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The Relationship Between Inter-Professional Collaboration, Job Satisfaction, and Patient Safety Climate for Nurses in a Tertiary-Level Acute Care Hospital

Noha Mohammedali Hamlan
The University of Western Ontario

Supervisor
Dr. Michael Kerr
The University of Western Ontario

Graduate Program in Nursing

A thesis submitted in partial fulfillment of the requirements for the degree in Master of Science

THE RELATIONSHIP BETWEEN INTER-PROFESSIONAL COLLABORATION, JOB SATISFACTION, AND PATIENT SAFETY CLIMATE FOR NURSES IN A TERIARY-LEVEL ACUTE CARE HOSPITAL

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by

Noha MohammedaliAbadiHamlan

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School of Graduate and Postdoctoral Studies
The University of Western Ontario
London, Ontario, Canada

ABSTRACT

The purpose of this secondary data analysis study was to examine nurses' perceptions about inter-professional collaboration (IPC), job satisfaction and patient safety climate and the possible relationship between them in a large tertiary care hospital in Ontario, Canada. The data used for this study came from a large quasi-experimental study to evaluate the impact of introducing a new model of IPC. D'Amour's Inter-professional Collaboration, Hackman & Oldham's Global Job Satisfaction, and Sexton's Patient Safety Climate were the main instruments used in this study. Study results showed that nurses reported moderate levels of IPC (M= 3.56, SD= .65) as measured by two inter-professional subscales including: care coordination (M= 3.46, SD= .74) and sharing clinical activity (M= 3.63, SD= .66), moderate levels of job satisfaction (M= 3.28, SD= .97), and lastly, nurses reported moderately high perceptions of patient safety climate (M= 75.59, SD= 16.96). Multiple linear regression showed that inter-professional collaboration and nurses' job satisfaction explained a significant amount of the variance in patient safety climate [R^2 = .33, F (7, 740) = 52,15, p < .05]. This is may be the first study to report nurses' perceptions about job satisfaction partially mediates the relationships between inter-professional collaboration and patient safety climate.

Keywords: inter-professional collaboration, nurses' job satisfaction, patient safety climate, nurses' perception, relationship.

CO-AUTHORSHIP

Noha Hamlan accomplished the following work under the supervision of Dr. Mickey Kerr and Dr. Kathy Momtahan who will also be co-authors on the publication resulting from part two of this manuscript.

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TABLE OF CONTENTS

Page

Table of Contents (Continued) Page

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENICES

PART ONE

INTRODUCTION

Health services are basic pillars of social services that countries support and fund, in an effort to help ensure the health of their citizens and communities. Over the past two decades, several social, political and economic changes have occurred that have had negative impacts on the health care delivery system (Shah, 2011). These negative impacts now require a variety of interventions to help healthcare workers cope with thechallenges created by sharply increased demand for their services (Trinkoff, et al., 2008).

In order to meet these challenges, health care organizations in Canada first have to deal with a growing shortage of health care professionals (Ogilvie, 2014) as well as the limitations of individual health professionals from different specialties to address the complicated and complex health care needs of patients and clients (Bourgeault&Mulvale, 2006; Parker Oliver, Wittenberg-Lyles, & Day, 2006). Identifying such challenges has led to an increased emphasis on the importance of providing cost-effective quality care, promoting wellness, and creating prevention strategies that take patients' needs into account (Trinkoff et al., 2008). Thus, it is suggested that to provide the best care possible for their patients and clients, health care professionals must work together as a team, sharing their skills and knowledge through inter-professional collaboration (Canadian Institute for Health Information [CIHI], 2010; Virani, 2012). Understanding the value of inter-professional collaboration is important to improve the effectiveness of healthcare organizations.

Inter-professional collaboration (IPC) has been advocated as one of the best strategies for health care systems to adopt when trying to improve outcomes (Chan & Wood, 2010). Inter-professional collaboration also enhances the effectiveness and

efficiency of practice, and also improves patient outcomes
(Martin, Ummenhofer, Manser& Spirig, 2010; Lumague, et al., 2006). In other words, effective collaborative teamwork is designed for team members to share and understand the responsibilities, skills, knowledge, trust and functions of every member of the team for treatment decisions and patient outcomes. The sharing and understanding also takes into account the goals and values of patients and their families (Bridges, Davidson, Odegrad, Maki,&Tomkowiak, 2011; The Canadian Interprofessional Health Collaborative [CIHC], 2010). The ultimate goal of IPC is to encourage the active and effective participation of every discipline required for patient care (Trinkoff et al., 2008).

Like many countries, Canada invests heavily in the development of health and health services. There is strong support for IPC in Canada amongst many health care disciplines, including nursing (Canadian Medical Association, 2008; Canadian Nurses Association [CNACNA], 2006; Canadian Pharmacists Association, 2003; Canadian Physiotherapy Association, 2012; College of Nurses of Ontario [CNO], 2009). The Canadian Nurses Association (2006) reported that quality health care could be supported through the collaboration of professionals, whereas every professional within a health care organization looks at inter-professional collaboration for patient care from different perspectives. In addition to enhancing health care outcomes, IPCcould provide clear benefits, such as decreasing waiting time, managing conflict, improving healthcare in rural areas, improving chronic disease management, and providing a healthy workplace environment (Canadian Interprofessional Health Collaborative [CIHC], 2009). IPC is especially effective in nursing environments, as nurses represent the largest segment of health sector workers in most health care organizations (Hughes, 2008). In addition, according to the Royal Collage of Nursing (RCN, 2012),nursing is considered the

backbone of health care delivery in health institutes and has a clear impact on health services.

In addition to IPC, job satisfaction plays a significant role in the outcomes of patient care and the nurses performance. Job satisfaction is defined as the degree of attitude or emotional response as well as the physical and social conditions to which individuals feel positively or negatively about their jobs (Jathanna, Melisha, Mary,&Latha, 2011). Job satisfaction is motivational and leads to positive collaborative employment relationships, which could also lead to positive patient outcomes (Lambrou, Kontodimopoulos,&Niakas, 2010). According to the literature, job satisfaction in health care organizations is related to numerous factors, such as good working arrangements, active participation in the decision-making process, effective communication among staff and supervisors, and the ability to freely express one's opinions (Lambrou et al., 2010). Within healthcare organizations, health care professionals will have difficulties in meeting the needs of their patients if their own needs are not met (Yildiz, Ayhan,&Erdoğmuş, 2009). Accordingly, when health care managers develop an environment that encourages and supports job satisfaction, health care employees would be more motivated, productive, and fulfilled comparing to other environments. This, in turn, could contribute to higher quality patient care and patient satisfaction (Rathert& May, 2007).

A successful patient safety climate is being considered as one of the major principles in health care organizations. This is because almost every process performed by health care professionals caries potential risks and problems associated with its use in practice (Flin, Burns, Mearns, Yule,& Robertson, 2006). Thus, there is a lot of interest regarding the patient safety climate within healthcare organizations as it has tremendous

potential benefit, especially the reduction of errors that may cause serious consequences to patients (Singer, Falwell, Gaba,& Baker, 2008). Patient safety climate refers to the shared perceptions of healthcare professionals on particular aspects within the organization's culture in relation to patient care and patient safety (Flin et al., 2006). The aim of patient safety climate is to avoid adverse outcomes or reduce possible harm to patients, resulting from the process of healthcare delivery (Flin et al., 2006; Sexton et al., 2006). There are many factors can shape and support employees' perceptions of safety climate such as interdisciplinary, interdepartmental, peer, and supervisory communication (Duthie, 2006). Many researchers have proposed that positive patient safety climate could promote and improve patient safety, in addition, to improving organizational reporting of errors, self reporting of errors, safety behaviors and safety audit ratings (Hellings, Schrooten, Klazinga,&Vleugels, 2007; Mearns, Flin, Gordon,& Fleming, 2001; Singer et al., 2009; Zohar, 2000). Therefore, healthcare professionals should continually modify their collaborative processes to make the patient safety climate more efficient and improve patient outcomes (Pronovost& Sexton, 2005). Effective inter-professional collaboration is therefore important to enhance and support the patient safety climate and increase job satisfaction levels.

A literature review was performed to search for previous studies on IPC, job satisfaction and patient safety climate, and the relationships between them. A number of separate studies have been conducted on IPC and its relation to communication and the level of job satisfaction reported by health care professionals (Dieleman et al., 2004; Pullon, 2008;Rodehorst et al., 2005; Suter et al., 2009) and on the patient safety climate (Ausserhofer et al., 2012; GodinhoRigobello et al., 2012). Many authors agreed that reasons for engaging in collaborative practice included improving provider satisfaction

and enhancing patient safety. However, no research has yet been done to study the perception of nurses about the relationship between IPC, job satisfaction, and patient safety climate. Many of the studies focused on the benefits of IPC and job satisfaction among health care professionals in general, and on developing a positive patient safety climate in hospital units. The results of this literature review suggest a research gap and thus provide the rationale for studying the relationship between IPC, job satisfaction, and the patient safety climate in nursing.

Therefore, a study of inter-professional collaboration in nursing and the work environment, including what nurses' experience within their workplace, is crucial for identifying the nature of the relationships between inter-professional collaboration, job satisfaction and patient safety climate. Several issues could develop because of the lack of collaboration within health care organizations, as simply boosting nursing numbers is not going to resolve all of today's health care delivery problems. In contrast, introducing inter-professional collaboration within health care organizations affords the potential for health care professionals to work collaboratively to provide high quality patient care (Haire, 2010). The purpose of this secondary data analysis study is to examine nurses' perceptions about inter-professional collaboration, job satisfaction and to explore patient safety climate and the possible relationship between them in a large tertiary care hospital in Ontario, Canada.

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PART TWO

MANUSCRIPT

Background and Significance

Despite significant advances in healthcare development, healthcare systems the world over are facing increasing challenges. The most important of these is the sharp rise in healthcare needs that is occurring at the same time as a severe lack of human resources in the health sector. The labour shortage limits the effectiveness both of healthcare systems and healthcare delivery (Peabody, Taguiwalo, Robalino,&Frenk, 2006).

The nursing profession has been experiencing a growing shortage in nurses for several decades. The extent of the shortage varies from country to country and has several different causes, including problems that nursing professionals experience on the job. These problems include increased workload and burnout, job dissatisfaction, and lack of effective communication among healthcare professionals in healthcare organizations (Berry,& Curry, 2012;Carayon,&Gurses, 2008; O'Daniel& Rosenstein, 2008; Paterson, Medves, Dalgarno, O'Riordan, &Grigg, 2013;Steckler, 2012; Toh, Ang,&Devi, 2012). As well as affecting the nurses themselves, these nursing-related issues have diverse impacts on patient safety and patient health outcomes (Berry & Curry, 2012).

In response to these issues, there is renewed interest in finding ways to improve the healthcare system through improving issues around access, quality, and effectiveness. One potential way to accomplish this goal is to introduce inter-professional collaboration (IPC) within health care organizations (College of Nurses of Ontario, 2008; Rose, 2011). The Canadian Inter-professional Health Collaborative (2010) defines IPC as "a partnership between a team of health providers and a client in a participatory

collaborative and coordinated approach to shared decision making around health and social issues." IPC in practice also includes good communication and decision-making skills, both of which influence the overall outcome of the care provided by collaborative teams (Canadian Inter-professional Health Collaborative [CIHC], 2009). Furthermore, IPC increases the level of cooperation and collaboration between team members; enhances team members' knowledge of one another's roles and scope of practice; heightens mutual trust and respect amongst colleagues; delineates the working arrangement; and helps balance the workload (Cioffi, Wilkes, Cummings, Warne,& Harrison, 2010; Donald, Misener, Lukosius, Kilpatrick, Kaasalainen, & Carter, 2010; Goldman, Meuser, Rogers, Lawrie,& Reeves, 2010; Howard, Brazil, Akhtar-Danesh,&Agarwal, 2011; Russel, Dabrouge, Hogg, Geneau, Muldoon,&Meltem, 2009).

Many professionals value IPC in healthcare and point to its importancein improving the quality of patient care and productivity along with the cost-effectiveness of primary health care, acute care and rehabilitation (Barrett, Curran, Glynn,& Godwin, 2007; Careau, Brie`re, Houle, Dumont, Vincent,&Swaine, 2015; Holland et al., 2013; Lumague et al., 2006). In addition to enhancing health care outcomes, IPCcould provide clear benefits, such as decreasing waiting time, managing conflict, improving healthcare in rural areas, improving chronic diseases management, and providing a healthy workplace environment (CIHC, 2009). The World Health Organization (WHO, 2010) also states that collaborative practice "will play an important role in mitigating the global health workforce crisis" (p. 7). Identifying such benefits for IPC in practice can lead to many IPC-related national and international policies.

IPC is especially effective in nursing environments, as nurses represent the largest segment of health sector workers in any healthcare organization and are considered the

backbone of healthcare delivery in all health institutes (Hughes, 2008; Royal College of Nursing [RCN], 2012). Moreover, in Canada, according to the Canadian Institute for Health Information's (CIHI) annual report on the nursing workforce, nursing is listed among the top occupations in terms of job growth over the next decade, with the Registered Nurse (RN) workforce expected to grow at nearly twice the rate of population growth. More than 360,000 nurses were employed in 2011 in Canada, which represents an increase of more than 8% since 2007 (Canadian Institute for Health Information, 2013). However, increased numbers of nurses does not necessarily improve healthcare delivery standards. The implementation of IPC would help to improve the working conditions for healthcare providers, as well as enhance patient safety and patient outcomes.

In terms of relevance, findings from this study may help in the delivery of information and knowledge on how nurses in Canada are impacted by inter-professional collaboration. Specifically, we may gain insight into the nurses' perspectives on the relationships between IPC, job satisfaction, and patient safety. Identifying these relationships would support the development of more effective ways for nurses to participate in collaborative teams, as nurses play a fundamental role in health care organizations.

In addition, the information identified in this study can be used by nursing administrators in Canada to develop future interventions to improve IPC and job satisfaction, with the aim of providing a better patient safety climate. The study findings could also serve as a model for improvements in the healthcare delivery system outside Canada. Finally, the results have the potential to drive policies related to IPC and working within healthcare teams. It is anticipated that this research will add value by

positively impacting evidence-based policy in areas that will directly affect and thus improve healthcare teams.

Literature Review

Inter-professional Collaboration

Since the early 1980s, discussions around IPC and how collaborative teams could help improve health outcomes have been the focus of many leaders and educators in health care organizations (The World Health Organization [WHO], 2013). Inter-professional collaboration (IPC) is one of many kinds of collaboration that exist within the literature. IPC was defined by The Canadian Inter-professional Health Collaborative (2010) as "a partnership between a team of health providers and a client in a participatory collaborative and coordinated approach to shared decision making around health and social issues." Health Force Ontario (2007) defined IPC as the "provision of comprehensive health services to patients by multiple health caregivers who work collaboratively to deliver quality care within and across settings" (p. 7), adding that IPC "involves the positive interaction of two or more health professionals to bring their unique skills and knowledge to assist clients, families and communities with their health decisions" (Canadian Association of Occupational Therapists, 2006, p. 122). The team works together in a relationship based on respect and interdependency towards a common purpose, which is patient-centered care (MacIntosh& McCormack, 2001). From these definitions, we can understand that inter-professional teamwork is more collaborative in nature, as the prefix "inter" in the term inter-professional refers to effective communication between and among inter-professional team members from different professions(MacIntosh& McCormack, 2001).

The aim of inter-professional collaboration in practice is to provide an equal

opportunity for each profession in the inter-professional collaborative team to share information and knowledge in a respectful and trusting environment (MacIntosh& McCormack 2001; Nowdbilski-Vasilios& Poole, 2001). A collaborative inter-professional team requires each member to have a respectful attitude for each other while sharing knowledge and responsibility, understanding the functions of each team member, and working together to deal with different client situations (Hall, 2005). Inter-professional teams also need to consider the patient and/or family as part of their collaborative effort. Thus, all decisions regarding the patient and his/her condition should be made by the whole group and involve each member, or that decision may not be a fully-informed one (Ray, 1998).

According to numerous studies, the first important step in implementing IPC within a healthcare organization is to provide "Patient-centered care", which means to provide care in an environment that gives patients high quality care according to his/her needs (Arevian, 2005; Callahan et al., 2006; Sharp, 2006; Watters & Moran, 2006). Arevian (2005) conducted a secondary analysis on the significance of a collaborative practice in improvement of care provided to diabetic clients in Lebanon (Beirut). Before conducting this study, the author assumed that "collaborative practice interventions may improve quality care of diabetes mellitus type 2 (DM2) and reduce or delay complications". The outcomes of this study were positive and revealed an improvement in documentation, an increase in the recruitment of clients, enhanced continuity of care, improvements in glycemic control, and a reduction in the cost of diabetes care (Arevian, 2005).

Collaboration between healthcare professionals within healthcare settings also plays a major role in increasing the positive outcomes of patients with Alzheimer's

disease. Callahan and colleagues (2006) conducted a study on the usefulness of collaborative care for older adults with Alzheimer's disease in primary care. In their controlled clinical trial, they offered collaborative care management and augmented usual care for 153 of older adults with Alzheimer's and their caregivers. The patients and their caregivers in the collaborative care management group received an intervention for one year by an inter-professional team that included their primary care physician and a geriatric nurse practitioner. As measured by usingthe caregiver Neuropsychiatric Inventory (NPI) at different times during the study, results were significant in primary care patients and their caregivers who had the intervention care for their behavioral and psychological symptoms of dementia, compared with clients in the augmented usual care group (Callahan et al., 2006).

Due to its considerable importance in the health sector, IPC is starting to be taught to healthcare students under the name of inter-professional education (IPE). Inter-professional education (IPE) is an essential approach for healthcare students who are preparing for their professional work as well as for healthcare employees to provide patient care in a collaborative team environment (Canadian Inter-professional Health Collaborative [CIHC], 2010). The proposed benefit of IPE is that when healthcare students and professionals have the knowledge and the ability to work together in a collaborative team, patient outcomes will improve (Brashers et al, 2001; Freeth, Hammick , Reeves, Koppel,& Barr, 2005; Koppel, Reeves, Hammick,&Freeth, 2005). There is strong support for IPC and IPE in Canada among many healthcare disciplines, including nursing (Canadian Medical Association, 2008; Canadian Nurses Association [CNACNA], 2006; Canadian Pharmacists Association, 2003; Canadian Physiotherapy Association, 2012; College of Nurses of Ontario [CNO], 2009; The World

Health Organization, 1988).Most notably, the Canadian Nurses Association (2006) declared that healthcare could be supported through the collaboration of professionals, while every profession within a healthcare organization looks at inter-professional collaboration from different perspectives of patient care.

Horsburgh and colleagues (2001) studied the attitudes of first-year medical, nursing, and pharmacy students toward IPE at the University of Auckland. In this study, the authors used the Readiness for Inter-professional Learning Scale (RIPLS) to analyze the differences between the three groups of students. Most of them reported positive attitudes towards shared learning, although "nursing and pharmacy students indicated more strongly that an outcome of learning together would be more effective team working" (p. 876).

In addition to enhancing healthcare outcomes, healthcare professionals could gain many benefits from implementing IPC within ahealthcare environment. These benefits include preventing unnecessary or repeated investigations from being performed (Ruhstaller et al., 2006); improving clinical rounds; decreasing errors in healthcare settings (Horak, Pauig, Keidan, & Kerns, 2004); professionals gaining an appreciation of their own profession (McKenzie, 1999); and professionals gaining a clearer understanding of and respect for other professionals (Ray,1998; Schofield &Amodeo, 1999). Benefits also include an increase in the level of trust, which leads to greater levels of understanding of the roles of other professionals (Ray, 1998). Additional benefits aredecreased waiting time, better conflict management, improved healthcare in rural areas, improved chronic disease management, the provision of a healthy workplace environment (Canadian Interprofessional Health Collaborative[CIHC], 2009),and an increase in productivity by reducing competition for the same patient (McKenzie, 1999).

Inter-professional collaboration is mainlyefficient in nursing environments, as nurses represent the largest segment of health sector workers in most healthcare organizations (Hughes, 2008). In addition, according to the Royal College of Nursing (RCN, 2012),nursing is considered the backbone of health care delivery in health institutes and has a profound impact on health services.Finally, from what has already been mentioned above, the objective of IPC is to provide good patient-centered care, which is linked to providing a collaborative environment for health practitioners as well as an enhanced patient safety climate in order to achieve the desired results.

Job Satisfaction

Job satisfaction amongst registered nurses (RNs) has been a focus of study for many years. It is an important part of the psychology and the behavior within any healthcare organization, which improves the productivity and the effectiveness of employees (Cameron, Mora, Leutscher,&Calarco, 2011). Job satisfaction is defined as the degree of attitude or emotional response as well as the physical and social conditions to which individuals feel either positively or negatively about their jobs (Jathanna, Melisha, Mary,&Latha, 2011). It is motivational and leads to positive collaborative employment relationships, which could also lead to positive patient outcomes (Lambrou, Kontodimopoulos,&Niakas, 2010). In contrast, job dissatisfaction is cited as one of the main reasons for many registered nurses in hospitals to leave their jobs (Hayes et al., 2006; Kovner, Brewer, Greene,& Fairchild, 2009).

Moreover, the working environmentis one of the factors that plays a key role in nurses' job satisfaction. The quality of the nursing working environment is considered an essential part of RN satisfaction, productivity, recruitment, and retention (Canadian Council on Health Services Accreditation, 2007; Canadian Nurses Association [CAN],

2006; Canadian Nurses Association, 2010). Within the nursing realm, a supportive work environment is defined as the presence of a set of organizational and human supports within health care facilities to support professional nursing practice (Canadian Nursing Associaition, 2008). According to the literature, job satisfaction in healthcare organizations is related to numerous factors around the nursing work environment, such as high standards of quality care, active participation in the decision-making process,adequate resources,effective communication among staff and supervisors (includingcollegial nurse-physician relationships), and the ability to freely express one's opinions (Lake, 2007, Lambrou, Kontodimopoulos,&Niakas, 2010).

Several empirical studies haveshown that the quality of nursing work environment in hospitals directly impacts the quality of care that registered nurses provide and also has an effect on patient safety (Aiken, Clarke, Sloane, Lake,& Cheney, 2008; International Council of Nurses, 2007). Studies also found that a positive and supportive work environment within healthcare organizations is associated with higher registered nurses job satisfaction (McHugh, Kutney-Lee, Cimiotti, Sloane,& Aiken, 2011; Patrician, Shang,& Lake, 2010).

Consequently, by building an environment that supports job satisfaction, healthcare professionals would be more motivated, productive, and fulfilled. This, in turn, would also help in providing high quality patient care and patient satisfaction (Prakash, 2010; Rathert&May, 2007). Thus, it is possible to link job satisfaction to inter-professional collaboration and possibly to patient safety climate as well.

Patient Safety Climate

A successful patient safety climate is considered one of the major priorities for healthcare organizations. This is because every process performed by healthcare

professionals has potential risks and problems in practice, use of products, or within some procedures (Flin, Burns, Mearns, Yule,& Robertson, 2006). Thus, there is immense interest in developing ways to improvethe patient safety climate within healthcare organizations, especially throughthe reduction of errors that may cause serious consequences to patients (Singer, Falwell, Gaba,& Baker, 2008). For instance, the 1999 report by the Institute of Medicine (IOM) "To Error is Human: Building a Safer Health System" suggested that within a safe culture where people are not blamed for reporting adverse events, health workers would have the opportunity to learn from their mistakes, and institutions would be able to make improvements to prevent futurehuman and system errors (*Institute of Medicine, 2004*). Hence, it is important for hospitals to know about patient safety climate and culture if they are to improve patient safety.

Patient safety culture and patient safety climate are generally considered to be similar concepts, but they are distinguished as separate topics in the literature (Scott et al., 2004). Safety culture refers to an overall phenomenon that includes the norms, values and basic assumption of an entire organization (Zohar, 2000), that determine a team or organisation's commitment to safety. Whereas safety climate refers to the shared perceptions of healthcare professionals on particular aspects within the organization's culture (Flin et al., 2006), that provide healthcare providers perceptions' to safety. The terms 'culture' and 'climate' are often used interchangeably.The aim of the patient safety climate is to avoid adverse outcomes and reduce possible harm to a patient from healthcare professionals(Flin et al., 2006; Sexton et al., 2006). In a safe climate, interdisciplinary, interdepartmental, peer, and supervisory communication can shape employees' perceptions (Duthie, 2006).

Smits and her colleagues (2008) recommended that creating a positive patient safety climate requirescomplex effort, including a range of actions in performance improvement, environmental safety and risk management, infection control, safe use of medicines, equipment safety, safe clinical practice, and safe environment of care. In addition, many researchers propose that positive patient safety climates could promote and improve patient safety, and improve error reporting, safety behaviors, and safety audit ratings(Hellings, Schrooten, Klazinga,&Vleugels, 2007; Mearns, Flin, Gordon,& Fleming, 2001; Singer et al., 2009; Zohar, 2000).

Finally, based on the literature reviewed, healthcare professionals should continually modify their collaborative processes to make the patient safety climate more efficient and improve patient outcomes (Pronovost& Sexton, 2005). Effective inter-professional collaboration is therefore important to increase job satisfaction levels and to enhance and support the patient safety climate and patient care.

Related Research

A literature review was performed to search for previous studies on IPC, job satisfaction and patient safety climate, as well as the relationships between them in relating to nursing. A number of separate studies were conducted on IPC and its relation to communication, the level of job satisfaction reported by health care professionals (Dieleman et al., 2004; Pullon, 2008;Rodehorst et al., 2005; Suter et al., 2009), and the patient safety climate (Ausserhofer et al., 2013;Rigobello et al., 2012). Most of the studies focused on the benefits of IPC and job satisfaction among health care professionals in general, and on developing a positive patient safety climate in hospital units. Study authors agreed that reasons for engaging in collaborative practice included improving provider satisfaction and enhancing patient safety climate. However, to date,

there have been no studies examining IPC in nursing within the context of job satisfaction and patient safety climate.

Inter-professional Collaboration and Job Satisfaction

Since 1998, many authors have advocated the benefit of IPC and it is relationship with job satisfaction amonghealthcare professionals (Proctor-Childs, Freeman, & Miller, 1998). In addition, study findings show that inter-professional collaboration among healthcare professional teams lead to improved professional development and increased job satisfaction between professionals working in two neuro-rehabilitation units (Proctor-Childs, Freeman, & Miller, 1998).

There was also strong evidence indicating the positive outcomes of collaborative practice between specific groups of professionals. For example, in their study of an inter-professional healthcare team (physicians, pharmacists, and nurses), Dieleman and colleagues (2004) reported that collaboration improved their work together as a community-based team to provide care to high-risk persons. Each team member reported experiencingeffective communication and understanding between them and noticed "an increased comfort level when interacting with other professionals, an appreciation for other team members' perspectives and roles in health care, and a preference to work in a team environment when providing care for high-risk individuals" (p. 77). O'Brien-Pallas, Hiroz, Cook,&Milden (2005) also reported positive outcome rising from nurse-physician collaboration.

In the theoretical literature, collaborative models of practice were mentioned by a few authors, where these models are associated with improved satisfaction among health professionals (Sharp, 2006; Yeager, 2005). Sharp and Yeager both considered that job satisfaction is an outcome of collaborative practice. Sharp (2006) suggested that a

collaborative approach could also lead to "more effective and efficient work by and improved satisfaction among health professionals" (p. 4). Thus, although there is some evidence of the link between job satisfaction and inter-professional collaboration, it is limited in the nursing literature.

Inter-professional Collaboration and Patient Safety Climate

The Health Council of Canada (2009) stated that there is strong evidence of a positive correlation between IPC and patient safety climate. They propose that when healthcare professionals communicate effectively and know how to work as a team, the quality of patient care increases (Health Council of Canada, 2009). Furthermore, Bridges, Davidson, Odegard, Maki,&Tomkowiak (2011)proposed that educating healthcare professionals and students about concepts of working collaboratively as an inter-professional team would enhance the culture of patient safety. In other words, the ability to work collaboratively within a workplace could enhance a culture of safety and professionals would be more effective in management of adverse health events when they do occur.

In 2007, the Canadian government established a task force on adverse health events in order to study and evaluate different adverse events in healthcare, and to see how they are determined by the healthcare system (*Task Force, 2009*). All regional health authorities and provincial Departments of Health and Community Services were to follow a culture of patient safety in order to identify, evaluate and respond to different adverse events. One of the forty-one recommendations put fort by Memorial University of Newfoundland (MUN) was the implementation of an inter-professional curriculum focused on patient safety (*Task Force, 2009*). The purpose of such a curriculum was to develop and evaluate of an undergraduate inter-professional patient safety education

module. Furthermore, it was recommended that inter-professional input be consulted for guidance in the curriculum's development by the Canadian Patient Safety Institute (CPSI, 2008) Safety Competencies Framework.

In 2007, the Canadian government carried out the Commission of Inquiry on Hormone Receptor Testing (Eastern Health, 2013), under Justice Cameron. This work was as a result of significant estrogen and progesterone receptor testing errors by the Eastern Health Regional Health Authority between 1997 and 2005. Justice Cameron outlined 60 recommendations in her final report. She recommended establishing clear policies to evaluate adverse events, electronic occurrence reporting, and senior leads for quality in all regional health authorities (Eastern Health, 2013).

Recently, Manojlovich and colleagues (2014) conducted a secondary data analysis study among 1,896 health professionals from 13 different disciplines, including nurses, physicians and physiotherapists. They conducted their study to evaluate the implementation of the inter-professional model of patient care (IPMPC) at the Ottawa Hospital in Ontario, Canada. The main objective for the original study was to improve interdisciplinary collaboration. Manojlovich and colleagues (2014) studied the relationship between inter-professional collaboration, patient safety climate, and respect through possible mediation by inter-professional conflict. They concluded that healthcare professionals benefited from the implementation of IPMPC as it deepens the understanding of healthcare workers on how to collaborate with each other in order to build an environment that supports a patient safety climate (Manojlovich et al., 2014).

Job Satisfaction and Patient Safety Climate

It is seems logical for researchers to link patient safety climate and patient satisfaction to healthcare professionals' satisfaction. This is because within a positive

work environment, health care professionals will be more satisfied, which will lead them to focus on their jobs, which will then lead to better performance, increased patient satisfaction, and an improved patient safety climate (Peltier& Dahl, 2009).

In July 2003, the Georgia Quality Initiative (U.S.A.), brought different organizations together in order to improve and increase the quality of long-term care throughout the state of Georgia (Grant, 2007). These organizations included the state regulatory agency, the Alzheimer's Association, the Georgia Health Care Association (GHCA), and nursing facilities. The authors reported that organizations with higher healthcare professional satisfaction had better clinical outcomes, workforce performance, and occupancy. The organizations included in the study also reported fewer patient falls and fewer residents with acquired pressure ulcers and acquired catheters, reduced nurse turnover, increased nurse stability, less absenteeism of certified nurse assistants and nurses (CNA), and higher occupancy (Grant, 2007). Based on these results, it was concluded that job satisfaction could directly impact patient care quality and the patient safety climate.

Furthermore, Saari and Judge (2004) found that there is a relationship between job satisfaction, performance and the complexity of the job. Higher job satisfaction and performance occur more in complex jobs such as nursing than in less complex jobs. In addition, there is growing evidence of a link between healthcare professional job satisfaction and the outcome of care. Nurses who were less satisfied with their job were found to isolate themselves from their patients and their responsibilities, causing a decrease in the quality of care, which negatively affected the patient safety climate (Kane, Shamliyan, Mueller, Duval,& Wilt, 2007). Yildiz, Ayhan, &Erdoğmuş (2009) used an ordinal regression model to explore the impact of the factors on nurses' intention

to quit. In their study they showed that problems faced by healthcare professionals, such as stress and illness, can lead to poor clinical judgment, which then not only risks harming patients, but leaves nurses vulnerable to injury and prone to higher absenteeism rates.

Rigobelloand colleagues (2012) conducted a cross-sectional descriptive studyto evaluate the perception of the safety climate of nursing professionals working in the medical and surgical clinics of a teaching hospital. In their study, they used the Safety Attitudes Questionnaire (SAQ) and concluded that the safety climate of professionals varied according to gender, clinic, professional category and time of work. In addition, they found that job satisfaction and support within a health care team are important for patient safety (Rigobelloet al., 2012), and that nurses' perceptions towards the patient safety climate could lead to improvements in health care and reduction in risks to the patient.

Hypotheses and Questions

The purpose of this secondary data analysis study is to examine nurses' perceptions about IPC, job satisfaction and patient safety climate in a large tertiary care hospital in Ontario, Canada. Possible relationships between these variables were examined based on the following two questions.

1) Is there a direct relationship between inter-professional collaboration and patient safety climate?
2) Does job satisfaction partially mediate the relationship between inter-professional collaboration and patient safety climate?

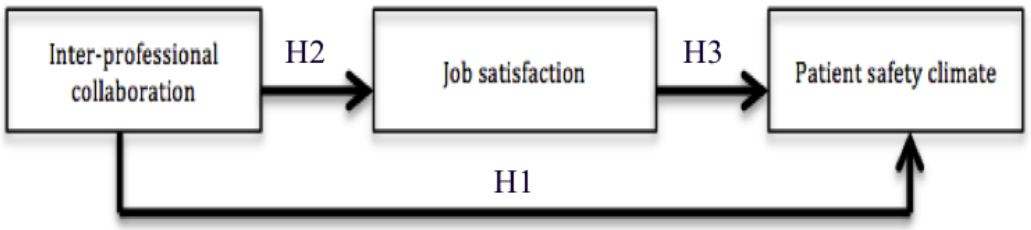

Figure 1. A conceptual model for assessing nurses' perceptions about the relationships between inter-professional collaboration, nurses' job satisfaction, and patient safety climate.

Based on the proposed study model shown in Figure 1, the following study hypotheses were developed:

1) Inter-professional collaboration is positively related to patient safety climate.
2) Inter-professional collaboration is positively related to nurses' job satisfaction.
3) Nurses' job satisfaction is positively related to patient safety climate.
4) Job satisfaction partially mediates the relationship between inter-professional collaboration and patient safety climate.

A review of previous studies in the nursing literature shows the importance of inter-professional collaboration on nurses' job satisfaction and patient safety climate. Researchers have shown that when healthcare professionals work collaboratively as inter-professional teams, professional staff nurse development is enhanced and job satisfaction for nurses and other professionals is increased (Dieleman et al., 2004). Researchers also reported that, as a result of improved collaboration, many professionals experienced better communication, greater understanding between them, and a heightened

appreciation for other team members' perspectives and roles in healthcare (Dieleman et al., 2004).

Within healthcare organizations, an unsupportive work environment is associated with higher job dissatisfaction for registered nurses (RNs), and is cited as one of the main reason for many RNs to leave their jobs (Hayes et al., 2006; Kovner, Brewer, Greene,& Fairchild, 2009). Therefore, it is possible to argue that nurses working collaboratively within inter-professional teams will be more satisfied with their job and will be in a better position to provide safe and effective care for their patients. The purpose of this study is to examine nurses' perceptions about the relationships between inter-professional collaboration, job satisfaction and patient safety climate in a large tertiary care hospital in Ontario, Canada.

Methods

Design

The study uses a secondary analysis of data collected from nurses prior to the implementation of the inter-professional model of patient care (IPMPC). The original study was implemented within the hospital mainly to evaluate the impact of the IPMPC onall healthcare professionals including nurses. The original study used a quasi-experimental pre-post study design to evaluate the impact of IPMPC on healthcare professionals. Study questionnaires and letters of invitation were delivered to each participating unit mailbox. The data for the original study were collected through the administration of self-reported questionnaires collected at three time points over two years during the study: first at the baseline prior the implementation of the IPMPC; second, six months after implementation, and third, one year after implementation

(Rodger, Kerr, Awada,& Debs-Ivall, 2007).The self-reported questionnaires were collected from more than 5,700 healthcare professionals from five sites at a large tertiary hospital (Rodger et al., 2007). The responses to the three parts of the questionnaires from the baseline survey (inter-professional collaboration, job satisfaction, and patient safety) are the focus of this study, which uses only nursing data in the analysis.

A descriptive non-experimental design will be used to examine the relationships between study variables using a secondary data analysis approach. The aim of this study is to assess whether or not there is any relationship between nurses perceptions of inter-professional collaboration and patient safety climate, and to test the same relationship with nurses' job satisfaction as a potential mediator.

Instrumentation

Inter-professional Collaboration

Inter-professional collaboration was measured based on a conceptualization of interdisciplinary collaboration among different healthcare professionals by D'Amour (D'Amour et al, 2005; Sicotte et al., 2002). It consists of a 17- item, 5 - pointLikert-type scale that measures healthcare professionals' perceptions about inter-professional collaboration. The 17 response categories ranged from "Strongly Disagree" to "Strongly Agree" (Appendix A. 02). Higher scale scores reflect higher perceptions of inter-professional collaboration. The tool addresses two subscales of inter-professional collaboration: (1) the care coordination subscale consists of the first 10 questions, and (2) the sharing clinical activity subscale comprises the last seven questions. The reliability of inter-professional collaboration tool was more than satisfactory with a Cronbach alpha of .93.

Global Job Satisfaction

Global job satisfaction was measured using a 4-item, 5-point Likert scale with categories response range from "Strongly Disagree" to "Strongly Agree" (Appendix A. 03). This scale originated in the Job Diagnostic Survey (JDS), which is an instrument for measuring how much employees are satisfied with their job (Hackman &Oldham, 1974). A higher scale score reflects higher job satisfaction among healthcare professionals. In this study, reliability was adequate, with a Cronbach alpha of .82.

Patient Safety Climate

Patient safety climate was measured using an eight-item, 5-point Likert scale that measures healthcare professionals' perceptions of how they address and react to aspects of patient safety in their organization (Sexton et al., 2006). The eight questions (Appendix A. 04) used in this study come from the Safety Attitudes Questionnaire (Sexton et al., 2006). The eight questions response categories ranged from " Disagree Strongly" to "Agree Strongly". For scoring, the eighth question in this study was re-coded to match the direction of the other seven questions. In addition, the response categories are re-scaled to obtain a mean patient safety score ranging from 0-100. A higher patient safety score is reflective of higher perceived levels of patient safety climate (Sexton et al., 2006). In this study, reliability was adequate, with a Cronbach alpha of .76.

Sample

In order to explore the relationships between inter-professional collaboration, nurses' job satisfaction, and patient safety climate, the sample size for a multiple linear regression analysis with two independent variables and one dependent variable needed to be 77 with a power of 0.80, an alpha level of 0.05 and an expected moderate effect size of

0.15 (Polit and Beck, 2004). Although the required sample size of this study was calculated to be 77 we used several times this number which could inflate the statistical power of the study making it easier to find statistical significance. As part of the main study, data were collected from 1,327 registered nurses who were working in a large tertiary care hospital in Ontario (Rodger et al., 2007). From the self-reported questionnaires, the data for demographics questions and the three main study variables (inter-professional collaboration, job satisfaction, and patient safety climate) were included. The survey response rate from the original study was 47%. Only data from full-time nurses (861) were used in this study, because they are the main focus of the study and would also be the most impacted by the possible relationships between inter-professional collaboration on job satisfaction and patient safety climate. From the original 861 surveys available, 748 usable questionnaires were included in the analysis; 113 questionnaires were deleted because of the high number of system missing and/or invalid responses (Appendix B. 01).

Table 1 shows the descriptive characteristics for the study sample. The mean age of study participants was 43.9 years. The participants had worked as clinical RNs on average for 16.5 (SD= 11.65) years, and had 13.4 (SD= 10.32) years' experience as RNs at the Ottawa hospital. In addition, they were female (90.8 %), and had either a college diploma degree (49.7%) or university degree (34.2%).

Ethics Approval

Ethics approval for the original study was obtained from the University of Western Ontario Research Ethics Board (REB) and from the research ethics committee at The Ottawa Hospital Research Institute (Appendix C).

Table 1

Means, Standard Deviation, and Frequencies for Nurses Demographic Characteristics N= 748

Demographics		***n***	***Mean***	***SD***
Age		748	43.99	11.34
Years worked as a clinical RN		745	16.53	11.65
Years worked at the Ottawa Hospital		745	13.44	10.32
	Group	***n***		***%***
Gender	Male	62		8.3
	Female	679		90.8
	Missing	7		0.9
Education level	High school diploma	6		0.8
	College diploma	372		49.7
	University degree	256		34.2
	Graduate degree	109		14.6
	Missing	5		0.7

Three missing values for " years worked as a clinical RN" and "Years worked at the Ottawa Hospital".Nurses with High school diploma were all older than 50 years old;ranging in age from 57 to71 years.

Data Analysis

The Statistical Package for Social Sciences (SPSS), version 23.0 (SPSS Inc., 2015), was used to perform all statistical analyses. Raw data cleaning and data distributions were performed before the main analysis to ensure that all data were ready to use for main analysis. As well, Pearson correlations, t-tests and analysis of variance (ANOVA) statistical tests were implemented for the descriptive statistical analysis and to explore any possible inter-relationship between the three main study variables and the demographic variables. Demographic variables were used as control variables for testing the hypothesized model. The Baron and Kenny (1986) approach for mediation was used to test the hypothesized model. In this approach, according to Baron and Kenny (1986), four conditions must be metin order for partial mediation to be present:

- Condition1: Inter-professional collaboration is positively related to patient safety climate.
- Condition 2: Inter-professional collaboration is positively related to nurses' job satisfaction.
- Condition 3: Nurses' job satisfaction is positively related to patient safety climate.
- Condition 4: Nurses' Job satisfaction partially mediates the relationship between inter-professional collaboration and patient safety climate. For this condition to be met, nurses' job satisfaction should significantly predict patient safety climate and the direct relationship between inter-professional collaboration and patient safety climate in condition 1, will decrease in magnitude but remain statistically significant.

If these four conditions are met, then partial mediation is supported and nurses' job satisfaction is said to partially mediate the relationship between inter-professional collaboration and patient safety climate.

Finally, the Sobel test was used to test the significance of the mediation effect of nurses' job satisfaction between inter-professional collaboration and patient safety climate. The Sobel test provides a method to determine whether the reduction in the effect of the independent variable (inter-professional collaboration), after including the mediator in the model (nurses' job satisfaction), is a significant reduction and thus whether the mediation effect is statistically significant. To examine this test, the following equation was used: z-value = $a*b/\text{SQRT}(b^2*s_a^2 + a^2*s_b^2)$; where a is theunstandardized regression coefficient for the association between independent variable (IV) and mediator; b is the coefficient for the association between the mediator and the

dependent variable(DV), when the IV is also a predictor of the DV; *Sa* is the standard error of a; *Sb*is the standard error of *b* (MacKinnon, Warsi,& Dwyer,1995).

Results

Descriptive Results

The results of the descriptive analyses for the major study variables are shown in Table 2. Study results showed that nurses reported moderate levels of inter-professional collaboration as measured by two inter-professional subscales, including: care coordination (M= 3.46, SD= .74) and sharing clinical activity (M= 3.63, SD= .66). In this study, nurses also reported moderate levels of job satisfaction (M= 3.28, SD= .97). Lastly, nurses reported moderately high perceptions of patient safety climate (M= 75.59, SD= 16.96).

Table 2

Observed Means and Standard Deviations and Internal Consistency Score of Main Study Variables

	n	***Mean***	***SD***	***# of items***	***Score range***	***Cronbach Alpha coefficients***
Inter-professional Collaboration Score	748	3.56	.65	17	1-5	.930
- Care Coordination Subscale	748	3.46	.74	10	1-5	.880
- Sharing Clinical Activity Subscale	748	3.63	.66	7	1-5	.886
Job Satisfaction score	748	3.28	.97	4	1-5	.829
Patient Safety Climate score	748	75.59	16.96	8	0-100	.763

The number of subjects is equal for all variables after the invalid questionnaires were deleted.

Relationship of Demographic Variables to the Major Study Variables

Demographic variables were examined for use as possible control variables. Statistical tests such as Pearson correlations, t-test and ANOVA were implemented, to address the potential influence of these variables on the hypothesized model. Statistical relationships were examined between the three main study variables and the demographic variables of age, gender, education level, years of experience as RN, and years of experience as RN in the Ottawa hospital.

Statistical tests showed that there are significant relationships between some of the demographic variables and main study variables. The Pearson correlation indicated that there were significant weak positive correlations between nurses' age and the three main study variables inter-professional collaboration ($r= .089$, $p<0.05$), nurses' job satisfaction ($r= .279$, $p< 0.01$), and patient safety climate ($r= .170$, $p< 0.01$). A one-way ANOVA also showed that there are significant relationships between education level and the three main study variables. It showed that there was a significant effect of education level on inter-professional collaboration [$F (3,739)= 3.12$], nurses' job satisfaction [$F (3,739)= 8.33$], and patient safety climate [$F (3,739)= 3.02$].

The number of years experienced as clinical RNs and the number of years worked as clinical RNs in the Ottawa hospital had significant relationships with nurses' job satisfaction and patient safety climate, but not with inter-professional collaboration. Furthermore, there was no association found between gender and three main variables; so it was not included in the main analysis (Appendix D).

Table 3

The Differences between Education Level Groups' Means and Their Relation to the Main Study Variables

		Descriptive		
		N	**Mean**	**SD**
Inter-professional collaboration	High school diploma	6	3.39	.650
	College diploma	372	3.59	.664
	University degree	256	3.47	.625
	Graduate degree	109	3.67	.673
Job satisfaction	High school diploma	6	3.29	1.239
	College diploma	372	3.43	.954
	University degree	256	3.04	.927
	Graduate degree	109	3.31	.988
Patient Safety Climate	High school diploma	6	80.2083	8.06872
	College diploma	372	77.2661	16.40823
	University degree	256	73.2640	17.34941
	Graduate degree	109	75.1242	17.59481

Nurses with college diploma and graduate degree had high perception on inter-professional collaboration, job satisfaction, and patient safety climate.

When exploring the inter-relationship between three main study variables, we found that inter-professional collaboration was positively correlated to patient safety climate ($r = .38$, $p < .001$). This suggested that when inter-professional collaboration is high within the organization, the nurses' perceptions of patient safety climate will also be high. Between two subscales of inter-professional collaboration variable, the results showed that care coordination subscale had a greater correlation to patient safety climate ($r = .38$, $p < .001$) than to sharing clinical activity ($r = .34$, $p < .001$).

The correlation between inter-professional collaboration and nurses job satisfaction is also positive ($r = .43$, $p < .001$). Thus, nurses who report high inter-

professional collaboration also reported higher job satisfaction. Finally, there was a positive relationship between nurses' job satisfaction and patient safety climate (r= .55, $p< .001$), which indicated that when nurses are highly satisfied in their job they also tend to report a higher patient safety climate.

Table 4

Correlation between Main Study Variables

	Inter-professional collaboration	**Care Coordination**	**Sharing Clinical Activity**	**Nurses' job satisfaction**	**Patient safety climate**
Inter-professional collaboration	1.00	-	-	-	-
- Care coordination subscale	0.998**	1.00	-	-	-
- Sharing clinical activity subscale	0.955**	0.954**	1.00	-	-
Nurses' job satisfaction	0.431**	0.428**	0.373**	1.00	-
Patient safety climate	0.380**	.380**	.340**	0.551**	1.00

** $p<0.01$

Test of Hypotheses

Nurses' age, years worked as a clinical RN, years worked as a clinical RN in the Ottawa hospital and education level are the demographic variables that were found to have relationships with the main study variables. However, as the nurses' age, years worked as clinical RN are highly correlated, only the variable of the nurses' age was used for adjusting the main analysis, along with education level. These two demographic variables (nurse age and education level) were used as control variables in the first step of the hierarchical multiple linear regression analysis used to test the study model; thus, all results presented below are adjusted for differences in these factors.

Hypothesis 1. Inter-professional collaboration is positively related to patient safety climate.

Inter-professional collaboration significantly predicted patient safety climate (β= .370, $p < .05$). Inter-professional collaboration explained a significant proportion of the variance in patient safety climate,after adjusting for nurses' age and education level [the change in $R^2 = .13$, F (6, 741) = 24.32, $p < .05$].

Hypothesis 2. Inter-professional collaboration is positively related to nurses' job satisfaction.

Inter-professional collaboration significantly predicted nurses' job satisfaction (β= .408, p<. 05). Inter-professional collaboration explained a significant proportion of the variance in nurses' job satisfaction, after adjusting for nurses' age and education level [the change in $R^2 = .16$, F (6, 741) = 40. 15, $p < .05$].

Hypothesis 3. Nurses' job satisfaction is positively related to patient safety climate.

Nurses' job satisfaction significantly predicted patient safety climate(β = .547, p<. 05). Nurses' job satisfaction explained a significant proportion of the variance in patient safety climate, after adjusting for nurses' age and education level [the change in $R^2 = .27$, F (6, 741) = 54.06, $p < .05$].

Hypothesis 4. Job satisfaction partially mediates the relationship between inter-professional collaboration and patient safety climate.

A hierarchical multiple linear regressionmodel was conducted to see if job satisfaction partially mediates the relationship between inter-professional collaboration and patient safety climate. Based on the final model from the hypothesis, we found that inter-professional collaboration and nurses' job satisfaction explained a significant amount of the variance in patient safety climate[$R^2 = .33$, F (7, 740) = 52,15, $p < .05$]. In

addition, when nurses' job satisfaction was added to the model with inter-professional collaboration, the proportion of variance accounted for by the model changed from R^2 = .16 to R^2= .33. For the fourth condition to be met, (1) nurses' job satisfaction has to significantly predict patient safety climate, and (2) the direct relationship between inter-professional collaboration and patient safety climate in Model 1 should decrease but remain significant (Baron & Kenny, 1986). In this study the regression coefficient (β) between inter-professional collaboration and patient safety climate decreased but remained significant, with (β = .179, p< .001). Therefore, we can say that nurses' job satisfaction partially mediates the relationship between inter-professional collaboration and patient safety climate.

The Sobel test is the final step to test the hypothesis by ensuring that the mediation effect of nurses' job satisfaction between inter-professional collaboration and patient safety climate is significant, and also ensuring that the reduction in β of inter-professional collaboration, after including nurses' job satisfaction, is a significant reduction. According to these study variables, we can say that nurses' job satisfaction significantly mediates the relationship between inter-professional collaboration and patient safety climate (β= 9.31, Std. Error= 0.53, p<0.001).

Table 5

Results of Hierarchical Multiple linear Regression Analysis for Hypothesis 4

Model	Variables	R^2	F	Sig	β	Sig
Model 1	Inter-professional Collaboration	.16	24.32	< .001	.370	< .001
Model 2	Nurses' Job Satisfaction	.30	54.06	< .001	.547	< .001
Model 3	Inter-professional Collaboration	.33	52.15	< .001	.179	< .001
	+					
	Nurses' Job Satisfaction				.469	< .001

All models adjusted for nurses; age and education level
Dependent Variable: Patient Safety Calamite
*Proportion of variance for the two demographics variables (age and education level).
β= standardized coefficient
R^2 = Proportion of variance explained Sig= statistical significance (p-value).

Discussion

The purpose of this study was to gain a greater understanding of nurses' perceptions regarding inter-professional collaboration, job satisfaction, and patient safety climate in a large tertiary care hospital in Ontario, Canada. The study sought to identify the relationships between these three variables among nurses with regard to their experiences as full-time RNs. The two study questions were:

1) Is there a direct relationship between inter-professional collaboration and patient safety climate?

2) Does nurses' job satisfaction partially mediate the relationship between inter-professional collaboration and patient safety climate?

From the study results as presented above, it appears that there were indeed relationships among the three study variables, including both direct and indirect pathways. Inter-professional collaboration had a direct positive relationship with patient safety climate, and nurses' job satisfaction was found to partially mediate the relationship

between inter-professional collaboration and patient safety climate. This means that when nurses perceive inter-professional collaboration is high within healthcare organizations, and there is a good collaborative environment for health practitioners, their job satisfaction level and perceptions of patient safety climate will also be higher.

From the first hypothesis, it appears that inter-professional collaboration is positively related to patient safety climate. In a literature review, the Health Council of Canada (2009) stated that there is strong evidence of a positive correlation between inter-professional collaboration and patient safety climate. They propose that when health care professionals communicate effectively and know how to work as a team, the quality of patient care increases (Health Council of Canada, 2009). Earlier studies also provided similar results (Bridges et al., 2011; Manojlovich et al., 2014), proposing that healthcare professionals benefited from inter-professional collaboration as their ability to work collaboratively within healthcare organizations can build an environment that enhances a culture of safety and supports a patient safety climate. With such an environment, professionals can more effectively manage adverse health events when they occur.

Inter-professional collaboration was measured in this study using two subscales: the care coordination scale, and the sharing clinical activity scale. The study findings suggest that nurses believed that care coordination within healthcare organization would result in an increase in patient safety climate more than sharing clinical activities.

As predicted in the second hypothesis, inter-professional collaboration is positively related to nurses' job satisfaction. Previous studies examining the relationship between inter-professional collaboration and job satisfaction among different healthcare professionals, including nursing, have reported similar results (Dieleman et al., 2004; O'Brien-Pallas, Hiroz, Cook,&Milden, 2005; Proctor-Childs, Freeman, & Miller, 1998;

Sharp, 2006; Yeager, 2005). This implies that when nurses work in collaborative healthcare teams and collaborative environments, they will also report improved satisfaction toward their job. This may be because job satisfaction is considered as an outcome of collaborative practice (Sharp, 2006; Yeager, 2005).

Furthermore, as part of the effective inter-professional collaborative practice in any healthcare organization, health team members must have abasic understanding of each other's roles as responsible and independent individuals, along with an understanding of each member's separate and shared scopes of practice.This understanding will result in increased their job satisfaction (MacIntosh& McCormack 2001; Nowdbilski-Vasilios& Poole, 2001). A study by Sharp (2006) also showed the effect a collaborative approach in healthcare organization, which can lead to "more effective and efficient work by and improved satisfaction among health professionals" (p. 4).

The third hypothesis in this study predicted that nurses' job satisfaction is positively related to patient safety climate, which is consistent with the literature (Peltier& Dahl, 2009; Rigobelloet al., 2012; Saari& Judge 2004). This finding suggests that when nurses practice in apositive work environment, they will be more satisfied; this, in turn, will lead them to focus more on their job, which will increases their performance as well as patient satisfaction and patient safety (Peltier& Dahl, 2009). It was also reported in a previous study thatorganizations with higher healthcare professional satisfaction had better clinical outcomes and workforce performance (Grant, 2007). This translated into fewer patient falls, fewer residents with acquired pressure ulcers and infected catheters, reduced nurse turnover, increased nurse stability, less absenteeism of certified nurse assistants and nurses (CNA), and higher occupancy (Grant, 2007). In

contrast, nurses' dissatisfaction could lead to a decrease in the quality of care, which could negatively affect the patient safety climate (Kane, Shamliyan, Mueller, Duval,& Wilt, 2007). It is important to recognize that a significant consequence of higher job satisfaction within healthcare organizations could be an increase in patient safety climate and patient safety.

The fourth hypothesis predicted that nurses' job satisfaction partially mediates the relationship between inter-professional collaboration and patient safety climate. This fourth hypothesis supports the previous hypotheses and the relationships between the three main variables. It suggests that nurses working within a collaborative environment who feel more satisfied with their job will also report an improved patient safety climate. The Baron and Kenny approach (1986) proposed that for this fourth condition to be met, (1) nurses' job satisfaction has to significantly predict patient safety climate, and (2) there should be a direct relationship between inter-professional collaboration and patient safety climate.

Inter-professional collaboration has a positive direct relationship with patient safety climate, which was previously suggested by numerous studies and tested in the first hypothesis (Bridges et al., 2011; Health Council of Canada, 2009; Manojlovich et al., 2014). Studies suggested that providing the concept of inter-professional collaboration within healthcare organization would build an environment that supports and improves the patient safety climate. Secondly, inter-professional collaboration also had a positive relationship with nurses' job satisfaction, which has been found by many other studies as well. Thirdly, nurses' job satisfaction had a positive relationship with patient safety climate, also shown in many previous studies (Peltier& Dahl, 2009;Rigobelloet al., 2012). Finally, nurses' job satisfaction was found to partially

mediate the relationship between inter-professional collaboration and patient safety climate. Thus, it appears that increasing inter-professional collaboration within a healthcare organization could increase nurses' job satisfaction and lead to a better patient safety climate. In addition, it can be suggested that improving patient safety climate could then translate into improved patient safety. Therefore, our results are consistent with the study hypotheses that there were relationships between the three study variables, findings that were not been reported in a previous study.

Finally, to ensure the mediation effect of nurses' job satisfaction, the Sobel test was used. The Sobel test ensures that the mediation effect of nurses' job satisfactionbetween inter-professional collaboration and patient safety climate and the reduction of β of inter-professional collaboration after including nurses' job satisfaction is a significant reduction.

These findings are consistent with the literature and support the aim of implementing the inter-professional collaboration within healthcare organizations. The findings alsopoint to the importance of inter-professional collaboration for healthcare professionals and for patients care. The results of our study suggest that inter-professional collaboration in practice can provide an equal opportunity for each profession in the collaborative team to share information and knowledge in a respectful and trusting environment. Inter-professional collaboration also leads to sharing responsibility, understanding the functions of each team member, and working together to deal with different client situations (Hall, 2005; MacIntosh& McCormack 2001; Nowdbilski-Vasilios& Poole, 2001). Such a shared and mutually respectful working environment could also translate into heightened healthcare professionals (nurses') job satisfaction, which is one of the key outcomes of inter-professional collaboration in this study.

Numerous studies have suggested that a focus on “Patient-centered care”, which means providing high quality care for a patient according to his/her needs, is an important step in implementing inter-professional collaboration within a health care organization(Arevian, 2005; Callahan et al., 2006; Sharp, 2006; Watters & Moran, 2006). It can also be suggested that improving patient safety climate is an important part of providing a high quality of care for a patient according to his/her needs, which is also considered as one of the outcomes of inter-professional collaboration. Examples includepreventing unnecessary or repeated investigations from being performed (Ruhstaller et al., 2006); improvements in clinical rounds, and decreases in errors in health care settings (Horak, Pauig, Keidan, & Kerns, 2004).

The findings of this study supported the hypotheses tested. This is may be the first study to examine nurses’ perceptions about the relationships between inter-professional collaboration, job satisfaction, and patient safety climate. The results of this study suggest that in order to provide a high quality of patient care, nurses must have high satisfaction in their job, a state which is dependent on the presence of inter-professional collaboration within a healthcare organization. Therefore, leaders and educators need to consider providing an inter-professional collaborative environment as a vital part of healthcare organization’s development to increase nurses’ performance, and thus improve the patient safety climate.

Limitation

This was a secondary data analysis, so the selections of data analysis variables were limited to selecting existing study variables. We could not add or change any variables that might impact the study results or have an effect on study variables. Additionally, we used cross-sectional analyses, which isnot normally used to describe the

causality.This study just examined the relationships between variables in the baseline of implementation of the Inter-professional Model of Patient Care (IPMPC), not across time periods. Although the sample size of nurses in the study was large, many questionnaires were deleted due to the large number of unanswered, system missing or invalid responses. This study also used a self-reported data, which means participants may have varied theirresponse according to their understanding or interpretation of particular questions, or they may tried to be honest that sometimes could provide inaccurate response to a question, which all decrease the sample size. In addition, there is a limitation in the ability of generalize the findings because all participants were from one hospital in Ontario, Canada.

Conclusion

The results of this study suggest that, for nurses, there are both direct and indirect relationships between inter-professional collaboration, job satisfaction, and patient safety climate. It is possible that, with the presence of inter-professional collaboration within healthcare organizations and a good collaborative environment for health practitioners, nurses' job satisfaction could increase, in turn, could lead to a better patient safety climate.

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PART THREE

DISCUSSION

Implications

Understanding the relationships between inter-professional collaboration (IPC), nurse job satisfaction, andpatient safety climate could help build successful professional teams within healthcare organizations. This study has a number of possible implications for policy makers, nursing administrators, nurse educators, and registered nurses (RNs). The results support the implementation of IPC within healthcare organizations.

Inter-professional collaboration and its relationship with other variables such as nurse job satisfaction and patient safety climate are now at the forefront of the healthcare policy agenda in Canada. Thus, many nurse administrators and educators are starting to support and address the benefits of IPC for nurses within their organizations. It is important for healthcare professionals, including nurses, to understand the significance of IPC and its positive effect on other variables. This study could help increase knowledge and information about the importance of IPC as well as its relationship with the job satisfaction of nurses and patient safety climate.

Implication for Policy Makers and Nursing Administrators

Although there are numerous studies examining the importance of implementing inter-professional collaboration, to date, there have been no studies examining IPC only in nursing within the context of job satisfaction and patient safety climate. An enormous amount of attention has been given to IPC as one of the best strategies for healthcare systems to adopt when striving to improve outcomes. Understanding the importance of such collaborations in enhancing the effectiveness and efficiency of practice and in improving patient outcomes is an important first step to being able to improve healthcare

services. The results of this study have the potential to drive policies related to IPC and to working within healthcare teams. In addition, it is anticipated thatthe study results provide support for policy makers to makeevidence-based changes that positively impact areas that will directly affect and thus improve healthcare teams.

The job satisfaction of attending nurses and the patient safety climate are important issues that should be considered for effective patient care.By changing policies related to IPC, healthcare organizations could help decrease job dissatisfaction and dissuade nursesfrom wanting to leave the workforce due to excessive work pressure. Conversely, simply ignoring these problems could lead to insufficient attention to patient care and patient safety, thus leading to the deterioration of the healthcare system.

This study can be used to improve the healthcare system and healthcare services by introducing inter-professional collaboration into the healthcare policy agenda. In addition, the information identified in this study can be used by nursing administrators in Canada to develop future interventions to improve IPC and job satisfaction, with the aim of providing a better patient safety climate. The study findings could also serve as a model for improvements in healthcare delivery systems outside of Canada. For example, the study findings could be used to help change the healthcare delivery system in Saudi Arabia, as the concept of IPC has not yet been introduced there and the healthcare system needs new ideas to help it improve.

Implications for Nurse Educators

Education plays a key role in the process of change and decision-making in any professional field. Hence,it is crucial for healthcare institutions not only to offeran appropriate work environment but appropriate preparation as well, so that nurses can provide the best healthcare to patients through inter-professional education (IPE) and

collaboration. This study will add support to the importance of IPE. Nursing educators in schools and hospitals need to increase their efforts to prepare nursing students for their professional career, and to help RNs (staff) provide patient care in a collaborative team environment. Through education, nursing students and nursing professionals will be better able to work together with other healthcare professionals in a collaborative environment to help improve patient outcomes.

The results of this study suggest that nurse educators should encourage nursing students and professionals to work in collaborative teams, as this could lead to better job satisfaction and benefit their work environment. Nurse educators could use these study results to teach their students and nurse professionals what they should take into account when practicing IPC in a team. Examples include finding viable ways to share responsibilities and participate in decision-making with their colleagues from other professionals, sharing knowledge, establishing good work relationships built around mutual respect, and, most importantly, taking care of patients and their needs. In addition, nursing educators need to further develop and integrate inter-professional education into nursing curricula and encourage their students and healthcare professionals by demonstrating the benefits of IPC, including a better work environment, improved patient care, and a heightened patient safety climate.

Implications for Nurses

The study findings can help build an evidence base for how nurses in Canada are impacted by inter-professional collaboration. Specifically, we may gain insight into nurses' perspectives on the relationships between IPC, job satisfaction and patient safety climate. Identifying these relationships will support the development of more effective

ways for nurses to participate in collaborative teams, as nurses play a fundamental role in healthcare organizations.

Furthermore, IPC can help nurses develop their identity within healthcare organizations as well as respect and understand other professional roles. The implementation of IPC will give nurses the opportunity to become more involved in the decision-making process for patient care. Nurses could develop more autonomy in patient care, through inter-professional collaboration enhancing their confidence in their performance and their satisfaction with their patient outcomes. Nurses can also use the findings of this study to recognize important factors related to collaboration and how they can enhance the patient safety climate through better collaboration.

Recommendations for Future Research

This may be the first study to examine nurses' perceptions about the relationships between inter-professional collaboration, job satisfaction, and patient safety climate. The results of this study suggest that in order to provide a high quality of patient care, it is important that nurses be satisfied with their work, which is in turn dependent on the presence of IPC within their healthcare organization. Therefore, leaders and educators need to consider ways to enhance the development of an inter-professional collaborative environment as a vital part of healthcare organization development to increase nurses' performance as well as patient safety climate.

Recently, a great deal of attention has been given to IPC as one of the best strategies for healthcare systems to adopt when trying to improve outcomes (Chan & Wood, 2010). Understanding the importance of IPC in enhancing the effectiveness and efficiency of practice and how it improves patient outcomes is an important first step to improving healthcare services. More studies are needed to examine the possible factors

contributing to ICP and its relationship with nurse job satisfaction and the patient safety climate.

The purpose of thesecondary data analysis study was to examine nurses' perceptions about inter-professional collaboration and job satisfaction,and to explore patient safety climate andpossible relationships between them. As we look to advance this field of research, it is important to establish connections between IPC and its positive outcomes for the working environments of nurses. There is a need for studies that explain the important elements requiredwhen introducingIPC within healthcare organizations and what factors enhanceIPC and its positive outcomes.

Furthermore, when researchers are selecting their tools to examine inter-professional collaboration for their study, they should ensure that the study captures the key dimensions of an organization and its work environment, as well as other factors thatpossibly facilitate the implementation of IPC and its linkage to inter-professional outcomes. Examining additional factors that affect inter-professional collaboration can provide important information and knowledge about the importance of IPC for nurses, and highlight the strength and weaknesses of this approach.

Conclusion

Inter-professional collaboration (IPC) has been advocated as one of the best strategies for healthcare systems to adopt when aiming to improve outcomes for both healthcare professionals and patients (Chan & Wood, 2010).Understanding the value of IPC is important for improving the effectiveness of healthcare organizations.This study suggests that when nurses perceive that inter-professional collaboration is high within healthcare organizations and there is a solid collaborative environment for health practitioners, their job satisfaction level will also be higher, as will their perceptions of

the patient safety climate. Recognition of these important outcomes of IPC for nurses would be a significant first step to improving the work environment of nurses and ultimately the overall quality of care and patient safety climate within healthcare organizations.

References

Chan, A. K., & Wood, V. (2010). Preparing tomorrow's healthcare providers for interprofessional collaborative patient-centred practice. *British Columbia Medical Journal, 1*(2), 22-24.

APPENDIX A

Study Instruments

A. 01 Demographic/ Job Characteristics

A. 02 Inter-professional collaboration at the Ottawa Hospital

A. 03 Global Job Satisfaction

A. 04 Patient Safety

A. 01 Demographic Characteristics

(Please place a check mark in the appropriate box where indicated.)

1. **Please indicate your gender.** 1 ☐ Female 2 ☐ Male

2. **What is your date of birth?** _____/_____/19_____
   Day Month Year

3. **What is the highest degree or diploma you have obtained?**

1 ☐ high school diploma 2 ☐ college diploma
3 ☐ university degree 4 ☐ graduate degree

Job Characteristics

4. **What is your current employment status?**

Full-time ☐ Part-time ☐ Job Share☐ Casual ☐ Other ☐

5.How many years in total have you worked in your current profession?

_____ Years.

6. **How many years in total have you worked at the Ottawa Hospital?**

_____ years.

A. 02 Inter-professional collaboration at the Ottawa Hospital

Please indicate to what extent you personally agree or disagree with each of the following statements. **(From D'Amour)**

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
D1. The entire patients' needs (physical, psychological and social) are taken into account by the different groups of professionals.	1	2	3	4	5
D2. The different groups of professionals take into account the data collected by other professionals.	1	2	3	4	5
D3. Professionals have a high tolerance of grey area (overlapping of jurisdictions between professionals groups) in the sharing of responsibilities.	1	2	3	4	5
D4. Professionals collaborate to elaborate a common care plan.	1	2	3	4	5
D5. Professionals' support is sought for from other disciplinary groups as necessary.	1	2	3	4	5
D6. Professionals from different disciplinary groups exchange information about common clients.	1	2	3	4	5
D7. There is collaboration among different professional groups to assure patient follow-up.	1	2	3	4	5
D8. The level of collaboration among professionals is high.	1	2	3	4	5
D9. Professionals from different disciplinary groups share clinical decision making.	1	2	3	4	5
D10. Working relations among the professional groups are egalitarian.	1	2	3	4	5
D11. The sharing of clinical responsibilities is well established among	1	2	3	4	5

the different groups of professionals.					
D12. Professionals do their care without nuisance to each other.	1	2	3	4	5
D13. Team-based routines between the different groups of professionals are well defined.	1	2	3	4	5
D14. Efforts are done to prevent conflicts concerning the sharing of tasks and responsibilities.	1	2	3	4	5
D15. Daily collaborative behaviours are largely integrated in day-to-day functioning.	1	2	3	4	5
D16. Several activities assumed by different professional groups concerning a particular patient are well co-ordinated.	1	2	3	4	5
D17. From the patient's perspective, professional collaboration is harmonious.	1	2	3	4	5

A. 03 Global Job Satisfaction

Please indicate how much you agree with the following statements as they relate to your experience working at the Ottawa Hospital. Please circle the number that corresponds to your answer. **(From JDS)**

	Strongly Disagree	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Strongly Agree**
I1. I feel very satisfied with my job.	1	2	3	4	5
I2. I feel that my co-workers are satisfied with their jobs.	1	2	3	4	5
I3. I feel I would be happy to work here until I retire.	1	2	3	4	5
I4. I feel that the health care facility provides a supportive work environment in which to work.	1	2	3	4	5

A. 04 Patient Safety

Please indicate how much you agree with the following statements as they relate to your experience working at the Ottawa Hospital. Please circle the number that corresponds to your answer. **(From Sexton)**

	Disagree Strongly	**Disagree Slightly**	**Neutral**	**Agree Slightly**	**Agree Strongly**	**Not Applicable**
L1. The culture in this clinical area makes it easy to learn from the errors of others.	1	2	3	4	5	9
L2. Medical errors are handled appropriately here.	1	2	3	4	5	9
L3. My suggestions about safety would be acted upon if I expressed them to management.	1	2	3	4	5	9
L4. I am encouraged by my colleagues to report any patient safety concerns I may have.	1	2	3	4	5	9
L5. I know the proper channels to direct questions regarding patient safety in this clinical area.	1	2	3	4	5	9
L6. I receive appropriate feedback about my performance.	1	2	3	4	5	9
L7. I would feel safe being treated here as a patient.	1	2	3	4	5	9
L8. Personnel frequently disregard rules or guidelines (e.g. hand-washing, treatment protocols/clinical pathways, sterile field, etc.) that are established for this clinical area.	1	2	3	4	5	9

APPENDIX B

Table of Deleted Data

B. 01 Table of deleted data: raw data cleaning

B. 01 Table of Deleted Data

Variables	Participants number	Number of Participants deleted	Delete reason
Starting number as taken	1327	By employment status	I select participants who are full-time RN
Starting number	861	By employment status	All participants are full-time RN
Gender	861	---	---
Age	804	57	Less than 20 and more than 75 (19/112/93)
Education level	804	---	---
Profession	804	---	---
Employment status	804	---	---
Years worked as a clinical RN	800	4	After subtract age from years of working as a clinical RN 4 participants ages are 17 and 19 which means invalid
Years worked at the Ottawa Hospital	800	---	---
Inter-professional collaboration	748	52	Participants dose not answer any question or answer one or two
Job satisfaction	748	52	Participants dose not answer any question or answer one or two
Patient safety climate	748	52	Participants dose not answer any question or answer one or two

APPENDIX C

Ethics Approval

C. 01 The University of Western Ontario Review Board of Health Sciences Research involving Human Subjects Certification of Approval, and the research ethics committee at The Ottawa Hospital Research Institute.

Office of Research Ethics

The University of Western Ontario
Room 4180 Support Services Building, London, ON, Canada N6A 5C1
Telephone: (519) 661-3036 Fax: (519) 850-2466 Email: ethics@uwo.ca
Website: www.uwo.ca/research/ethics

Use of Human Subjects - Ethics Approval Notice

Principal Investigator: Dr. M.S. Kerr
Review Number: 13699E **Revision Number:**
Review Date: April 17, 2009 **Review Level:** Expedited
Protocol Title: Evaluation of the Implementation of an Interprofessional Model of Patient Care at the Ottawa Hospital
Department and Institution: Nursing, University of Western Ontario
Sponsor:
Ethics Approval Date: April 17, 2009 **Expiry Date:** July 31, 2010
Documents Reviewed and Approved: Revised Study End Date
Documents Received for Information:

This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the Health Canada/ICH Good Clinical Practice Practices: Consolidated Guidelines; and the applicable laws and regulations of Ontario has reviewed and granted approval to the above referenced revision(s) or amendment(s) on the approval date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in Division 5 of the Food and Drug Regulations.

The ethics approval for this study shall remain valid until the expiry date noted above assuming timely and acceptable responses to the HSREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the UWO Updated Approval Request Form.

During the course of the research, no deviations from, or changes to, the protocol or consent form may be initiated without prior written approval from the HSREB except when necessary to eliminate immediate hazards to the subject or when the change(s) involve only logistical or administrative aspects of the study (e.g. change of monitor, telephone number). Expedited review of minor change(s) in ongoing studies will be considered. Subjects must receive a copy of the signed information/consent documentation.

Investigators must promptly also report to the HSREB:

a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) all adverse and unexpected experiences or events that are both serious and unexpected;
c) new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to this office for approval.

Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.

[redacted]

Chair of HSREB: Dr. Joseph Gilbert

Ethics Officer to Contact for Further Information			
☐ Janice Sutherland (jsutherl@uwo.ca)	☐ Elizabeth Wambolt (ewambolt@uwo.ca)	☑ Grace Kelly (grace.kelly@uwo.ca)	☐ Denise Grafton (dgrafton@uwo.ca)

This is an official document. Please retain the original in your files.

cc: ORE File

Université d'Ottawa University of Ottawa

Service de subventions de recherche et déontologie Research Grants and Ethics Services

March 12, 2008

Ginette Lemire-Rodger
Ottawa Hospital
503 Smyth Road
Ottawa, ON K1H 8L6

Kathryn A. S. Higuchi
School of Nursing
Faculty of Health Sciences
University of Ottawa
Ottawa, ON K1H 8M5

Barbara Davies
School of Nursing
Faculty of Health Sciences
University of Ottawa
Ottawa, ON K1H 8M5

Danielle d'Amour
Faculté des sciences infirmières
Université de Montréal
CP 6128, succ. Centre-ville
Montréal, QC H3C 3J7

Michael Kerr
School of Nursing
University of Western Ontario
London, ON N6A 5C1

Dear Dr. Lemire-Rodger, Dr. Higuchi and colleagues,

This is to certify that the University of Ottawa Health Sciences and Science Research Ethics Board (REB) has examined the application for ethical approval for the research project entitled **Evaluation of the Implementation of an Inter-Professional Model of Patient Care at the Ottawa Hospital (H 02-08-11)** submitted by Dr. Ginette Lemire-Rodger of the Ottawa Hospital, Dr. Kathryn A.S. Higuchi of the School of Nursing at the University of Ottawa and their colleagues.

The REB found that this research project met appropriate ethical standards as outlined in the Tri-Council Policy Statement and in the Procedures of the University of Ottawa Research Ethics Boards and accordingly gave it a conditional approval. The approval is conditional upon the researchers providing the REB with French translation of the consent form and a copy of the ethical approval of the Ottawa Hospital REB.

The REB will grant final clearance (1A approval) once the abovementioned documents are submitted and approved. The researchers cannot begin the research with human subjects until final clearance is obtained.

Please note that changes to the protocol of forms cannot be initiated without prior written approval from the REB.

Sincerely yours,

[redacted]

Germain Zongo
Protocol Officer for Ethics in Research
For Dr. Daniel Lagarec, Chair of the Health Sciences and Sciences REB

APPENDIX D

Tables of Correlation between Demographic Variables and Main Study Variables

D. 01 Pearson Correlation between demographic variables (age, years worked as a clinical RN, years worked in the Ottawa hospital as a clinical RN) and main study variables.

D. 02 T-test the correlation between gender and main study variables.

D. 03 One-Way ANOVA to test the correlation between education level and main study variables.

D. 01 Pearson Correlation between Demographic Variables (age, years worked as a clinical RN, years worked in the Ottawa hospital as a clinical RN) and Main Study Variables.

Correlations

		Age by years	Years worked as a clinical RN	Years worked at the Ottawa Hospital	Patient Saftey	Total_Job_satisfaction	Total_interprofessional_collaboration
Age by years	Pearson Correlation	1	.863**	.754**	.170**	.279**	.089*
	Sig. (2-tailed)		.000	.000	.000	.000	.014
	N	748	745	745	748	748	748
Years worked as a clinical RN	Pearson Correlation	.863**	1	.804**	.169**	.245**	.067
	Sig. (2-tailed)	.000		.000	.000	.000	.067
	N	745	745	743	745	745	745
Years worked at the Ottawa Hospital	Pearson Correlation	.754**	.804**	1	.132**	.213**	.002
	Sig. (2-tailed)	.000	.000		.000	.000	.954
	N	745	743	745	745	745	745
Patient Saftey	Pearson Correlation	.170**	.169**	.132**	1	.551**	.380**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	748	745	745	748	748	748
Total_Job_satisfaction	Pearson Correlation	.279**	.245**	.213**	.551**	1	.431**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	748	745	745	748	748	748
Total_interprofessional_collaboration	Pearson Correlation	.089*	.067	.002	.380**	.431**	1
	Sig. (2-tailed)	.014	.067	.954	.000	.000	
	N	748	745	745	748	748	748

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

D. 02 T-test the Correlation between Gender and Main Study Variables

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Patient Saftey	Female	679	75.6872	16.89836	.64850
	Male	62	74.0207	17.88563	2.27148
Total_Job_satisfaction	Female	679	3.28	.967	.037
	Male	62	3.32	.921	.117
Total_interprofessional_collaboration	Female	679	3.56	.649	.025
	Male	62	3.64	.699	.089

D. 03 One-Way ANOVA to Test the Correlation between Education Level and Main Study Variables

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Patient Saftey	Between Groups	2581.684	3	860.561	3.023	.029
	Within Groups	210399.652	739	284.709		
	Total	212981.337	742			
Total_Job_satisfaction	Between Groups	22.642	3	7.547	8.331	.000
	Within Groups	669.466	739	.906		
	Total	692.108	742			
Total_interprofessional_collaboration	Between Groups	3.978	3	1.326	3.121	.025
	Within Groups	314.010	739	.425		
	Total	317.988	742			

Descriptives

			N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance
							Lower Bound	Upper Bound			
Patient Saftey	High school diploma		6	80.2083	8.06872	3.29404	71.7407	88.6759	71.88	93.75	
	Collage diploma		372	77.2661	16.40823	.85073	75.5933	78.9390	28.13	100.00	
	University degree		256	73.2640	17.34941	1.08434	71.1286	75.3994	21.88	100.00	
	Graduate degree		109	75.1242	17.59481	1.68528	71.7837	78.4647	31.25	100.00	
	Total		743	75.5968	16.94216	.62155	74.3766	76.8170	21.88	100.00	
	Model	Fixed Effects			16.87331	.61902	74.3815	76.8120			
		Random Effects				1.36961	71.2380	79.9555			3.81776
Total_Job_satisfaction	High school diploma		6	3.29	1.239	.506	1.99	4.59	1	4	
	Collage diploma		372	3.43	.954	.049	3.33	3.53	1	5	
	University degree		256	3.04	.927	.058	2.93	3.16	1	5	
	Graduate degree		109	3.31	.988	.095	3.12	3.50	1	5	
	Total		743	3.28	.966	.035	3.21	3.35	1	5	
	Model	Fixed Effects			.952	.035	3.21	3.35			
		Random Effects				.136	2.85	3.71			.044
Total_interprofessional_collaboration	High school diploma		6	3.39	.650	.266	2.71	4.07	3	4	
	Collage diploma		372	3.59	.664	.034	3.53	3.66	1	5	
	University degree		256	3.47	.625	.039	3.39	3.55	2	5	
	Graduate degree		109	3.67	.673	.064	3.54	3.79	2	5	
	Total		743	3.56	.655	.024	3.51	3.61	1	5	
	Model	Fixed Effects			.652	.024	3.51	3.61			
		Random Effects				.054	3.39	3.73			.006

APPENDIX E

Letters for Participants

E. 01 Letter for Information for Participants

Letter of Information (Staff)

Evaluation of the Implementation of an Inter-professional Model of Patient Care at the Ottawa Hospital.

Investigating Team:

Principal Investigator: Michael S. Kerr, PhD, Assistant Professor, School of Nursing, University of Western Ontario

Co-Principal Investigator: GinetteLemire-Rodger, PhD, Chief of Nursing for the Ottawa Hospital

Co-investigators: Danielle D'Amour, PhD, Associate Professor, Faculty of Nursing Sciences, University of Montreal
Barbara Davies, PhD, RN, Associate Professor, School of Nursing, Faculty of Health Sciences, University of Ottawa
Kathryn A. S. Higuchi, PhD, RN, Assistant Professor, School of Nursing, Faculty of Health Sciences, University of Ottawa
Heather Laschinger, PhD, RN, Professor, School of Nursing, University of Western Ontario

Introduction:

You are invited to participate in a research study being conducted at The Ottawa Hospital by a team of researchers led by Dr. Michael Kerr of the School of Nursing, University of Western Ontario and the Institute for Work and Health. The study is entitled: Evaluation of the Implementation of an Inter-professional Model of Patient Care at the Ottawa Hospital.It is funded by the Ontario Ministry of Health and Long-term Care (MOHLTC) with in-kind contributions from the Ottawa Hospital (TOH).

Purpose of the Study:

The main purpose of this evaluation is to determine the multilevel impact of adopting a new inter-professional model of patient care practice at The Ottawa Hospital (TOH). Our study will examine the impact of adopting the new model through a long-term study looking at how the introduction of the new model impacts important some outcomes staff, patient and the overall organization. The introduction of the new practice model itself is not part of this study. The context of the model and its implementation are controlled by the Ottawa Hospital. The aim of this study is to provide a detailed evaluation of its impact on staff collaboration, their satisfaction with the care they provide and the quality of patient care, as perceived by the patients themselves.

Description of Research:

If you agree to participate in this study, we will arrange for you to complete three self-administered questionnaires over the next 12 months (one at baseline – before implementation of the new care model, and one at 6 and 12 months). The questionnaire will address: collaboration, work stressors, well being, organizational climate, quality of patient care and some basic demographic information such as age, sex, etc. This questionnaire should take about 15 minutes to complete. It is estimated that the total time involved for your participation in this study is about 1 hour, including time to read the letter of information and to complete the three questionnaires. The questionnaires will be collected by the study coordinator at the worksite.

Eligibility:

- Between the ages of 20-65
- A professional staff member at one of the Ottawa Hospital sites involved in the implementation of the new inter-professional practice model.
- Anyone on long-term disability, maternity or other extended leave at baseline (time of first survey) is ineligible to participate.

Participation:

Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions or withdraw from the study at any time with no effect on your employment status. If you choose to withdraw, all data collected and recorded to this time will be destroyed. There are no known risks involved in participating in this study. The results from this study may however inform the investigating team about how adopting a new inter-professional practice model for provision of patient care will impact on inter-professional collaboration, staff well being, organizational climate, and quality of patient care. By carefully documenting and evaluating the change process we can utilize these findings so that other organizations might benefit from the pioneering work being carried out at the Ottawa Hospital. In recognition of your contribution to the project you a $2 gift certificate to Tim Horton's will be attached to the questionnaire.

Confidentiality:

The principal investigator and project coordinator will be the only people with access to your name and address. This information will be kept in a secure location and will not be disclosed to anyone nor will your name or any personal identifiers be used on study questionnaires. Once you agree to participate in this study, you will be identified by research code (e.g. OCH 0000 T1) on all questionnaires. The results of this study may be described in oral and written presentations and may be published in professional journals. However, at all times the results will be presented in a combined group format only and no personal identifiers will be used. Data on individual subjects will not be released in any format. This letter is yours to keep.

Contact Persons for Participants:

If you have any further questions about the study entitled: Evaluation of the Implementation of an Inter-professional Model of Patient Care at the Ottawa Hospital, please feel free to contact the following individuals:

Dr. Michael S. Kerr
Principal Investigator
The University of Western Ontario
Assistant Professor
School of Nursing

Project Co-ordinator
Wendy Diegel
Contact Information
The Ottawa Hospital,
1053 Carling Avenue,
Ottawa ONTARIO, K1Y 4E9

If you have any questions about the conduct of this study or your rights as a research subject you may contact:

The Office of Research Ethics at the University of Western Ontario

CURRICULIM VITAE

Name:	Noha MohammedaliAbadi Hamlan
Place of Birth:	Jeddah, Kingdom of Saudi Arabia
Post-Secondary Education and Degree:	King Abdul Aziz University Jeddah, Saudi Arabia 2004-2009 BScN The University of Western Ontario London, Ontario, Canada 2012-2015 MScN
Honors and Awards:	No
Related Work Experience:	King Abdul Aziz University Hospital Internship nursing student 2008-2009 The University of Western Ontario Statistic class - Teaching Assistant 3 months- 2013
Professional Membership:	Saudi Commission for Health Specialties