment to the organization as demonstrated by helpful and loyal behavior. By far, the second most commonly shared reason for working overtime in the current study was to help, support, and sometimes simply spend time with colleagues at work. In many cases this was more important to participants than the financial incentives overtime offered to them. Montour, Baumann, Blythe and Hunsberger (2009) found within rural community hospitals in Southwestern Ontario, nurses were similarly motivated, stating that while the increased paycheck was nice, their primary motivation was to help out their colleagues. This is consistent with Bae et al.'s finding (2012) that 75% of nurses worked voluntary overtime because they did not want to let their colleagues down and they did this even against their better judgment, when fatigued, so that their colleagues would not suffer. The Canadian Federation of Nurses Unions (2010) cites the compassionate nature of nurses as the driver of ethical distress which motivates nurses to come in for support even to their potential detriment.

The Outcomes of Working Overtime

This study also extends the current understanding of outcomes related to nursing overtime in critical care. It helps to explain the implications of overtime for different stakeholders, as well as the different facets (personal and professional) of nurses' lives. Findings from this study go into greater depth and detail than previous research and provide insight that can be helpful for nurses, managers, administrators and unions to be aware of.

There has been a surge of scholarly and clinical enthusiasm over the past decades to promote healthy workplaces with the goal of both patient and nurse satisfaction (Hall & Kiesners, 2005). Overtime, most often mandatory, is raised repeatedly as one reason nurses leave their posts, or the profession altogether (Albaugh, 2003; Cline et al., 2004; Kushner & Ruffin, 2015). The continued reports of overtime's negative effects on patients and nurses that have gone relatively unheeded are troublesome, however, they are only one side of the story.

The outcomes of working overtime that nurses in the current study shared can be organized according to O'Brien-Pallas, Tomblin-Murphy et al.'s (2001) Health Human Resources Framework. Use of overtime falls under their concept entitled "resource deployment and utilization" and depends upon accurate planning and forecasting (of personnel, finances, training, as well as the management, organization and delivery of services) (O'Brien-Pallas, Tomblin-Murphy et al., 2001). The way in which these resources are deployed gives rise to (a) health outcomes, (b) provider outcomes and (c) system outcomes which can be either positive or negative. Study findings are discussed in relation to these outcomes below.

Health Outcomes. Patient health outcomes of overtime receive the most public attention and academic study. This study is one of, now 10, that explore the relationship between nursing overtime and patient outcomes, which cumulatively seem to indicate poorer patient outcomes with increasing overtime (Arnow et al., 1982; Berney & Needleman, 2006; Bobay et al., 2011; Olds & Clarke, 2010;

Rogers et al., 2004; Russell et al., 1983; Scott et al., 2006; Stone et al., 2007; Trinkoff et al., 2011). Qualitative responses from participants in the current study suggested that when they worked overtime hours they perceived increased risk to patient safety. However, the patient outcomes explored in the quantitative arm of this study do not reflect that. These quantitative results align with many others who found that increasing overtime did result in increasingly poorer patient outcomes; however, many of these findings were not statistically significant (Lobo et al., 2015).

Perhaps this can be explained in part by findings from Stone et al. (2007) and Berney and Needleman (2006) who found that increases in nursing overtime resulted in *fewer* central-line blood stream infections and patient deaths respectively. These authors propose that because overtime hours are most often worked by permanent and full-time staff, their experience and knowledge of individual patients may offset their fatigue and in some cases even outweigh it (Berney & Needleman, 2006). Particularly in critical care units, additional time at the bedside is likely to be with the same patient(s). Therefore with more intimate knowledge of their history, preferences and reactions, these nurses working overtime may be more likely to pick up on nuances and little changes, before they worsen, than their part-time or temporary status counterparts (Berney & Needleman, 2006).

Findings from the current study which show increasing worked hours as being significantly related to increased CLI and nosocomial MRSA infections can

be explained in a number of ways. Perhaps because of the higher number of infections present, additional frontline nurses had been called in to provide care or perhaps increased worked hours account for new graduates in training, who overlook infection precautions or other nuances resulting in higher transmission rates. Eight of the nine existing studies show significantly positive relationships between overtime and nurse errors, MRSA infections, patient mortality, unplanned emergency department visits, catheter-associated urinary tract infections, ulcers, pneumonia and myocardial infarctions (Arnow et al., 1982; Berney & Needleman, 2006; Bobay et al., 2011; Olds & Clarke, 2010; Rogers et al., 2004; Scott et al., 2006; Stone et al., 2007; Trinkoff et al., 2011). These findings did not materialize in the current study, possibly due to the low number of cases present on each unit, and potential confounding variables for which data were unavailable.

Despite the quantitative findings, participants in the qualitative component of this study were quick to enumerate the safety concerns and additional risks to patients they perceived when they worked additional hours. Nurses who participated in Stimpfel and Aiken's (2013) study reported that the more hours they worked, the poorer the quality of care they provided even after adjusting for nurse demographics. Many other studies cite similar concerns that nurses have voiced over decades about their inability to provide high quality care when working long hours (even contesting the now-standard 12-hour shift) (Mills, Arnold & Wood, 1983).

Participants in the current study echoed those findings that working overtime was accompanied by greater fatigue which sometimes resulted in decreased alertness and slower reaction time, poorer decision-making ability, less skill accuracy, less proactivity and being more prone to errors and missing things (Dinges et al., 1997; van Dongen, Maislin, Mullington & Dinges, 2003; Trinkoff et al., 2011). Scott at al. (2006) articulate the danger of these issues specific to critical care environments wherein patients' "natural resilience" is lower due to critical illness and they are consistently exposed to more medications, treatments and opportunities for errors. Additionally, nurses in these specialty care areas tend to work more overtime where Garrett (2008) found that the effect of working increased hours may compare to that of being under the influence of alcohol. After 17 hours without sleep, she found that performance degraded to the equivalent of having a blood alcohol level of 0.05% (Garrett, 2008). If some of the 23,000 patients who suffer as a result of nursing errors in Canada every year can be avoided by reducing nurse overtime, then it merits further exploration (Blackwell, 2015). Therefore, even though the quantitative results fail to reveal a significant relationship between nursing overtime and the infection rates explored, there is much at stake if what the participants shared in the qualitative arm of the study is true.

Provider Outcomes. The outcomes of working overtime for nurses themselves were described repeatedly by participants in the current study, more often with negative implications, but supplemented with advantages as well. The

physical effects on nurses have been previously explored, where the general expectation is that a nurse who is fatigued will not voluntarily work beyond required hours (College of Nurses of Ontario [CNO], 2013). However, Olds and Clarke (2010) found that nurses were likely to do just that in order not to let their colleagues down. This guilt regarding abandoning their colleagues was enough to compel nearly 70% of nurses in Bae's study (2012) to work overtime hours.

Although professional responsibility compels nurses to ensure safe patient care, it may also instigate greater risk due to fatigue (Huston, 2014). Either decision can induce feelings of guilt as nurses struggle with the possibility of patients receiving substandard care in their presence or their absence. Finally participants in this current study experienced guilt when making the choice between work demands and spending time with their families, particularly, their children. A recent qualitative study found that one of nurses' substantial sources of stress emanated from their inability to keep up with their children's activities and spend enough time with them (Milazzo, 2014). Kushner and Ruffin (2015) explain that this guilt often arises out of a neglect of home responsibilities in order to meet the demands of work.

Participants in the current study, especially those with younger children spoke of their challenge in maintaining a fulfilling work-life balance. For nurses, more time at work necessarily means "less time with family, less time to help a child with homework, less time for play" (Golden & Jorgensen, 2002, para. 2). As a predominantly female profession, nurses often bear the brunt of housework and

childcare in addition to their bedside positions. Yildirim and Aycan (2008) have written about the bidirectional relationship between a nurses work life and personal life wherein, a nurse's personal life may interfere in their professional domain, but more commonly, work may interfere with the family domain. Participants in this study explained exactly that. They were unable to take out any frustration in their professional environment, and as a result, they found themselves "taking it out" on their loved ones at home. In their study of Turkish nurses, Yildirim and Aycan (2008) found that longer work hours and irregular schedules were significant predictors of work-to-family conflict and that work-to-family conflict was in turn associated with lower job and life satisfaction (Skinner & Chapman, 2013). Overtime results in both longer work hours and irregular schedules due to its impromptu nature.

System Outcomes. The feelings of disrespect that nurses perceive when overtime usage is high have been previously described and can affect the healthcare system as a whole if nurse recruitment and retention are stunted as a result (Flinkman et al., 2008; Hayes, 2012). It is also a system issue because nurses see so many other professions whose hours are limited in the interest of public safety, while their pleas for adequate staffing to regulate work hours go unheeded (Bae & Yoon, 2014). The Ontario Provincial Police (2012) saw a 27% cost savings in overtime expenditures of $14.1 million after imposing overtime constraints to reduce fatigue and increase reaction time. Failure to resolve this

issue may result in demoralization, deter potential candidates from the profession, and demand unnecessary public monies that could be better spent elsewhere.

Summary

This study is the first to take an in-depth look at critical care nurses' perceptions of overtime and the outcomes of working it for different stakeholders (both qualitatively and quantitatively). The use of overtime has long been regarded as a questionable practice and research evidence, particularly with regards to mandatory overtime, suggests that nurse, patient and system issues arise with additional work hours (Bae, 2013; Beckers et al., 2008; Faller, 2008; Golden & Wiens-Tuers, 2005; Huston, 2014). Notably less research has been conducted with regards to the effects of voluntary overtime on relevant stakeholders. The findings from this study confirm and further illuminate the effect that overtime has on patients, systems and nurses who work it. Many of the perceptions participants shared are intuitive realities that clinicians will recognize, however, these are couched in detail and substantiated by real-life examples.

The majority of existing academic literature is focused on patient outcomes and mandatory overtime with the general conclusion being that overtime is likely not a good solution. However, Becker et al. (2007) suggest "that overtime should not be conceptualized as a phenomenon which …has negative implications for health and well-being" (p. 43). Participants who worked moderate amounts of overtime in their study were motivated, and energized

(Beckers et al.). Hart (2004) also suggests that other positive consequences which may result from overtime hours include recognition from peers, promotions, time off, and most commonly, financial remuneration (Caruso et al., 2006; Hall & Kiesners, 2005). Finally, Brewer, Kovner, Greene, Tukov-Shuser and Djukic (2011) found that higher overtime hours decreased newly licensed nurse turnover. This is a positive consequence for the organization and also indicates higher nurse satisfaction.

Negative consequences of nurses working overtime are more frequently documented in the literature than positive consequences. Research findings suggest a nearly perfect correlation between overtime and sick time (O'Brien-Pallas, Thomson et al., 2001), while also claiming that overtime is highly predictive of increased lost-day injury claim rates among nurses (Shannon & French, 2005). These adverse health effects may be related to fatigue due to encroachment upon recovery time during and between workdays (Sluiter, de Croon, Meijman, & Fringes-Dresen, 2003). Caruso et al. (2006) state that it is likely mandatory overtime that serves as the most tiring, stressful and disruptive. The lack of control (inherent in mandatory overtime) disproportionately affects women who may have additional child and family responsibilities (Ala-Mursula, Vahtera, Pennti, & Kivimaki, 2004). Trinkoff et al. (2006) found overtime to be significantly related to musculoskeletal problems in nurses, and all of the stressors detailed above in combination can lead to burnout, absenteeism, and nurse job

dissatisfaction leading to turnover (Fisher et al., 2007; Twarog, 2011; Zeytinoglu et al., 2006).

Consequences of nurse overtime to the patients being cared for include the potential for medication-related errors (Olds & Clarke, 2010; Rogers et al., 2004; Scott et al., 2006), poorer patient care (Bobay et al., 2011), and an increased risk of a host of adverse outcomes including pneumonia, infections, myocardial infarctions and mortality (Stone et al., 2007; Trinkoff et al., 2011). In contrast, Berney and Needleman (2006) found that increased overtime was associated with a decreased rate of mortality; results they attribute to the experience and time spent with patients by the full-time nurses who primarily work overtime.

The current study supports and extends existing literature finding both positive and negative new outcomes of overtime and the key reasons that nurses choose to work it. Participants in this study valued the option of overtime work in the form of picking up full shifts, however when worked within the shift (missing breaks), it felt more like mandatory overtime with all of the negative repercussions and resentment that accompany it. While participants certainly spoke of the financial and social advantages that overtime hours afforded them, the most valuable contributions that this study makes to the profession highlight some of the more negative outcomes that affect nurses themselves, patients they care for, and organizations as a whole.

Implications for Practice, Policy, Education and Research

There are a number of practice implications arising from this study that are relevant to nursing managers. First, it is vital to address the issue of fatigue that can accompany overtime work. The issue of nursing fatigue has been aptly featured in the literature to date and combatting it is a substantial concern because of its extensive effects on patients and staff safety (Beckers et al., 2008; Smith-Miller et al., 2014). The Canadian Federation of Nurses' Unions (2009) goes so far as to say that excessive overtime is an occupational health and safety hazard. The CFNU is very clear in their statement that employers bear the obligation of ensuring the appropriate number and mix of nursing staff on each unit and these merit further scrutiny going forward (CFNU, 2009). Fatigue risk-management software is available and has been successfully used in other industries as an aid to developing healthy schedules (Geiger-Brown & Trinkoff, 2010). This may be of value in combination with a serious push for appropriate staffing.

Adequate numbers of nursing staff (unit nurses, as opposed to agency staff) are also important to ensure that nurses can find relief for the mealtimes they are entitled to (Keogh, 2014). Although barriers to hiring additional frontline nurses undoubtedly exist, Drebit et al. (2010) suggest that creating more full time positions out of overtime hours being worked may be part of the solution. It is full-time nurses who contribute the bulk of overtime hours after already working a full work week. The addition of any additional hours beyond their regular schedule should be carefully considered (Drebit et al., 2010). There may be

administrative challenges associated with working in a contracted environment that restrict what managers are able to change, and as a result, collaboration with unions will be essential in moving this discussion forward. Wilson, Talsma and Martyn (2011) advocate *mindful staffing,* which is evidenced by effective decision-making that "safely balance[s] unexpected changes in patient acuity and census with the availability and experience of staff nurses" (pg. 819). Patient acuity, patient census, availability of nurses, and nurse experience levels are all important considerations in the decision of whether or not to use overtime against other available options.

Participants in the current study spoke often of being hungry and tired with no time to sit down or even use the washroom some days. Reasons preventing them from capitalizing on the breaks they were allotted varied and warrant investigation on individual units in order to be properly handled. Initiating a tracking system for missed breaks could be a starting point. This would allow managers to see when they are happening, particular teams who seem overworked (perhaps changes in skill mix would ameliorate the issue), times of day, years or weeks it is happening - and begin to look at tailored solutions once the data is in. This type of (typically unpaid) overtime requires formal acknowledgement and inclusion in organizational definitions if it is to be dealt with effectively. The amount of overtime in the way of missing breaks and staying late is likely hugely underestimated in part because nurses are too tired at the end of a very busy shift to think about submitting a claim for overtime. This

makes its effects difficult to test quantitatively. Tracking these hours will allow for the acquisition of stronger data and subsequent correlations.

At the unit level, individual nurse overtime hours (in the way of picking up of additional shifts) are also worth tracking in order to assess their distribution as well as render them more equal and less risky. Managers should also investigate the root cause of their need for overtime. If for instance they have a large number of senior staff with substantial vacation time that requires covering, perhaps the solution is to hire more part-time staff. Different instigators of overtime will necessitate different solutions.

One of the predictors of intent to leave in the nursing profession is a dissonance between the care a patient requires (and a nurse wants to provide), and what the nurse is able to do for them in practice (Kovner & Djukic, 2009; Stone et al., 2006). Therefore it behooves nurse managers to monitor nurse's job satisfaction in relation to the patient care they provide in order to retain them (Lobo, Fisher, Baumann & Akhtar-Danesh, 2012).

Participants in this study also described feeling like machines who were being taken advantage of and expected to work non-stop without fair compensation. They expressed a desire to be recognized, and for the situation to be rectified in order to demonstrate a respect for their role and hard work. One way of showing respect with regards to overtime would be to schedule it as much in advance as possible. Rather than issuing last minute calls, an option is to have a schedule book where individuals can place their names if they wish to work

overtime on certain days. That way, rather than cold-calling through the list according to seniority (as per union contracts), nurses can have some idea of whether or not they will be called (based on how many other names are on the same date), they can schedule any personal commitments accordingly, and be adequately rested to work. In order to implement such a change, management and union leaders will need to renegotiate the current overtime allocation strategy in conjunction with human resources and organizational executives who can begin to institute policies. Soliciting input from staff nurses regarding their needs and visibly working (with unions as necessary) to find a solution would also demonstrate respect for nurses from their nurse managers.

With the exception of a small handful of participants, nurses in this study were able to confidently assert that when they worked overtime they were more likely to get sick, injured, or simply call in sick in order to acquire some time off. In an attempt to mitigate those possibilities, Olds and Clark (2010) recommend setting limits on how much voluntary overtime nurses are allowed to pick up. In unionized facilities, this too may require negotiation in order to include it in staff contracts. In six of the studies Caruso et al. (2004) reviewed, 12-hour shifts combined with greater than 40 hours of work per week resulted in increased health complaints. Lipscomb et al. (2002) found that overtime was associated with a high risk for neck, shoulder and back disorders. While on the units, breaks should be scheduled and encouraged so that nurses are able to nourish and care for their bodies and stand a greater chance of remaining satiated, hydrated, rested

and in a state of good health. Stimpfel and Aiken (2013) insist that nurse managers are critical to both the planning and enforcement of staff breaks. They can do this by communicating the importance of breaks to staff, scheduling them at appropriate (meal) times and ensuring adequate frontline staff are available to cover patients while nurses are away from the units (Stimpfel & Aiken, 2013).

When nurses are off on sick leave, not only can patient care suffer, but the organization's finances are drained unnecessarily as they are forced to pay a sick day to the nurses in question, while also funding other (likely overtime) nurses to cover those positions (Russell, 2015). One way to reduce this redundancy is to develop incentives (with staff input) that encourage nurses who work part-time to pick up additional hours, and intentionally work to ensure that part-time staff are getting the scheduled hours they commit to. In so doing, managers might be better able to retain committed part-time staff that are willing to help the team and are not forced to work another job simultaneously (Conway & Briner, 2002; Zeytinoglu et al., 2006).

At the policy level, there is a need for institutional accountability for the hours that nurses are working, and these should be limited within reason to safeguard nurse and patient well-being (Olds & Clarke, 2010). As similar issues related to work hours exist in law-enforcement, researchers in the policing profession advocate the development and implementation of sound policies regarding excess work hours, scheduling of shifts and shift length in the interest of public safety (Vila, Morrison & Kenney, 2002). Vila et al. (2002) suggest that

this be accomplished at the policy level and then tailored and systematically transmitted to frontline staff through their direct managers. Accomplished with union involvement, this process could help to protect the organization from legal liability by showing that management was indeed concerned about these issues and had worked to ensure compliance. It is frequently noted in hospital mission and value statements that it is the responsibility of the organization to ensure patient and staff well-being. Therefore, quality improvement programs would be an appropriate channel through which to address the relationships between staffing levels and patient safety as well as nurse outcomes.

Policies around infection incident data collection may also benefit from revision in order to encourage more accurate reporting. The Ontario government currently requires public hospital reports of nine different outcomes (CDI, MRSA, VRE, VAP, CLI, hospital-standardized mortality-rate, surgical site infections, hand hygiene compliance, surgical safety checklist compliance) alongside reports of actions taken by the hospital to reduce infection rates (Ontario Ministry of Health and Long-Term Care, 2014). It is possible that public funding based on punitive measures encourages underreporting of infections and if this is the case, any association with overtime would be very difficult to observe. Policy makers should consider audits of infection rates and reconsider funding structures that cater to population needs beyond rewarding improving patient outcomes.

In an effort to secure adequate staffing levels, nurses at every level of the system need to actively engage in advocacy for the profession by lobbying the

government, with data, to fund it. It is incumbent upon nurses themselves to be proactive more than reactive in putting this case forward rather than depending upon managers to fight on their behalf. Perhaps through frontline nurse and professional organization advocacy, union contracts could be made more flexible and reflexive of nurses' concerns related to their well-being and the safety of patients in their care.

Also, for full-time nurses who are on the 4/5 schedule (two days, followed by two night and then five days off), the "pick up shifts" they are contractually obligated to work each year above and beyond their typical rotation (to complete their 1950 hours) should be worked at straight time before they are allowed to accept overtime shifts. This too may involve union negotiations. With regards to educational implications, nurses and nursing students should be educated about healthy work lives and the importance of breaks, nutrition and rest. This could be incorporated into nursing curricula in clinical education (practicum) or professional development courses as well as during professional orientation within healthcare organizations.

Finally, in terms of implications for future research, there is a need for more primary research, which makes use of diverse methodologies to understand the reasons for the widespread use of overtime (from an administrative perspective), further testing of the relationship between overtime and various patient outcomes in different settings (i.e.: emergency departments), alternative staffing models to mitigate overtime, and nurses' perceptions of the outcomes of

overtime. Prospective, individual level studies will more accurately capture unpaid overtime hours and provide stronger data that can begin to uncover causal relationships. These studies should also explore the difference between nurses' perceptions of overtime and overtime's effect on outcomes in unionized and nonunionized environments.

Participants in this study spoke of leaving the "less critical" aspects of patient care, the intangibles, and the undocumented components undone at the end of shifts out of fatigue from their additional work hours. The impact of these oversights requires further investigation in the way of larger, multi-site longitudinal studies. While failing to turn or change an ICU patient frequently is likely to lead to decubitus ulcers (Reddy, Gill & Rochon, 2006), the impact of less patient education, less emotional support, less ambulation, poor oral hygiene and slower response times to patient needs requires further research. In order for these studies to produce increasingly meaningful results, systems also need to be developed to accurately collect data related to patient outcomes. Further study of the introduction of less qualified or unlicensed care providers (nursing assistants, personal support workers etc.) to manage the workload in place of hiring additional frontline nurses will also be important. An understanding of patient outcomes in critical care with the addition of non-nursing personnel will help to ensure that the highest standards of care are maintained. It will be important to conduct these studies at the nurse and patient level (as opposed to amalgamating

data at the unit level) to better account for comorbidities, individual nurse performance and undocumented overtime hours.

In Canada, work-related injuries accounted for nearly half of time-loss injuries in 2001 and the absenteeism rate that resulted from illness and injury for full time RNs was 83% higher than the average fulltime national workforce in 2002 (Health Canada, 2004). In light of these statistics, participants' perceptions of increased body pain, and their propensity to take shortcuts when they are exhausted from working overtime hours, further study of the effects of nursing overtime on sick time is warranted, both qualitatively and quantitatively. Quantitative studies should be done prospectively at the individual nurse level with minimal aggregation to enhance accuracy. Qualitative studies should drill deeper into nurses' perceptions of the appropriate use of sick time, and the specific consequences of overtime that drive them to use sick days.

Further research is also required regarding nurses' perceptions of the importance of breaks during their shifts and the effects of missing them. In addition to nurses' perceptions of overtime work, studies related to nurse managers' perceptions of overtime work, its effect on the unit, and their choice to continue using it are also warranted. These qualitative studies should explore nurses' and managers' perceptions in diverse therapeutic areas with differing amount of professional experience (as this appeared to differentiate opinions). A final area for future research concerns the definition of overtime and its standardization so that it can be more effectively measured and its effects studied

clinically. The concept analysis authored by Lobo et al. (2013) highlights the antecedents, attributes and consequences that should be considered in this endeavor.

Study Strengths and Limitations

Findings from the current study should be considered alongside an understanding of the methodological strengths and limitations. A primary strength of this study was the use of both qualitative and quantitative methods in order to gain a more comprehensive understanding of overtime in critical care settings. Data were also collected from three separate organizations and 11 different clinical units in order to sample a wider population and elicit different perceptions. Triangulation between members of the research team served to challenge assumptions and also brought different perspectives to the discussion.

While data were collected from 11 units these belonged to only three different corporations – all tertiary care, teaching hospitals in one area of Ontario. As such, findings may not be transferable to smaller, nonacademic hospitals, settings other than the ICU and non-unionized facilities. For the quantitative arm of the study, retrospective data was employed and not all data was standardized across the three organizations. It is difficult to guarantee that the data reflected identical definitions. Also, as a secondary, retrospective analysis, these results imply association, not causation.

Another limitation relates to difficulties in differentiating between a true effect of overtime hours on nursing sick time and the possibility that it is actually

sick time that results in the use of overtime to meet staffing needs. This relationship can likely only be clarified through additional longitudinal quantitative inquiry. With regards to patient outcomes, infection rates explored were generally very small making it difficult to model a relationship that might exist given greater counts and resultant greater power. There may also have been inconsistencies in the way that organizations collected their data, including their very definitions of overtime. The data obtained was amalgamated monthly at the unit level making values potentially much less reflective of the entire picture and leaving no strong way to control for potentially confounding variables. Retrospective data abstracted from administrative sources also obscured how many nurses worked overtime hours and whether they frequently stayed for a short time, or occasionally picked up full overtime shifts. Patient MODS scores were the only indication of levels of acuity, and they were found to be insignificant in each model and ultimately removed. Finally, qualitative data was collected via self-report (through interviews), where participants may have been reluctant to report the negative outcomes of their own overtime hours on patient care.

Conclusion

The purpose of this study was to focus the attention of the nursing profession and health human resources on the important issue of overtime in critical care: why nurses chose to work it, and its outcomes for clinicians, patients and organizations. This study makes important new contributions to the

understanding of key issues in those areas. The relationship between nursing overtime and nursing sick time was also shown to be statistically significant, and both confirmed and extended qualitatively.

Ultimately, nurses in this study perceived negative effects of overtime for themselves and their patients, but they desired to work it regardless. Participants counted the financial gain, continuity and seniority as positives, but were quick to enumerate the negative outcomes of overtime for their families, their patients and their own health. Despite this, overtime has become a strategy used to handle expected variations in patient census and nurse staffing, and it will likely be increasingly drawn upon to care for the aging North American population in coming decades (Sharp & Clancy, 2008). Each of the findings from this preliminary study can serve as a springboard for future, more in-depth research, with the expectation that this work can inspire discussion and positive change to defend the well-being of nurses, patients and the Canadian healthcare system.

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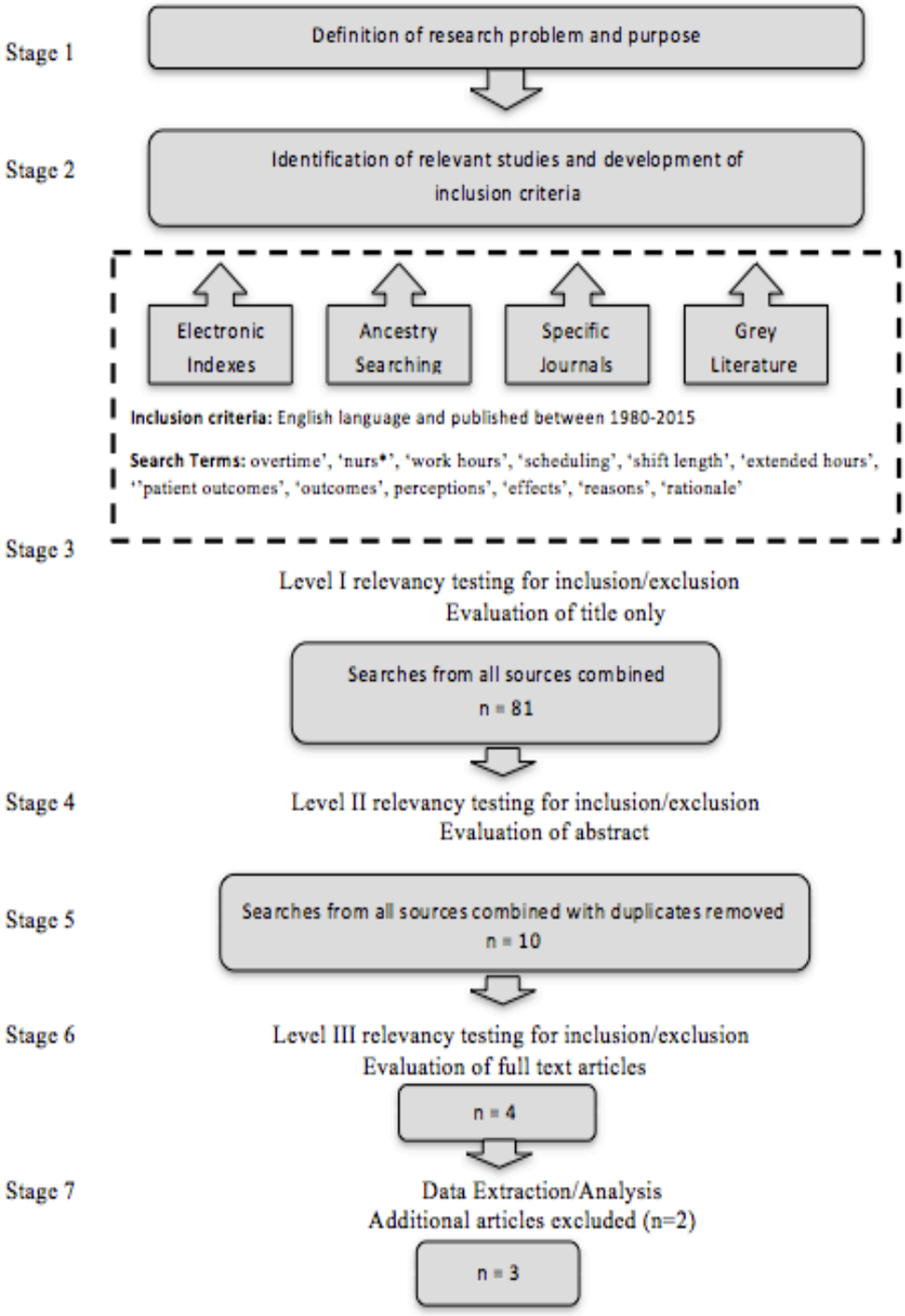
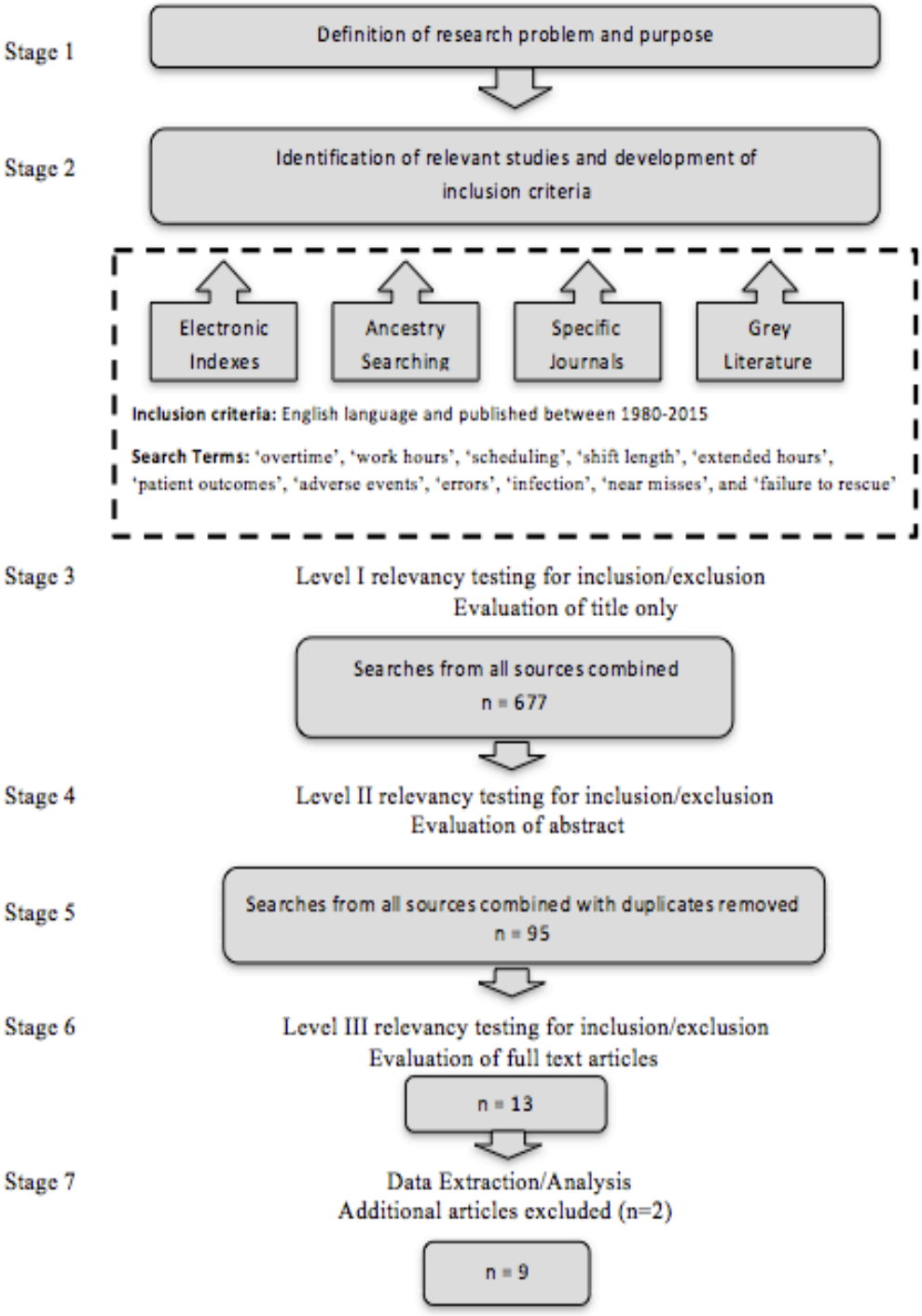
APPENDIX A

Search Strategy Related to Nurses' Perceptions of Overtime



APPENDIX B

Search Strategy Related to Nurse Overtime and Patient Outcomes



APPENDIX C

NURSE'S PERCEPTIONS OF OVERTIME WORK IN CRITICAL CARE (Organizations A and B)

STUDY INFORMATION SHEET

Local Principal Investigator: Dr. Anita Fisher
Associate Professor/School of Nursing
McMaster University

Principal Investigator: Vanessa Lobo
PhD Nursing Candidate
McMaster University

Invitation to participate in research

You are being invited to participate in a research study exploring critical care nurses perceptions of overtime work and its effect on patient outcomes because you are a critical care nurse. This is a student research project conducted under the supervision of Dr. Anita Fisher. The study will help the student learn more about the topic area and develop skills in research design, data collection, analysis and writing a research paper.

We are asking you to participate in an interview discussion and to answer some questions about why you do or do not work overtime hours, what factors underlie that decision, and how you think working overtime hours affects the patient care you are able to provide. This component of the overall mixed methods study will include approximately 27 nurses from intensive care units across three different academic health science centers across southwestern Ontario. By choosing to take part in this study you will be contributing to the development of increasingly effective staffing models that may increase your job satisfaction and patient safety in the future.

Why is this research being done?

Economic instability over the past two decades has resulted in shrinking healthcare budgets, and augmented pressure on health care organizations to care for increasingly sicker patients with fewer resources. Statistics Canada reported that nurses in the country worked a total of 20,627,800 hours of overtime in 2010 at a cost of $891 million dollars, raising questions as to its cost efficiency, and thus, its utility. Indeed, the incidence of overtime is higher among publicly

employed Canadian Registered Nurses (RNs) than the rest of the general national workforce.

These figures arose from an interplay of factors including nurse shortages, elevated patient volume and acuity, staff hiring freezes, and fiscal constraints resulting in lower base staffing levels. These underlying issues tend to be more prevalent in critical care units which experience unpredictable and rapid fluctuations in patient volume and acuity. Numerous studies show that overtime results in nurse fatigue and irritability. It has been suggested that fatigue has negative consequences to patients cared for by these nurses. The magnitude and direction of the effect of nursing overtime hours on patient outcomes is unknown, along with nurses' perceptions of, and preferences surrounding, overtime work.

What is involved in participating in this study?

We will ask you to participate in an individual interview discussion about overtime work. The process will take about half an hour and will take place in a conference room within your hospital.

How will information be kept private?

Each participating individual will be assigned a personal identification code which will be separately maintained. No one who reads or hears a report about this study will be able to identify you. Audiotapes, digital audio files, and transcripts from the interviews will be destroyed when the project is finished. You have the right to listen to the tape of your interview and change any information you provided therein. Information collected during this study will be stored for ten years after the study is finished in a locked area and then will be destroyed.

How will you benefit from participating in this project?

We cannot promise any personal benefits to you from participating in this study. However, possible benefits include enhanced staffing models, increased job satisfaction and better patient safety.

Are there any risks or discomforts involved in participating in this study?

While there are no known risks to participating in this study, it is possible that participants may experience mild anxiety or discomfort during the interview process.

Are there any costs or payments involved?

It will not cost you anything to participate. A $10 Tim Horton's gift certificate will be given to each participating nurse immediately following the interview.

How will I find out the results of this study?

This study will inform the development of effective, efficient nurse staffing strategies. What we learn will be shared with other health professionals through medical and academic publications. If you are interested in the results of the study after publication, please contact the principal investigator toward the end of 2014. We will be happy to share those publications with you.

What are my rights as a participant?

You are free to decide whether or not you will participate in this study. If you do decide to take part in this study, you may withdraw at any time. Information you provide will not be reported to your manager. Choosing not to participate in this study will in no way affect your standing as an employee. You may refuse to answer any questions you do not want to answer and still remain in the study. We will give you a copy of the consent form to keep for your records.

What information will be kept private?

Your data will not be shared with anyone except with your consent or as required by law. For the purposes of ensuring the proper monitoring of the research study, it is possible that a member of the organization's Research Ethics Board may consult your research data. However, no records which identify you by name or initials will be allowed to leave the university. By singing this consent form, you authorize such access. If the results of the study are published, your name will not be used and no information that discloses your identity will be released or published without your specific consent to the disclosure.

Whom do I call if I have any questions or problems?

Vanessa Lobo at 289-834-2526

If you have any questions regarding your rights as a research participant you may contact XXX

CONSENT

I understand that my participation in this study is voluntary, and that initial participation does not obligate me to participate in the study at a future date. All information gathered for this study is strictly confidential, and will be used by study investigators for research relating to nursing retention. I will not be identified in the published report. I am free to refuse participation or withdraw at any time. I have been given a chance to ask questions and feel that all of my questions have been answered. I understand that my individual results will not be given to me. I will receive a signed copy of this form.

Participant's Name	Participants Signature	Date
_____	_____	_____

I observed the process of consent. The prospective nurse read this form, was given the chance to ask questions, appeared to accept the answers and signed to enroll in this study.

Person Obtaining Consent	Signature	Date
_____	_____	_____

INVITATION TO PARTICIPATE IN ADDITIONAL RESEARCH

As interviews proceed and different ideas emerge, it may become important to clarify some initial thoughts and further explore emerging findings. This would result in a small number of additional individual interviews designed to explore specific ideas and how they relate to other themes that are emerging.

These interviews will:

1) Last for approximate 30 minutes
2) Be one-on-one
3) Involve a deeper exploration of specific themes

Participation is again entirely voluntary and you will be free to withdraw from the study anytime.

Should you choose to participate, you will receive a $10 Tim Horton's gift certificate.

If you might be willing to participate, please leave your e-mail address, which will only be used by the researcher to contact you at that time.

Thank you very much for your consideration and for sharing your thoughts today!

Yes! I am willing to participate in an additional individual interview ☐

You can contact me at this e-mail address (please print clearly):

_____

No thank you, I would not like to participate in an additional individual interview ☐

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

(Organization C)

STUDY TITLE: Nursing Overtime and its Effects on Patient Outcomes in Critical Care

NAME OF PRINCIPAL INVESTIGATOR (Study Doctor): XXX

CONTACT INFORMATION:

XXX

INTRODUCTION:

You are being asked to take part in a research study. Please read this explanation about the study and its risks and benefits before you decide if you would like to take part. You should take as much time as you need to make your decision. You should ask the study doctor or study staff to explain anything that you do not understand and make sure that all of your questions have been answered before signing this consent form. Before you make your decision, feel free to talk about this study with anyone you wish including your friends, family, and family doctor. Participation in this study is voluntary.

BACKGROUND/PURPOSE:

Economic instability over the past two decades has resulted in shrinking healthcare budgets, and increased pressure on health care organizations to care for sicker patients with fewer resources. Statistics Canada reported that nurses in the country worked 20,627,800 hours of overtime in 2010 at a cost of $891 million dollars, raising questions as to its cost effectiveness, and in turn, its utility. Indeed, the incidence of overtime is higher among publicly employed Canadian Registered Nurses (RNs) than the rest of the general national workforce.

These figures arose out of a number of factors including nurse shortages, higher patient volume, increasingly sicker patients, staff hiring freezes, and budget reductions resulting in lower numbers of nursing staff. These underlying issues tend to be more prevalent in critical care units that experience unpredictable and rapid changes in patient volume and acuity. Many studies show that overtime

results in nurse fatigue and irritability. It has been suggested that fatigue has negative consequences to patients cared for by these nurses. The extent and direction of the effect of nursing overtime hours on patient outcomes is unknown, along with nurses' perceptions of, and preferences surrounding, overtime work. The purpose of this study is to explore critical care nurses' preferences regarding overtime work, their perceptions of how it affects patient outcomes, and to determine if a relationship exists between critical care nursing overtime and specific patient outcomes.

You are being invited to participate in a research study exploring critical care nurses perceptions of overtime work and its effect on patient outcomes because you are a critical care nurse. Approximately 35 nurses will participate in this study with 12 from UHN, and it will take 3 months to complete. This study may contribute to the development of effective staffing models that may increase your job satisfaction and patient safety in the future.

STUDY DESIGN:

In order to gain a more complete understanding of nursing overtime and its effects in critical care, both qualitative and quantitative research methods will be employed. You are being invited to participate in the qualitative component of this study which involves interviews with critical care nurses about why they do or do not work overtime, how they think it affects themselves, the organization and their patients, and their limits when it comes to working additional hours.

PROCEDURES:

Study Visits: There will be one study visit that will last approximately half an hour for a single interview and a short demographic questionnaire.

We are asking you to participate in an interview discussion and to answer some questions about why you do or do not work overtime hours, what factors underlie that decision, and how you think working overtime hours affects the patient care you are able to provide. The process will take about half an hour and will take place in a conference room within your hospital. Interviews will be conducted by the study coordinator (Vanessa Lobo) from McMaster University. Interviews will be audio recorded so that they can be transcribed and analyzed with no identifying information.

VOLUNTARY PARTICIPATION:

Your participation in this study is voluntary. You may decide not to be in this study, or to be in the study now and then change your mind later. You may leave the study at any time without affecting your employment status. We will give you new information that is learned during the study that might affect your decision to stay in the study. You may refuse to answer any question you do not want to answer, or not answer an interview question by saying "pass".

WITHDRAWAL FROM STUDY:

If you decide to withdraw from the study, it will be your decisions whether or not to allow the research team to use any information already collected. If you decide that you would like it all removed from the records, your data will all be destroyed. No new information will be collected without your permission.

RISKS:

While there are no known risks to participating in this study, it is possible that participants may experience mild anxiety or discomfort during the interview process. Should you feel uncomfortable at any time you are free to decline any questions or withdraw from the interview entirely.

BENEFITS:

You may not receive direct benefit from being in this study; however, possible benefits include better staffing models, increased job satisfaction and better patient safety.

REMINDERS:

It is important to remember the following things during this study:

- Ask your study team about anything that worries you
- Tell your study team if you change your mind about being in this study

CONFIDENTIALITY:

If you agree to join this study, the study team will look at your years of nursing experience, level of education, age, marital status, number of children, gender and employment status. This information that you provide for the study will be kept in a locked and secured area by the study coordinator for 10 years. A list linking your study number with your name will be kept by the study coordinator in a secure place, separate from your study file. Representatives of the organization's Research Ethics Board may come to the hospital to check that information collected for the study is correct and to make sure the study followed proper laws and guidelines.

Some study information will be sent outside of the hospital to the research team at McMaster University. Any information about you that is sent out of the hospital will have a code and will not show your name or any information that directly identifies you. The research team may use the study information to help answer the research question.

All information collected during the study will be kept confidential, and will not be shared with anyone outside the study unless required by law. You will not be named in any reports, publications or presentations that may come from this study.

Audiotapes and digital audio files, from the interviews will be destroyed when the project is finished – at most two years from the time of your interview. You have the right to listen to the tape of your interview and change any information you provided therein.

COSTS:

It will not cost you anything to participate. A $10 Tim Horton's gift certificate will be given to each participating nurse immediately following the interview.

RIGHTS AS A PARTICIPANT

Information you provide will not be reported to your manager. Choosing not to participate in this study will in no way affect your standing as an employee.

By signing this form you do not give up any of your legal rights against the investigators, sponsor or involved institutions for compensation, nor does this

form relieve the investigators, sponsor or involved institutions of their legal and professional responsibilities.

CONFLICT OF INTEREST

McMaster University, the sponsor of this study, will reimburse the hospital and researcher for the costs of doing this study. All of these people have an interest in completing this study. Their interests should not influence your decision to participate in this study.

QUESTIONS ABOUT THE STUDY

If you have any questions, concerns or would like to speak to the study team for any reason, please call: XXX or Vanessa Lobo at 289-834-2526

If you have any questions about your rights as a research participant or have concerns about this study, call the Chair of the organization's Research Ethics Board or the Research Ethics office number at XXX. REB is a group of people who oversee the ethical conduct of research studies. The REB is not part of the study team. Everything that you discuss will be kept confidential.

CONSENT

As interviews proceed and ideas emerge, it may become important to clarify some thoughts and further explore findings. This would result in a small number of additional individual interviews designed to explore specific ideas and how they relate to other themes that are emerging. These interviews would follow the same format, be about half an hour each, and you would again receive a $10 Tim Horton's gift card as a small token of our gratitude.

Would you be willing to participate in an additional interview?

Yes ☐ No ☐

This study has been explained to me and any questions I had have been answered.

I know that I may leave the study at any time. I agree to take part in this study.

_____	_____	
Print Study Participant's Name	Signature	Date

(You will be given a signed copy of this consent form)

My signature means that I have explained the study to the participant named above. I have answered all questions

Name	Signature	Date
_____	_____	_____

APPENDIX D

Interview Guide

1. Do you work overtime? Why or why not?

   (Probes)
   a. What are some reasons you choose to come in for overtime?
   b. What are some reasons you would say no to overtime hours you are offered?

2. Do you work more, less or exactly as much overtime as you would like to work?

3. How do you think that working overtime affects:

   (Probe to speak about both types of overtime)
   a. You? (personally and/or professionally)

   b. The patients you care for?

   c. Your critical care unit?

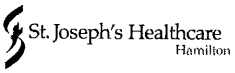
   d. The hospital/organization at large?

4. What do you like about working overtime?

5. What do you dislike about working overtime?

6. Do you see an effect of nursing overtime on nursing sick time in critical care?

APPENDIX E
McMaster University Ethics Approval Letter



Hamilton Integrated Research Ethics Board (HIREB)
293 Wellington St. N., Suite 102, Hamilton, ON L8L 8E7
Telephone: 905-521-2100, Ext. 42013
Fax: 905-577-8378

June 24, 2013

PROJECT NUMBER: **13-337**

PROJECT TITLE: A Mixed Methods Study of Nursing Overtime and its Effect on Patient Outcomes in Critical Care

PRINCIPAL INVESTIGATOR: **Vanessa Lobo**
LOCAL PI: **Anita Fisher**

This will acknowledge receipt of your letter on June 12, 2013 which enclosed revised copies of the Information/Consent Form and the Application Form along with response to the additional queries of the Board for the above-named study. These issues were raised by the Hamilton Integrated Research Ethics Board at their meeting held on May 21, 2013. Based on this additional information, we wish to advise your study has been given ***final*** approval from the full HIREB.

The following documents have been approved on both ethical and scientific grounds:

- The submission
- Study Protocol version dated April 30, 2013
- Information/Consent Form version dated April 30, 2013
- Invitation to Participate in Study – Perceptions of Overtime version dated April 30, 2013
- Interview Guide version dated April 30, 2013
- Demographic Form version dated April 30, 2013

Please note attached you will find the Information/Consent Form with the HIREB approval affixed; all consent forms used in this study must be copies of the attached materials.

We are pleased to issue final approval for the above-named study for a period of 12 months from the date of the HIREB meeting on May 21, 2013. Continuation beyond that date will require further review and renewal of HIREB approval. Any changes or revisions to the original submission must be submitted on an HIREB amendment form for review and approval by the Hamilton Integrated Research Ethics Board.

PLEASE QUOTE THE ABOVE-REFERENCE PROJECT NUMBER ON
ALL FUTURE CORRESPONDENCE

Sincerely,

S. Salama

Suzette Salama PhD.,
Chair, Hamilton Integrated Research Ethics Board

The Hamilton Integrated Research Ethics Board operates in compliance with and is constituted in accordance with the requirements of: The Tri-Council Policy Statement on Ethical Conduct of Research Involving Humans; The International Conference on Harmonization of Good Clinical Practices; Part C Division 5 of the Food and Drug Regulations of Health Canada, and the provisions of the Ontario Personal Health Information Protection Act 2004 and its applicable Regulations; for studies conducted at St. Joseph's Hospital, HIREB complies with the health ethics guide of the Catholic Alliance of Canada

APPENDIX F

List of Quantitative Variables in Data Set

Nursing Variables

Nursing Worked Hours (excluding overtime)
Nursing Overtime Hours
Nursing Sick Hours

Infection Variables

Central Line Days
Central Line Infections Incidents - nosocomial and community
Central Line Infection Rate

Vented Days
Ventilator Associated Pneumonia Incidents - nosocomial and community
Ventilator Associated Pneumonia Rate

Clostridium Difficile Infections
Clostridium Difficile Rate

MRSA community acquired
MRSA nosocomial infections

VRE community acquired infections
VRE nosocomial infections

Patient Variables

Deaths
Discharges
Mortality Rate
Multiple Organ Dysfunction Score (MODS) minimum
MODS maximum
MODS mean
Number of patients