

**PUTTING EDUCATION INTO ACTION:
SUPPORTING URINARY CONTINENCE AMONGST OLDER ADULTS IN ACUTE
CARE THROUGH INTERPROFESSIONAL STAFF EDUCATION**

by

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

(Nursing)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

March 2014

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Abstract

Background: Many older adults experience urinary incontinence (UI) and as a result suffer from a variety of physical, emotional, and social consequences. Despite the presence of an interprofessional team to support urinary continence in hospital-based care, studies show that the team has insufficient knowledge to manage patients' UI. **Purpose:** To assess changes in UI knowledge among an interprofessional hospital-based team after following an evidence-based educational intervention. The study also aims to better understand the facilitators and barriers to evidence-based learning in a hospital-based setting. **Sample/Methods:** 32 participants including registered nurses, licensed practical nurses, physiotherapists and occupational therapists from an older adult unit in an urban community hospital participated in the study. Participants met the pre/post-test study design inclusion criteria by completing the UI pre-test, 2/3 educational interventions and UI post-test. Changes in pre/post-test scores were analyzed to assess the effectiveness of the educational intervention. Semi-structured interviews were also conducted after post-test data collection to gain an in-depth understanding of the facilitators and barriers to learning within the context of the research site. **Results:** Overall UI knowledge showed statistically higher post-test scores ($p = .001$). Nevertheless when broken down into foundational and advanced knowledge, the former improved ($p = .005$) where the latter showed no statistically significant improvement ($p = .103$). Qualitative results described many facilitators and barriers within the following categories: 1) attempting to learn in the workplace, 2) putting evidence-based education into action and 3) learning and providing care within an interprofessional team. **Implications:** The Putting Education into Action study supports the need for a critical evaluation of current trends in hospital-based workplace learning. It provides

suggestions for effective workplace learning and supports the need for further education-based studies in order to continue learning how to best keep nursing and allied health professional up to date with evidence-based practices that are continuously evolving within healthcare research.

Preface

This is an independent descriptive study that used a pilot pre/post-test design and supportive qualitative component initially designed by supervisor Jennifer Baumbusch. I modified the initial study design to meet the needs of the research site and master thesis requirements. I recruited the study participants, collected and analyzed the research data, and wrote the entire thesis with guidance from my supervisor, Jennifer Baumbusch, and committee members, Alison Phinney and Maureen Shaw. UBC Behavioural Research Ethics Board provided ethical approval for the study, certificate number H11-02282.

Table of Contents

Abstract.....	ii
Preface.....	iv
Table of Contents	v
List of Tables	x
List of Abbreviations	xi
Acknowledgements	xii
Dedication	xiii
Chapter 1: Introduction	1
1.1 Problem Statement.....	3
1.2 Purpose and Aims	5
1.3 Significance	5
Chapter 2: Literature Review.....	7
2.1 Conducting the Literature Review.....	7
2.2 Part I: Urinary Incontinence	10
2.2.1 Chronic UI and Risk Factors	10
2.2.2 Acute UI: A focus on Hospitalized Older Adults.....	11
2.2.3 Consequences of Urinary Incontinence	14
2.2.3.1 Physical Consequences of UI	14
2.2.3.2 Emotional and Social Consequences of UI.....	17
2.2.3.3 Financial Costs of UI.....	20
2.2.4 Inter-professional Knowledge of Urinary Incontinence	22

2.2.5	Least Invasive and Behavioral Management for UI in Hospitalized Older Adults ..	26
2.2.6	Part I: Summary and Gaps in UI Literature	27
2.3	Part II: Putting Education into Action: Knowledge Translation and Exchange	29
2.3.1	Knowledge Exchange	29
2.3.2	Theoretical Framework: Roger’s Diffusion of Innovation Theory	31
2.3.3	Part II: Summary and Gaps in Knowledge Translation and Exchange Literature....	32
Chapter 3:	Methods	33
3.1	Research Questions	33
3.2	Theoretical Framework: Roger’s Diffusion of Innovation Theory	33
3.3	Research Design	35
3.4	Study Site and Sample	36
3.4.1	Site	36
3.4.2	Sample	37
3.5	Study Procedures	38
3.5.1	Step 1: Consent and Collection of Baseline Data	39
3.5.2	Step 2: Educational Intervention Preparation	40
3.5.3	Step 3: Implementation of Education Tools	40
3.5.4	Step 4: Collection of Post-test Data and Evaluation of Knowledge Exchange	41
3.6	Data Collection	42
3.6.1	Instrumentation	42
3.6.1.1	Questionnaire	42
3.6.1.2	Semi-Structured Interview Guide	44
3.7	Analysis	45

3.7.1	Quantitative Data	45
3.7.2	Qualitative Data	46
3.8	Ethical Consideration.....	46
3.9	Knowledge Exchange of Study Results.....	46
Chapter 4: Results	47
4.1	Pre/Post-Test Sample Characteristics	47
4.2	UI Knowledge.....	48
4.2.1	Foundational Knowledge.....	49
4.2.2	Advanced Knowledge.....	50
4.3	Comfort and Confidence Scale (CCS).....	51
4.4	Perceived Support (PS).....	51
4.5	Importance of Evidence-based Practice (EBP).....	52
4.5.1	Summary	53
4.6	Interview Sample Characteristics	53
4.7	Qualitative Research Question.....	54
4.7.1	Requirements for Learning	54
4.7.1.1	Time	55
4.7.1.2	Structural Supports	57
4.7.1.3	Common Goals	58
4.7.1.4	Methods of Education Distribution.....	59
4.7.2	Putting Evidence-based Learning into Action	60
4.7.2.1	Importance of Evidence Based Practice	60
4.7.2.2	Barriers to PEA	60

4.7.2.3	Facilitators to PEA.....	62
4.7.3	Interprofessional Learning and Care.....	63
4.7.3.1	Interprofessional Care.....	63
4.7.3.2	Interprofessional Learning.....	64
4.7.4	Summary.....	65
Chapter 5: Discussion	66
5.1	Key Findings.....	66
5.1.1	Changes in UI Knowledge.....	66
5.1.2	Facilitators and Barriers to Learning and Implementing Evidence Based Practice..	67
5.2	Findings Supported in Literature.....	69
5.3	Findings Supported by Roger’s Diffusion of Innovation Theory.....	72
5.4	Limitations.....	73
5.5	Implications.....	74
5.5.1	Nursing Practice and Education.....	75
5.5.2	Leadership.....	75
5.5.3	Future Research.....	76
References	77
Appendices	83
Appendix A	Pre-Test Questionnaire.....	83
A.1	Consent Form.....	83
A.2	Pre-Test.....	85
Appendix B	In-services.....	91
B.1	Fact Sheet #1.....	i

B.2	Fact Sheet #2	i
B.3	Fact Sheet #3	i
	Appendix C Post Questionnaire.....	97
C.1	Consent Form	97
C.2	Post-Test.....	99
	Appendix D Qualitative Interviews	106
D.1	Interview Consent Form	106
D.2	Semi-Structured Interview Guide	108

List of Tables

Table 4-1 Sample Characteristics (N=32)	48
Table 4-2 UI Knowledge	49
Table 4-3 Foundational Knowledge	49
Table 4-4 Advanced Knowledge	50
Table 4-5 Comfort and Confidence Scale.....	51
Table 4-6 Perceived Support (PS)	52
Table 4-7 Importance of Evidence-based Practice (EBP)	52
Table 4-8 Interview Sample Characteristics N=6.....	54

List of Abbreviations

PEA: Putting Education into Action

UI: Urinary incontinence

PT: Physiotherapists

OT: Occupational therapists

RN: Registered nurses

LPN: Licensed practical nurses

CNL: Clinical Nurse Lead

BPG: Best practice guideline

CINAHL: Cumulative Index to Nursing and Allied Health Literature

RNAO: Registered Nurses' Association of Ontario

UTI: Urinary tract infection

IUC: Indwelling urinary catheter

Acknowledgements

I would like to start by thanking my supervisor Jennifer Baumbusch with tremendous gratitude for her unwavering support throughout the program and through the development of my thesis, which would not have been possible without her expertise, support and direction. Your patience and guidance have allowed me to grow both academically and professionally for which I will be forever grateful.

I would like to extend my thanks and appreciation to my committee members Alison Phinney and Maureen Shaw who encouraged me to critically reflect on my work from start to finish. Your time, experience, knowledge and feedback gave me the direction required to submit a final product to be proud of.

The Helen Shore Nursing Endowment Fund provided partial funding for the study.

A final thank you to my friends and family who have supported and encouraged me in my continuing education and kept me grounded in the more challenging times. A special thank you to my dear sister Maya, classmates Katie and Cindy, friends Diana and Kimi and roommate Blou. I could not have completed this academic chapter without your late night edits, helpful advice, direction and friendship.

Dedication

To all who saw my capabilities even when I could not.

Chapter 1: Introduction

Prevalence of urinary incontinence (UI), or involuntary urine loss, has been reported and researched across the world (McCarthy, McCormack, Coffey, Wright, & Slater, 2009). In Canada, for example, over 3.3 million Canadians experience UI annually (The Canadian Continence Foundation, 2012). Similarly, up to 13 million Americans are affected by UI, with one-third of community dwelling older adults, half of long-term care residents, and 11- 23% of hospitalized patients having been affected at some point in time (Fasing, 1996). A Swedish study assessed the risk of UI in women who had a single vaginal birth versus a single caesarian section 20 years prior, in this way assessing the longitudinal effects of childbirth on UI in women (Gyhagen, Bullarbo, Nielsen & Milsom, 2012). The study showed that women who had a vaginal birth 20 years prior were at 67% greater risk of experiencing UI than those women who had a planned or an acute caesarian section, putting women at increased risk of UI in older age (Gyhagen et al., 2012). Though less research focuses on UI prevalence in men, Shamliyan, Wyman, Ping, Wilt, & Kane (2009) reviewed 1083 observational studies and randomized control trials between 1990 and 2007, which looked at epidemiology and prevention of UI in men. This study showed incidence rates of UI in elderly men in the range of 21% to 32%. Worldwide, people of all ages experience UI, women frequently report rates up to twice as much as men, and older adults more often than younger adults (Farage, Miller, Berardesca, & Maibach, 2007; Fasing, 1996).

Regardless of gender, age, or nationality those who experience involuntary urine loss suffer from a variety of physical, emotional, and social consequences. Additionally, there is a financial impact to both the person and the health care system. For example, UI is a leading cause of many chronic conditions among older adults such as increased risk for urinary tract

infections, pressure sores and dermatitis (Bradway, Hernly & NICHE faculty, 2011; Cooper & Watt, 2003; Fasing, 1996; Wilson, Brown, Shin, Luc, & Subak, 2001). While attempting to reach the toilet and avoid incontinence, older adults also experience increased rates of falls and in turn are at risk for new or prolonged hospital admissions as well as functional decline (Cooper & Watt, 2003). Although these are just a few of the negative physical consequences, UI also negatively impacts people's emotional and social quality of life. Stigma associated with involuntary urine loss can be socially isolating, may restrict recreational activities, and can lead to depression (DeMaagd & Davenport, 2012; Fasing, 1996; Subak et al., 2006). Among older adults UI is a common reason for transfer from acute to long term care settings without returning home, affecting social routines and independence (Fasing, 1996). Not only does UI negatively affect the person experiencing the symptoms, hospitals also bear a huge financial burden through the increased number of admitted patient days, the cost of incontinence supplies, and the associated rates of readmission (Subak et al., 2006).

Despite costs to the hospital organization, most UI research remains focused on community dwelling older adults and those in long term care facilities (Pfisterer, Johnson, Jenetzky, Hauer, & Oster, 2007; Subak et al., 2006; Wilson et al., 2001). Compounding the lack of UI research in hospital-based care, the literature also describes the tendency of UI to be overlooked and insufficiently understood by hospital staff as well as under reported by patients and is therefore often poorly assessed, managed and treated in this setting (Fasing, 1996; Subak et al., 2006). Although UI is infrequently the principle illness in hospital admissions it remains an important health concern due to the physical, emotional, and financial impact on individuals and the healthcare system and therefore merits further attention and research (Cooper, & Watt, 2003; Fasing, 1996; Wilson, et al., 2001).

Current literature shows that there are many treatment options aside from surgical interventions that can help decrease rates and minimize consequences of UI if healthcare providers have the skills to assess, manage, and implement strategies at the bedside in support of urinary continence (Cooper & Watt, 2003; DeMaagd & Davenport, 2011; Dumoulin, Korner-Bitensky & Tannenbaum, 2007). The International Consultation on Incontinence suggests that least invasive and behavioral management strategies should be prioritized as the first set of actions prior to surgical interventions. Activities such as: educating patients on strategies to strengthen the pelvic floor, maintaining proper nutrition and hydration, preventing constipation, reducing caffeinated beverages, monitoring voiding patterns and introducing voiding schedules as well as reviewing medications, all promote and support urinary continence in the hospital setting (DeMaagd & Davenport, 2012; Dumoulin et al., 2007). By implementing further UI education, among hospital staff, and exploring the effectiveness of educational services in the workplace we will be able to learn how to support staff and enable UI treatment while minimizing the negative consequences that UI has on both patient and healthcare system.

1.1 Problem Statement

Hospital-based care relies on the work of many professionals including nursing, physiotherapists (PTs), occupational therapists (OTs), social work, medicine, rehabilitation assistants, dieticians, respiratory therapists etc. in order to assess and manage patients' diverse health needs. Through reference to the literature and practical experience each member of the interprofessional team is able to provide unique knowledge, assessment, and management of conditions such as UI (Molinuevo & Batista-Miranda, 2012). With the complexity of UI and its' consequences, it is to the benefit of the patient and the hospital to have all those who work in direct contact with patients to share the responsibility of continence promotion for older adults

(Bradway et al., 1998; Cheater, 1992; Dumoulin et al., 2007). However, despite having multiple professionals in an ideal position to support urinary continence in this setting, Cooper and Watt (2003) showed that hospital-based nurses, for example, have insufficient knowledge to manage patients with new onset UI or to support patient's continence prior to discharge home. Similarly, Dumoulin et al.'s (2007) study looking at Canadian PTs and OTs assessments and interventions of UI in post stroke patients, showed that they do not routinely express UI as a problem. In this study less than 20% of OTs and 15% of PTs used best practice assessments and only 2% and 3 % respectively used best practice interventions. Being discharged home from hospital with new UI puts older adults at high risk of re-admission to acute care hospital settings (Subak et al., 2006). Therefore, effective educational interventions that help streamline assessments and support an interprofessional team's knowledge of UI in fast-paced and busy hospital settings may play an essential role in ensuring that older adults are returning home with urinary continence.

Many acute care settings do not have best practice or clinical practice guidelines for UI, although continence promotion and management programs are easy to find within community care in many health authorities. The Registered Nurses Association of Ontario, however, developed a best practice guideline (BPG) for Promoting Continence Using Prompt Voiding and although it is funded by the Ontario Ministry of Health and Long Term Care it is meant to serve as a resource for all practice areas including acute care, community, and long term care (Registered Nurses Association of Ontario, 2011). Resources such as this may serve to support clinical practice when introduced, implemented, and integrated into routine care.

It is not sufficient to simply provide staff with resources and education without studying effective means of knowledge translation and exchange. It is important to understand how the evidence, the context of the workplace, and methods of distribution affect the successful

diffusion of new initiatives (Rycroft-Malone et al., 2004; Shirey, 2006). Further research is required to better understand the needs of people receiving education so that new knowledge is not left with the researcher, or in the classroom, but instead may be effectively implemented in practice where it has the potential to better the health and care of patients. Without this, clinical care and practice will continue to lag far behind evidence-based research leaving patients to suffer the consequences of poor quality, uninformed, and outdated care (Rycroft-Malone, et al., 2004 & Shirey, 2006).

1.2 Purpose and Aims

This study holds two purposes: (1) to assess change in knowledge among interprofessional team members following an educational intervention based on the Registered Nurses Association of Ontario's best practice guideline: Promoting Continence using Prompt Voiding; (2) to better understand the facilitators and barriers when implementing new education and evidence-based practice in the workplace as experienced by an interprofessional team.

These objectives will allow for this study to:

- Assess a hospital-based interprofessional team's baseline knowledge of urinary continence.
- Pilot an educational intervention to support learning in the workplace.
- Evaluate the effectiveness of such learning in order to better support best practices in future hospital-based care.

1.3 Significance

Given that over 3.3 million Canadians experience UI, that the prevalence of UI increases with age, and that we have an aging population research related to UI has never been more important. With a predominant amount of research focused on UI in the community, hospital-

based care warrants further research to reduce the negative effects of UI on our aging population. Furthermore, recognizing the negative physical, social, and financial consequences to both patient and health care system it is imperative that healthcare professionals are adequately supported to understand and implement best practices in areas such as urinary continence in the hospital.

This study will evaluate the effectiveness of an educational intervention on an interprofessional team's UI knowledge in an older adult hospital-based setting. Additionally, the study will look to better understand the facilitators and barriers to implementing evidence based education in the workplace. This research has the potential to effectively transform interprofessional team members' knowledge and improve patient health outcomes related to UI. Health care professionals need to continuously learn and adapt to new research and changes in best practices. This study will therefore add to the body of literature looking at knowledge translation for best practice implementation in the workplace.

Chapter 2: Literature Review

Urinary incontinence has been studied and addressed in a variety of contexts. Existing research on the topic has been conducted in diverse healthcare settings, among different medical disciplines, and utilizing a wide array of patient populations. The following literature review will provide an overview of current UI research and will be divided into two parts based on the content of this study's two research questions; Part I: Urinary Incontinence and Part II: Putting Education into Action: Knowledge Translation and Exchange. Part I will look at different forms of UI from an inter-professional perspective with a focus on acute UI in hospitalized older adults. In particular, Part I will focus on chronic UI and the associated risk factors, along with acute or transient UI in hospitalized older adults. Next, the physical, emotional, and financial consequences that UI has on patients and the health care system will be examined in order to support the need for further research and education in this area. Thirdly, a look into the inter-professional team's knowledge of UI in hospital-based care is reviewed; concluding with a review of the non-invasive treatment strategies for acute UI with in the hospital environment. Part II of the literature review will focus on knowledge translation in order to understand the key components of putting education into action. Each section will conclude with a brief summary and highlight the gaps in the literature to support the need for this study.

2.1 Conducting the Literature Review

In order to better understand the existing research on UI and identify the current methods for knowledge translation a thorough review of literature was conducted using the Cumulative Index to Nursing and Allied Health Literature (CINAHL) along with Medline (OvidSp) database and manual searches from reference lists. Due to the magnitude of literature found related to Part I, UI was been divided into five key areas, including: chronic UI and its' risk factors, acute

UI in hospitalized older adults, consequences of UI, inter-professional knowledge of UI, and current least invasive and behavioural management strategies for acute UI in hospital-based care.

While chronic UI and its' risk factors are frequently mentioned within the literature, for the purposes of this study the Registered Nurses Association of Ontario's (RNAO's) best practice guideline (Promoting Continence Using Prompt Voiding and the RNAO's Self-Learning Package: Continence Care Education (2011)) will be used as the evidence-based source for defining and reviewing chronic UI. In order to conduct the literature search, shifting focus from chronic to acute UI in older adults within hospital-based care, search terms included combinations of the following: UI, transient UI, acute UI, causes, risk factors, hospital, unit based, acute care, older adults. The search based on these terms provided less than 20 articles within CINAHL. Within these articles, the majority looked at management and prevalence of UI versus incidence rates or focused on community or long-term care research sites over hospital settings. However, this initial search lead to a study by Zizberg, Gary, Gur-Yaish, Admi and Shadmi (2011), which examined the effect of several continence aids and new onset of UI in older adults in acute care and will be further discussed below. The search was expanded to include articles that briefly address risk factors of acute UI in hospital-based care though their primary focus was assessment and management of UI.

In exploring the consequences of UI, the literature review was conducted using various combinations of key terms such as: UI, acute UI, transient UI, consequences, costs, hospital, acute care and older adults within CINAHL and Medline databases. The search terms of consequences and costs were found to be too broad and were narrowed down to terms that highlighted very specific physical, emotional, or financial costs and consequences. Key words in this secondary review included: indwelling urinary catheters, urinary tract infections, falls,

isolation, quality of life, stigma, financial burden, healthcare costs etc. Emotional consequences of UI were far easier to find within the literature while physical and financial consequences required very specific search terms and a more in-depth review of reference lists to identify relevant articles to expand the literature review. The Canadian Urinary Continence Foundation also provided several statistics and a relevant reference list that were further reviewed.

In order to review the literature on interprofessional team knowledge of UI key word searches included: knowledge, assessment, management, UI, hospital, and acute care. These search terms proved to be sufficient in bringing up multiple primary studies, in English, focusing on care of older adults with UI. Many of these studies primarily address the lack of understanding or poor use of appropriate assessments and management strategies in hospital-based care. Studies tended to be discipline specific and therefore two studies were selected addressing nurses' knowledge of UI and one study looking at a rehabilitation team's tendencies related to recognizing and addressing UI concerns.

While investigating current treatment strategies in acute care no study was found describing current best practices outside of the RNAO BPG: Promoting Continence Using Prompt Voiding (2011). Unfortunately, current treatments were described most frequently within review studies on healthcare professional's lack of consistent treatment choices. Non-invasive behavioral interventions recommended in these studies and supported by the RNAO BGP are reviewed.

Part II used key word search terms such as: continuing education, learning, knowledge translation, nursing and workplace, which provided several studies that introduced Roger's Diffusion of Innovation Theory and addressed knowledge translation in the workplace. Two review studies are used to address key components in successful implementation of new

knowledge in the workplace and guided the selection for the theoretical framework used in this study; Roger's Diffusion of Innovation Theory.

2.2 Part I: Urinary Incontinence

2.2.1 Chronic UI and Risk Factors

Chronic UI is comprised of 5 classifications, each of which has its' own risk factors; stress, urge, mixed, overflow and functional UI (Bradway et al., 1988; Fasing, 1996; Registered Nurses' Association of Ontario, 2011). Stress UI occurs when intra-abdominal pressure exceeds that of which the urinary sphincters and pelvic floor muscles are able to hold, in turn causing involuntary urine loss. Risk factors include anything that weakens the pelvic floor including having had multiple child births, muscle atrophy, surgeries affecting the urinary system, lower estrogen levels, etc. as well as anything that might increase abdominal pressure such as sneezing, coughing or picking up heavy objects (Registered Nurses' Association of Ontario, 2011). Urge UI on the other hand is described as the involuntary loss of urine with a strong urge to void and is often associated with frequency. Risk factors for urge UI include things that irritate the bladder wall including: caffeine, infections, medications and pathological conditions that might neurologically increase bladder contractions such as Parkinson's disease (Registered Nurses' Association of Ontario, 2011). Thirdly mixed UI is experienced by someone who suffers from a combination of stress and urge UI. Next, overflow UI is caused by the inability of the bladder to appropriately empty. In this case anything that leads to retention such as medications that relax the bladder, neurological conditions that decrease the contractility of the bladder muscles, an enlarged prostate or stool in the rectum that block the urethra put someone at greater risk for overflow UI. When experiencing overflow UI urine leaks out of a full bladder because there remains no more capacity to store it (Registered Nurses' Association of Ontario, 2011). Finally

functional UI, unlike most of the other forms occurs because of a wide variety of risk factors that are unrelated to the urinary system. Risk factors here may be cognitive impairments, environmental space, mobility, staffing, education etc. It is clear when it comes to chronic UI, risk factors range widely from physical damages and pathology of the urinary system to environmental factors (Registered Nurses' Association of Ontario, 2011).

It is important to understand chronic UI as many of its' risk factors are shared with acute or transient episodes of incontinence. While both acute and chronic episodes are seen within the hospital setting, this study will focus on patients with no previous history of UI and the causes that may be resolved with relatively simple non-invasive interventions prior to discharge from hospital care. For this reason the literature review that follows focuses on acute UI in hospitalized older adults.

2.2.2 Acute UI: A focus on Hospitalized Older Adults

The literature often uses the language of new, acute or transient UI to describe the quick onset of UI episodes. Acute UI is caused by risk factors outside of the urinary system and is therefore reversible if identified and addressed appropriately. Chronic UI, on the other hand, typically affects the urinary system and patients have a long history of UI making it more difficult to reverse.

Zizberg et al. (2011) conducted a prospective observational study titled 'Hospitalization Process Effects on Functional Outcomes and Recovery'. The aim was to describe a variety of continence aids used in acute medical units on hospitalized older adults in Israel and to assess their association with the occurrence of new UI upon discharge. Exclusion criteria for the study were older adults with a history of UI, those with co-morbidities that would hinder their ability or a family member's ability to report UI aid use and those whose hospital stay was too short for

participation. The final sample was made up of 352 patients from one of five general medical units at a tertiary-care teaching hospital in Israel. A baseline interview was conducted within the first 48 hours of admission to determine if the client met study criteria and had not experienced previous episodes of UI. During any given interview (up to three were conducted on any patient between February to November of 2009) clients or family caregivers were asked to report on use of urinary catheters, adult diapers, commodes or urinals, or if they were self-toileted within the previous 24 hours. By testing the association between different continence aids and the onset of new UI Zizberg et al. (2011) reported that the odds of developing new UI at discharge was 8.63 times higher (95% CI + 3.71-20.28) among patients who had a urinary catheter than those reporting self-toileting. Similarly, there was 5.3 (95% CI = 2.66 – 10.29) times greater risk of developing new UI with the use of adult diapers compared to self-toileting. With the admission to a new environment, hospitalized patients experience barriers that disturb routine voiding and in turn increase the risk of developing new UI.

Apart from the Zizberg et al.'s (2011) study it was challenging to find primary studies in the literature that looked directly at the risk factors of acute UI in hospital care settings. However, many articles addressing the assessment and management of UI in hospital-based care did briefly mention the risk factors that contribute to acute UI. Fasing (1996), for example, discusses the impact that particular admission diagnoses as well as the use of catheters, side rails and medications may have on new and reversible episodes of UI.

Fasing (1996) first reports that a variety of admission diagnosis may predispose patients to acute UI, these include depression, delirium, dehydration, constipation or fecal impaction. Compounding the fact that patients may already be predisposed to risk factors the author also highlights that the hospital environment may increase risk of UI by its' use of urinary catheters

and bedrails. Urinary catheters put people at risk of urinary tract infections, which may irritate the bladder and increase urgency and frequency of voiding when the catheter is removed (Lee & Malatt, 2011). Similarly, physical deconditioning occurs rapidly among older adults and the decreased need to get up to the bathroom when using a catheter may be sufficient in accelerating any functional decline. This functional decline makes it more challenging to reach the bathroom after catheters are removed, in turn putting patients at increased risk of developing functional UI. A second environmental factor considered by Fasing (1996) is the use of bedrails, which may hinder an older adult's ability to navigate their bed, and new room, in order to make it to the bathroom in time. Any environmental concern that prolongs time for a patient to reach the toilet may not only put them at risk of incontinence episodes it may also increase the risk for falls (Fasing, 1996). Falls may in turn prolong hospital admissions and further physical deconditioning (Cooper, & Watt, 2003). Finally Fasing (1996) describes the effect that medications can have on increasing rates of acute UI. Sedatives used for anxiety or as a sleeping aid increase episodes of acute UI particularly for older adults with impaired cognition or limited mobility. Diuretics increase the frequency in which older adults require toileting while narcotics or antidepressants may lead to urinary retention and UI symptoms such as overflow leaking. Acute UI has the potential to turn into chronic UI if these barriers are not sufficiently considered, assessed and treated.

There is a lack of current primary studies that assess the pre-admission, environmental, and pharmacological risk factors described in Fasing's (1996) article as causes of acute UI. However, many studies over the years use the acronym DIAPPERS to describe reversible causes of acute or transient UI; delirium, infection, atrophic, pharmacological, psychological, endocrine (access urine output), restrictive mobility and stool impaction (Bradway et al., 1998; DeMaagd &

Davenport, 2012; Fasing 1996). Hospital admissions do not provide sufficient time to thoroughly assess and treat chronic UI however, understanding acute UI risk factors within hospital-based care allows healthcare providers to recognize, assess, and treat many reversible causes of UI so that older adults are not discharged home to suffer the many negative consequences that UI has to a person and healthcare system (Bradway et al., 1998; DeMaagd & Davenport, 2012; Fasing 1996).

2.2.3 Consequences of Urinary Incontinence

2.2.3.1 Physical Consequences of UI

Urinary incontinence negatively impacts patients' physical, emotional, and social health each of which will be reviewed in this section. Starting with physical consequences the literature reviewed describes how infections, skin breakdown and falls are potential outcomes of UI in hospitalized older adults (Bradway, Hernly & NICHE faculty, 2011; Cooper & Watt, 2003; Wilson et al., 2001). Urinary tract infections are often associated with indwelling catheter use and their links to UI will be further explored through a review of Elpern et al.'s (2009) study. Following this, further discussion of incontinence associated dermatitis and falls will be addressed.

The Elpern et al.'s (2009) study looked at indicated versus un-indicated days of urinary catheter usage and associated rates of urinary tract infections. While there are many indications for the use of indwelling urinary catheters (IUC), when used inappropriately they run the risk of creating physical consequences such as decreased mobility and de-conditioning, prolonged hospital admission and urinary tract infections (UTI) (Lee & Malatt, 2011). Elpern et al. (2009) had a team of clinicians develop appropriate and inappropriate indications for catheter use by reviewing current practices and analyzing appropriate publications.

Using this data clinicians implemented educational sessions for the nurses and physicians on a 21 bed medical intensive care unit in Chicago, Illinois. The focus of the intervention was on daily evaluations of catheter appropriateness and recommendations for removal of those not indicated. The study compared total number of days of catheter use and associated UTIs of consecutively admitted patients to the medical intensive care unit over a six-month period and compared it to 11 months of data collected prior to the intervention phase (Elpern et al. 2009). During the intervention phase a total of 1432 days (238.6 mean catheter days/month) of IUC use was recorded for 337 patients. Of the 1432 catheter days 456 days were considered inappropriate. The most common reason nurses gave for continuing the use of catheters against recommendations during the intervention phase was that clients were incontinent (Elpern et al. 2009). This emphasizes the importance of appropriately supporting staff in the assessments and management of UI so that we are not putting clients at greater risk with inappropriate interventions such as IUC. During the 11 months of pre-study collection 15 incidences of UTI were recorded making it 4.7 incidences of infection per 1000 days compared to 0 incidences of UTIs occurring in the 1432 catheter days for the intervention phase (Elpern et al. 2009). It is clear that decreasing catheter days decreases rates of UTIs while also emphasizing that appropriate indications for catheterization must be further reinforced so that UI is not hastily treated by healthcare staff with the use of IUC, in turn putting patients at greater risk of complications such as UTIs (Elpern et al. 2009).

The Elpern et al.'s (2009) findings however do need to be interpreted with consideration to the sample demographics. Elpern et al. (2009) used a subject sample with a mean age of 65 ranging between 18-99. As people age it is important to consider physiological changes such as the bladder's ability to hold less urine, difficulty efficiently emptying the bladder, and greater

susceptibility to irritation, which puts older adults at increased risk of UI (Farage et al., 2007). Elpern et al. (2009) indicates that the most frequent reason for inappropriate use of IUC was nurse's report that patients were incontinent. It is important that healthcare workers are not using UI as the sole reason for the insertion of an IUC without the presence of any other indicating factor, as this study shows increased IUC days puts clients at greater risk for UTI (Elpern et al. 2009).

Next, I reviewed literature addressing the impact of UI on skin fragility and the risks of developing incontinence-associated dermatitis. Older adults experience increased skin fragility because they become increasingly prone to cracking, leaving skin less resistant to infections over time (Farage et al., 2007). With exposure to water alone, skin is at increased risk of damage within 48 hours. Urine however contains irritating ammonia, which raises pH and adds chemical components to breakdown skin (Farage et al., 2007). Grey et al. (2007) reported similar findings in their review of literature on incontinence-associated dermatitis (IAD). Using Medline and CINAHL databases an expert panel convened and found that the literature consistently defined IAD by redness, edema, inflammation, and in advanced cases erosion of the surface of the skin with the potential for further complications such as bacterial infections. While the review considers both urinary and fecal incontinence they differentiate consequences of each summarizing that UI is a risk factor for dermatitis because of how it increases the pH, hydrates the skin and activates fecal enzymes (Farage et al., 2007).

Finally, the literature commonly describes urinary incontinence as a risk factor for increased fall rates among hospitalized older adults (Cooper & Watt, 2003; Morris & Wagg, 2007). Morris and Wagg's (2007) review of the literature shows that there is significant correlation between UI and falls among older adults. However, the literature lacks primary

studies and future research should include UI management in fall prevention strategies research. Falls and urinary incontinence increase lengths of hospital admissions and rates of discharge to long term care facilities (Cooper & Watt, 2003; Morris & Wagg, 2007). Morris and Wagg's (2007) report on the UK's National audit for continence care in older adults and found that 22% of hospital patient's recurrent falls were associated with having UI. They continue by reporting that the majority of falls occurred in patient hospital rooms with the remainder having fallen between the bedroom and bathroom and within the bathroom itself. In an attempt to make it to the bathroom in time patients may experience functional incontinence and are at higher risk of falling as they attempt to hold their urine and manage an unfamiliar environment (Cooper & Watt, 2003). The negative consequences of infections, skin break down, and falls associated with UI have on hospitalized older adults not only impacts them physically but also has a negative impact on emotional health.

2.2.3.2 Emotional and Social Consequences of UI

While the physiological impact of UI is significant the emotional stress and social isolation experienced by many older adults further impacts quality of life (Komorowski & Chen, 2006; Molinuevo & Batista-Miranda, 2012). Fear of having an incontinence episode in public or of not having access to washrooms causes emotional stress and worry. Kopec and Schultz (2003) did a cross-sectional analysis of data from the 1996/97 National Population Health Survey and determined that there is a decreased health-related quality of life associated with various self-reported chronic conditions, those suffering from UI are impacted in a similar extent as those living with osteoarthritis, stroke and chronic obstructive pulmonary disease. Molinuevo & Batista-Miranda (2012) also report that severe cases of UI can lead to anxiety and even depression. In order to further explore the emotional and social consequences of UI I will share

findings from Molinuevo and Batista-Miranda's (2012) non-systematic review of MEDLINE and PsycINFO databases and Komorowski and Chen's (2006) study on the experiences and perspectives of UI.

Molinuevo and Batista-Miranda (2012) reviewed psychological factors involved in the emotional distress experienced by patients with urinary incontinence. The aim was to gain a better understanding of UI and treatment methods. The researchers found that emotions such as embarrassment and frustration are commonly expressed as people view their UI as socially unacceptable and a result of their own social or physical incompetence (2012). Through their review of literature Molinuevo and Batista-Miranda (2012) categorized experiences into two psychological factors: cognitive barriers and safety behaviors. Cognitive barriers include the idea that UI is part of the normal aging process, has no treatment and finally that UI is an inevitable long-term condition (Molinuevo & Batista-Miranda, 2012). The authors suggest that people experiencing UI often hold cognitive biases that create negative thoughts and decrease an individual's ability to cope. An example provided by the authors is 'personalizing bias', where someone experiencing UI fears having an accident in the theatre for example and thinks that no one would sit next to them because they would be perceived as dirty. Safety behaviors on the other hand are described to be actions to minimize risk of feared incontinence; active behaviors, restrictive behaviors, and cognitive strategies (Molinuevo & Batista-Miranda, 2012). The article describes active behaviors as choosing to wear dark clothes, restrictive behaviors as being selective of social situations to participate in, and finally cognitive strategies such as mapping of washroom locations (2012).

Komorowski and Chen (2006) captured many of these same emotional and social barriers in their interpretive phenomenological study of 15 women on an obstetrics and gynecology unit

at Fuzhou General Hospital, Fujian, China. All 15 women were experiencing UI and participated in a semi structured interview developed to capture three subject areas; knowledge of UI, impact on quality of life and lastly treatment experiences. Through the analysis of field notes from two researchers, participant quotes, and interpreter verification, five key themes emerged from the data: uncertainty of UI, self-blame, avoidance, emotional isolation and desire for treatment. It was evident that these women had a poor understanding of the causes of UI, six participants starting off their response with 'I don't know' followed by a string of guesses, eight having used words such as 'maybe' or 'might have' and only one participant felt strongly that she knew the cause of her incontinence and related it to having eaten a Chinese nut. It was evident from responses that the women did not have a clear understanding of the causes of UI, giving as other examples, working too hard and childhood habits (Komorowski & Chen, 2006). Similarly, participant's lack of knowledge was evident by the second theme, self-blame, for which many attributed having UI. Women expressed it being their own fault for having poor childhood habits of voiding frequently or having not rested sufficiently in the months after childbirth. The third and fourth themes are both indicators of the impact UI has on quality of life, avoidance and emotional isolation respectively. Participants described avoiding activities such as going for walks, being with friends or exercising because of the fear of being incontinent or bound by the frequency of using public bathrooms in an attempt to avoid incontinence (Komorowski & Chen, 2006). Emotional isolation on the other hand was the feeling of not being understood by others and therefore ashamed, sad, frustrated, anxious and fearful to be in social gatherings. Finally the authors indicated desire for treatment as a last category. Six participants had never sought out treatment, four did not know treatment existed, one was too ashamed and another stated symptoms were not severe enough. Of the nine who had sought treatment 6 were

dissatisfied with previous attempts and only 3 were satisfied with the care they received (Komorowski & Chen, 2006).

With the shame and embarrassment felt by those experiencing UI and the lack of trust in effective treatments it is no wonder that UI is so often underreported to healthcare professionals (Edgley, 2002; Komorowski & Chen, 2006; Ostaszkiwicz, O'Connell & Millar, 2008; Registered Nurses' Association of Ontario, 2011; Vigod & Stewart, 2007). While consequences and complications of UI occur in individuals both physically and emotionally, there is also a financial cost to patients and hospitals that merit discussion; as they too may be reduced through better urinary continence education and management among older adults in hospital based care.

2.2.3.3 Financial Costs of UI

Urinary incontinence costs both the individual and the healthcare system a great deal of money annually and will be further reviewed in this section. Starting at the individual level, it is estimated that 50-70% of costs associated with the management of UI are spent on routine care such as absorbent pads, liners and laundry mat fees which places much of the financial burden on individuals suffering from UI (Subak et al., 2006). Despite the cost to individuals, little research has been conducted on the lack of understanding of predictors to incontinence based spending. With an aim of closing the gap in literature Subak et al. (2006) conducted a study to determine costs of routine care for community dwelling women with UI and reviewed patient's willingness to pay for improvements in their UI. The study recruited 301 women over the age of 40 through newspaper advertisements. Each participant had UI at the time of the study and completed a self-reported questionnaire. Questions addressing routine care costs included: "During a typical week, how many of each of the supplies listed below do you use specifically for your urine leakage?" and "During a typical week, how many loads of wash do you do because of your urine

leakage?” (Subak et al., 2006, p. 909). Fourteen stores and six states were used to estimate national unit costs of supplies in order to calculate average expenditures. Similarly average dry cleaning and personal laundry costs were calculated. Result showed that 90% of women reported some costs associated with their UI, although 10% of women accounted for 50% of costs and the highest 50% of women accounted for 93% of total group costs. Therefore estimated mean routine care costs, described by the weekly use of minipads, maxipads, incontinence pads, diapers, toilet paper, paper towels, laundry and dry cleaning, were \$10.59 (SD+/- 18) for the 262 women that reported any cost associated with their routine care. This represents an annual cost of \$550 (SD+/- 933) similar to other findings in the literature such as Canadian community dwelling older adults spending \$1000-\$1500 annually on absorbent products, collection devices and mechanical devices to manage urinary incontinence at home (The Canadian Continence Foundation, 2012). Despite the significant costs Subak et al. (2006) found that women would be willing to pay up to \$39/month (SD +/- 43) for 50% reduction in UI episodes and \$70/ month (SD +/- 64) for 100% improvement of incontinence episodes (Sudak et al., 2006). The financial burden of the cost of routine supplies is a challenge for individuals experiencing UI and can also be problematic for their caregivers. An Australian study interviewed 8 older adults (4 from rural settings and 4 from a metropolitan area) caring for their spouses who were experiencing UI, with an aim to address a variety of ways that UI impacts them as caregivers (Cassells & Watt, 2003). Using grounded theory methodology the authors conducted 8 interviews with participants. Study results showed that financial costs were one of three primary consequences to caregivers along with role changes and decreased intimacy. Participants reported not only the financial costs of routine care supplies as addressed in the above studies but included the purchasing of two single beds motivated by spouses incontinence (Cassells & Watt, 2003). With such a high financial

burden on community dwelling individuals it is important to also consider the costs on the healthcare system when these clients are admitted to acute or long-term care.

While individual costs to manage urinary incontinence are large, the summed cost on the healthcare system reinforces the need for appropriate UI prevention and management. The Canadian Continence Foundation's briefing on the impact of incontinence in Canada says that \$1.95 billion in healthcare costs are spent on UI annually. Wilson et al. (2001) study looking at the annual direct costs of UI in the USA (based on the \$1995) estimated that UI for each institutionalized elderly approximates \$3687 per year. The \$3687 breaks down to annual routine care costs between \$912-3650, diagnostic evaluations between \$100-400 and \$150-600 for behavioral therapy with additional costs for complications including: UTIs, falls and skin breakdown (2001). While the costs of re-admissions were not evaluated by Wilson et al. (2001) urinary tract infections, frequently associated with UI among the elderly, are the tenth most likely reason for older adults to experience unplanned readmissions to American hospitals (Lee & Malatt, 2011). With an aging population paired with the fact that prevalence of UI increases with age, we can expect that UI associated costs will continue to rise and impact healthcare spending. Despite the lack of literature related to the acute care costs associated with UI we can extrapolate that we will be continuing to see increased expenses related to supplies, assessment time, increased hospital days and risk of re-admission due to UI among older adults in hospital-based care.

2.2.4 Inter-professional Knowledge of Urinary Incontinence

The shame and stigmatization experienced by patients with UI explains why it is so frequently under reported and under diagnosed (Ostaszkievicz, O'Connell & Millar, 2008; Vigod & Stewart, 2007). Molinuevo and Batista-Miranda (2012) suggest that under reporting UI

also leads to a poor understanding of patient experiences and will hinder nursing and allied health professional's progress towards affective UI assessments and management. Care needs to be interprofessional and should address concerns, worries, expectations, emotions and the quality of life issues during admission interviews (Molinuevo and Batista-Miranda, 2012). The interprofessional healthcare team must not only have sufficient knowledge and assessment skills to support urinary continence but must also understand the importance of their roles in relation to patient care and their colleagues. Physiotherapists assess mobility, strength and balance while occupational therapists are specialists around space and function. Social workers can assess needs at home, patient's motivations, goals and fears and the medical team can provide diagnostics to decipher between physiological disorders that may require surgery versus behavioural interventions. Finally registered nurses and licensed practical nurses provide personal support and care 24/7 and can help assess, monitor and implement interventions to promote urinary continence daily while maintaining constant communication with the healthcare team. Early assessment and communication between the interprofessional team will allow patients to gain a better understanding of their urinary incontinence and improve the effectiveness of treatments and interventions prior to discharge home (Molinuevo and Batista-Miranda, 2012).

Cooper and Watt (2003) studied how Australian nurses in an acute care setting assessed and manage patient's UI based on 5 different vignettes. The vignettes were created to fit the profile of a typical medical and surgical client experiencing different forms of UI. This study asked participants to respond to each vignette with the questions "How do you assess this situation? What action do you take and why?" (Cooper & Watt, 2003, p. 307). Analysis of the 34 completed qualitative questionnaires reported that nurses in acute care hospitals poorly

manage patients with UI particularly in the areas of knowledge, attitudes and practice issues. The authors found that nurses lacked systematic methods of assessments and therefore had difficulty knowing what actions to take. The study reported a particular lack of knowledge related to the interactions of medications and UI (Cooper & Watt, 2003). Next, the study found that nurses often felt that UI was a natural part of aging, and that little can be done to improve cases; these two myths affect the way that nurses approach UI. Finally, with regards to practice, nurses in this study failed to perceive UI as central to nursing care. It is therefore understandable that few responses showed knowledge of patient education, scheduled voiding or use of bladder charts. Cooper and Watt (2003) conclude that the nurses who participated in the study lacked an appreciation for the role they could have in continence promotion and had limited assessment and management approaches towards incontinence, emphasizing the need for further research and clinical interventions.

An earlier descriptive study by Cheater (1992) similarly reported strong evidence towards the insufficient knowledge held by charge nurses, staff nurses and enrolled nursing students in the knowledge and management of UI. The study collected data through a three-part questionnaire including both closed and open-ended questions. Three scenarios were also provided representing three forms of UI in which participants were asked to suggest the causes of UI and provide management strategies (Cheater, 1992). When participants were asked to recall pre-registration training of UI, 82.2%-99.1% for each category responded that they had received some. However when asked to recall the nature of this training a total of 72.2% recalled management strategies using continent aids and appliances with only 5.7% recalling bladder or habit training, 5.3% recalling promotion of continence education, 5.3% for environmental factors and 4.4% on methods of prevention (Cheater, 1992). When asked about

causes of incontinence the respondents averaged only 3 answers of which urinary tract infections were the most common at 40.7%. Despite some participants suggesting nerve damage or neurological disorders, answers were often non-specific, vague and described symptoms rather than causal factors. Finally of those surveyed 24% of charge nurses and learners, 20% of staff nurses, and 17 % of enrolled nurses provided aging as a reason for incontinence. Patient laziness had a 4.1 % response rate while 'poor' nursing management only had a 2.2% response for causes of incontinence, showing that little ownership or reflection on nursing care in relation to UI was considered (Cheater, 1992).

It is not only among nurses that research shows lack of acknowledgement and assessment of UI among older adults. Dumoulin et al., (2007) conducted a cross-sectional telephone survey to assess physiotherapist's and occupational therapist's assessments and interventions of UI in post stroke patients across Canada. The aim of the study was to assess practice patterns of a random sample of PTs and OTs across the country providing care to this population. Stroke clinicians and researchers created three vignettes: one for acute care, one for inpatient rehabilitation, and finally one for community outpatient services. The results showed that a mere 39% of OTs and 41% of PTs routinely express UI post stroke as a problem. When looking solely at the acute care vignette on stress UI however, 53% of clinicians identified UI as a problem post stroke compared to only 37% responding to community's functional UI vignette and 29.6% for those responding to rehabilitation urge UI vignette. Despite acute care recognizing UI as a problem among this population the study also showed that less than 20% of OTs and 15% of PTs used best practice assessments and only 2% and 3 % respectively used best practice interventions.

It is evident that several studies suggest nurses and allied health professionals lack knowledge in the area of UI of older adults in acute care settings. The non-specific nature of many responses in the Cheater (1992) article shows that nurses at all education levels have superficial and often inaccurate knowledge of UI. Similarly, in all three studies participants lacked the knowledge to identify urinary continence management as central to care, reducing the tendencies to provide appropriate evidence-based assessment and management of this condition.

2.2.5 Least Invasive and Behavioral Management for UI in Hospitalized Older Adults

Despite the busy nature of acute care settings and the evidence that healthcare professionals may lack sufficient knowledge to appropriately assess and manage UI there are many non-invasive treatment options and teaching points that staff can share with hospitalized older adults experiencing new episodes of UI. In McCarthy et al.'s 2008 study on the prevalence, management, staff knowledge and professional practice environment related to incontinence on a rehabilitation unit they reported that 64% of contributing factors to UI were deemed physical and 19% environmental, both important factors to consider in urinary continence promotion.

The management of acute UI is based primarily on two notions: the removal of contributing factors and providing sufficient opportunities to empty the bladder (Bradway, et al., 1998). Many contributing factors affect client's ability to void and therefore require thorough assessment and client education for proper treatment. Common non-invasive and behavioural management strategies include the assessment and treatment of dehydration, constipation, infections, atrophic vaginitis, body weight, diet and medication use (Bradway et al., 1998; DeMaagd & Davenport, 2012; Fasing, 1996; Registered Nurses Association of Ontario, 2011). When health care professionals are aware of these contributing factors and are able to intervene

and provide patient education in a timely manner the consequences are minimized and patient's acute UI treated.

When promoting continence in hospital based care consideration of the environment and culture of the work place are important, as it may facilitate or hinder patient's ability to void. Bradway et al.'s, (1998) review looking at UI in older adults in acute care described the importance of hospital environments to support and facilitate urinary continence. Simple organizational factors, such as placement of clients call bell and assistive equipment may increase the ease with which clients access the toilet. For older adults whose mobility has declined or who are undergoing rehabilitation post surgeries, modifying space with the use of commodes, urinals or bedpans as well as raising the toilet seats will improve access and effectiveness of reaching the bathroom (Bradway et al., 1998). The culture of a unit also impacts clients' opportunities to toilet. It is therefore suggested that an interprofessional team approach where toileting is not only an assessment of nurses, but also of allied health professional's assessment of activity of daily living be the norm. Finally a culture where clients are actively encouraged and given the opportunity to void prior to going for tests or leaving the unit promotes urinary continence and therefore needs to be considered as environmental interventions (Bradway et al, 1998).

2.2.6 Part I: Summary and Gaps in UI Literature

The review of literature allows for further understanding of both chronic and acute UI and the importance of differentiating between chronic conditions and acute episodes with reversible causes. This differentiation allows for quick interventions and education that has the potential to minimize the negative impact that UI has on quality of life among older adults. With the physical, emotional, and financial consequences of UI it is imperative that interprofessional

healthcare teams have strong knowledge of assessment and treatment options of acute UI so that older adults are not discharged from hospital left to manage the negative consequences of UI at home. Unfortunately, the literature shows us that healthcare professionals lack sufficient knowledge to identify UI as a health concern and do not have the skills to appropriately assess, educate and treat patients with new UI. Non-invasive behavioural modifications can significantly improve if not reverse acute UI and therefore further education needs to be provided in the workplace to support healthcare professionals in providing evidence-based urinary continence care.

While searching the literature on UI there is an apparent gap in research due to the fact that minimal studies have been conducted in acute care settings (Subak et al., 2006; Wilson et al., 2001). While several studies have been reviewed here, there has been significantly more research on UI conducted among community-dwelling older adults and people living in long-term residential care with a particular focus on elderly female patients (Subak, et al., 2006). Among the studies that did look at healthcare professionals in relation to UI assessment and management, the majority looked at nurses or care aids with few considering allied health professionals, despite the fact that the literature does support the idea that urinary continence is a multidisciplinary concern (Molinuevo & Batista-Miranda, 2012). Allied health professionals serve a fundamental role in UI care. Physiotherapists for example have a particular understanding of mobility and occupational therapists of space. Mobility and patient's space can contribute to UI both positively and negatively and therefore further research including allied health professionals is merited. Furthermore the literature on UI in hospital-based care is heavily weighted with review studies, lacking the volume of current primary studies required to understand current prevalence, costs and management in this setting. This study will add to the

body of primary research assessing the management skills of an interprofessional hospital-based team on acute UI.

2.3 Part II: Putting Education into Action: Knowledge Translation and Exchange

Within the literature, knowledge translation, dissemination of knowledge, and diffusion of innovations are terms used to describe workplace learning. In order to tie the literature together I have chosen the language of knowledge translation and exchange to reflect the ideas of putting education into action in the workplace. As new and improved medical evidence emerges, knowledge translation will continue to be important to ensure healthcare professionals immerse current best practices into care in areas such as urinary continence promotion among hospitalized older adults. Shirey (2006) suggested that up to 85% of practice is not scientifically validated. Evidently challenges exist in providing care based on best evidence, and therefore further investigation is merited so that practice does not continue to lag behind new research findings (Rycroft-Malone et al., 2004).

2.3.1 Knowledge Exchange

In the review that follows I looked at the literature surrounding effective exchange of knowledge and discuss three common themes brought forth by the literature: the evidence used, the facilitators and the barriers within the setting context, and finally the effectiveness of knowledge translation and implementation (Grol & Grimshaw, 2003; Rycroft-Malone et al, 2004). In their systematic reviews Rycroft-Malone et al., (2004) along with Grol and Grimshaw (2003) make evident the complexity that transitioning evidence into practice entails and the need for continuing research in the field of knowledge translation.

Both reviews suggest that many attributes of the evidence being introduced significantly affect the ease with which it is implemented into practice. Grol and Grimshaw (2003) reviewed

four studies looking specifically at attributes of clinical guidelines that affect knowledge translation, and concluded that educators must have a better understanding of these characteristics in order to enhance compliance to new innovations and adherence to the best practice guidelines. Grol and Grimshaw (2003) found that compliance was stronger when guidelines addressed acute versus chronic care conditions, that implementation was easier with greater quality of evidence and compatibility with existing workplace values and finally where specific direction and description of behavior change was provided. Rycroft-Malone et al. (2004) suggested that challenges arose when staff viewed the research as too complex, academic or statistical. Uptake, adherence and compliance increased where fewer new skills needed developing and where less organizational change was necessary (Grol & Grimshaw, 2003) Similarly when changes in organizations or clinical practice were complex or there was an increased need for inter-professional collaboration the implementation of new innovations was deemed to be more difficult (Grol & Grimshaw, 2003). Understanding how attributes of evidence affect compliance allows educators to shape initiatives for most effective change in practice. However, it is also important to consider the characteristics and context of participants and work environments that facilitate learning (Grol & Grimshaw, 2003; Rycroft-Malone et al., 2004).

Aside from the innovation itself, the target group, unit and organization also create barriers and facilitators to change (Grol & Grimshaw, 2003). Barriers at the individual level occurred when staff did not perceive the evidence to be strong enough or to be sufficiently credible or when they were not motivated to change behaviour (Grol & Grimshaw, 2003; Rycroft-Malone et al., 2004). Lack of leadership and accountability on the unit also contributes to poor acceptance and buy-in of new innovations (2003). At an organizational level, hospitals

may have demanding workloads creating a perceived lack of time on admission to address UI. These time demands create a culture that fails to promote evidence-based continence care (Cooper & Watt, 2003; Grol & Grimshaw, 2003; Rycroft-Malone et al., 2004; Shirey, 2006). Using team leaders and managers to understand the work environment in which evidence-based practice is to be integrated is essential in order to adapt innovations with the considerations of the individual's, unit and organizational demands and practices.

Finally the effectiveness with which knowledge, of new best practice guidelines for example, is exchanged into the workplace plays a major role in staff compliance and long-term adherence to change (Grol & Grimshaw, 2003). In Baro et al.,'s (1998) and Grol and Grimshaw's (2003) systematic reviews, both studies found that educational materials had limited effect on knowledge translation alone, but were however strengthened in combination with small group interactive education sessions. Similarly, these authors found that prompts and reminders had the greatest effect on knowledge exchange and adherence for staff (Beao et al., 1998; Grol & Grimshaw, 2003). It is evident that when implementing new initiatives into practice multiple avenues of knowledge exchange need to be provided for optimal adherence to innovation. In the process, the individual, the unit and the organizational constraints and facilitators should be considered for effective knowledge exchange.

2.3.2 Theoretical Framework: Roger's Diffusion of Innovation Theory

In the section 2.3.1 Knowledge Exchange, the literature describes how the evidence, context and methods of facilitation are central to transferring evidence into practice (Rycroft-Malone, 2004). These three notions are further supported and developed through Roger's Diffusion of Innovation Theory. Roger (2003) defines diffusion as the communication process through the use of different channels over time, in which an innovation is to reach the members

of a social system. Its fit in supporting and guiding the knowledge translation and exchange of evidence-based research, central to the PEA Project, made it an ideal theory to shape this study. The four primary components of diffusion innovation theory are the innovation, communication, time and social systems, and will be further addressed in Chapter 3: Methods.

2.3.3 Part II: Summary and Gaps in Knowledge Translation and Exchange Literature

Providing education in the workplace faces many challenges. Critically thinking about the evidence, context and methods of delivering new knowledge will aid in the successful exchange of information from research to practice. Roger's Diffusion of Innovation theory provides a framework from which to structure new educational initiatives in the workplace and was therefore chosen as the theoretical framework for the PEA Project. Be it UI, wound care, or the management of diabetes, healthcare workers will always need to be up to date with current research. Understanding strategies to implement new education will allow for further success and retention of new knowledge among staff and ultimately improve patient care and outcomes.

The small body of literature on UI in acute care consistently points to the lack of evidence-based approaches for nursing and allied health professionals despite the best practice research available. The gap between evidence and actual practice emphasizes the importance of understanding how evidence, context and methods of translation affect knowledge exchange in hospital-based care (McCarthy et al., 2008). However, few studies ask recipients of educational interventions what they perceive to be facilitators or barriers to learning and putting education into practice. The literature supports the need for further research in the area of workplace learning.

Chapter 3: Methods

3.1 Research Questions

Two primary questions guided my research.

1. Does providing education based on the Registered Nurses' Association of Ontario's (RNAO's) best practice guideline: Promoting Continence Using Prompted Voiding in a hospital-based care setting improve interprofessional team members' knowledge of UI, increase their comfort and confidence providing urinary continence education to patients, change their perceived support for workplace learning or their value of the importance of evidence based practice?
2. What facilitators and barriers does the interprofessional healthcare team experience when implementing best practices in hospital-based care.

3.2 Theoretical Framework: Roger's Diffusion of Innovation Theory

Roger's Diffusion of Innovation Theory is ideally suited to support and guide the PEA Project and its aim to transfer evidence-based urinary continence knowledge to an interprofessional team in a hospital-based setting. Roger (2003) states that a diffusion research study, campaign or program should identify the four elements that define diffusion: the innovation, communication channels, time and social systems. As a form of a diffusion research study, the PEA Project's outcomes rely on the effectiveness of the educational intervention to reach members of the research site through channels of communication during the PEA Project timeline. The four elements are further described below.

An **innovation** is an idea or practice that is perceived to be new or modified to an individual or work environment (Roger, 2003; Shirey, 2006). In section 2.3.1 Knowledge Exchange, Grol and Grimshaw's (2003) review introduced the importance of understanding the

way certain attributes of evidence affect knowledge transfer. Roger's theory similarly states that attributes such as compatibility with work environment, perceived advantages and complexity of innovation, the degree to which experimentation or trial ability of innovation can occur on a short term basis and finally the degree to which innovation results are observable all affect the rate of participation and intervention adoption. PEA Project educational interventions served as this study's innovation and is further addressed in section 3.5 Study Procedures.

Roger's (2003) second element of diffusion is **communication** and is defined as the way participants share information to reach a mutual goal or understanding. Communication channels on the other hand are the means through which information is transferred from one individual to another and is central to the introduction and recruitment of participants to the PEA Project (Roger, 2003; Shirey, 2006). In a work environment, supportive managers, for example, may develop communication channels directly with the researcher, staff or team leaders to help guide effective dissemination by gaining acceptance, buy in and support for the educational intervention.

Time is the next important component to diffusion innovation theory and refers to the time required for an innovation-decision process to develop (Roger, 2003). The innovation-decision process has five sequential stages that describe the transition from hearing of an innovation to deciding to participate (Roger, 2003). Stage one is knowledge, the initial awareness of new innovation by individuals or members of an organization. Stage two is persuasion and is what follows as individuals form an opinion that is either favorable or unfavorable towards the innovation. Stage three is where decisions are made to adopt or rejected the intervention. The fourth stage reflects the physical implementation of new ideas into the practice of a workplace. Finally stage five is confirmation where users of the innovation seek to

reaffirm that their initial decision to accept the innovation was the correct choice and that positive outcomes have been developed (Roger, 2003).

As members of a group become integrated into an innovation diffusion process, participants within the social system venture towards new and common goals (Shirey, 2006). **Social structures** are both formal, by positions held, seniority or experience, and informal by means of who communicates and engages with whom within a group (Roger, 2003). As the fourth and final component of Roger's Innovation Diffusion Theory it is important to note that social structures can both facilitate and hinder the effectiveness of knowledge translation and exchange within an intervention based research study.

In hopes of maintaining a united social system throughout the integration of an innovation, communication channels that target opinion leaders may strengthen the adherence to new innovation strategies and therefore strengthen the ability to integrate evidence based practice innovations into the work environment (Shirey, 2006). As a theoretical framework, diffusion innovation theory helped guide my research from the introduction of the study, dissemination of pre-tests, the development of the intervention's education tools, and the evaluation of the study's effectiveness through post-test analysis.

3.3 Research Design

This descriptive study used a pilot pre/post-test design with a supporting qualitative component (Polit & Beck, 2012). The quantitative component included a pre/post-test format that assessed healthcare professional's knowledge surrounding urinary continence care before and after an educational intervention. This format analyzed the effectiveness of the evidence introduced while the small purposive sample of semi-structured interviews provided in depth understanding of what facilitates and hinders learning within the context of the research site.

Incorporating a smaller qualitative component to this pilot study provided a unique understanding of the intervention's effectiveness (Polit & Beck, 2012).

3.4 Study Site and Sample

3.4.1 Site

The 52-bed Vancouver based hospital unit selected as the study site served patients ranging in age from 18-105, with an estimated 60% of whom were over the age of 65. Patients were admitted to the site from acute care requiring extra time, treatments and assessments before returning home safely. The unit had 9 private rooms with private washrooms, 12 double rooms, 11 of which shared a single bathroom and 5 four-bed rooms. The rooms were divided into four hallways extending out from a centralized nursing station. Patients had all their daily meals delivered to the bedside and a common lounge area between the two middle hallways allowed for extra space to relax and watch TV. One common single stall bathroom existed adjacent to the lounge.

Many patients on the unit experienced UI, which put the interprofessional team in an ideal position to monitor, assess and treat patients before being discharged home. Despite not having a formal continence promotion program in place the unit did have a registered nurse who was trained as a Nurse Continence Advisor. In an attempt to support urinary continence on the unit she had provided two in-services each month since January 2012 on her own time. These in-services provided a brief overview on a new topic related to UI monthly. Having been introduced to UI education it was presumed that the unit, both management and staff, held some value to the importance of UI management among their patient population. The leadership team on the unit thought it would be of great value to both their staff and patient population to participate in such a study and had appropriate communication channels in place to advance education and support

new research in the workplace. It was agreed by the research committee that this site would be an ideal fit, as the research would serve to boost the effectiveness and acceptance of promoting urinary continence education already initiated on the unit.

One of the four elements of knowledge translation is the time for innovation-decision process to occur, a five-stage process from knowledge of a new initiative to confirmation by choosing to participate (Roger, 2003; Shirey, 2006). With the initiative of the nurse trained Continence Advisor the site was prepared for the first three stages of the innovation-decision process. Stage one: knowledge of continence promotion initiative; stage two: participants had been persuaded to participate in previous educational in services; stage three, they held some level of favorable attitudes towards the innovation and were therefore more likely to make the decision to engage in the PEA Project (Shirey, 2006). With an ideal patient population, the lack of a formal continence program and the introduction to UI management through informal in-services the research site was ideally suited for the initiation of the PEA Project.

3.4.2 Sample

This 52-bed hospital unit staffed 70 people onto their interprofessional team where they worked diligently to help patients with many co-morbidities transition home from hospital. The interprofessional team included occupational therapists (OT), physiotherapists (PT), rehabilitation assistants, dietitians, social workers, registered nurses (RN), licensed practical nurses (LPN) along with the unit manager and nurse team leaders. Physicians were not contacted to participate due to their schedules on the unit and their time constraints working with medical students and residents.

All 70 staff members employed in fulltime, part-time or casual positions in September 2012 were invited to participate in the pre -test questionnaire, educational in-services and later

post-test questionnaire. To be included in the final sample however participants needed to have completed both pre and post-tests along with 2 of 3 in-services. Therefore staff members who completed the pre-test but were not present for 2 of 3 educational in services, be it due to injury related time off, or frequency of casual shifts were not included in final sample. Similarly participants who completed 2 of 3 in-services but were not able to complete pre and post-test due to leaving position on unit, being hired mid study or infrequency of casual shifts were not included in the final sample. With staff turnover 74 people participated in at least one component of the study however 32 participants (RN, LPN, PT, OT and rehabilitation assistants) met the required inclusion criteria for the study, having completed pre-test, 2/3 educational in-services and post-test.

Power analysis was conducted using GPower 3.1 software (Faul, Erdfelder, Lang & Buchner, 2007). Knowing the sample size, alpha and the effect size, power could be determined. A moderate Cohen's *d* effect size of 0.5 was used as most nursing research does not expect effect sizes greater than 0.5 (Polit & Beck, 2012). With a final sample size of 32, a 0.5 effect size and an alpha of 0.05, power was calculated to be .78.

While all interprofessional employees on the unit were invited to participate in the components of the study only a small purposive sample was targeted for semi-structured interviews. In order to have a mixture of health care professionals and to gain a variety of perspectives, six participants (RNs, LPNs and PTs) with varying positions, years of experience etc were invited to participate in interviews.

3.5 Study Procedures

In consultation with the unit's manager and a nurse trained continence advisor, it was decided that the implementation of staff education, based on RNAO's best practice guideline for

promoting urinary continence, would benefit staff and patients alike on the unit. With the support of management and staff leaders the study was conducted in four steps: consent and collection of baseline data; preparation of BPG educational tools; implementation of educational in-services; and finally post education data collection and evaluation.

3.5.1 Step 1: Consent and Collection of Baseline Data

According to Roger's Innovation Diffusion Theory, support from management and team leaders helps to increase the rate of intervention adoption by participants (Shirey, 2006).

Therefore initial introduction of the study to staff came through multiple avenues starting with an email from the manager introducing myself as the researcher, the goals of the study and the dates I would be on the unit to introduce the PEA Project and recruit participants. Recruiting the nurse trained continence advisor and a few active staff encouraged others to participate and began to spark conversations on the unit about the pre-test questionnaire.

Nurses were subsequently recruited on the unit in person with a one on one introduction to the study, reviewing consent with staff and the handing out of pre-test questionnaires when workload and time allowed (Appendix A). In consultation with the manager it was decided that the most effective way to target the allied health professionals would be in their monthly staff meetings where there was both high attendance and a quiet time off the unit where study introductions, consent and pre-test participation could occur. By the time the first staff meeting was held, allied health professionals were aware of the PEA Project surveys on the unit and were curious and open to participating in this research.

Consent and pre-test data were collected for a total of five weeks to give sufficient time to recruit both casual and part time staff as well as nurses and allied health professionals. Pre-test data results were used to guide the development of educational interventions as well as

served as the baseline for comparison with post-test data in the evaluation of educational intervention effectiveness.

3.5.2 Step 2: Educational Intervention Preparation

After reviewing results from participant's pre-tests, three fifteen minute in-services and fact sheets were developed to address trending gaps in knowledge among study sample. As a recognized body of evidence based knowledge the RNAO BPG on promoting urinary continence served as the backbone from which educational tools were developed. Fact Sheet #1 reviewed myths and introduced several risk factors of UI (Appendix B.1). Fact sheet #2 was developed to review assessment and intervention strategies along with introducing the various forms of UI (Appendix B.2). Lastly Fact Sheet #3 focused on reinforcing the need for a team approach to urinary continence promotion (Appendix B.3).

3.5.3 Step 3: Implementation of Education Tools

Once pretests were written and fact sheets prepared, it was decided that I would attend the allied health professional's monthly staff meeting in order to provide them with the PEA Project's educational interventions. This was decided because of the heavy workload and demand on staff working eight-hour shifts between 0800-1500. For the remainder of the participants I spent evenings between 4-6pm at the nurse's station of the research site providing quick one to one or small group educational in-services as nursing staff became available. This format was selected after consultation with the nurse trained continence advisor, as this is what she found to be most successful in captivating staff while they worked. The unit's manager was in agreement as pulling staff off the unit for PEA Project staff meetings faced its' own challenges, particularly in regards to covering patient care while staff were off the unit. Therefore participants sat at the nursing station and worked through the Fact Sheets which

incorporated some written information, some interactive case studies, and promoted conversation and questions. Each participant signed in after having completed an in-service and were provided with a copy of the Fact Sheet to take with them. Each fact sheet and supporting documents were added to a yellow PEA Project Education Binder, which remained at the nurse's station in a visible and central location. Finally a PEA Project Tip of the Week was added on a white board in the main hallway outside of the nursing station serving as reminders and information for staff and patients alike. A new Fact Sheet / in- service was introduced every two weeks to attempt to get the majority of the staff learning the research content in a similar timeline. Education was therefore provided for a total of six weeks.

Working with the unit's manager and continence trained nurse was guided by innovation diffusion theory which states that not only is it important to target opinion leaders in research settings but also that goals are most likely to be accomplished by joint problem solving (Shirey, 2006). These social systems, as referred to by innovation diffusion theory, had important insight and problem solving strategies that increased the effectiveness of research in their workplace. Picking a time during the working shift that is less busy for example, and doing one to one or small group educational pieces at the nurse's station allowed participants to work through the educational pieces at their own rate in a timely manner while being able to prioritize patient care compared to a once daily team in-services off the unit.

3.5.4 Step 4: Collection of Post-test Data and Evaluation of Knowledge Exchange

After 6 weeks of educational interventions I administered the post-test (Appendix C). During the distribution of post-tests, participants were also invited to take part in a semi-structured interview if they were able and willing to share their experiences implementing best practice guidelines (Appendix D). The aim of the interviews was to gain participant perspectives

of the facilitators and barriers to learning in the workplace. As a thank you for participating and for their time a \$10 gift card was given to all participants who completed a post-test and also for those who participated in an interview.

3.6 Data Collection

3.6.1 Instrumentation

Quantitative data was collected using a questionnaire. Qualitative data was collected using semi-structured interviews. A description of both the pre/post-test questionnaire and the semi-structured interview guide follow below.

3.6.1.1 Questionnaire

The aim of the pre/post-test questionnaire was to measure four constructs; UI knowledge, comfort and confidence in participant's own knowledge and educating patients, staff's perceived support and finally, participant's values towards the importance of evidence based practices. UI knowledge was composed of two sub-sections, foundational UI knowledge, measured using twenty-seven true/false/unsure questions, and advanced UI knowledge, measured using five multiple-choice questions. Comfort and confidence was measured by calculating mean scores of three separate 5-point numeric rating scale questions. Finally perceived support and values towards the importance of evidence-based practice were each measured with a single 5-point numeric rating scale question. Each section is further described below (Appendix A.2¹).

First participants were given a score out of thirty-two to measure their levels of UI knowledge, higher scores reporting a better understanding of UI. Foundational knowledge was

¹ Original questionnaire titles as seen in the Appendix correspond as follows to sections within the body of the thesis: firstly questionnaire section A) True/False/Unsure Questions are referred to as Foundational Knowledge in the body of the thesis, next section B) Multiple Choice Questions are referred to as Advanced Knowledge data, the questionnaire's visual analog scale questions 1-3 were combined to create the Comfort and Confidence data, visual analog scale question 4 is referred to as perceived support for workplace learning and finally visual analog scale question 5 is referred to as value of importance for evidence-based practice.

assessed through the evaluation of twenty-seven true/false/unsure questions looking at risk factors, common UI myths and types of UI. The first fourteen of twenty-seven true/false/unsure questions were modified from Sana Keller's (1999) incontinence quiz used in her research on urinary incontinence focusing on the occurrence, knowledge and attitudes of women greater than 55 years of age living in rural settings. Sana Keller (1999) drew these questions from a previous study, which established content validity through the use of their primary reference source Agency for Health Care Policy and Research Clinical Practice Guideline: Acute and Chronic Incontinence (Keller, 1999). The remaining thirteen foundational knowledge questions were developed using the RNAO Best Practice Guideline (BPG) on supporting urinary continence as its' primary reference. Similarly in order to assess advanced knowledge of UI I drew on the RNAO BPG to develop five multiple-choice questions that required both a strong understanding of UI and that of chronic co-morbidities experienced by hospitalized older adults. The twenty-seven foundational knowledge questions and five advance knowledge questions gave participants a total UI knowledge score out of thirty-two. The content of this section was also in line with previous teachings done by the nurse trained continence advisor in the months leading up to the PEA Project.

Next, the comfort and confidence scale consisted of three 5 point numeric rating scale questions in order to assess if the PEA Project's intervention impacted participant's feelings of confidence supporting their patient's continence, confidence in participant's own knowledge of UI and finally comfort providing education to patients about UI. Participants were given a comfort and confidence score out of five created from the means of the three 5-point numeric scale question responses. Lastly a participant's self-reported score between 1-5 on one 5-point

numeric scale question was used to measure perceived support provided for learning in the workplace and similarly importance of evidence-based practice for participants.

Content and face validity for scales measuring knowledge, comfort and confidence, workplace learning support and importance of evidence-based practice were considered in several ways. While a portion of the true/false/unsure questions were validated by prior research, face validity was completed for the entire pre-survey by having colleagues with experience in acute care as well research review the pre-test. These two colleagues, along with the nurse trained as a continence advisor and finally my research committee served as in field consultants and gave face validity to the test by providing insight as to the content, format and structure of the instrument. Diffusion of innovation theory suggests that innovations may be modified to enhance the initial adoption and acceptance of the innovation (Shirey, 2006). Incorporating UI material previously introduced by the nurse trained continence advisor reinforced learning and gave support to the research and knowledge exchange of the study (Shirey, 2006).

3.6.1.2 Semi-Structured Interview Guide

The qualitative component of the study used a semi-structured interview guide and recorded interviews to collect data. The aim of the interview guide was to capture participant's perceptions on the importance of evidence-based practice and the facilitators and barriers of knowledge translation and exchange in the workplace (See Appendix B.3). A semi-structured format was chosen to facilitate the collection of similar types of data while giving participants some control of the flow and direction of the interview (Holloway & Wheeler, 2010). The interview guide was validated by in-field consultants who reviewed its' content, format and structure.

3.7 Analysis

3.7.1 Quantitative Data

Analysis was conducted to provide test score comparisons in two points in time, before and after the PEA Project's educational intervention. By comparing data we were able to provide staff with information that allowed them to validate and confirm the effectiveness of the study's intervention, stage 5 of the innovation-decision process (Roger, 2003; Shirey, 2006).

Before entering data into statistical software, data was cleaned and organized. In this process it was noted that due to researcher error, the post-test failed to provide the final foundational knowledge question leaving seven participants with only twenty-seven of the original twenty-eight questions in this section. It was therefore decided that the 28th question be removed from all participants of both pre and post-test to provide an equal test score opportunity. Data was then entered into an SPSS Statistics Version 21 data file and multiple statistical tests ran to analyze quantitative data.

First, sample characteristics for both quantitative and qualitative data were analyzed using frequencies and descriptive statistics from pre-test questionnaires at start of study (Munro, 2005; Pallant, 2010). Next, the match paired t-test was used to compare mean pre-test knowledge, totals scores out of thirty-two, with mean post-test knowledge assessing any differences within the same sample group between two points in time (Munro, 2005; Pallant, 2010). While analyzing knowledge between two points in time it became clear that there was a difference between the changes in foundational knowledge as compared to advanced knowledge and so match paired t-tests were then conducted to measure change in foundational knowledge and advanced knowledge separate from one another. Similarly, the t-test was used to compare pre and post-test comfort and confidence scale scores. Lastly the Wilcoxin sign ranked test, a

non-parametric equivalent to the T-test, was used to compare pre and post perceived workplace learning support and finally pre and post-test values of EBP importance (Munro, 2005; Pallant, 2010).

3.7.2 Qualitative Data

Tape-recorded interviews were transcribed verbatim and analyzed using thematic analysis describing participant's experiences and perspectives regarding workplace learning and knowledge application (Polit & Beck, 2012). Following transcription of the interview, each interview was read over and key words and phrases were highlighted and coded. After each interview was read on its' own, codes were reviewed and grouped into categories and sub-themes (Polit & Beck, 2012). Final themes were reflected upon, analyzed and interpreted in consideration of the PEA Project research questions.

3.8 Ethical Consideration

Ethics approval was obtained from UBC and Vancouver Coastal Health Research Institute. No risks for patients were perceived as there was no direct contact with them, however they may have benefited from improved assessment and management of UI. Participant confidentiality was maintained by coding participant questionnaires so that no identifying information was accessible. Informed consent was obtained from all participants before starting the research, where aims and steps of research were also disclosed.

3.9 Knowledge Exchange of Study Results

PEA Project findings will be offered back to participants through a presentation at the research site and upon individual request. Disseminating the result of the study back into nursing and allied health professional's practice will also occur through conference presentations such as at the annual Ethel Johns conference and through publication in a peer reviewed manuscript.

Chapter 4: Results

4.1 Pre/Post-Test Sample Characteristics

The sample included registered nurses (RNs), licensed practical nurses (LPNs) and Allied Health professionals employed between the study dates of September 2012 and March 2013. In September there were approximately 70 staff available for potential recruitment however, over the seven-month course of research up to 7 staff members left the unit and 11 were hired. With significant staff turnover there was a wide variety of participation within the study with a total of 74 healthcare professionals participating to some degree whether it was the pre-test, an educational in service, accessing the PEA Project Education binder, completing the post-test or participating in an interview. Of the 74 participants only 37 completed both pre and post-test questionnaires, and of these only 32 were able to participate in two or more educational opportunities provided by the PEA Project. The data from these 32 participants were used as the final sample in this study.

SPSS Statistics Version 21 was used to analyze participant demographics by means of frequencies and descriptive statistics (Table 4-1) (Pallant, 2010). Of the 32 participants, most were female (N=28; 87.5%) and worked as LPNs (N=18; 56.3%). Participants had a range of 1-20 years of work experience at the research site (M \pm SD) (4.13 \pm 4.245) and the majority worked in permanent full time positions (N=18; 56.3%). Participant's ranged in age from 21- 60 (38 \pm 10.91) and had varied levels of education from diploma (N=18; 56.3%), bachelor (N=12; 37.5%), master (N=1; 3.1%) and one nurse continence advisor (N=1; 3.1%).

Table 4-1 Sample Characteristics (N=32)

Variable	Total Participants
Gender, n (%)	
Female	28 (87.5)
Male	4 (12.5)
Age (years), mean \pm SD	38.1 \pm 10.913
Position, n (%)	
Permanent Full Time	18 (56.3)
Temporary Full Time	2 (6.3)
Permanent Part Time	6 (18.8)
Casual	6 (18.8)
Profession, n (%)	
RN	11 (34.4)
LPN	18 (56.3)
Allied Health Professional	3 (9.4)
Highest Level of Education in Profession, N (%)	
Diploma	18 (56.3)
Bachelors	12 (37.5)
Master	1(3.1)
Other	1(3.1)
Years in Profession, mean \pm SD	5.81 \pm 5.051
Years at Research Site, mean \pm SD	4.13 \pm 4.245

4.2 UI Knowledge

The effectiveness of the PEA Project's educational intervention on changes in UI knowledge was assessed using a match paired sample t-test (Pallant, 2010). Summed pre-test scores, out of a possible 32 points, were lower than post-test scores with a mean difference of -4.906 points. Paired sample t-test showed statistically significant results, $t(32) = -7.516$, $p = .000$, 95% CI -6.238 to -3.575, with a large effect size of .646 indicating a high magnitude of the intervention's effect on post-test results (Table 4-2).

Table 4-2 UI Knowledge

Variables	N	Range	Mean	SD	Std. Error Mean	T	p	95% CI	Effect Size
Pre-Test /32	32	12-28	20.88	3.572					
Post-Test /32	32	20-30	25.78	2.028					
Match Paired T-Test	32		-4.906	3.693	.653	-7.516	.000	-6.238 to - 3.575	.646

4.2.1 Foundational Knowledge.

After analyzing the effects of educational intervention on summed UI knowledge scores, raw data was separated to assess foundational knowledge apart from advanced UI knowledge. Range and mean pre-test scores for foundational knowledge, measured by 27 true/false/unsure questions, were lower than post-test scores with a mean difference of -4.688 points. Paired sample t-test showed statistically significant results, $t(32) = -7.605$, $p = .000$, 95% CI -5.945 to -3.430, with a large effect size of 0.651 indicating a high magnitude of the intervention’s effect on foundational knowledge (Table 4-3).

Table 4-3 Foundational Knowledge

Variables	N	Range	Mean	SD	Std. Error Mean	T	p	95% CI	Effect Size
Pre-Test /27	32	11-24	18.91	3.38					
Post-Test /27	32	18-27	23.59	1.7					
Match Paired T-Test	32		-4.688	3.487	.616	-7.605	.000	-5.95 to -3.34	0.651

4.2.2 Advanced Knowledge

Five multiple-choice questions assessing advanced UI knowledge requiring participants to draw on their learning of simple UI facts as well as linking their understanding of different forms of UI and chronic diseases. The advanced UI knowledge section gave each participant a pre and post-test score out of 5, one point for each correct response. Average pre-test multiple-choice scores were 1.91 (SD = .893) with a range of 0-4. Average post-test scores were 2.16 (SD = .723) with a range of 1-3 (Table 4-4). Despite having higher average post-test scores, mean difference in test scores was small ($.250 \pm .842$) with a 95% confidence interval of differences between -.554 and 0.54. There was no significant difference in advanced knowledge test scores $t(32) = -1.679, p = .103$ (Table 4-4).

Table 4-4 Advanced Knowledge

Variables	N	Range	Mean	SD	Std. Error Mean	T	p	95% CI	Effect Size
Pre-Test /5	32	0-4	1.91	.893					
Post-Test /5	32	1-3	2.16	.723					
Match Paired T-Test	32		-.250	.842	.149	-1.679	.103	-.554 to .054	0.0833

4.3 Comfort and Confidence Scale (CCS)

Participants were given a comfort and confidence score out of five created from the mean of three 5-point numeric scale question responses. Pre-test comfort and confidence scale scores were lower than post-test scores with a mean difference of -.532 points (SD = .751). Paired sample t-test showed statistically significant results, $t(32) = -4.003$, $p = .000$, 95% CI -.802 to -.261. The eta-squared statistic calculated a large effect size of .341 indicating a high magnitude of the intervention’s effect on participant’s increased post-test comfort and confidence (Pallant, 2010) (Table 4-5).

Table 4-5 Comfort and Confidence Scale

Variables	N	Mean	SD	Std Error Mean	T	p	95% CI	Effect Size
Pre-Test CCS	32	3.49	.79	.14				
Post-Test CCS	32	4.02	.68	.12				
Match Paired T-Test CCS	32	-.532	.751	.133	-4.003	.000	-.802 to -.261	.341

4.4 Perceived Support (PS)

The Wilcoxon signed rank test is used as the nonparametric equivalent to the t-test used previously (Munro, 2005; Pallant, 2010). The change in perception as reflected by the Wilcoxon signed rank test for the 5-point numeric scale questions are represented in Table 4-6. Mean pre-test scores on this single 5-point numeric scale question were 3.64 and were practically unchanged as compared to post-test mean score of 3.63. Both pre and post-test results show that participants perceived their level of support for workplace learning between neutral (question

response 3) and somewhat supported (question response 4). The change in perception as reflected by the Wilcoxon signed rank test shows that the PEA Project’s educational intervention provided no significant change in participants’ perceptions of support provided to them in order to learn in the workplace ($z = -.024, p = .981$).

Table 4-6 Perceived Support

Variables	N	Range	Mean	SD	z	p	Effect Size
Pre-Test PS	32	2-5	3.64	1.09			
Post-Test PS	32	2-5	3.63	.907			
Wilcoxon Sign Ranked Test	32				-.024	.981	0.03

4.5 Importance of Evidence-based Practice (EBP)

Finally change in perceived importance of evidence-based practices was analyzed. This 5-point numeric scale question found unchanged mean scores between pre and post-tests. The pre and post-test mean score was 4.72 representing that evidence based practice was perceived to be somewhat important (question response 4) to important (question response 5) for participants. PEA Project educational interventions did not change participants’ perceptions of the importance of evidence-based practice in the workplace ($z = -.333, p = .739$).

Table 4-7 Importance of Evidence-based Practice

Variables	N	Range	Mean	SD	z	p	Effect Size
Pre-Test EBP	32	2-5	4.72	.634			
Post-Test EBP	32	3-5	4.72	.523			
Wilcoxon Sign Ranked Test	32				-.333	.739	0.04

4.5.1 Summary

In summary, the study demonstrated some change in knowledge as a result of the PEA Project educational intervention. Statistically significant results showed improved overall UI knowledge. Summed scores from the foundational knowledge section showed significantly higher post-test scores as compared to pre-test scores. However, no significant changes were noted for the summed scores of advanced knowledge questions between pre and post-tests. Significantly higher responses were also reported on the post-test comfort and confidence scale showing increased confidence supporting patients' continence, confidence in participants' knowledge of UI as well as comfort in providing UI education to patients. No significant difference was reported in perceived learning support in the workplace or importance of evidence based practice after the PEA Project's educational intervention.

4.6 Interview Sample Characteristics

Frequencies and descriptive statistics were used to analyze interview sample characteristics and are presented in Table 4-8 (Pallant, 2010). Of the 6 participants the majority were female (N = 5; 83.3%) and worked in permanent full time positions (N=4; 66.7%). Three LPNs, two RNs and one allied health professional agreed to participate in the semi-structured interviews. Participant's age ranged from 24-54 with a mean of 37.17 years of age and SD of 10.07. Education levels varied from diploma (N=3; 56%), bachelor (N=2; 33.3%) and one participant with advanced training as a nurse continence advisor (N=1; 16.7%), as did years of experience at research site ranging from 1-13 years with a mean 4.67 and standard deviation of 4.68.

Table 4-8 Interview Sample Characteristics N=6

Variable	Total Participants
Gender, n (%)	
Female	5(83.3)
Male	1(16.7)
Age (years), mean ± SD	37.17 ± 10.07
Position, n (%)	
Permanent Full Time	4 (66.7)
Temporary Full Time	0
Permanent Part Time	1(16.7)
Casual	1 (16.7)
Profession, n (%)	
RN	3 (50)
LPN	2 (33.3)
Allied Health Professional	1 (16.7)
Highest Level of Education in Profession, N (%)	
Diploma	3 (50.0)
Bachelors	2 (33.3)
Master	0
Other	1(16.7)
Years in Profession, mean ± SD	7.33 ± 5.47
Years at Research Site, mean ± SD	4.67 ± 4.68

4.7 Qualitative Research Question

What facilitators and barriers does the interprofessional healthcare team experience when implementing best practices in hospital-based care? In determining the facilitators and barriers we are able to evaluate the effectiveness of knowledge translation and better support best practices in future hospital-based care. Three categories were identified during the qualitative data analysis, each of which were broken down into several smaller themes and are each described below. The three categories were: requirements for learning, putting evidence-based learning into action and finally interprofessional learning and care.

4.7.1 Requirements for Learning

During interviews participants expressed the need for sufficient time as well as support from the structure and culture of the unit in order to adequately learn in the workplace. Similarly,

participants felt that there was significant benefit in identifying mutual goals among staff and utilizing appropriate methods of education distribution. These four themes will be further analyzed here.

4.7.1.1 Time

Time to learn was the most common of the four themes expressed as a requirement for workplace learning. Time however was expressed by participants in a variety of ways including: time to access resources, appropriate time of day to be able to attend education sessions, and finally time for staff educators to plan and prepare appropriate educational interventions.

Firstly participants expressed heavy workloads and the inability to make time during working hours to look up evidence-based best practice guidelines as the predominant barrier. One participant commented, “Just to find the time to sit and actually look up stuff... usually it’s a person you grab and ask instead of going and looking it up”. When staff perceived workloads to be too heavy they turn to colleagues for advice under the assumptions that colleague knowledge sharing is faster than looking up current practice standards. The risk of relying on a colleague is that they themselves may not be up to date on best practice standards. Without time to look up and use resources, staff fall into a pattern of providing habitual care versus evidence based care.

In January 2012 before the PEA Project started, a nurse trained as a nurse continence advisor provided informal in-services at the nurse’s station for staff. This nurse first trialed her program by providing education in the conference room outside of the nurse’s station but found, as mentioned above, that staff were too busy to leave the unit and sit in the conference room for the extension of the in-service. The nurse trained continence advisor moved in-services to the nurse’s station where staff could answer call bells and in return miss smaller portions of the

teachings than if education was held off the unit. However, when interviewed one participant also expressed in-services at the nurse's station to be ineffective, due to constant interruptions. "If they want us to keep up with this stuff, which I think is important and it should be encouraged, then provide us with time for it!" This quote depicts the frustration experienced by staff valuing the need for ongoing education, yet who don't have the time to physically attend education sessions and maintain adequate patient care.

Secondly participant expressed appropriate time of day to attend in-services as a challenge. In order to have space at the nurse's station in-services by the nurse trained continence advisor prior to the PEA Project were held between 3-4 pm when the unit was a little quieter. "I'm off shift!" one participant commented. At 3pm all non-shift work staff, such as allied health professional and those working 8-hour days were off shift. Even a staff member working a 12-hour shift expressed the challenge of attending the previous in-services despite being on shift. This participant stated at 4pm she usually took her break during a 12hour shift, and even if she didn't take her break at that time, after working 8 hours she was tired and found it hard to focus. Participants consistently expressed the challenges of fitting in education in an already busy 37.5 hour work week. When asked how, in an ideal world, education would best fit into practice participants were all in consensus stating "so maybe they could give us some paid time for education", " in an ideal world either paying people for their time or some other way of getting them to come in on their day off".

Lastly, one participant who was involved with supporting education on the unit felt they were spread too thin and that they did not have sufficient time to develop, coordinate and implement as many educational interventions as they would have liked for the staff. It is clear both for staff working directly with patients and for staff involved in developing educational

interventions time is required for the development and dissemination of knowledge in the workplace.

4.7.1.2 Structural Supports

Structural supports were further broken down and described by participants in four ways. Firstly the need to have staff coverage in order to attend at work in-services, secondly the need to know which best practice guidelines had been updated in order to direct independent learning. The need to advocate for courses of interest was the third theme followed by the need for financial support to attend said courses.

First participants expressed frustrations with expectations held to attend in-services, whether at the nursing station or in the unit's conference room, and at the same time being able to provide adequate patient care. One participant notes "it's just not the time, there's people coming to the desk, and if you're just sitting there talking, they're clearly going to interrupt and ask for help, because that's what you're there to be doing, so I think it's an inappropriate place to be learning, is sitting at the nursing station. And I think that there isn't enough staff to cover you when you are trying to sit and learn." Increasing supports on days that it is expected for staff to participate in workplace learning would allow for sufficient patient coverage as well as support uninterrupted learning of updated best practices.

Next, when asked about resources available to participants they were quick to list off available resources that could be accessed in order to update themselves with best practice policies and procedures. Most commonly mentioned were Vancouver Coastal Health's policies and procedures on the intranet, magazines and email updates from particular agencies or information groups that staff were associated with and finally asking the clinical nurse lead to follow up on a particular topic of interest for review. If staff had a question on a particular topic

area they knew which resources would help provide them with appropriate answers. Participants expressed that resources were only effective if learning was self-directed and expressed the desire to be better informed when new practices were updated. “We rely on outside people (researchers) taking surveys or whatever and saying, ‘it’s not working’. If we don’t get that back then we’ll keep doing what we’re doing”. Another participant commented

I think they try to encourage education days, but they’re not actually... I know when I worked three quarter time, I was supposed to do an education day once every couple months or something, but nobody organized it or says you should do these courses or why don’t you go and learn about blabbity blah, which would be super beneficial if once a month the nurse was sent to some new class”

It is evident by these excerpts that participants require notice of changing practices in order to utilize resources available in the workplace.

Finally, advocating for course attendance was described as a barrier, particularly if courses are for a specific clinical specialty and if they are exclusively offered during the workweek. On a generalized floor, for example, where patients are admitted from hospital in hopes of transitioning home, staff require the knowledge of a wide variety of diagnoses, comorbidities and psychosocial challenges. One participant expressed “it can be sometimes tough” to advocate the importance of courses for particular clinical specialties if it does not serve the majority of the patients on the unit.

4.7.1.3 Common Goals

The third theme analyzed within requirements for learning was the importance for staff to have common goals. Participants agreed that having a common goal was required for workplace learning. One participant states “none of us are there twenty four hours a day...if we are doing things in isolation, and everybody else is doing things differently...kind of defeats the purpose”. Effective patient care can only occur if everyone is on the same page. For this to happen updated

policies and procedures need to be advertised and education needs to be facilitated. Another participant described the need for people at all levels to be on the same page, from management, to educators, primary care, nursing and allied health professionals, “The whole team should be involved...when we have a common goal, then you know, that the communication is much more straightforward and time is not a problem”. If all levels of care truly have common goals people work more effectively together, learning is facilitated and the barrier of time becomes less of a hindrance.

4.7.1.4 Methods of Education Distribution

The fourth and final requirement for workplace learning derived from the data is having appropriate methods of education distribution. Throughout the interview participants described attributes of educational interventions that facilitate learning. Examples include objectives that are clearly outlined, easy to follow and education sessions that are appropriate in length. Participants described the benefits of having education provided face to face with the educator versus online learning or emailed updates. “Face to face is best because I always have questions and sometimes it’s difficult just being sent a memo or practice guideline update because it leaves me like ‘who do I go to to ask a question about that?’”

Participants also expressed the benefit of a variety of modes of distribution. The case study helped participants tie information together, although there were suggestions that physically working on a patient case versus a hypothetical case would have enhanced learning and the ability to apply learning into practice. Participants appreciated that in-services were provided in person. The tip of the week also served as a reminder of the study and topic of UI, and additionally the education binder gave participants confidence that there was a resource when the educator was not present. “Different people learn in different ways” and this was

shown through the interview data. Accounting for different learning styles by means of different methods of distribution facilitated workplace learning during the PEA Project.

4.7.2 Putting Evidence-based Learning into Action

During interviews participants were asked about the importance of evidence based practices and how workplace learning translates into change in practice. Participants responded by describing their values towards evidence-based practices as well as describing the facilitators and barriers to implementing new knowledge in a hospital-based care setting. Firstly participants across the board expressed the importance of practicing based in evidence. Next, barriers to implementing knew evidence-based knowledge included time as well as lack of sufficient support by not having a permanent full time educator. Lastly participants were also able to reflect on several facilitators to putting evidence-based education into action and how this could help affect change in patient care even if in the short term.

4.7.2.1 Importance of Evidence Based Practice

The importance of evidence-based practice came through consistently in the interviews. Participants agreed that evidence provided the basis for patient care and that it was valued among staff. One participant commented, “I just think it’s important that whatever we’re doing, whatever we’re practicing is supported by evidence-based research. I don’t think it is ethical to do things willy nilly without any previous research being done. It’s a waste of our time”. Participant’s agreement for the value of research and evidence based practices supports the need to better understand the barriers and facilitators involved in workplace learning.

4.7.2.2 Barriers to PEA

Participants discussed challenges with having enough time in their working day to implement new knowledge. The perceived time required to affectively implement interventions

and change patient outcomes was deemed by several participants to be unrealistic. One participant commented that while the PEA Project intervention information was interesting and relevant to the hospitalized older adult population, the lack of time to implement new assessments, communication tools and any added workload was not realistic stating, “That will be the day”. This comment reflects ongoing frustrations with the inability to successfully utilize new knowledge however relevant in the workplace. Participants questioned the value in identifying a patient’s form of UI if they were unable to provide the time and resources required to implement strategies that would improve patient outcomes. Participants expressed challenging caseloads as being a barrier to initiating and following up with introduced voiding records for example. They also expressed concern that patient’s length of stay was insufficient to initiate pelvic floor strength training.

The second barrier noted in the data was the effect of insufficient follow up and support that would be available with a permanent educator position. In order to transfer knowledge participants expressed the need to have the education facilitator present, participating with staff and available for long-term follow up, review and re-evaluation. Currently on the unit there is a Clinical Nurse Lead (CNL) who supports staff by liaising with other educators and guest speakers to facilitate workplace learning. The CNL however has many other roles and responsibilities on the unit making it difficult to provide continuous support and updates stating “you educate people, they move on, then you get new staff and it’s hard to maintain that awareness”. Similarly guest educators often provide short one-day in-services that target staff working on that given day. Without long-term educator involvement, an insufficient number of staff are able to access education, which makes a unit’s ability to cohesively change patient care challenging. A participant, for example, reflects on the ineffectiveness of implementing a new

assessment form without it having been communicated sufficiently to staff, a result of not having a distinct position responsible for educating staff and implementing best practice changes:

I don't think I ever saw one of them used, or one of them was maybe half used, but they were in there (charts), which was interesting. I don't think I ever got an email about what the form was for, I just was never really aware of what the form specifically was for.

Another participant reflects on my time spent on the unit with the PEA Project "It was extremely effective...but sad that it had to end because when it ends it's kind of like the muscle that doesn't get a lot of usage". The education provided through the PEA Project occurred during 1-2 hour daily sessions over 3-4 months with the sole intent to educate staff on the subject area of UI. However helpful the knowledge may have been, without review or follow up much of the learned material will likely be lost just as the strength of an unused muscle.

4.7.2.3 Facilitators to PEA

Despite the challenges, three participants felt that education provided by the PEA Project increased their ability to change practice, even if it was in the short-term. The knowledge gained through the project allowed participants to complete more thorough assessments and increased interprofessional communication. The allied health professional, for example, felt that despite not having medication administration within their scope of practice, added knowledge of medication risk factors related to UI increased their ability to bring up questions with nurses. Another participant noted, "I felt more confident talking to people about their incontinence and thinking of ways to solve it". Education supports staff by providing them with the confidence needed to approach assessments in different ways. Conversations with patients provide an avenue for patient education along with the ability to brainstorm possible solutions that align with patient goals of care. In areas such as UI these conversations facilitate staff's ability to put education into action.

4.7.3 Interprofessional Learning and Care

The third category addresses the benefits and barriers to providing interprofessional care and coordinating interprofessional learning in the workplace. Participants agreed that providing interprofessional care in a hospital-based setting should be the goal and standard of care, recognizing that several barriers are currently in place to prevent this from happening effectively. When it came to addressing interprofessional learning participants noted both pros and cons in learning with other professions.

4.7.3.1 Interprofessional Care

When asked about interprofessionalism in the workplace there was consensus among participants that working across professions would provide optimal patient care. With the overlapping nature of healthcare professionals work, communication was described to be the glue that makes interprofessional patient care possible. “There are definitely specific skills that each profession brings. So while it’s important that we’re all doing our jobs, it’s also important that we’re all communicating to one another.” Another participant commented, “I think it [interprofessional communication] improves patient care because everyone gets on the same page”. Working within each professions scope of practice and communicating common areas of care allowed participants to get on the same page and work together to improve patient care. Despite the PEA Project promoting interprofessional care of UI, for example, one participant still held his or her own perceptions of unique independent care roles. “like continence I think is kind of like for nursing, because we’re the hands on.... Even OT because they don’t really, they don’t deal with it, they just need for us to explain if they [patients] can do it [are continent] or not”.

While communication connects interprofessional patient care, when lines of communication break or are not effectively made interprofessional care can be challenged.

Participants shared the effective use of some communication tools such as binders and clipboards where professions shared information in order for the team to be on the same page. Another example provided was interprofessional rounds that are held weekly on the unit in order to discuss discharge planning and patient goals of care. These rounds were held with physicians, PT, OT and the clinical nurse lead and were effective at bringing an interprofessional team together to communicate and plan goals of care, however one nurse noted “there’s no where for anyone else to see that information”. This excerpt describes a staff members experience not being on the same page with representatives of the interprofessional team even when care is planned. These planning meetings lose effectiveness if there is no plan in place to disseminate the collaborative care planning strategy with the rest of the healthcare team who are involved in 24/7 care. In summary communicating common goals and care plans is essential in effectively providing interprofessional care.

4.7.3.2 Interprofessional Learning

Despite potential communication challenges, each participant felt that interprofessional hospital-based care was important. Participants however were more divided on the notion of interprofessional hospital-based learning. Some participants highlighted positive perspectives:

“I think learning together is good because you’ve got experiences. Everyone brings his or her own experiences and so it’s a really good place for discussion. I think more comes out of open discussion than like if it was just your own profession it would be a very narrow view of what’s going on, so you need the whole picture”.

These participants felt that learning together allowed for different viewpoints to be expressed and facilitated discussion across areas of expertise. Learning together can provide a positive forum for questions where all participants have the ability to benefit from the responses,

thus enabling staff involvement, even from staff who are less inclined to ask questions out of fear or embarrassment.

Other participants shared potential barriers to learning together, the primary concern being that a generalized learning program would under-serve some and over-serve others. Different professions hold different expert knowledge; although some learning may be pertinent to one profession it may not be required in the same depth for another and visa versa. It was noted that different learning styles may exist between individuals but also between professions. The final barrier noted was the challenge of getting healthcare professionals who work different schedules together at the same time to attend and learn simultaneously. It may be that a combination of profession specific and interprofessional learning is the most appropriate balance.

4.7.4 Summary

Through the six qualitative interviews participants were able to share their experiences learning and implementing best practices in hospital-based care. Thorough analysis revealed categories and sub-themes in the barriers and facilitators to success including; requirements for learning, putting evidence-based learning into action and finally interprofessional learning and care. Having a richer understanding of the experiences of an interprofessional team provides firsthand feedback on the issues related to knowledge translation in the workplace and has the potential to support new methods of workplace learning so that research transfers from researcher, to healthcare professionals and finally and most importantly to patients.

Chapter 5: Discussion

The purpose of this study was to assess the effectiveness of an evidence-based educational intervention on improving an interprofessional health care team's UI knowledge in a hospitalized older adult population. This study also aimed to demonstrate the facilitators and barriers experienced by the participants in their attempt to learn and implement new knowledge in the hospital setting. Using a pilot pre/post-test design this study describes the learning that occurred during a six-week intervention based on the RNAO's BPG for promoting urinary continence. With the addition of a supporting qualitative component, the semi-structured interviews were able to shed light on how the qualities of an intervention and the culture of a workplace can both facilitate and hinder the ability for an interprofessional team to maintain evidence based practices. The combination of both qualitative and quantitative data triggered a critical reflection on how nurses and the interdisciplinary team are meeting professional responsibilities for ongoing education. This chapter provides a discussion around the study's key findings and limitations while also highlighting the study's contribution and implications for nursing practice, leadership, education and future research.

5.1 Key Findings

5.1.1 Changes in UI Knowledge

Change in knowledge was measured by comparing pre and post-test results in four different areas of evaluation: UI knowledge, comfort and confidence providing UI care, perceived work place learning support and finally importance of evidence-based practices. Statistically significant results showed improved overall UI knowledge with significantly higher post-test scores. When total UI knowledge was broken down the foundational knowledge section also showed statistically significant higher post-test scores. This section evaluated

common misconceptions around UI and its' care. Data analysis showed that the improvements in foundational knowledge scores were unlikely to have occurred by chance and that RNAO based educational intervention significantly improved staff's knowledge and understanding of UI and its' affect on hospitalized older adults. No change, however, was noted in the advanced knowledge section of the questionnaire. The content of these questions was more extensive, requiring participants to draw on their knowledge of the 5 types of UI as well as their association with various other chronic conditions that commonly affect hospitalized older adults. While overall UI knowledge improved the fact that statistical results were seen in the breakdown evaluation of foundational knowledge and not advanced knowledge tells us that the educational intervention improved knowledge only to a certain degree and complexity.

Next the comfort and confidence scale showed higher post-test scores and therefore improved comfort and confidence in participant's perceived ability to provide UI education and care. The benefits of workplace learning are seen here as increased comfort and confidence has the ability to improve patient education and conversation regarding the under reported and poorly evaluated effects of UI. While the PEA Project educational intervention showed significant changes in scores, participant's perceptions of their supports for learning in the workplace, and the importance of evidence based practice for them remained unchanged. As the study's intervention did not seek to effect change in values towards evidence-based practices or to increase supports within the workplace these results are appropriate.

5.1.2 Facilitators and Barriers to Learning and Implementing Evidence Based Practice

Three primary categories came from the analysis of six semi-structured interviews: requirements for learning, putting evidence-based learning into action and finally interprofessional learning and care. When looking at the requirements for learning the primary barrier described by

participants was time which included in part the time to look up best practices and time to attend in-services while on shift. Participants also described the need for structural supports such as having sufficient staffing for colleagues to cover patient care in order to facilitate learning in the workplace as essential. Having professionals at all levels on the same page with common goals and using effective methods of educational distribution in the workplace were the final two sub-themes noted as requirements for learning.

The second category was putting evidence-based learning into action. During interviews participant's expressed high value for the use of evidence-based practices describing them to be the basis for how the interprofessional team provides patient care. In order to put evidence-based education into action, participants expressed the importance of initiatives fitting both the needs of the patient population and fitting with the culture of the unit. Similarly, participants required sufficient support, follow up and review in order for evidence-based education to transfer from research to patient care. These factors are essential particularly in workplace settings with high staff turnover and many casual nurses and allied health professionals. Without follow up and accessible support of educators, participants don't know where to have questions answered and therefore this hinders the ability for the interprofessional team to be on the same page and provide consistent care based in evidence.

This leads to the third category, interprofessional learning and care. Here participants unanimously agreed that interprofessional care was important for patient outcomes, however participants were less clear as to the role of interprofessional learning. Several participants felt that they would benefit from more integrated learning with colleagues and that this would get everyone on the same page and working towards common goals. Learning together also allows for several people to hear questions asked and answered, thus breaking barriers for staff who may

be hesitant to ask question. However, other participants noted the challenge of being able to get the interprofessional team together and secondly the challenge of having appropriate educational material that do not over serve some members on the interprofessional team while under serving others.

5.2 Findings Supported in Literature

Evidence supports the need for healthcare professionals to stay current with hospital-based best practice guidelines, including guidelines to support urinary continence (Cheater, 1992; Cooper & Watt, 2003; Dumoulin et al., 2007). Despite the significant amount of time and resources put in by clinical researchers to advance best practices, insufficient attention has been placed to ensure these findings reach patient care settings (Bero, 1998). It is therefore not surprising that the literature focusing on UI shows that nursing and allied health professionals lack the required knowledge to provide up to date evidence-based UI care for hospitalized older adults (Cheater, 1992; Cooper & Watt, 2003; Dumoulin et al., 2007).

The statistically significant increase in post-test UI knowledge, however, proves that knowledge can be improved in clinical practice areas with effective evidence-based educational interventions. Bero's (1998) systematic review analyzed intervention based studies to assess the effectiveness of various methods of knowledge translation and exchange. While most of the studies reviewed showed modest improvements in performance, studies whose interventions proved to be consistently effective included those with dissemination strategies such as interactive educational meetings, multifaceted interventions and those that provided reminders for participants (Bero, 1998). The PEA Project supports Bero's (1998) findings in that methods of knowledge translation and exchange such as interactive in-services, visual reminders of the PEA Project study and content, and multiple forms of educational interventions including

handouts, conversations, case studies and supportive education binder, together improved participants' knowledge regarding common misconceptions around UI and the care that this condition requires. In the qualitative interviews participants highlighted these various methods of disseminating knowledge to be beneficial to their learning.

Statistically significant improvements in UI knowledge test scores as well as qualitative results suggest many effective methods of education distribution were created within this study. In order to better understand this occurrence I reflect on the four aspects required to put education into action considered in Rycroft-Malone et al.'s (2004) study. The authors found that not only is the manner in which educational interventions are put into practice important, as described earlier, but secondly that the interventions must also fit with the culture and practice issues common to the workplace. Thirdly, putting education into action requires collaboration with an interprofessional team. Lastly, there must be sufficient resources and leadership for successful integration of new initiatives into practice (Rycroft-Malone et al., 2004). It is possible that some of these factors described by Rycroft-Malone et al.'s (2004), affected the ease with which participants gained foundational knowledge yet not advanced knowledge. Perhaps the multiple forms in which education on the topic was provided and secondly, because the topic of UI fit within the culture and practice issues on the unit participants were able to remember common myths and facts about UI (2004).

Despite these findings, however, there were barriers to interprofessional collaborations including scheduling, misunderstanding of team member's roles and variable levels between scopes of practice. Not only is it important to consider the facilitators and barriers to integrated learning between nursing and interprofessional health members moving forward, it is also important to reflect on the impact that a shared care nursing model may have had on research

findings. The research site used a shared care LPN and RN model with the majority of staff being LPN's (56%) as reflected in the study sample. It is possible that the PEA Project's educational intervention provided significant post-test results because the sample had an LPN majority. With different level of baseline education RNs and LPNs may benefit from different depths of educational interventions, which may explain the interventions affect on foundational knowledge but not advanced knowledge. Despite the possible impact of the research sites nursing model on findings, all nurses and members of the interdisciplinary team have a professional responsibility for ongoing education (Walker, Olson and Tytler, 2013). With increased collaboration, resources, long term leadership and a better understanding of the learning needs of each healthcare profession it is possible that we would see an increase in participant's ability to transfer evidence based education directly to patient care outcomes (Rycroft-Malone et al., 2004).

Scotland's publicly funded health care system NHSScotland has published that to provide care in the year 2020, staff will need to be provided with opportunities to learn in the workplace (Workforce Vision, 2013). The PEA Project study provides a glimpse into the facilitators and barriers to workplace learning that are so important in understanding continuing education provided in hospital-based settings. The perspective gained through the PEA Project's semi-structured interviews contributes a unique angle to the literature on workplace learning. In reviewing the literature it was found that the majority of studies related to nursing and allied health professional's workplace learning were heavily weighted towards the evaluation of student learners' experiences in clinical placements, or transitioning from students to new healthcare employees (Jackson & Watson, 2011; Walker, Cooke, Henderson & Creedy, 2013; Wareing, 2010). While this literature is important to bridge the gap from university training to

independent professional practice it does not serve to understand how healthcare professionals keep up with current practices throughout the course of one's career, which is essential in order to keep up with continuously changing evidence based care. The PEA Project therefore provides a first hand understanding to what healthcare professionals require for life long learning in the workplace, essential in order for evidence based practices to reach patient care.

5.3 Findings Supported by Roger's Diffusion of Innovation Theory

Roger's Diffusion of Innovation Theory emphasizes the need for diffusion research studies, such as the PEA Project, to identify the four elements that define diffusion: innovation, communication, time and social structures (Roger, 2003). The PEA Project's findings support the four principles of Roger's Diffusion of Innovation that were highlighted by participants as being essential components when implementing evidence-based initiatives to an interprofessional team in the workplace. Participants felt it was important that **innovation** was introduced in a manner that was logical, clear, concise, and disseminated in a variety of formats such as in-services, handouts, reminders and case studies.

Communication was imperative to learning in the workplace, putting education into action and in keeping informed up to date with evidence-based practice changes. Communicating the goals and aims of initiatives, while having participants understand how they will be supported through the process of learning was an important component in enhancing participant's buy in and support. Furthermore, this study supports Roger's (2003) theory by identifying the importance that **time** plays in the diffusion process of workplace learning. Not only was I as a researcher, cognizant of the timeline for communicating, introducing, developing, disseminating and evaluating the research, but participants also described the severe time

restraints during a working day evidenced by heavy caseloads and insufficient coverage to access resources or attend in-services as a barrier.

Lastly, the PEA Project counted on both formal and informal **social structures** described by Roger (2003) in order to disseminate the educational intervention based on the RNAO BPG in this study. Formal social structures helped support the study through each of its stages by continuously engaging with the unit's manager, clinical nurse lead and the staff nurse trained as a nurse continence advisor. However, when considering workplace learning as a whole, participants expressed that at times innovations such as the implementation of new documentation forms are ineffective because communication did not transfer to all members of the social system leaving them confused and unsure as to the purpose of new forms. Social structures both formal and through informal conversations among colleagues can facilitate and hinder the diffusion of innovations in the workplace and thus must be identified and discussed when hospital-based learning interventions are presented, disseminated and evaluated.

5.4 Limitations

The PEA Project had limitations in different phases of the study including recruitment, and the dissemination and validity of the questionnaires. Firstly, recruitment was impacted by the extensive staff turnover and number of staff on medical leave during the study dates affecting the number of available staff to volunteer for all stages of the study including consent, pre-test, in-services and post-test data collection. A larger sample size would have provided a more representative sample, and may have given significance to the advanced knowledge scale.

Finally, as a pilot study the questionnaire used had not been previously tested for reliability and validity measures. While colleagues were consulted to assess the validity of the questionnaires, strategies could have been implemented to ensure reliable results. While the pre

and post-test questions were identical, strategies were not put in place to control for the fact that participants could have collaborated when completing questionnaires or used external information to answer the questions. It is difficult to assess that the questionnaire reliably measured each individual participant's change in UI knowledge or if several key informants may have impacted the change. Self reported questionnaires also have methodological problems associated with how accurately they reflect the scope and depth of the respondents' knowledge (Cheater, 1992).

Finally, the workplace learning that occurred was limited to the level of understanding that allowed the interprofessional team to address common myths and forms of UI. The education was insufficient to transfer into more integrated questions that assessed UI in conjunction with other chronic conditions that hospitalized older adult experience. Having a better understanding of healthcare worker's needs for learning, before implementing educational interventions, might have improved my ability to adapt interventions in a way that would have not only improved scores on the foundational knowledge section aimed to break myths of UI and care but would also have improved advanced knowledge that tested the integration of UI and chronic co-morbidities, which is so often the case in older adults. Despite the limitations, the findings of the PEA Project will have important implications for nursing practice, education, leadership and undoubtedly future research.

5.5 Implications

While the literature reports that healthcare workers' lack of knowledge, assessment and management of UI and also highlights the importance of integrating evidence-based practices, few studies assess the facilitators and barriers to workplace learning as experienced by participants or their ability to integrate new learning into practice. Analysis of the study's

qualitative interviews and quantitative pre/post test results provides important implications for nursing practice and education, leadership and future practice.

5.5.1 Nursing Practice and Education

The PEA Project's primary contribution to practice is its' ability to better understand the facilitators and barriers to workplace learning as experienced by the interprofessional team. As an education based study its' implication on practice and education go hand in hand. This study highlights the importance of continuing education in hospital-based settings. It supports the notion that attention needs to be placed not simply on educating staff but on structural changes such as staffing, coverage and financial supports in order to see effective workplace learning in action. The study's findings for example suggest that nursing practice should strive to incorporate funded education days. The limitations described by participants in this study explains first hand the challenges that staff face in keeping up to date with changing best practice guidelines and supports the need for education to be better integrated into nursing practice.

5.5.2 Leadership

Policy makers and clinical leaders must support interprofessional healthcare teams so that they are able to continuously provide evidence-based care as current practices change with new clinical research findings (Googaerts, Grealish & Ranse, 2008). Institutional standards must be evaluated by policy makers and communicated clearly at all levels of the interprofessional team. Policy makers might set forth new best practice standards but they must also implement strategies to support workplace learning. The PEA Project's findings suggest that a fulltime education leadership positions must be central to nursing and allied health professionals practice. Someone designated as the responsible team member for updating staff on changing practices and who can focus attention on implementing effective educational interventions over time with

appropriate evaluation of staff learning and patient outcomes would allow for continuity of learned material and support ongoing evidence-based practices.

5.5.3 Future Research

Research is ongoing in the healthcare profession, and evidence-based practices are continuously changing. Having healthcare professional's express the importance of evidence driven practice supports the need to better understand how to effectively update and educate staff in order for them to be able to provide up to date interprofessional patient centered care. Further research is therefore needed, to give strength and support the findings of this study. Future research should continue exploring the needs of healthcare workers in order to facilitate effective learning in the workplace (Rycroft-Malone et al., 2004; Shirey, 2006). Future research should also evaluate the level of educational interventions required for an interprofessional team to learn new evidence-based data, to implement the learning, and then measure patient outcomes. Without assessing all three stage of education integration we will only get a glimpse into the facilitators and barriers faced by workplace learners.

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Appendices

Appendix A Pre-Test Questionnaire

A.1 Consent Form

THE UNIVERSITY OF BRITISH COLUMBIA



School of Nursing
T201- 2211 Wesbrook Mall
Vancouver, B.C. Canada
V6T 2B5
Tel: (604) 822-7417
Fax: (604) 822-7466

Consent Form: Putting Education into Action (PEA) to Support Continence among Older Adults

In acute and transitional care urinary incontinence (UI) is an important area of research. With an aim of transitioning patients back home, UI negatively affect patient's independence along with physical, emotional and social well-being. These negative impacts also lead to increased hospital costs related to extra hospital days and increased re-admission rates. Multidisciplinary care of patients experiencing new onset of UI is vital for older adults to be able to transition back home without involuntary loss of urine.

The purpose of this study is to assess change in staff's knowledge and management skills related to urinary incontinence among older adults with the implementation of an evidence based educational intervention.

Who is eligible to participate? All fulltime, part-time and casual staff employed on your unit that provide direct patient care.

Confidentiality and anonymity: Your confidentiality will be respected. Any information resulting from this research study will be kept strictly confidential and will be protected in several ways.

- You will not be asked to record your name on the survey.
- Each participant will only be identified by a survey identification number.
- No names or other identifying information will be used in any research reports or publications resulting from this research.
- No individual in your workplace or school will be able to identify your answers to these questions as yours.
- All records will be securely stored in a locked filing cabinet and/or password secured computer files.

Information obtained in this study may also be used for educational purposes and for research involving secondary data analysis of the information that has been collected. All data will be anonymous.

Potential Risks: We do not perceive any potential risks to participation, as survey results will be kept in strict confidence.

Potential Benefits: Your participation in this study may increase your knowledge and confidence providing care in the area of urinary continence promotion among older adults on your unit.

What is involved? If you agree to participate in this study, you will be asked to complete the attached survey on urinary incontinence at two points in time, now and in one month post educational intervention. Completing the survey will take approximately 10 minutes. Submitting a completed survey indicates that you understand the attached information and that you voluntarily agree to participate in this study.

In the weeks that follow the consent process a researcher will be present on your unit daily for several hours in the early evening. While on the unit the researcher will have a short in service and fact sheet that will take no more than 15 minutes to review. The aim is that over 3 weeks, participants will have the opportunity to complete 3 mini in services based on urinary continence assessment and management strategies conveniently while on shift.

One month after in service initiation participants will be presented with the post survey. On completion of the post survey you will receive a \$10 Starbucks gift card for your time.

Consent:

Your participation in this study is entirely voluntary and at any point your data can be removed from the study if you wish to withdraw participation without jeopardy to your employment.

Completion of the survey that follows indicates that you have received a copy of this consent form for your own records and consent to the study.

<input checked="" type="checkbox"/> Yes, I understand what this study entails, I am comfortable with the procedures
--



Contact for concerns about the rights of research subjects:

If you have any concerns about your treatment or rights as a research subject, you may contact the Research Subject Information Line in the UBC Office of Research Services at 604-822-8598 or if long distance, e-mail to RSIL@ors.ubc.ca.

A.2 Pre-Test

THE UNIVERSITY OF BRITISH COLUMBIA



School of Nursing

T201- 2211 Wesbrook Mall

Vancouver, B.C. Canada

V6T 2B5

Tel: (604) 822-7417

Fax: (604) 822-7466

Putting Education into Action (PEA) to Support Urinary Continence among Older Adults

Thank you for agreeing to participate in this study. This survey is about health professional's perceptions and knowledge of urinary continence as it relates to the care of older adults on your unit. The survey includes questions about your knowledge and understanding of urinary incontinence (UI), your comfort and perception providing care, your perception of learning in the workplace and finally demographic information.

The survey will take about 15 minutes to complete and consists of **4 sections**. Please complete this survey at a time that is most convenient for you and return the completed survey and this cover sheet following the directions on the information sheet provided to you.

Before you complete the survey, it is important for you to know that we need to link your pre-survey to your post-survey that you will complete at the end of the educational in-services. We ask that you write your **first name** and **last initial** in the space provided below as your unique identifier.

My first name and last initial is

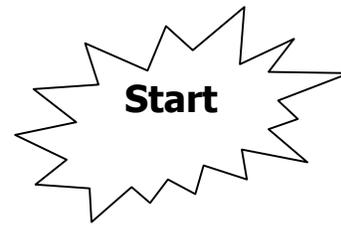
Please Note: Once all the data are collected, you will be assigned a unique code and your unique identifier will be removed from your survey.

Please **DO NOT** write your name anywhere else on the survey or on the envelope.

All your answers will remain **confidential** and **anonymous**.

Please read through each item carefully before responding. It is important that you answer each question as thoughtfully and honestly as possible. There are no right or wrong answers, only your individual opinions. Your answers are important to this research project.

Please answer ALL of the questions.



URINARY CONTINENCE QUIZ

We are interested in your knowledge about continence. This quiz includes **A) 28** true/false/unsure questions, **B) 5** multiple-choice questions, **C) 5** visual analog scale questions

CIRCLE the ONE number that best corresponds to your answer: 1 if you believe the statement is true, 2 if you believe it is false and 3 if you are unsure at this time.	1	2	3
	True	False	Unsure

SECTION A) TRUE / FALSE / UNSURE QUESTIONS

1.	Most patients who have involuntary urine loss live normal lives.	1	2	3
2.	Many patients with involuntary urine loss can be cured and almost everyone can experience significant improvement.	1	2	3
3.	There are exercises that can help control urine for patients who leak urine when coughing, sneezing, or laughing.	1	2	3
4.	Involuntary loss of urine can be caused by several easily treatable medical conditions.	1	2	3
5.	Women are more likely than men to develop urinary incontinence.	1	2	3
6.	Many common over-the-counter medications can cause urinary incontinence.	1	2	3
7.	Once patients start to lose bladder control on a regular basis, they usually can never regain complete control over it again.	1	2	3
8.	The best treatment for urinary incontinence is usually surgery.	1	2	3
9.	Other than pads, diapers, and catheters, little can be done to treat or cure urinary incontinence.	1	2	3
10.	Most health care professionals ask their older patients whether they have bladder control problems.	1	2	3
11.	Most patients will involuntarily lose their urine on a regular basis by the time they reach age 85.	1	2	3

12.	Urinary incontinence is caused by one or two conditions.	1	2	3
13.	Urinary incontinence, often called a leaky bladder or involuntary urine loss, is one of the results of normal aging.	1	2	3
14.	Most people with urinary incontinence talk to their doctors about it.	1	2	3
15.	Incontinence can happen at any age.	1	2	3
16.	The more babies and prolonged labors a woman has had the more her risk for incontinence.	1	2	3
17.	Common causes of stress UI are diuretics, coughing and high body mass index.	1	2	3
18.	The loss of the muscle tone in the pelvic muscles holding up the bladder can cause urinary incontinence.	1	2	3
19.	Drinking too much fluid can lead to overflow urinary incontinence.	1	2	3
20.	Caffeine causes the bladder to squeeze or contract more causing frequent voiding or urge UI.	1	2	3
21.	Constipation can be a risk factor for incontinence.	1	2	3
22.	There are many age related risk factors to UI.	1	2	3
23.	Alcohol is helpful in relaxing the bladder.	1	2	3
24.	Restricting fluid intake can promote continence.	1	2	3
25.	Estrogen enhances bladder tone and elasticity making it easier to hold onto urine.	1	2	3
26.	A patient's inability to reach the toilet can cause functional incontinence.	1	2	3
27.	Some medications can directly or indirectly affect the bladder in a negative way.	1	2	3
28.	Parkinson's disease can cause overflow UI.	1	2	3



👉 You are half way there!

Please continue!

SECTION B) MULTIPLE CHOICE

	CIRCLE the ONE letter that best represents your answer.	A	B	C	D	E	F
1.	Causes of overflow incontinence associated with an elevated post void residual urine volume include all of the following except: a) Diabetic neuropathy b) Benign prostatic hyperplasia c) Urethral stricture d) Severe pelvic prolapse e) Fecal impaction f) Atrophic vaginitis	A	B	C	D	E	F
2.	All of the following clinical states are causes of urge incontinence except: a) Parkinson's disease b) Acute exacerbation of congestive heart failure c) Atrophic vaginitis d) Cerebrovascular accident e) Use of diuretics	A	B	C	D	E	F
3.	Requirements for continence include all of the following except: a) A compliant patient b) An intact lower urinary tract c) A motivated patient d) Adequate cognitive and physical function e) An appropriate environment	A	B	C	D	E	F
4.	A cause of urinary incontinence is a) A problem with emptying: Urethra does not open fully and bladder squeezes weakly. b) A problem with storing: urethra opens easily and bladder squeezes frequently. c) Both a) and b) d) Neither a) or b)	A	B	C	D	E	F

5.	Causes of stress incontinence include all of the following except: a) Urethral damage secondary to prostate surgery b) Multiple childbirth with resultant nerve damage secondary to instrumentation c) Severe chronic lung disease d) Atrophy of the vaginal mucosa e) Chronic congestive heart failure	A	B	C	D	E	F
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SECTION C) VISUAL ANALOG SCALE

For the following five questions please **CIRCLE ONE** number on the scale that best represents your answer. 1 Being the least and 5 being the most

1. How confident are you to support patient’s continence.

Unconfident ---Somewhat Unconfident---Neutral---Somewhat Confident---Confident
 -----1-----2-----3-----4-----5-----

2. How confident are you in your knowledge of urinary incontinence.

Unconfident ---Somewhat Unconfident---Neutral---Somewhat Confident---Confident
 -----1-----2-----3-----4-----5-----

3. How comfortable are you providing education to patients regarding their urinary incontinence.

Uncomfortable---Somewhat Uncomfortable---Neutral--Somewhat Comfortable--Comfortable
 -----1-----2-----3-----4-----5-----

4. How well supported do you feel your learning is in the workplace.

Unsupported ---Somewhat Unsupported---Neutral---Somewhat Supported--Supported
 -----1-----2-----3-----4-----5-----

5. How important is evidence-based practice to you.

Unimportant---Somewhat Unimportant---Neutral---Somewhat Important---Important
 -----1-----2-----3-----4-----5-----

SECTION D) DEMOGRAPHICS

This section helps us gain some background information about our participants.

Please **CIRCLE** the number that best describes yourself or your situation, where indicated,

1. What is your profession? CIRCLE APPROPRIATE RESPONSE

- RN (including care management and clinical nurse leads) -----1
- LPN -----2
- Allied Health (PT, OT, SW, RA, Dietician, Pharmacist)-----3
- Physician -----4
- Other -----5

2. What is your current position? CIRCLE APPROPRIATE RESPONSE

- Permanent Full Time -----1
- Temporary Full Time-----2
- Permanent Part Time-----3
- Temporary Part Time-----4
- Casual -----5

3. How long have you worked at UBC Hospital TCU unit? Years

4. What year did you complete your FIRST/INITIAL education program in your profession?

5. What is your highest educational qualification in your profession?

- Diploma -----1
- Bachelors-----2
- Masters-----3
- PhD-----4
- Other (Please specify) -----5

6. What year were you born?

7. What is your gender?

- Male -----1
- Female-----2
- Other (Please Specify)- -----3

THANK YOU, YOU HAVE COMPLETED THE SURVEY.
👉 Please ensure that **ALL** questions are answered!

Appendix B In-services

B.1 Fact Sheet #1



FACT SHEET#1: A: Dispelling Myths of Urinary Incontinence (UI) B: Urinary Incontinence Risk Factors

A: Dispelling Myths of Urinary Incontinence

- Urinary incontinence is a natural sign of aging. = **MYTH**
- Most healthcare staff ask their adult patients about their bladder control= **MYTH**
- Most people who suffer from urinary incontinence seek help. = **MYTH**
- Urinary tract infections cause urinary incontinence. = **MYTH**
- Drinking too much fluid can lead to urinary incontinence. = **MYTH**
- **FACT** - UI has many risk factors and present with a wide variety of conditions.
- **FACT** - One in four Canadians over the age of 65 experience urinary incontinence.
- **FACT** - Almost all patients can improve their UI if not cure it.
- **FACT** - Over-the-counter medications can positively & negatively affect UI.
- **FACT** - Women have higher rates of UI than men.

B: Risk Factors of UI. *See PEA Project Education Binder for further details.

- Medications
- Vaginal births
- Change in hormone levels
- Anatomical differences.
- Infection of the bladder, vagina or prostate
- Enlarged prostate
- Constipation
- Holding on to urine too long
- Fluid intake
- Smoking
- Age
- Mobility
- Weight
- Surgeries
- Foods

B.2 Fact Sheet #2

Putting Education into Action: Supporting Urinary Continence Amongst Older

Fact Sheet #2: A: Forms of UI B: Case Study #1

A: Forms of UI:

Urge Incontinence: Urine loss caused by an unstoppable urge to urinate and is sometimes referred to as an overactive bladder associated with frequent urination.

Risk Factors: _____

Stress Incontinence: Urine loss with a sudden increase in abdominal pressure. (this form is more common in women)

Risk Factors: _____

Overflow Incontinence: Bladder is full at all times and leaks as it overflow throughout the day and night. (this form is more common in men)

Risk Factors: _____

Functional Incontinence: The inability to make it to the bathroom in time.

Risk Factors: _____

Mixed Incontinence: A combination of urge and stress urinary incontinence.

B: Case Study #1:

Mrs. Bradley is a 72 year old female with three adult children and four grandchildren. She is admitted to the transitional care unit after having had a total knee replacement. She is being followed by the allied health team as her mobility has significantly declined and she is having a hard time with the recovery process. She is grateful to have the support of her family and looks forward to her daily visits from her grandchildren who bring her a thermos of her favorite brewed coffee from home.

Mrs. Bradley has a history of hypertension and CHF and has been placed on a diuretic since she has been admitted. When asked about her toileting routines she states “Because of all the things going on with my knee and my medications I don’t always make it to the bathroom in time. This has never happened to me before and I feel like a baby again. Plus the room is small and it is difficult getting around with my new walker.

Assessment Questions and Answer Key

1. What urinary incontinence **risk factors** are evident in Mrs. Bradley’s case study?

- Decreased mobility: require increased time to reach bathroom, this may also affect bowel regularity if the client is significantly less active then she was prior to admission.
 - Appropriate environment: does the environment support patients ability to get to the bathroom in enough time with her walker in a tight space?
 - Fluids: How much coffee is she drinking daily? Is she hydrating with any other fluids? Caffeine can irritate the bladder and is an associated risk factor of urge incontinence.
 - Medications: Mrs. Bradly is on a diuretic, which may affect her need to void more frequently.
 - Patient may be discouraged and embarrassed.
2. Are there other contributing factors that may require you to **further assess** Mrs. Bradly? What questions would you ask?
- Are you taking any medications to manage your pain post surgery?
 - How often are you having a bowel movement, has your routine changed since admission?
 - Other then the coffee you are you drinking other fluids?
 - How was Mrs. Bradly's experience with child birth related to UI.
 - Has she had any previous history of urinary incontinence.
 - How has this experience affected her emotionally and how can we support patient's motivation to resolve her UI.
3. What **forms of UI** is Mrs. Bradly at risk for.
- Functional (doesn't make it to the bathroom in time, walker, room, space)
 - Urge (bladder may be irritated by caffeine, pelvic floor may be weak, diuretic may also cause increased frequency)
 - Stress (may have weak pelvic floor from births or constipation)
 - Overflow (chronic constipation may lead to retention and overflow UI)

See the yellow PEA PROJECT EDUCATION BINDER at the Nurse's station for

- **Focused assessment Questions and Answers**
- **Components of Optimal Care model**
(added Dec. 26)

Focused UI Assessment Q & A: Questions and Assessments

UI history:

- Was your patient continent prior to admission?
- Ask your patient if they know why they are experiencing incontinence and if they have previously seen a physician or received any treatments for UI in the past.

Fluid Intake:

Questions: How much is your patient drinking daily? Are they on fluid restrictions?
Are beverages caffeinated or decaffeinated?

Assessment: Reduced fluid intake can irritate the bladder and contribute to urinary tract infections, this may cause irritation when voiding and contribute to urge incontinence. Caffeine also irritates the bladder and acts as a diuretic, which contributes to frequent urge to void.

Bowel Function:

Questions: What is your patient's routine bowel function?
Do they manage this routine with a particular diet or medic



Assessment: Pelvic floor muscles can weaken with straining to have bowel movements, and a distended rectum can compress the bladder and cause retention. Chronic constipation can negatively impact urologic function.

Medications

Questions: Is your patient on medications that may affect UI?

Assessment: Diuretics will increase the frequency your patients require voiding, medications with a sedative property can impact awareness of need to void and therefore assessing the timing that medications are given may be important. Ask your pharmacist if there are medications or creams that can help support continence as well?



Functional Assessment

Questions: Does your patient have access to the bathroom?
Does your patient have any functional impairments that may hinder their ability to get to the bathroom?

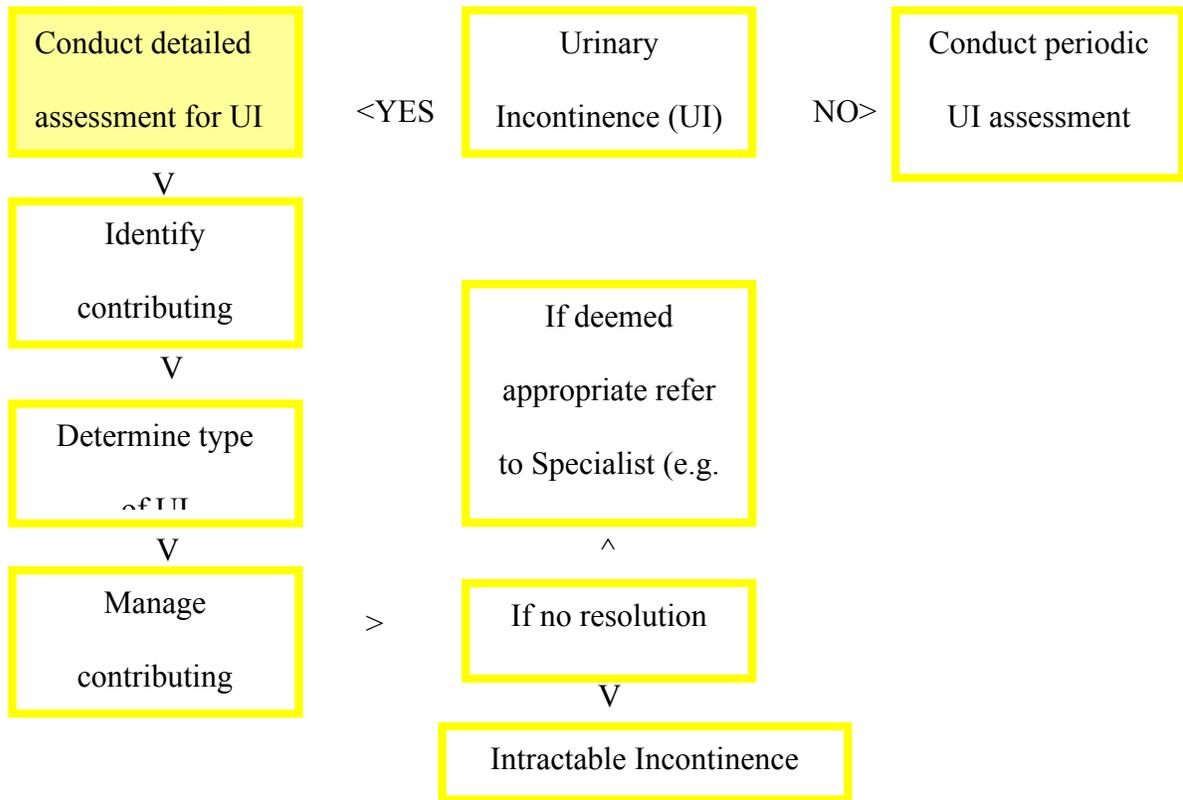


Assessment: It is vital to understand your patient's functional abilities in order to support their continence. Assess patient's ability to transfer from bed, their mobility, balance, arm strength, manual dexterity, eyesight and ability to communicate. Tips: is the call bell in reach? Can the distance be reduced to the bathroom? Is their clothing appropriate?

Voiding Record:

Ask patient to complete a three-day voiding record to help assess the patterns of UI and any aids that they have used. This will help staff assess where intervention, support and management of incontinence can be improved with aims at supporting our patient's continence upon their discharge home. (See RNAO's voiding record document)

C: Components of Optimal Continence Care



Nursing Best Practice Guidelines Program: RNAO

**Putting Education into Action:
Supporting Urinary Continence Amongst Older**

Fact Sheet #3: Interdisciplinary Management to Functional Incontinence

If your patient was continent at home prior to admission and has had no surgery involving the bladder or other urologic changes, lets get your patient continent upon discharge!

Assess Pain: Pain management is always important to recovery and can also help support mobility, movement and progress to functional independence.

Work with interdisciplinary team members to support patient's needs.

- **Nursing:** Nurses are at the bedside 24/7 and have a good understanding of patient's daily routines. Patients voiding record can help nurses better understand their patterns of incontinence and assess associated risk factors such as reactions to medications, fluid intake, mobility, motivation etc.
- **Physiotherapy:** Physiotherapists play an active roll in assessing and improving patient's mobility, strength and can monitor patient's progress and areas for continuous improvement.
- **Occupational Therapy:** Occupational therapists can support functional incontinence with assessments and assistive devices. Does the patient benefit from having a bedpan or urinal at the bedside if urgently needing to void? Can the patient pivot-transfer to a chair but not walk to the bathroom and can benefit from a commode?
- **Pharmacy:** Has pharmacy been consulted with regards to medication affecting incontinence or related to constipation or pain?
- **Medicine:** Is the medical team aware of patient's incontinence? Are conservative treatments sufficient for your patient or is further consultation by a specialist supported?
- **Social Work:** Is the patient lack motivation in the recovery process? Social workers can help support patients so that they have the motivation to reach their goals for a safe discharge.
- **Students:** Are students on the unit being trained to assess and manage incontinence. Can they help support patients who may require a voiding schedule?

* It is important for the interdisciplinary team to communicate and support one another in the goal of promoting continence amongst older adults. Use each other as resources and make promoting continence everyone's goal.

Appendix C Post Questionnaire

C.1 Consent Form

THE UNIVERSITY OF BRITISH COLUMBIA



School of Nursing
T201- 2211 Wesbrook Mall
Vancouver, B.C. Canada V6T 2B5

Tel: (604) 822-7417

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- No individual in your workplace will be able to identify your answers to these questions as yours.
- All records will be securely stored in a locked filing cabinet and/or password secured computer files.

Information obtained in this study may be used for educational purposes. All data will be anonymous.

Potential Risks: We do not perceive any potential risks to participation, as survey results will be kept in strict confidence.

Potential Benefits: Your participation in this study may increase your knowledge and confidence providing care in the area of urinary continence promotion among older adults on your unit.

What is involved? If you agree to participate in this study, you will be asked to complete the attached survey on urinary incontinence. For some this will be the second point in time completing the survey. For those who were not available to complete the pre-survey at the beginning of the study this may be the first and only time the survey will be completed. Completing the survey will take approximately 10 minutes. Submitting a completed survey indicates that you understand the attached information and that you voluntarily agree to participate in this study. On completion of the post survey you will receive a \$10 Starbucks gift card for your time.

Consent: Your participation in this study is entirely voluntary and at any point your data can be removed from the study if you wish to withdraw participation without jeopardy to your employment.

Completion of the survey that follows indicates that you have received a copy of this consent form for your own records and consent to the study.

Yes, I understand what this study entails, I am comfortable with the procedures



Contact for concerns about the rights of research subjects:

If you have any concerns about your treatment or rights as a research subject, you may contact the Research Subject Information Line in the UBC Office of Research Services at 604-822-8598 or if long distance, e-mail to RSIL@ors.ubc.ca.

C.2 Post-Test

Putting Education into Action (PEA) to Support Urinary Continence among Older Adults

Thank you for agreeing to participate in this study. This survey is about health professional's perceptions and knowledge of urinary continence as it relates to the care of older adults on your unit. The survey includes questions about your knowledge and understanding of urinary incontinence, your comfort and perception providing care and learning in the workplace along with some background information.

The survey will take about 10 minutes to complete and consists of **4 sections**. Please complete this survey at a time that is most convenient for you.

Before you answer the following questions, it is important for you to know that we need to link your survey to the survey you may have completed at the beginning of the educational in-services. We ask that you write your first name and last initial in the space provided below.

My first name and last initial is

Please Note: Once all the data are collected, you will be assigned a unique code and your name will be removed from your survey.

Please **DO NOT** write your name anywhere else on the survey or on the envelope.

All your answers will remain **confidential** and **anonymous**. To safeguard the privacy of your answers, a sealable envelope is enclosed.

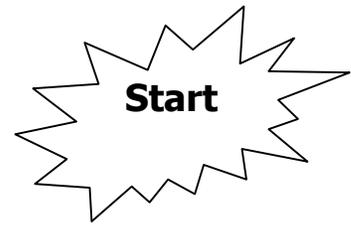
Please read through each item carefully before responding. It is important that you answer each question as thoughtfully and honestly as possible. There are no right or wrong answers, only your individual opinions. Your answers are important to this research project.

Please answer ALL of the questions.



Starbucks Coffee card will be given for completing our survey!

Thank you for your participation!



URINARY CONTINENCE QUIZ

We are interested in your knowledge about continence. This quiz includes **A) 28** true/false/unsure questions, **B) 5** multiple-choice questions, **C) 5** visual analog scale questions

A) TRUE / FALSE / UNSURE QUESTIONS

<p>For the following true/false/unsure questions, if you believe a statement is true, please circle the number one. If you believe the statement is false, please circle the number two. If you are unsure of the answer at this time please circle the number three.</p> <p>CIRCLE the ONE number that best corresponds to your answer</p>	1 True	2 False	3 Unsure
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1.	Most patients who have involuntary urine loss live normal lives.	1	2	3
2.	Many patients with involuntary urine loss can be cured and almost everyone can experience significant improvement.	1	2	3
3.	There are exercises that can help control urine for patients who leak urine when coughing, sneezing, or laughing.	1	2	3
4.	Involuntary loss of urine can be caused by several easily treatable medical conditions.	1	2	3
5.	Women are more likely than men to develop urinary incontinence.	1	2	3
6.	Many common over-the-counter medications can be risk factors to urinary incontinence.	1	2	3
7.	Once patients start to lose bladder control on a regular basis, they usually can never regain complete control over it again.	1	2	3
8.	The best treatment for urinary incontinence is usually surgery.	1	2	3
9.	Other than pads, diapers, and catheters, little can be done to treat or cure urinary incontinence.	1	2	3
10.	Most health care professionals ask their older patients whether they have bladder control problems	1	2	3
11.	Most patients will involuntarily lose their urine on a regular basis by the time they reach age 85.	1	2	3

12.	Urinary incontinence is caused by one or two conditions.	1	2	3
13.	Urinary incontinence, often called a leaky bladder or involuntary urine loss, is one of the results of normal aging.	1	2	3
14.	Most people with urinary incontinence talk to their doctors about it.	1	2	3
15.	Incontinence can happen at any age.	1	2	3
16.	Number of babies and prolonged labors a woman has had the more her risk for incontinence.	1	2	3
17.	Common causes of stress UI are diuretics, coughing and high body mass index.	1	2	3
18.	The loss of the muscle tone in the pelvic muscles holding up the bladder can cause urinary incontinence.	1	2	3
	Drinking too much fluid can lead to overflow urinary incontinence.	1	2	3
20.	Caffeine causes the bladder to squeeze or contract more causing frequent voiding or urge UI.	1	2	3
21.	Constipation can be a risk factor for incontinence.	1	2	3
22.	There are many age related risk factors to UI.	1	2	3
23.	Alcohol is helpful in relaxing the bladder.	1	2	3
24.	Restricting fluid intake can promote continence.	1	2	3
25.	Estrogen enhances bladder tone and elasticity making it easier to hold onto urine.	1	2	3
26.	A patient's inability to reach the toilet can cause functional incontinence.	1	2	3
27.	Some medications can directly or indirectly affect the bladder in a negative way.	1	2	3
28.	Parkinson's disease causes overflow UI.	1	2	3

 You are half way there!
 Please continue!

B) MULTIPLE CHOICE

	Please read each statement carefully and CIRCLE the ONE letter that best represents your answer.	A	B	C	D	E	F
1.	Causes of overflow incontinence associated with an elevated post void residual urine volume include all of the following except: a) Diabetic neuropathy b) Benign prostatic hyperplasia c) Urethral stricture d) Severe pelvic prolapse e) Fecal impaction f) Atrophic vaginitis	A	B	C	D	E	F
2.	All of the following clinical states are causes of urge incontinence except: a) Parkinson's disease b) Acute exacerbation of congestive heart failure c) Atrophic vaginitis d) Cerebrovascular accident e) Use of diuretics	A	B	C	D	E	
3.	Requirements for continence include all of the following except: a) A compliant person b) An intact lower urinary tract c) A motivated patient d) Adequate cognitive and physical function e) An appropriate environment	A	B	C	D	E	
4.	A cause of urinary incontinence is a) A problem with emptying: Urethra does not open fully and bladder squeezes weakly. b) A problem with storing: urethra opens easily and bladder squeezes frequently.	A	B	C	D		

	c) Both a) and b) d) Neither a) or b)						
5.	Causes of stress incontinence include all of the following except: a) Urethral damage secondary to prostate surgery b) Multiple childbirth with resultant nerve damage secondary to instrumentation c) Severe chronic lung disease d) Atrophy of the vaginal mucosa e) Chronic congestive heart failure	A	B	C	D	E	

C) VISUAL ANALOG SCALE

For the following five questions please **CIRCLE ONE** number on the scale that best represents your answer. 1 Being the least and 5 being the most

1. How confident are you to support patient's continence.

Unconfident ---Somewhat Unconfident---Neutral---Somewhat Confident---Confident
-----1-----2-----3-----4-----5-----

2. How confident are you in your knowledge of urinary incontinence.

Unconfident ---Somewhat Unconfident---Neutral---Somewhat Confident---Confident
-----1-----2-----3-----4-----5-----

3. How comfortable are you providing education to patients regarding their urinary incontinence.

Uncomfortable---Somewhat Uncomfortable---Neutral--Somewhat Comfortable--Comfortable
-----1-----2-----3-----4-----5-----

4. How well supported do you feel your learning is in the workplace.

Unsupported ---Somewhat Unsupported---Neutral---Somewhat Supported--Supported
-----1-----2-----3-----4-----5-----

5. How important is evidence-based practice to you.

Unimportant---Somewhat Unimportant---Neutral---Somewhat Important---Important
-----1-----2-----3-----4-----5-----

👉 Please ensure that you have answered **ALL** of the questions.

SECTION D) DEMOGRAPHICS

This section helps us gain some background information about our participants.

Please **CIRCLE** the number that best describes yourself or your situation, where indicated,

2. What is your profession? CIRCLE APPROPRIATE RESPONSE

- RN (including care management and clinical nurse leads) -----1
- LPN -----2
- Allied Health (PT, OT, RA)-----3
- Physician -----4
- Other -----5

2. What is your current position? CIRCLE APPROPRIATE RESPONSE

- Permanent Full Time -----1
- Temporary Full Time-----2
- Permanent Part Time-----3
- Temporary Part Time-----4
- Casual -----5

3. How long have you worked at UBC Hospital TCU unit? Years

4. What year did you complete your FIRST/INITIAL education program in your profession?

5. What is your highest educational qualification in your profession?

- Diploma -----1
- Bachelors-----2
- Masters-----3
- PhD-----4
- Other (Please specify) -----5

6. What year were you born?

7. What is your gender?

- Male -----1
- Female-----2
- Other (Please Specify)- -----3

THANK YOU, YOU HAVE COMPLETED THE SURVEY.

👍 Please ensure that **ALL** questions are answered!

Yes, I wish to receive a Starbucks gift card.



Choose one of two options by placing a check mark in the appropriate ___√___ depending on how you prefer to receive your honorarium.

A) In person _____

*** Gift cards will be available to give out while researcher is on the unit, and if not given personally will be left in your mail box upon study completion.**

B) Mailed to you _____

***Instructions**

1. Complete your contact information below.
2. Detach this last sheet of paper from the survey, fold it in half and insert in envelope with the completed survey.
3. When you return this information form, your name will not be connected to your answers in any way.
4. Once we receive your completed information form we will mail you a Starbucks gift card.

Please mail the Starbucks gift card to:

Name: _____

Address: _____

City: _____

Postal Code: _____

YES I would consider participating in an interview.



In hopes of gaining a better understanding of how YOU perceive education in the work place and in your profession I will conduct several one to one interviews.

The aim is to assess facilitators and barriers to learning and the implementation of new knowledge.

Participants may be approached in the coming weeks with further information about interview consent, honorariums and setting up a time and space convenient for you. In the mean time if you think that you may be interested in participating in an interview please leave your name _____ and email address _____.
Thank you. Mila

Appendix D Qualitative Interviews

D.1 Interview Consent Form

THE UNIVERSITY OF BRITISH COLUMBIA



School of Nursing
T201- 2211 Wesbrook Mall
Vancouver, B.C. Canada V6T 2B5

Tel: (604) 822-7417
Fax: (604) 822-7466

Consent Form: Promoting Education into Action (PEA) to Support Continence among Older Adults.

Purpose:

The purpose of this interview is to better understand the facilitators and barriers to implementing evidence based practice in the promotion of urinary continence amongst older adults on a medical/transitional care unit.

Study Procedures:

If you agree to participate in the interview, a researcher will ask questions about your experiences with the implementation of evidence based education in the workplace over the previous month. The researcher may take notes during the interview.

The interview will be audio-recorded and will take approximately 30-45 minutes. It will occur at a time that is mutually agreeable to you and the researcher. The interview will occur in a quiet and confidential environment.

Demographic information will be asked of you. No identifying information will be present, and this will allow researchers to better understand the interviewed sample.

Potential Risks:

Participating in this study entails minimal risk to you. The conversations will be held in strict confidence. There is also a remote possibility that you may experience some emotional discomfort when sharing. If you become distressed, you could contact your employee assistance program for counseling.

Potential Benefits:

Although there are no immediate benefits, your participation in this study may be contributing to a greater understanding of the benefits and challenges associated with implementing evidence in practice. You may also experience some benefit from the opportunity to talk about your experiences.

Temporary Part Time-----4
Casual -----5

3. How long have you worked at UBC Hospital TCU unit? Years

4. What year did you complete your FIRST/INITIAL education program in your profession?

5. What is your highest educational qualification in your profession?

Diploma -----1
Bachelors-----2
Masters-----3
PhD-----4
Other (Please specify) - -----5

6. What year were you born?

7. What is your gender?

Male -----1
Female-----2
Other (Please Specify)- -----3

SURVEY IS COMPLETE 🖱️ Please ensure that **ALL** questions are answered!

D.2 Semi-Structured Interview Guide

Semi-Structured Interview Guide

1. Can you share with me your thoughts about the use of evidence in clinical practice?

How well do you feel evidence is used on your unit?

How, if at all, do you integrate evidence into YOUR practice?

2. What do you require to facilitate learning in the workplace?

Are there barriers to learning in the work environment?

Can you expand?

3. How did having two monthly in services on issues related to urinary continence prior to the study starting affect your knowledge and ability to apply new knowledge in the workplace.

Is there anything you can think of that would improve the effectiveness and if so what are some examples?

4. For you, how effective were the three fact sheet based in services at the nurses station following the completion of the pre-test?

Barriers? Facilitators? How could it have been improved?

5. What were your thoughts on the effectiveness of the education tools such as the PEA binder, the PEA checklist on patient charts, fact sheets and case study?