

Evaluation of Nurses' Knowledge, Attitudes, and Perceptions after  
Participating in an Oral Health Interprofessional Education Program

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### Abstract

Epidemiological studies have revealed that older adults who live in residential care facilities (RCFs) have the worst oral health status of all older adults. Oral diseases have an adverse effect on quality of life as they negatively impact the ability to eat, speak, and socialize, and they place older adults at increased risk of developing systemic diseases (Registered Nurses Association of Ontario [RNAO], 2008). The scientific literature confirms that one of the main reasons this problem persists is that Bachelor of Science in Nursing (BScN) students have inadequate oral health education in their curricula (RNAO, 2008). Additionally, the existing curriculum for students in health professions schools is fragmented and has not kept up with the increasing complexity of health care delivery that requires health care providers from unrelated professions to collaborate and deliver coordinated patient-centered care (King et al., 2013). The ability to work collaboratively with unrelated providers and deliver interprofessional care is considered the best model of care for vulnerable older adults in RCFs (Ho et al., 2008). The World Health Organization (2013) recommended interprofessional education (IPE) and stated that providers who work together should be trained together. It endorsed IPE between nursing and dental hygiene students as a means of achieving improved oral health outcomes (Monajem, 2005). Therefore, the purpose of this study was to evaluate the BScN students' knowledge, attitudes, and perceptions of an oral health IPE program. A quantitative descriptive post-test design was used to survey year-one students at one community college. The participants were a convenience sample of 47. A validated tool was used to measure the students' oral health knowledge, attitudes, and perceptions. The tool also measured the impact of an oral health IPE program on their attitudes and perceptions toward IPE and how the program influenced their attitudes and perceptions toward their professional identity, role, and responsibility. The results showed that the students' mean oral health knowledge score was high and that overall they had more positive attitudes and perceptions

toward oral health care than was generally reported in the literature. The students had positive attitudes and perceptions toward the oral health IPE program, which positively influenced their attitudes and perceptions toward their professional identity, roles, and responsibility. The findings related to IPE aligned with the findings in the literature reviewed. In conclusion, the findings from this study support an oral health IPE program for BScN students as a way to improve oral health knowledge and delivery and prepare students for interprofessional collaborative practice. The results cannot be generalized due to the study's limitations: only one school was involved, the sample was convenient, there was no control group, and there was no qualitative analysis. Thus, more research needs to be conducted, and researchers should consider these limitations when designing their studies.

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**Table of Contents****Chapter 1: The Problem Defined**

Problem Statement.....	11
Purpose of Study.....	15
Research Questions.....	15
Scope and Assumptions.....	16
Limitations of Study.....	16
Definition of Terms.....	17

**Chapter 2: Review of the Literature**

Background.....	19
The Need for Oral Health Education in Nursing Curricula.....	22
Literature review for Research Question One.....	24
Oral Health Knowledge of Registered Nurses: Oral Hygiene Care.....	24
Oral Health Knowledge of Student Nurses: Oral Hygiene Care.....	26
Oral Health Knowledge of Registered Nurses: Oral Health Assessment.....	27
Oral Health Knowledge of Student Nurses: Oral Health Assessment.....	28
Oral Health Attitudes and Perceptions of Registered Nurses.....	29
Oral Health Attitudes and Perceptions of Student Nurses.....	30
Impact of Knowledge, Attitudes, and Perceptions on Oral Care Delivery.....	32
Quality of Life.....	33
Oral-Systemic Disease Link.....	34
General Literature Review for Research Questions Two, Three, and Four.....	35
Interprofessional Collaboration.....	35
Interprofessional Education.....	38

Interprofessional Education Initiatives and Recommendations.....	41
Study College's Interprofessional Education Program.....	41
New York University's Interprofessional Education Initiative.....	43
Registered Nurses of Ontario's Recommendations.....	43
Literature Review for Research Question Two.....	44
Professional Identity and Nurses.....	44
Literature Review for Research Question Three.....	48
Professional Role and Responsibility.....	48
Literature Review for Research Question Four.....	51
Attitudes and Perceptions Toward Interprofessional Education.....	52
Benefits and Challenges of Interprofessional Education.....	54
Summary.....	55
<b>Chapter 3: Methods of Research.....</b>	<b>59</b>
Research Methodology.....	59
Site.....	59
Study Design.....	60
Sample.....	60
Measurement Tool/Data Sources.....	61
Research Procedure.....	66
Data Analysis.....	68
Ethical Review.....	69
<b>Chapter 4: Data Analysis and Results.....</b>	<b>71</b>
Participants' Education and Oral Health Data.....	71
Research Question Analysis.....	73

Research Question One.....	73
Part: A.....	73
Part: B.....	75
Research Question Two.....	79
Research Question Three.....	80
Research Question Four.....	80
<b>Chapter 5: Summary, Conclusion, and Recommendations.....</b>	<b>82</b>
Summary.....	82
Discussion of the Findings.....	87
Research Question One.....	87
Part: A.....	88
Part: B.....	91
Research Question Two.....	95
Research Question Three.....	98
Research Question Four.....	101
Conclusion.....	104
Recommendations.....	105
Limitations.....	108
<b>References.....</b>	<b>111</b>
<b>Appendices</b>	
Appendix A: Introduction Letter.....	128
Appendix B: Consent Form.....	130
Appendix C: Education and Oral Health Data.....	131
Appendix D: PART A–Oral Health Care Knowledge Test.....	133

Appendix D: PART B–Attitudes and Perceptions Toward Oral Health.....135

Appendix D: PART C–Attitudes Toward Interprofessional Education.....136

Appendix E: Study College Presentation



**List of Tables**

Table 1. Oral health care knowledge survey questions.....	73
Table 2. Oral health care knowledge questions with high scores.....	74
Table 3. Oral health care knowledge questions with average scores.....	75
Table 4. Oral health care knowledge questions with poor scores.....	75
Table 5. Oral health care knowledge test: summary statistics scores.....	75
Table 6. Attitudes and perceptions toward oral health care.....	76
Table 7. Attitudes and perceptions toward oral health care: Level of agreement for statements two, five, and nine.....	76
Table 8. Attitudes and perceptions toward oral health care: Level of agreement for statements three and seven.....	77
Table 9. Attitudes and perceptions toward oral health care: Level of agreement for statements one, four, eight, and 10.....	78
Table 10. Attitudes and perceptions toward oral health care: Level of agreement for statement six.....	78
Table 11. Professional identity and interprofessional education.....	79
Table 12. Role and responsibility and interprofessional education.....	80
Table 13. Attitudes and perceptions toward interprofessional education.....	81

## Chapter One: The Problem Defined

Since the 1970s, international and national epidemiological data findings have revealed that residents in residential care facilities (RCFs) who can no longer effectively perform oral self-care due to advancing age, a decline in physical and mental ability, a decrease in sensory acuity, and or a decrease in motor skills (Frenkel, Harvey, & Newcombe, 2001), experience the poorest oral hygiene and health status of all older adults (Alacqua Gow [AG], 2013; Mathews et al., 2012). Despite a plethora of literature in medical and dental academic journals dedicated to increasing awareness of how health care providers (HCPs) may best address the unmet oral health care needs of this population, this issue still persists (AG, 2013; MacEntee et al., 2007; Wårdh, Jonsson, & Wilström, 2012; Weening-Verbree, Huisman-de-Waal, van Dusseldorp, van Achterberg, & Schoonhoven, 2013).

Many residents suffer pain, discomfort, and halitosis from periodontal disease, dental caries, xerostomia, denture stomatitis, and angular cheilitis (Le, Dempster, Limeback, & Locker, 2012). Residents are generally unaware they have these conditions, and they remain unknown sources of pain (Jablonski, Munro, Grap, Schubert, Ligon, & Spigelmeyer, 2009), as they often remain undiagnosed and untreated, especially in residents who may be too frail to communicate or complain, and pain is even more challenging to detect in residents with dementia (Sims-Gould, Brondani, Bryant, & MacEntee, 2011, p. 5-8). As a result, most dental services residents receive in RCFs are related to a dental problem that in 66% of the time requires emergency treatment (Nitschke, Majdani, Sobotta, Reiber, & Hopfenmuller, 2010). Painful oral conditions can impact residents' ability to receive daily oral hygiene care, and in the case of demented residents, this inability to accept oral care may be misconstrued as uncooperativeness by the oral hygiene provider (Chalmers & Pearson, 2005; McNally et al., 2012). Some HCPs stated they found performing oral care to be the most disagreeable care they provided due to the halitosis and care

resistive behavior of residents and tended to forgo it (AG, 2013; Cobban, 2012; Forsell et al., 2011; Wårdh, Andersson, & Sörensen, 1997).

Challenges in providing quality oral care in RCFs arise from a combination of barriers that exist at the resident, HCP, and organizational levels. At the resident level, barriers include compliance with oral care, low perceived need of oral care, and degree of physical and cognitive dependency. At the HCP level, barriers include a lack of awareness of the importance of oral health, lack of oral health knowledge (OHK) and skills to perform oral health care, and the low priority given to oral health care. At the organization level, barriers include financial and time constraints, increased workloads, staff shortages, large proportion of care-dependent residents, lack of oral health care policies, and lack of a specific HCP role in performing oral care (Dahm, Bruhn & LeMaster, 2015). Many HCPs stated that lack of professional standards and leadership support for staff development on oral health care education (OHCE) are major barriers in providing oral care to residents and are the main reasons oral care is given a low priority or is neglected (Van der Putten, de Visschere, de Baat, & Vanobbergen, 2010). This paper will address the barriers of oral health care delivery at the HCPs level: the low priority given to oral care by HCPs in RCFs may be due to the lack of initial OHCE in the curriculum of the nursing profession (Frenkel, Mathews, & Nitschke, 2011, p. 192), and personal support workers (PSWs) in particular receive minimal, if any, initial OHCE (AG, 2013; Samson, Iverson, & Strand, 2010). Yet, in health care settings, PSWs provide up to 90% of oral care under the supervision of a registered nurse (RN) (Registered Nurses Association of Ontario [RNAO], 2008), and the RNs seldom hold them accountable for its delivery (AG, 2013; Finkleman, 2009).

### **Problem Statement**

Research findings revealed that nursing staff lacked OHK (RNAO, 2008) and they had

negative attitudes and perceptions toward oral care delivery (MacEntee et al., 2011; Wårdh et al., 1997). The researcher posits that this is partly responsible for the persistence of poor oral hygiene status among residents in RCFs. Newly licensed nurses enter the workforce with minimal OHCE in their undergraduate studies. Many novice nurses placed nursing schools second after senior nurses as their main source of OHK, thus senior nurses may be teaching novice nurses oral health practices and perpetuating beliefs that are not evidence based (Lin, Chang, Chang, & Lou, 2011).

Bruan-Wimmer and Ruiz-Skol (2012) stated that nursing staff lacked OHK. The OHK deficit is critical, particularly for RNs, as in the last decade the use of unregulated HCPs has increased and at the same time the nurses' role has expanded to include teaching and supervising unregulated HCPs. The findings also revealed that RNs were unclear regarding their role in the maintenance of patients' oral care. An OHCE intervention improved the RNs knowledge, attitudes, and perceptions (KAPs) of oral care practices and clarified the RNs role in oral care provision.

The health care sector and the educational sector, therefore, must implement OHCE programs for RNs in the face of the changing demographics and oral health profiles of Canadians. In 2011, Canada had 4845 RCFs providing care for 250,837 residents (Statistics Canada, 2011). Up to 95% of residents require assistance with three or more activities of daily living, including mouth care, dressing, and eating (RNAO, 2008). Canada's population, similar to many developed countries, is aging and living longer; 14.4% of Canadians are currently over 65, and by 2036 the percentage of people age 65 and over will double (Statistics Canada, 2011), while the number of people over 80 years of age will triple (Finkleman, 2009). It is expected that Canada's long-term sector will grow by an additional 120,000 beds (AG, 2013; McGregor & Ronald, 2010). Haumschild and Haumschild (2009) stated that 75% of the baby boom generation will reside in RCFs. Increasingly, new admissions into RCFs are older adults who are sicker, are older and

frailer, and have more complicated health problems and dementia than previous cohorts. They are more likely to be dentate and have complex dental restorations. The challenges facing the HCPs who are responsible for oral health care delivery in RCFs will continue to increase as demand and complexity increases (AG, 2013; Cobban, 2012). Never before have HCPs been responsible for the health of a population that has such a large proportion of people over the age of 65 (Yellowitz & Scheiderman, 2014). According to the World Health Organization [WHO] (2013), the “needs of the people should shape the way the workforce is educated” (p. 16). Higher learning institutions (HLI) have to respond by creating an educational model for HCPs that is responsive to the needs of the students, teachers, and the community they serve (WHO, 2013).

The researcher, a dental hygienist and a dental hygiene (DH) educator, selected this topic because her primary role is oral health promotion and the prevention of oral diseases. She is concerned about the overwhelming amount of scientific literature that reports that institutionalized older adults have poor oral health status, as most dental problems in this population can be treated or prevented by regularly scheduled oral health assessments using valid and reliable standardized oral health assessment tools and daily oral hygiene care (RNAO, 2008). The researcher agrees with Compton, Cobban, and Kline (2013) that given these trends, nursing staff’s lack of positive attitudes, and the paucity of academic and continuing OHCE and training of HCPs, there is serious concern about whether the increasing demand for oral health care provision in RCFs can be met. Neglecting daily provision of oral hygiene care places vulnerable and frail older adults at increased risk of morbidity and mortality from oral and systemic diseases and diminishes their quality of life (Stewart, 2013). To combat the deleterious effects oral diseases have on older adults, Ontario made legislative changes to the *Dental Hygiene Act, 2007*, which granted dental hygienists the ability to provide their services independent of a dental surgeon (MacDonald et al., 2011) and

coincided with changes in the health care system calling for collaborative team-based models (WHO, 2010; Pardue, 2013).

Increasingly, dental hygienists are providing DH services to clients in RCFs and championing oral health care in collaboration with non-dental professionals to improve the oral health status of older adults living in RCFs (Yakiwchuk, 2013). To ensure HCPs are “collaborative ready” to work in the health care system when they graduate (Pardue 2013, p. 98), the researcher agrees with the WHO (2010) recommendation that HCPs who work together should be trained together for optimal patient outcomes. The 2003 report by the *Romanow Commission on the Future of Health care in Canada* recommended that changing the way in which HCPs are educated is key to sustaining Canada’s health care system. Introducing interprofessional education (IPE) at the undergraduate level was recommended as a means of improving patient safety, quality of patient care, and provider and patient satisfaction (Anderson & Dean, 2005). In 2004, Health Canada challenged HLIs to “join in effecting a ‘sea change’ in education” (Anderson & Dean, 2005, p. 84), as Bachelor of Science in Nursing (BScN) students OHK, attitudes and their ability to work in interprofessional health care teams can be improved by implementing innovative curricula initiatives that would enable nursing students to learn about oral health care in collaboration with DH students, both in nursing schools and in geriatric facilities (Compton et al., 2013; RNAO, 2008; WHO, 2010). Interprofessional education is beneficial for students in the health science professions. Nursing students who participated in IPE increased their knowledge, strengthened their professional identity, clarified their role in collaborative practice and gained an understanding of the professional role and contributions of other students’ professions (WHO, 2010).

These concerns led the researcher to investigate HLIs that were embedding IPE oral health programs into the nurses’ curriculum. Although many universities and colleges have responded to

Health Canada's challenge and created IPE programs, in Ontario the DH program is a two-year program that is taught at the community college level. Over half of the colleges offer the program (Colleges Ontario, n.d.), and most of them also offer a BScN program, but only two colleges have developed an IPE program for both disciplines (HealthForce Ontario, 2009). One of these colleges is a large community college in the Greater Toronto Area (GTA). The college (henceforth referred to as study college) created an oral health IPE program initiative in 2005 for BScN and DH students (Ryerson University, 2014). The IPE program encompassed an oral health assessment and oral hygiene component—which DH students taught to the BScN students—who in turn taught the DH students the components of taking blood pressure and pulse (Grant et al., 2011). The researcher wants to assess the BScN students' knowledge, attitudes, and perceptions (KAPs) toward oral health care delivery and their attitudes toward oral care delivery in collaboration with DH students after they participate in the IPE program.

### **Purpose of Study**

The purpose of this quantitative study was to evaluate the BScN students' KAPs of an oral health IPE program.

### **Research Questions**

The research questions that have been formulated for this study will evaluate the BScN students' KAPs toward an oral health IPE program. The questions will be answered using quantitative methodology utilizing an assessment tool and a Likert-scaled questionnaire. Descriptive statistics will be used to analyze the data. Below are the four questions.

1. What is the impact of an oral health IPE program on BScN students' KAPs toward oral health care provision—especially oral hygiene care and oral health assessments?
2. How are BScN students' attitudes and perceptions toward their professional identity influenced by an oral health IPE program?

3. How are BScN students' attitudes and perceptions toward their role and responsibility in oral health care influenced by an oral health IPE program?

4. What is the impact of an oral health IPE program on BScN students' attitudes and perceptions toward IPE?

The answers to the research questions are impacted by the researcher's scope and assumptions about the study, which is the next topic to be discussed.

### **Scope and Assumptions**

In answering the research questions, the researcher will define the scope and assumptions associated with the proposed study. The scope of this study is limited to first year students enrolled in the BScN program. The program will accept 180 students into the program in the fall 2015 semester. All students who participated in the oral health IPE program were invited to participate in the study. All of the participants were given the same survey. With regard to capturing the purpose of the study, it was assumed that the validated assessment tools successfully measured students' KAPs and it was also assumed that the students who participated in the study answered the questions honestly. Along with the abovementioned scope and assumptions of the study, the study has limitations, which will be discussed in the next section.

### **Limitations of Study**

The findings of the study can be limited by its design, and the researcher acknowledges that six main limitations will be present in this study. First, the participants in this study will be from one nursing school that has a well-established IPE program. Second, the IPE program will cover two of the most important oral health topics, but the IPE program will not provide in-depth coverage of oral health diseases and their prevention due to time constraints. Third, the study will include only one college in the GTA, and the participants were a convenience sample.

Convenience samples fall prey to selection bias (Cobban, 2012), as they suffer from the risk that



volunteers tend to be the informal leaders and smarter members of the class who may already have good OHK. Also, the participants who choose to participate in the study may be those that have more positive or negative beliefs toward IPE and therefore could bias the findings (Honan, Fahs, Talwalkar, & Kayingo, 2015). Volunteering to participate might motivate some students to improve their KAPs (Anderson et al., 2011) and lead to an overestimation of the findings. Fourth, 50% or better is an acceptable response rate (Babbie & Benaquisto, 2010, p. 266), and there is the possibility that less than 50% of the participants may respond to the questionnaire. Five, the study will not have baseline data, as it will only be reporting after IPE measurements, and sixth, as the program is mandatory, there will be no control group in this study. Generally this limits the ability to study the benefits of IPE programs versus traditional methods of learning, and an unknown factor besides the IPE could influence the oral health KAPs of the students (Anderson et al., 2011). Consequently, given the abovementioned limitations, the findings from this study must be interpreted with caution and cannot be generalized to other IPE programs. The next section provides definitions of relevant terms used throughout this paper.

### **Definition of Terms**

**Collaborative practice:** “Includes working relationships not only between professionals but between branches of the same profession, between professional, paraprofessional and non-professional personal and between organization and practice settings” (Zwarenstein, Goldman & Reeves, 2009, p. 2).

**Interprofessional collaboration:** “A partnership between a team of health providers and a client in a participatory, collaborative and coordinated approach to shared decision-making around health and social issues” (Canadian Interprofessional Health Collaborative [CIHC], 2010, p. 24).

**Competency:** “A complex ‘know act’ that encompasses the ongoing development of an integrated set of knowledge, skills, attitudes, and judgments enabling one to effectively perform the activities

required in a given occupation or function to the standards expected in knowing how to be in various and complex environments and situations” (CIHC, 2010, p. 24).

**Interprofessional education:** occurs when “Two or more professions learn with, from and about each other to improve collaboration and the quality of care” (Centre for the Advancement of Interprofessional Education [CAIPE], 2002). “Explanatory note: includes all such learning in health, social, academic, work and community based settings adopting an inclusive view of “professional” to include all those who provide, care/ service as well as patients/ clients, families and communities who are integral components of education continuum” (CIHC, 2010, p. 24).

**Interprofessional learning:** “Learning arising from interaction between members (or students) of two or more professions. This may be a product of interprofessional education or happen spontaneously” (Thistelwaite, 2012, p. 60).

**Multiprofessional education:** a parallel model in which health care students from different professions learn side by side (Bennett et al., 2011).

**Nursing Staff:** is all staff within a health care facility that provide nursing care. It includes registered nurses, licensed practical nurses, registered practical nurses, and unregulated care providers such as personal support workers (RNAO, 2008).

## Chapter Two: Review of the Literature

In chapter one, the findings from scientific literature revealed that in the last several decades, the oral health of the older adults has improved overall, but that of the older adults with disabilities or chronic diseases is still suboptimal (Dolce, Haber, & Shelley, 2012), particularly for seniors who live in RCFs (Haumchild & Haumschild, 2009). According to Miguel and Watchel (2009), the poor oral health status of institutionalized seniors is a longstanding universal problem that remains unresolved. Yet, most oral diseases can be managed or prevented through daily oral hygiene care (Wilkins, 2009, p. 14), as demonstrated by the definition of oral health.

Oral health is the prevention and management of oral diseases to maintain a clean, healthy, and functioning mouth. Chronic dental diseases are not part of the aging process, but the risk of developing them increases with age. They have an adverse effect on quality of life as they negatively impact the ability to chew, communicate, and socialize (RNAO, 2008). Many older adults enter a RCF with existing oral diseases that have been present for many years (McNally et al., 2012). Admission into a RCF, therefore, can serve as an opportunity to assess, screen, and promote oral care for this population (AG, 2013; Preston, Kearns, Barber, & Gosney, 2006). This highlights the importance of the nurse's role in performing an oral health assessment on residents upon admission to a RCF. Research findings have revealed that once older adults enter a RCF, their oral diseases tend to exacerbate, and sometimes the progression can occur quickly (AG; McNally et al., 2012) due to their inability to receive and access oral health care (AG; Frenkel, Matthews, & Nitschke, 2011, p. 189). Presently there is no consensus on how to improve the oral health of residents. Although more research needs to be done on OHCE programs for this population, the literature supports the foremost strategy of providing OHCE for nursing staff in collaboration with dental hygienists (AG, 2013; Cobban, 2012; Frankel et al., 2011).

This strategy, at the educational level, will be the focus of the research for this study. Thus, this chapter will provide a review of the literature on background relating to the defined problem followed by the literature reviewed according to each of the research questions.

## **Background**

Providing nursing students with an OHCE program in collaboration with DH students can diminish the OHK deficit that has contributed to the increased prevalence of oral diseases, as lack of OHK is the primary reason oral health care has not traditionally been part of the holistic total care offered by the medical profession (McNally et al., 2012). They generally have shown little interest in treating older adults in RCFs (Tepper, 2008, p. 425). The medical profession, which is responsible for assisting or providing daily oral hygiene care and monitoring for dental diseases, is unaware of the serious problem oral diseases pose for the residents. Medical doctors do not perform routine oral assessments as part of a resident's medical assessment, as they do not think it is their responsibility, but the responsibility of the dental profession to examine the oral cavity for oral diseases (Yellowitz, 2008, p. 65). Most physicians caring for residents in RCFs do not consider oral health important, and most oral assessments they perform have been reported to be inaccurate (Coleman, Hein, & Gurenlian, 2006). Nurses including highly trained nurses tend to overlook the mouth during their initial assessment of the residents and neglect performing regular oral health assessments and oral hygiene care for the same reasons as the doctors (Van der Putten et al., 2010). This has contributed to oral health's low priority or neglect in RCFs (AG; 2013; Yellowitz, 2008, p. 65).

In 2000, The United States released the *Oral Health in America: A Report of the Surgeon General (OHA Report)*, which revealed that Americans' poor oral health status was a "silent epidemic" (Dolce et al., 2012, p. 1). The report highlighted that emerging research has linked oral diseases to systemic diseases and that medical HCPs lack knowledge of the oral implications of

systemic diseases (Coleman, 2005; Grant et al., 2011). The report called for improving oral care delivery, particularly for vulnerable elderly people, by enhancing OHCE in nursing schools and health care facilities (Coleman, 2005). This was followed by the release of the Institute of Medicine (IOM) (2011) Report, *Improving Access to Oral Health care for Vulnerable and Underserved Populations*. The report endorsed the formation of interprofessional health care teams to address the socioeconomic barriers that limit access to oral health care. The main recommendation in the report was to grow the oral health workforce by educating non-dental professions in oral diseases (Hahn, FitzGerald, Markham, Glassman, & Guenther, 2012). Lawrence and Leake (2001) wrote a paper called the *US General Report on Oral Health in America: A Canadian Perspective* in response to the *OHA report* that revealed that Canada's oral disease burdens paralleled those found in the United States. The main recommendation in the *Canadian Perspective*, which mirrors the *OHA report* (2000) and the *IOM Report* (2011), was to "educate non-dental health professionals about oral health and disease and their role in ensuring that patients receive good oral health care" (Grant et al. 2011, p. 41). The College of Family Physicians in Canada recommended interprofessional collaboration (IPC) should be a core competency (CC) for all HCPs, particularly for managing geriatric health and chronic diseases (MacEntee, 2011).

Although the College of Nurses of Ontario (CNO) lacks a specific oral hygiene care standard, the RNAO (2008) stated that the CNO is the process of developing protocols to ensure RNs deliver oral hygiene care. The RNAO (2008) supports a standard on oral hygiene because they acknowledged that nurses lack fundamental OHK due to insufficient education in their formal training and their workplace. The Canadian Nurses' Association (CNA) (2011) supports IPE and called for increasing OHCE, particularly in the areas of oral health assessments and daily oral hygiene care in collaboration with dental professionals. The CNO (2014) developed the *National*

*Competencies for Entry Level Registered Nurses* that mandates nurses create and foster interprofessional collaborative relationships in health care teams for ameliorating quality of patient care and safety. According to Falk, Hult, Hopwood, and Dahlgren (2013), the educational sector has not adequately prepared future HCPs for IPE and collaboration. Most health care education models have a discipline-specific curricula and are conducted in a siloed environment, which ill prepares newly licensed HCPs for the realities of what is expected of them in the workplace (Hendricson, 2001; Wilder et al., 2008). Upon graduation, however, HCPs are required to have the skill and knowledge to work independently as well as collaboratively with unrelated HCPs in an increasingly complex health care system (Hendricson, 2001; Lapkin, 2013; Pardue 2012). The next topic reviewed will address the need for OHCE in nurses' curricula.

### **The Need for Oral Health Care Education in Nursing Curricula**

To ensure HCPs have the skills required to work in an increasingly complex health care system, novel pedagogical approaches, such as IPE and interprofessional learning (IPL) are necessary. An oral health IPE program would prepare BScN students to provide oral care in a collaborative team approach (Wang, Shi, Bai, Zheng, & Zhao, 2015). Presently, nursing schools have minimal OHCE integrated into nurses' curricula (Coleman, 2005; Frenkel et al., 2011, p 192). Research findings from a 1999 study revealed that only 23% of baccalaureate nursing programs had mandatory courses in geriatric nursing. Less than 1% of nurses and 3% of advanced practice nurses had geriatric nursing credentials (Coleman, 2005). Coleman (2005) stated, "not even 30 minutes of OHCE is devoted to geriatric oral health" (p. 35). Frenkel et al. (2011, p. 192) reported that on average student nurses receive 1 hour of instruction and nearly 50% did not receive any OHCE. Samson, Iverson, and Strand (2010) investigated the level of OHCE training of future HCPs in 188 Norwegian HLIs. The study findings revealed that none of the schools provided sufficient OHCE. Seventy-four percent of schools provided 3 hours of theoretical and

clinical instruction. Jablonski (2012) reviewed seven textbooks to assess the quality and quantity of oral health theory in the books educators used in OHCE programs. Only one book discussed the oral-systemic link and all of the books had oral health care recommendations that did not align with best practice guidelines. According to the WHO, the present level of OHCE in the curricula of medical students will not give future HCPs the OHK that is required to improve the oral health of care-dependent older adults (Samson et al., 2010). The call to educate nurses in oral health is critical to ensure vulnerable and underserved older adults receive quality oral health care. The RNAO (2008) stated, “Nurses who provide oral hygiene care, either directly or indirectly, must participate in, and complete oral hygiene training” (p. 10).

Ensuring nurses have adequate OHCE and training is vital, as research findings reported that nurses lack the OHK to deliver effective oral hygiene care and that they use mouth care practices that are not evidence-based and fall below the standard of care (Cobban, 2012; Chan & Ng, 2012; RNAO, 2008). For example, the use of sponge swabs is contraindicated for oral care, as they do not remove biofilm as effectively as a toothbrush and they pose a safety risk as the sponge part of the swab can break off from the stick, drop to the back of the throat, and create a choking emergency situation (Dyck, Bertone, Knutson, & Campbell, 2013). Despite these well-documented concerns, there is tremendous resistance to stopping the use of sponge swabs (Jiang, 2012). The Dyck et al. (2013) study revealed that an OHCE in-service program for nursing staff in a RCF reduced the use of swabs, but it did not eliminate their use, as the use of swabs declined from 29,000 to 7,000 one year after the study.

Chan and Ng (2012) found that there is a lack of consistency in nurses’ clinical practices with regard to frequency of oral care, type of oral hygiene supplies used to provide oral hygiene care, and oral health assessments. Consequently, RNs who lack OHK were unable to assess oral health status and recognize common oral disorders when performing oral health assessments

(Frankel et al., 2011, p. 192). For example, xerostomia is a debilitating and painful condition that remains undiagnosed and untreated because “nurses do not appreciate the dry mouth potential and other oral sequelae of seniors’ medication regime” (Coleman, 2005, p. 34). Yet, most oral diseases can be managed or prevented. The gold standard for daily oral hygiene care for residents are toothbrushing and regularly scheduled oral health assessments, and although nurses acknowledged the importance of oral health, they play a minor role in oral health’s maintenance (RNAO, 2008). The next section will examine literature reviewed for research question one.

### **Literature Review for Research Question One**

A review of the literature was conducted to help answer research question one: What is the impact of an oral health IPE program on BScN students’ KAPs toward oral health care provision—especially oral hygiene care and oral health assessments? The OHK section of the literature review will address oral hygiene delivery and oral health assessments of RNs and student nurses. The literature reviewed for this question also pertains to research question three. The first topic below will review RNs OHK pertaining to oral hygiene care.

#### **Oral health knowledge of registered nurses: oral hygiene care.**

In the Sharbatti, Sadek, Sreedharan, and Muttappalluymyalil (2013) descriptive study, 115 nurses responded to a questionnaire that examined their OHK in three domains: oral conditions, indicators of a healthy mouth, and oral hygiene products. The authors converted the nurses’ scores in the domains into percentages and deemed a score of 60% or less as possessing inadequate OHK. A high proportion of the nurses had inadequate OHK, as only 56% of nurses had adequate scores regarding oral conditions, and the lowest score of 50% was in the domain of indicators of a healthy mouth; however, 78% were aware of oral hygiene products. A score of 60% or less on OHK tests was also found in a descriptive cross-sectional study by Chan and Ng (2012). They conducted a quantitative study to examine the attitudes, practices, and knowledge of nurses caring for critically



ill patients in intensive care units. They surveyed 244 nurses, of which 81% were RNs and 19% were student nurses, regarding their OHK and attitudes. The findings revealed that the level of OHK increased with the nurses' level of education. Although 81.4% of nurses stated that they received OHCE in their formal training, 40% also stated that their OHK was learned from nursing coworkers. Over 80% of the nurses believed oral care played an important role in health outcomes, but only 43% of them had OHK scores that were categorized as good. Only 16% stated they followed the Ministry of Health's oral care guidelines, and 44% used oral care practices that fell below the standard of care. For example, 96% of nurses chose foam swabs more frequently than toothbrushes. Although over 80% of the nurses received oral care training as part of their formal education, 33% of the nurses felt they had insufficient OHK to meet their patients' needs and 66% of the nurses stated they required more OHK and training and evidence-based oral health protocols. Nearly 60% found oral care a difficult task to perform but only 15% found it to be an unpleasant task (Chan & Ng, 2012).

Similar findings as Chan and Ng (2012) were found in a cross-sectional descriptive study with 209 nursing participants conducted by Lin, Chang, Chang, and Lou (2011). The study findings revealed that nurses had a mean pretest OHK score of 58.8% and nurses ranked oral care's priority eighth from a list of nursing care duties, which translated to oral care being practiced 49% of the time. The authors concluded that the nurses' OHK was suboptimal and many of their oral care beliefs and practices were not evidence-based. Nurses chose foam swabs 70% of the time for performing oral care. The findings revealed that there was "no significant correlation between knowledge and attitudes scores and age, experience, or educational attainment" (p. 329), as senior nurses also lacked OHK. The authors stated this finding is important, as 88% of nurses stated they placed nursing school OHCE second after senior nurses as their main source of OHK.

Senior nurses, therefore, may be contributing to the oral care practices that are contraindicated and in effect be perpetuating the findings in the study.

Howard (2010) conducted a descriptive cross-sectional study on the oral health KAPs of 945 nursing staff of which 33% were RNs in 30 RCFs. The nursing staff's knowledge was tested with 33 true or false questions and their attitudes toward oral care and oral care practices were surveyed with 20 Likert-type questions. The overall nursing staff's knowledge was suboptimal as only 4 out of 15 true or false questions on standard oral care for dentate residents were correctly answered by more than 60% of the participants. For example, 54% of the participants stated oral swabs were a good alternative to toothbrushes and only 49% knew that bleeding was a sign that biofilm was contributing to periodontal disease. Sixty-four percent stated they used a toothbrush twice a day to remove plaque and debris from a resident's mouth and tooth surfaces, and 95% knew that people who are edentulous also require oral hygiene. Most of the participants (89%) correctly stated that biofilm on teeth can affect general health and 72% had knowledge related to xerostomia. Participants had good knowledge related to denture care, as only 24% stated that soaking dentures in water with a denture tablet is an ideal way to ensure dentures are clean and 75% reported that biofilm can form on dentures. The next topic will review the OHK of student nurses pertaining to oral hygiene care.

#### **Oral health knowledge of student nurses: oral hygiene care.**

Minimal research exists on OHK of nursing students (Chan & Chin, 2015). Chan and Chin studied the level of OHK and behavior of 188 graduate and 831 undergraduate nursing students. The findings revealed that participants' OHK was poor regardless of study program, as the overall mean OHK score was 10 (53%) out of a possible 19 points. A quantitative study by Rwakatemba et al. (2015) assessed the oral health KAPs of 214 nursing students with previous theoretical and clinical OHCE. The findings revealed that 47.2% of the respondents had "poor preventive dental

knowledge” (p. 6). Less than 35% had knowledge related to bleeding gums, and less than 10% knew the causes of bleeding gums. Students in the BScN program had significantly higher OHK scores than students enrolled in a Diploma in Nursing program. A contributing factor is that the former receive more in-depth OHCE in the curricula than the latter. The next topic will review RNs OHK pertaining to oral health assessments.

### **Oral health knowledge of registered nurses: oral health assessment.**

An oral health assessment involves an examination of the oral cavity, including evaluation of: the mouth for abnormal tissue and lesions; cancer screening; mouth or facial pain and discomfort, particularly related to chewing and swallowing; partial and full dentures to assess if they are broken or ill-fitting; the dentition to assess for dental caries, fractured teeth, gingiva for inflammation and bleeding; and overall assessment of periodontal and oral hygiene status (Pudwell, 2013). Generally, research findings revealed that RNs do not include oral health assessments in their clinical practices (Clemmens, Rodriguez, & Leef, 2012). Frenkel et al. (2011) reported that if RNs lacked OHK they were unable to apply best practice guidelines into clinical practice and they were unable to assess oral health status or recognize abnormal oral conditions, and consequently, they detected only 50% of oral disorders (Frenkel et al., 2011, p. 192). Yet, given the nurse’s scope of practice and central role in continuous patient care, nurses are ideally situated to conduct oral health assessments (Clemmens et al., 2012). Thema and Singh (2013) reported that with comprehensive OHCE RNs were able to successfully identify 95% of common oral diseases and disorders and make the appropriate referrals. The next study in the literature reviewed exemplifies the need for comprehensive OHCE in IPE programs.

Sharbatti et al. (2013) found that nurses could not conduct an oral health assessment because they did not have the OHK essential for screening for oral conditions, as only 56% of nurses had adequate scores regarding “oral conditions” and 50% had an adequate score regarding

“indicators of a healthy mouth.” In the Chan and Ng. (2012) study, 60% of nurses stated they had insufficient time to perform an oral health assessment. Yet, 81% of nurses stated that they “always” or “most of the time” performed oral health assessments within a day of a patient being admitted into ICU. Ninety-five percent of the nurses stated that they “always” or “most of the time” performed oral health assessments regularly, and 42% stated that it was not a priority. The next topic will review student nurses’ OHK pertaining to oral health assessment.

### **Oral health knowledge of student nurses: oral health assessment.**

Most RNs still lack the ability and confidence to recognize signs and symptoms of oral diseases and disorders when they graduate (Coleman et al., 2006) because the topic of oral health is lacking in nurses’ curricula. For example, Hein, Schonwetter, and Iacopino (2011) surveyed HLIs in Canada, the US, Australia, Asia, and New Zealand that educate nursing, medical, and pharmacy students and found that over 50% of the schools did not require the students to assess the oral cavity and there were no theoretical or clinical components of how to conduct an oral health assessment course in the students’ curricula (Hein et al., 2011). The next study in the review examined nursing students’ knowledge related to oral health assessments.

Clemmens et al. (2012) surveyed 163 baccalaureate nursing students to determine their knowledge and attitudes and practices toward oral health assessments, and the study findings revealed that 97% of the students believed they had a strong understanding of the components of an oral health assessment, but only 25% were able to recognize the components of oral health assessments. Less than 2% stated they performed assessments on all their patients, and 49% conducted oral health assessments on some of their patients. The authors stated that oral health assessments were included in the curricula, but in clinical placement students were exposed to a variety of oral health assessment methods and tools. This is well supported in the literature, accordingly, lack of congruency between education and practice influences student nurses’

knowledge. It can also influence student and RNs attitudes and perceptions toward oral care delivery (Wårdh et al., 2012). The next topic will review is the attitudes and perceptions of RNs.

### **Oral health attitudes and perceptions of registered nurses.**

Some nursing staff have negative attitudes toward oral care delivery (Wårdh et al., 2012). The majority stated that they find oral care the most disagreeable care they provide (Wårdh et al., 1997; Forsell et al., 2011). Wårdh et al. (1997) were the first researchers to recognize some nursing staff neglect the mouth care needs of institutionalized older adults. Wårdh et al. (1997) hypothesized this was due not only to their lack of OHK, but also to their negative attitudes toward oral health care. Forsell et al. (2011) stated that the most likely explanation is this “was due to a gap between knowledge and behavior influenced by attitudes and perceptions toward oral care among the nursing staff” (p. 200). Wårdh et al. (1997) conducted exploratory research to study the attitudes of various levels of nursing staff and how their attitudes impacted the oral care they delivered to institutionalized elders. The results from the questionnaire revealed that giving nursing staff information on oral care and increasing their knowledge does not necessarily lead to behavioral changes that improve clinical practices without addressing the issue of attitudes. The negative attitudes also correlated with levels of nursing education, with the least trained nurses having the most negative attitudes.

Chang and Ng (2012) reported positive attitudes and perceptions in their study, as over 80% of the nurses believed oral care played an important role in health outcomes and Lin et al. (2011) reported a positive mean attitude score toward oral care of 79.4% in their study. The Howard (2010) study reported that the attitudes of nursing staff toward oral care delivery were dependent on their personal oral care and the perception of its importance to the residents. The findings revealed that the nursing staff provided oral care 88% of the time and 73% of the respondents stated brushing should continue even if the patient’s gums bleed. Fifty percent of the

nursing staff stated that they always felt comfortable performing oral care, 18.5% said often, 21% said sometimes, 5.1% said seldom, and 4.5% said they never felt comfortable performing oral care. Eighty percent perceived oral care to be as important as other nursing duties and only 1% said it was never as important. Additionally, findings revealed that participants perceived losing teeth as one ages to be a natural consequence of aging, as 40% stated that aging always causes tooth loss.

According to the RNAO (2008), the value a nurse places on the importance of oral health care and how the task is perceived are both associated with the quality of oral care delivered. Consequently, the RNAO (2008) recommended that nurses should be cognizant of their personal oral health attitudes and perceptions, as these can influence the quality and quantity of oral care their patients receive. Howard (2010) reported that 49% of the nursing staff said they have a regular checkup once a year or more, 48.5% visited a dental professional if they were in pain, and 2.1% never had any dental visits. Bruan-Wimmer and Ruiz-Skol (2012) surveyed four RNs, and the study findings revealed that 100% of the nurses perceived oral self-care and visiting a dental professional were important to maintain good dental health and 100% of the nurses strongly believed in maintaining their patients' oral health. The next topic will review student nurses' attitudes and perceptions pertaining to oral health.

### **Oral health attitudes and perceptions of student nurses.**

Research related to the oral health behavior and attitudes of nursing students is limited. What research does exist, mainly reports students' attitudes toward their own oral self-care, and similarly to RNs, these attitudes can impact the oral care they are likely to provide to their patients (Chan & Chin, 2015). Chan and Chin (2015) found that only 10% of the students had never visited a dental professional and that graduate students were more likely to visit a dental professional than undergraduate students. In the Rwakatema et al. (2015) study, 86% of the

respondents had not visited a dental professional within the last year. Kaira, Srivastava, Giri, and Chopra, (2012), investigated the oral health practices of student nurses and reported that 49% visited a dental professional only if they had a toothache, and 39% had visited a dental professional within the last year. Most of the participants cited fear, lack of time, and high dental fees as reasons for lack of dental care.

Students' attitudes and perceptions, however, can improve by attending an OHCE program, as Wårdh et al. (1997) stated that OHCE programs delivered in collaboration with dental professionals would improve nursing staff's attitudes toward mouth care delivery. Simons, Baker, Jones, Kidd, and Beighton, (2000) also indicated that improving attitudes requires comprehensive OHCE programs with salient oral health theory including the oral-systemic link and this may influence caregivers to change their behavior. In the Nitschke et al. (2010) study, the findings concur that when nursing staff have increased awareness of the importance of mouth care in relationship to the overall health and quality of life of the residents, they are more likely to be empowered and motivated to modify their behavior and attitudes by improving their mouth care practices toward their own self-care as well as their clients.

Generally, OHCE should improve KAPs (Mason, 2005, p. 40). For the intervention to be successful, education should result in behavioral changes. Knowledge, however, does not always lead to improved attitudes or perceptions, or changes in behavior. If the increase in knowledge does lead to improved attitudes and perceptions which change behavior, studies are inconclusive regarding the extent and sustainability of the improvements (MacGiolla, Geurin, & Nunn, 2013). Attitudes are intricate concepts that may be related to knowledge, behavior, or both (Lindemark, Hakeberg, & Hugoson, 2011). Researchers know little about the attitudinal factors that influence individuals to adopt or not adopt new behaviors (Cobban, 2012). The intention to adopt new oral health attitudes and behaviors, however, can be difficult if barriers exist (Adair & Ashcroft, 2007,

p. 322). For example, McAullife (2007) examined student nurses' oral care practices in a hospital setting. The findings revealed that student nurses perceived they were discouraged from implementing evidence-based oral care practices by senior nurses and ultimately 78% of the participants agreed that they felt compelled to deliver oral care already in practice at the hospital even though they knew it fell below the standard of care. The next section will review the impact of nurses KAPs toward oral care delivery for older adults in RCFs.

### **Impact of Knowledge, Attitudes, and Perceptions on Oral care for Older Adults**

In a RCF, a resident's level of oral disease is directly correlated to his or her level of dependency on HCPs for the provision of daily oral hygiene care (RNAO, 2008). Suboptimal OHK along with less than ideal attitudes toward oral care provision has adverse effects on the oral cavity and can contribute to oral pain and discomfort due to unmet oral care needs. These include gingival inflammation and bleeding, visible plaque and debris on teeth, gums, and dentures, and halitosis (Cobban, 2012). Pain can also arise from periodontal disease, dental caries, xerostomia, denture stomatitis, and angular cheilitis (Le et al., 2012). One of the most important factors in whether nurses use evidence-based oral care in their clinical practices is their attitudes and perceptions toward oral health care (Yeung & Chui, 2010). Registered nurses' KAPs are therefore inextricably linked to oral care delivery and performance and are major determinants of residents' oral health status (Wårdh et al., 2012). Their attitude may impact the quality of mouth care the resident receives as well as the referrals the resident receives if there is a suspected abnormality or a potential dental problem (Nitschke et al., 2010). The attitudes and perceptions of nurses are critical, given they are primarily responsible for the mouth care of dependent older adults residing in RCFs (RNAO, 2008).

Lack of daily oral care can contribute to or exacerbate systemic conditions such as malnutrition, diabetes mellitus, and pneumonia (Compton et al., 2013), and it can hasten the



effects of cognitive and physical decline (MacEntee, 2011) and diminish quality of life (RNAO, 2008). Oral health care education interventions have improved nursing staff's KAPs toward the importance of oral care delivery for their patients, and improved oral hygiene clinical practices. Provision of daily oral hygiene care promotes oral health as an integral part of systemic health and improves quality of life (Compton et al., 2013). The next two sections will discuss the impact of suboptimal oral care delivery on residents' quality of life and systemic health.

### **Quality of Life.**

Oral-health-related quality of life is increasingly becoming an important aspect for older adults as they age (Thompson, 2014). Stewart (2013) argues that as important as the oral-systemic disease link is, it is also important for this population, which is already medically compromised, to focus on their quality of life. Although older people stoically adapt to a less than ideal oral health status, quality of life is poorer among those who are edentate or have missing teeth or carious lesions in their teeth, halitosis from lack of oral care, or xerostomia (Thompson, 2014). Provision of daily oral hygiene care can ameliorate a resident's psychosocial well-being and quality of life "even if the clinical indices of health in the mouth do not show a measurable improvement in the oral health status" (AG, 2013; Jiang, 2012, p. 10).

Researchers have found that dental diseases exacerbate without daily oral hygiene care, even if residents receive professional dental services (AG, 2013; MacEntee, Thorne, & Kazanjian, 1999). MacEntee et al. (1999) stated, "daily oral hygiene may be the most effective way to maintain oral health in this population" (p. 171). Good oral health is integral to quality of life and systemic health. Nurses who have up-to-date OHK can promote that daily oral care, and regular assessments are vital components of quality of life and minimize the risk of developing or exacerbating systemic diseases linked to poor oral health (Weening-Verbree et al., 2013). The oral-systemic link is increasingly a topic of interest in health care journals, as emerging research

findings have linked oral diseases to systemic diseases (*IOM*, 2011). This link will be reviewed in the next section.

### **Oral-Systemic Disease Link.**

In 2000, the *OHA Report* revealed that Americans' poor oral health status was a "silent epidemic" (Dolce et al., 2012, p. 1). A year later the *Canadian Perspective Report* revealed that the oral health status of Canadians paralleled that of the Americans (Grant et al., 2011). Over a decade later, the *IOM* (2011) reported that the oral health status of older persons was still poor. The reports highlighted that emerging research has linked oral diseases to systemic diseases and that all medical HCPs lacked knowledge of the inflammatory process of periodontal disease and its deleterious effects on systemic health (Grant et al., 2011). One of the main recommendations in the reports was to "educate non-dental health professionals about oral health and disease and their role in ensuring that patients receive good oral health care" (Grant et al., 2011, p. 41). When older persons receive denture or toothbrushing less than once a day in health care settings, they are more likely to develop oral diseases, which can place patients at increased risk of developing systemic diseases such as malnutrition, cancer, and respiratory diseases (Coleman, 2005; Grant et al, 2011).

Nurses in all health care settings should be able to assess a healthy mouth because more than 100 systemic diseases display oral manifestations, such as cardiovascular disease, respiratory diseases, haematological diseases, cancer, diabetes mellitus, and inadequate nutritional intake (Wilder et al., 2008).

The education of nurses in the importance of the oral-systemic link has been inadequate (Dolce, 2012; RNAO, 2008). Bruan-Wimmer and Ruiz-Skol (2012) reported that RNs lacked awareness of the implications of the oral-systemic link and endorsed OHCE programs for RNs delivered in collaboration with dental hygienists. Because, according to Rantanen et al. (2009), the most critical shared characteristic of the oral-systemic disease link is that it can be managed by

OHCE, oral health assessments, diagnosis, and oral care delivery through a collaborative approach. The next section will provide a general review of IPC, IPE, and IPE initiatives and recommendations that provide a background for the remaining research questions. This will be followed by a review of the literature pertaining to each of the three remaining research questions. Accordingly, the first topic to be reviewed is IPC.

### **General Literature Review for Research Questions Two, Three, and Four**

#### **Interprofessional collaboration.**

The RNAO (2008) stated that to bring oral care closer to best practice in RCFs, oral care is to be delivered in a “collaborative practice model” (p. 44). Interprofessional collaboration is defined as “A partnership between a team of health providers and a client in a participatory, collaborative and coordinated approach to shared decision-making around health and social issues” (CIHC, 2010, p. 24). Interprofessional collaborative practice can meet the demands of the increasing prevalence of chronic disease in the aging population and improve patients’ health outcomes (Thistlethwaite, 2012). It can also improve communication and attitudes across different health professions and increase provider and patient satisfaction (Sommerfeldt, 2013). Besides the oral-systemic link, collaboration is also being fuelled by the fragmented health care system, the multifaceted and complex medical problems of older adults, and financial restraints (Lasker, Miller, & Weiss, 2001). Collaboration can connect fragmented parts of the health care system and provide a holistic approach to overall health (Bridges, Davidson, Odegard, Maki, & Tomkowiak, 2011; Lasker et al., 2001). Most oral and systemic health problems residents in RCFs suffer from cannot be solved by a single discipline (Bridges et al., 2011). According to the CIHC (2010), the overlapping complications that can result from medical and dental health issues require an interprofessional practice model. Collaboration helps to improve patient-centered care and ameliorate health outcomes (MacDonald et al., 2011). The WHO stated that collaborative OHCE

programs are a means of improving the oral health of dependent residents (Samson, Berven, & Strand, 2009). According to Lawlor (2013) and Infante (2012), collaboration helps reduce the risk of oral and systemic diseases.

This is a topic dental hygienists are well educated on, and they can offer their expertise when collaborating with other HCPs. In Ontario's RCFs, the *Long Term Care Act* positioned oral care provision under the skin and wound care program and mandated that an interdisciplinary team containing a regulated HCP is responsible for coordinating the delivery of the care and ensuring that care follows best practice guidelines (Grant et al., 2011). *The National Dental Hygiene Competencies for Entry-to-Practice* were adopted into the DH curricula in 2010 (Grant et al., 2011). The curricula will ensure DH students have the CCs to "function effectively within oral health and interprofessional teams and settings and to promote team relationships and support client services" (Lawlor, 2013, p. 11). The abovementioned CCs in the DH curricula have enabled dental hygienists to be regarded as leaders in oral health promotion (Rantanen, et al., 2009). The WHO calls dental hygienists the HCPs "best poised" to facilitate the integration of oral health with primary care (Monajem, 2005, p. 47). Research findings have identified dental hygienists as the optimal choice in educating non-dental HCPs (Gil-Montoya, de Melo, Cardenas, & Lopez, 2006; Wårdh et al., 1997).

Although dental hygienists are ready to be part of an evolving health care system that is adopting interprofessional collaborative practices to deal with the increasingly complex health care needs of the population, nurses face challenges adjusting to their new interdependent role. For a nurse to be part of interprofessional collaborative practice, they need to have a clear sense of their identity. Developing an identity is foundational to understanding one's role as a nurse, and it is essential for nurses to be able to communicate their role to other HCPs (Summerfeldt, 2013). A concern for the nursing profession, administrative bodies, and nursing schools is the difficulty in

articulating the nurse's role in interprofessional collaborative practice. The CNA (2011) released a position statement which stated that "each profession brings its own set of knowledge and skills – the result of education, training, and experience – to collaborative health services... Shared decision-making, creativity and innovation allow providers to learn *from* each other and enhance the effectiveness of their collaborative efforts" (Sommerfeldt 2013, p. 2). Sommerfeldt stated that while the statement addressed *learn from each other*, it is only one part of The CAIPE IPE definition; it omits two other parts, *learn with* and *learn about*, which are essential to IPE. This omission is critical because the Canadian Registered Nurse Examination has three competencies relating to interprofessional practice that expects nurses to communicate their nursing expertise to other HCPs, become partners and collaborators in health care teams, and gain an understanding of the expertise and roles of unrelated HCPs (Sommerfeldt, 2013). Sommerfeldt argued that nurses can develop these competencies through IPE and through field placements and be collaborative-ready after they graduate and throughout their professional lives. The next study to be reviewed examined the practicality of collaboration between DH and BScN students.

Jablonski, Swecker, Munroe, Grap, and Ligon (2009) conducted a prospective study on the practicality of collaboration between DH and BScN students to measure the oral health status of residents in two RCFs. The authors concluded that the interactions between the nursing and hygiene student teams were enthusiastic and that they respected and shared their knowledge and expertise. The findings support an interprofessional approach to improve the oral health status of older adults. Haumschild and Haumschild (2009) agreed and stated that collaboration between nurses and dental hygienists is cost effective, as preventive treatment is less costly than curative treatment. Stein and Henry (2009) argued that OHCE can help improve the OHK of HCPs employed in health care settings and that OHCE and IPC should be part of the DH and nursing

students' curricula. As RNs make up the largest portion of HCPs, they can play a major role in ensuring daily oral care is provided for their patients (RNAO, 2008)

The RNAO (2008) and the WHO (2013) stated that to ensure student nurses have the foundational OHK necessary to ameliorate the health status of their patients, they need to collaborate with DH students in IPE, because IPE initiatives between these professions are yielding positive results (Grant et al., 2011). Interprofessional collaboration would facilitate oral health's integration into overall health (Hahn et al., 2012). A collaborative-ready workforce is dependent, however, on whether students in the health science disciplines participate in IPE programs (Sommerfeldt, 2013). Interprofessional education is the next topic to be reviewed.

### **Interprofessional education.**

Interprofessional education initiatives were developed in response to health care reforms to improve collaboration among teams of HCPs, which is an effective and efficient way to maximize the individual knowledge and skills of HCPs to deliver quality, safer, and more economical care (Sommerfeldt, 2013). For nursing students, IPE is considered to be the best strategy to enhance the curriculum of the BScN program (Bresseler & Persico, 2015). Thistlethwaite (2012) and Gilbert (2010) stated that the CAIPE definition is the most widely accepted definition of IPE. According to CAIPE (2002) "Interprofessional education occurs when two or more professions learn with, from and about each other to improve collaboration and the quality of care" (p. 1). The CAIPE uses the term IPE to include all such learning in academic and work-based settings before and after qualification, adopting an inclusive view of "professional" (CIHC, 2010, p. 24). The words *with*, *from*, and *about* are essential to the learning context of IPE. All three must be present during the learning process to qualify as IPE; students must engage and interact with one another (Thistlethwaite, 2012). This contrasts with multiprofessional education, a parallel model in which health care students from different professions learn side by side (Bennett et al., 2011).

Interprofessional education can also take place between unrelated HCPs working in a variety of health care settings (Dolce et al., 2012).

Besides the aging population, IPE is being fuelled by same forces that fuelled IPC—the multifaceted health problems, increases in chronic diseases, technological advances, financial constraints, public demand for improved services and outcomes due a fragmented health care system (Falk et al., 2013). The existing curricula for students in health professions in HLIs are as fragmented as the health care system, as it has not kept up with the increasing complexity of health care delivery (King et al., 2013; WHO, 2013). King et al. (2013) stated that the need for IPE is critical, as health care education has not developed beyond its “fragmented, outdated, and static curricula that produce(s) ill-equipped graduates” (p. 429). Students can no longer learn in a siloed environment, as it does not build the CCs necessary for effective teamwork and collaborative practice (Summerfeldt, 2013). Lasker et al. (2001) stated that collaboration of HCPs is necessary to deal with the fragmented health care system. They argued that collaboration could connect fragmented parts of the health care system and provide a holistic approach to overall wellness. Tzountzouris and Gilbert (2009) stated that the educational sector plays a pivotal role and is closely linked to the health care system, as it can respond to health human resources issues and address deficiencies in the skills and competencies of HCPs. The health care system is trying to deal with the fragmentation of the system and contain costs while finding innovative solutions to deliver the patient-centered care the public has come to expect. The educational sector has responded, and some institutions are offering IPE (Tzountzouris & Gilbert, 2009) and IPE is increasingly being introduced into the curricula of HLIs across Canada.

The Health Council of Canada recommended that by 2008, IPE programs should be in place at all universities that educate HCPs (Kearney, 2008). The majority of IPE initiatives have limited participants to RNs and medical doctors and much of the research has focused on graduate

students (Olson & Bialocerkiwski, 2014). Very few IPE studies have included DH students, as generally DH and BScN students do not have a tradition of IPC (Coleman, 2012). However, with the recent reports highlighting the importance of oral health, DH students are increasingly having opportunities to participate in IPE and IPC (Coleman, 2006). Community colleges were not included in this recommendation. This might be an oversight, as Ontario's colleges educated 70% of all HCPs currently employed in Canada's health care system (Shekter-Wolfson, 2009). The main goal of IPE is to ensure Canadians receive optimal health care (CIHC, 2010). This may be achieved if the educational sector responds to the needs of the community it serves. According to McHarg and Kay (2010), "a curriculum should be fit for purpose" (p. 493). The curriculum's syllabus should provide students with the knowledge, skills, CCs, and values needed to work with other HCPs in order to provide optimal patient-centered care (CIHC, 2007; McHarg & Kay, 2010).

Providing optimal patient-centered care was the impetus for the CIHC (2007) review of the interprofessional competency literature, which found that governments, HLIs, and organizations had developed a myriad of CCs. Findings from Ontario-based competencies revealed that no two disciplines defined their CCs alike, but there were some fundamental aspects of the CCs that overlapped, from which a set of CCs were developed. These foundational principles consist of a common platform all student professions share, and they can be adapted to the specific requirements of each discipline. Fundamental elements for all HCPs include the CC headings of "professional," "expert," and "scholar." Each element has the subcategories of "manager," "communicator," and "collaborator." For learners to gain the most from IPE and collaborative practice, they have to have a clear understanding of the terms (CIHC, 2007, p. 10).

In 2010, CIHC developed the National Interprofessional Competency Framework to provide "an integrated approach" (p. 9) to outlining the CC necessary for effective IPC. The framework includes six CCs:



- interprofessional communication
- patient/client/family/community-centered care
- role clarification
- team functioning
- collaborative leadership
- interprofessional conflict resolution

Once CCs were developed, the next phase of IPE was to develop the curricula that enabled “learners to be educated together so they can work together” in HLIs (CIHC, 2007, p. 10). The next section of the literature will review IPE initiatives and recommendations.

### **Interprofessional Education Initiatives and Recommendations**

One of the first IPE initiatives between BScN and DH students was developed at the study college and another initiative was developed at New York University (NYU) College of Nursing in collaboration with NYU College of Dentistry. This section will conclude with recommendations based on the RNAO (2008). Thus, the next topic to be reviewed is the study college’s initiative.

#### **Study college’s interprofessional education program.**

In 2005, the study college developed an IPE initiative that aligned with four of the CCs developed by CIHC as well as an ethical component, but no conflict resolution or leadership competencies. The college initiated, developed, and implemented an IPE program composed of an oral health assessment/daily oral care protocols and a blood pressure/pulse component. The initiative took place in a simulated lab over the course of four days—2 hours per day—and was led by BScN and DH students, who took turns being “learners” and “teachers,” while faculty from both disciplines acted only as facilitators (Grant et al., 2011). Two hundred first-year nursing students, eight second-year DH students, and six faculty members participated in the oral

assessment component. Dental hygiene “teachers” demonstrated how to conduct an oral assessment and how to perform oral hygiene care to the BScN student “learners.” In the blood pressure component, three faculty members and 15 nursing “teachers” demonstrated how to take blood pressure and pulse to DH student “learners” (Grant et al., 2011).

Upon completion of the simulations, students completed a questionnaire to evaluate and develop the IPE components. Findings from the questionnaire revealed that all students agreed the IPE experience was worthwhile, the student teachers were very knowledgeable, and the material covered was accurate and easy to understand. Participants, including faculty, stated that IPE highlighted the importance of cross-disciplinary communication as the term “calibration” caused some confusion because it had a different meaning for the nursing than for the hygiene students (Grant et al., 2011). The program provided them with “An opportunity to experience each other’s professional language” (Grant et al., 2011, p. 42). Good communication in school will facilitate the students’ transition into health care teams in the workplace. Overall most students stated, “I enjoyed working with students in another profession” (Grant et al., 2011, p. 42). The program gave them an appreciation and respect for each other’s expertise, roles, and language. Understanding each other’s professional language is particularly important because according to Christenson (2014), approximately 80% of medical errors are due to miscommunication among HCPs and improved communication among HCP teams can eliminate about 50% of communication errors.

The college’s next step is to provide BScN and DH students with practicums in RCFs and to include PSWs and registered practical nurses in IPE programs. Since the inception of the IPE program, the college’s health discipline programs are located in the same building (Grant et al., 2011). The next topic to be reviewed is the IPE initiative developed at NYU.

**New York University’s interprofessional education initiative.**

Another IPE initiative between BScN and DH students took place after the Interprofessional Education Collaborative Expert Panel in the United States adopted four CCs from the CIHC framework. Although the IPEC lacks a framework, it focused on minimizing the gap between education and practice (Gum et al., 2013). An example of an IPE program that is bridging the education to practice gap is the continuing IPE—Oral Health Nursing Education and Practice (OHNEP) Program. The program was initiated, developed, and implemented at NYU College of Nursing in collaboration with NYU College of Dentistry. The purpose of the OHNEP program was to strengthen the role of nurses in oral health promotion. This included the development of the *Smiles for Life* curriculum, which encompassed oral health competencies for student nurses, and the dissemination of best practice oral health guidelines for nurses employed in the health care sector (Dolce et al., 2012). The authors concluded that NYU College of Nursing successfully responded to the *OHA Report* recommendations. The next topic to be reviewed is the RNAO (2008) recommendations.

#### **Registered Nurses of Ontario’s recommendations.**

The recommendations of the *OHA Report* adopted at NYU College of Nursing parallel the RNAO (2008) recommendations in response to the *US General Report on Oral Health in America: A Canadian Perspective Report*. In Ontario, health care facilities are mandated to address any gaps in their oral care policies by comparing them to the RNAO document *Oral Health: Nursing Assessment and Interventions* (Canadian Dental Association [CDA], 2008). 2009). The document is for all nursing staff. Section two of the document relates to education and states, “Nurses who provide oral hygiene care to their clients, either directly or indirectly, must participate in, and complete, appropriate oral hygiene education and training” (2008). This is a work in progress, as research findings revealed that only 30% of nursing staff had previous OHCE

(Gil-Montoya et al., 2006). Over 65% of nurses want to have continuing OHCE and training (Chan & Ng, 2012).

According to Clements, Dault, and Priest (2007), continuing IPE should be part of a health care facility's organizational culture to help promote staff development and to help achieve optimal patient-centered outcomes. Continued IPE is an effective means to ensure that post licensure HCPs have the skill set including to work "in real teams to deliver real health care" (Hays, 2013, p. 340). Interprofessional pre-qualification and post-qualification will ensure that student nurses doing their practical placements will have positive role models to emulate when delivering oral health care. This is important in the socialization process of becoming a nurse, "fitting in" in the profession, developing an understanding of one's role, and forming a sense of identity as a nurse (McAuliffe, 2007). The latter is the next topic to be reviewed for research question two.

### **Literature Review for Research Question Two**

A review of the literature was conducted to help answer research question two: How are BScN students' attitudes and perceptions toward their professional identity influenced by an oral health IPE program? Below is the literature reviewed to address this research question.

#### **Professional identity and nurses.**

Having positive role models is critical to the socialization process of developing an identity and becoming a nurse (McAuliffe, 2007; McIntyre & McDonald, 2014, p. 186). For a nurse to fit it and be part of an interprofessional collaborative practice, it is important for a nurse to have sense of identity, which is foundational to understanding one's role as a nurse. Understanding one's role is essential for nurses to be able to communicate their role to other HCPs. A concern for the stakeholders in the nursing profession is the difficulty nurses have in articulating their role in interprofessional collaborative practice (Summerfeldt, 2013). This may be due to the fact that

students in health professions have a strong professional identity with their chosen profession at the beginning of their education, but for nursing students, sense of identity significantly diminishes once they start the second year of their program (Coster et al., 2008). Thus, encouraging a nursing culture that helps support an identity that embraces “interprofessionality” can improve IPC and health care outcomes (Hood et al., 2014), and conversely, students are less likely to continue embracing IPC if the health care environment sees little value in IPC (Derbyshire & Machin, 2011). Consequently, how nursing students are educated and socialized influences their nursing practices (McAuliffe, 2007). The next study to be reviewed examines how role models influence the nurses’ socialization process.

McAuliffe (2007) examined second-year diploma nursing students’ practice in providing oral care for hospital patients and discovered that the effect of socialization and role modeling of senior nurses can be a reinforcing factor on how student nurses performed oral care. Participants in the study stated that modeling the more experienced nurses behavior helped them fit into the health care setting and “fitting in” was vital to their socialization of becoming a nurse. This influence was strong enough for 78% of the students to agree to use oral health care practices already in place. Additionally, 59% of the student nurses agreed or strongly agreed that they followed RNs oral care behavior because they placed them in the position of “role model”. Given that role modeling not only helps build the nursing students’ identities, but it also reinforces behavior, it is likely that that student nurses will practice in the same way as their role model practices—regardless of whether it is correct or not. Participants behaved in this way even though only 27% of them stated that RNs were using evidence-based oral care protocols. In addition, the experienced nurses discouraged the students from using evidence-based oral care practices (McAuliffe, 2007). This study reinforces the need to ensure nurses have IPE training in oral health care so that they can be exposed to positive role models in the program and then in turn be role

models to nursing students in the process of developing a professional identity. Lack of positive role models may cause student nurses to become disillusioned and this may be a factor in their diminished sense of identity as reported by Coster et al. (2008), which is the next study to be reviewed.

Coster et al. (2008) conducted a rare longitudinal study that surveyed eight health care groups, including nurses and dental professionals in three universities. The survey contained similar statements to those in the Infante (2012) study. The findings revealed that most students had strong identities in year one, but the identify scores declined by year-four for all professions, with the largest changes in professional identity occurring between year-one and the start of year-two. For nursing students, the decline in identity was statistically significant at both year-two and four. The authors hypothesize that nursing students may be disillusioned by their clinical experiences in year-two of their studies. Another explanation reported by Coster et al. (2008) that is cited in other studies is that perhaps the strength of professional identity weakens as a natural consequence of students' "unrealistically high expectations" of IPE in year one. The next study to be reviewed highlights the importance of IPE in developing a professional identity.

Wilhelmsson, Svensson, Timpka, and Jaresjo (2013) conducted a study involving three universities' undergraduate nursing programs. One university was recognized as "the IPE University," as all of its health sciences programs had IPE embedded into the curricula. The other two universities were recognized as "non-IPE Universities" and offered a traditional curriculum. The researcher surveyed 303 nursing students one year after graduation. The study's survey examined eight goals. Three of the goals were communication skills, cooperation with other professions, and whether their education had prepared them to work professionally. The participants were asked to report if their nursing education had prepared them to meet the goals and whether they perceived that they were significant educational goals to achieve. The findings

revealed that all participants perceived that the most salient goal of their nursing education was “to work as a nurse,” followed by “communication with patients, managing sick patients and cooperating with other professions.” Students who attended IPE programs were better prepared to participate in interprofessional collaborative practices than nurses who did not participate in IPE. Nurses trained in the IPE universities stated that IPE enabled them to get a sense of identity, communicate effectively with patients, and collaborate with unrelated HCP students (Wilhelmsson et al., 2013). The next study to be reviewed examines a voluntary university IPE program.

Infante (2012) developed an IPE program at a local university for four disciplines—medical doctors, nurses, DH, and dental students. Four teams of volunteers were formed and each team had four students from each discipline. The nursing and DH students had prior IPE experience, but not the medical and dental students. The purpose of the study was to have the participants work with transitional homeless families to develop health care plans to address the oral-systemic link. A 29 item Likert-type survey was administered to 48 participants prior to and after the IPE program. The results revealed that the difference between mean professional identity scores of the pre-test and post-test questions were not statistically significant except for the one negative identity statement. On the pre-test, the students disagreed and on the post-test they strongly disagreed with the following statement: working with students from other professions got in the way of my own learning. For the positive professional identity statements, the results revealed that there was minimal change in the respondents’ scores before and after the IPE program. For example, in both the pre- and post-test, the respondents strongly agreed that it is important for students in the health professions to understand each other’s skills and roles in patient care. The students responded that they were confident when it came to assessing findings from patient exams and jointly creating a treatment plan with their teammates. They were also confident when it came to understanding what students from other schools/disciplines were saying when they

communicated about patients (Infante, 2012). In the next study to be reviewed, an IPE program can help nursing students in third and fourth year strengthen their professional identity.

Christenson (2014) cross-sectional study evaluated an oral health cancer IPE program for 64 first and second year DH and third and fourth year nursing students. The IPE evaluation tool was similar to those used in the Infante (2012) and Coster (2008) studies. The researcher also administered an oral cancer knowledge test made up of 10 questions to the participants. The findings revealed that students who participated in an oral cancer health care IPE program increased their OHK significantly on all items. Negative professional identity section which evaluated negative statements toward participants' attitudes toward IPE reported that the students' overall pretest score was 5.5 out of a possible 15, which is very low, as the participants' mean score ranged from disagree to strongly disagree. As the negative pre-score was very low at baseline, it decreased only by 1 point after the IPE program, but it was still a significant change. Positive professional identity scores, which relates to the evaluation of participants' collaborative learning such as developing collaborative and problem solving skills improved by 10 points after the IPE program. This change was statistically significant, thus supporting that IPE strengthened students' understanding of professional identity, as the mean score ranged from agree and strongly agree on the items relating to positive professional identity. Positive professional identity is inextricably linked to students' development and securement of their professional role and responsibility (Christenson, 2014; Coster et al., 2008), which is the next topic to be reviewed in the literature for addressing research question three.

### **Literature Review for Research Question Three**

A review of the literature was conducted to help answer research question three: How are BScN students' attitudes and perceptions toward their role and responsibility in oral health care influenced by an oral health IPE program? The literature review for oral hygiene and oral health



assessments was discussed in research question one. Below is the literature reviewed to address this research question.

**Professional role and responsibility.**

Positive professional identity is the result of socialization, which is “an essential process of learning skills, attitudes, and behaviors necessary to fulfill professional roles” (McIntyre & McDonald, 2014, p. 186). Several studies found that respect and trust of HCPs in IPC teams is more likely to be due to lack of understanding of each other’s roles rather than of competing interests (Engel & Prentice, 2013). The literature supports that IPE initiatives improve role awareness within one’s profession and those of unrelated professions (Derbyshire & Machin, 2011; Olson & Bialocerkoski, 2014). Questions relating to role and responsibility relate to a participant’s understanding of his/her professional role and the role of other HCPs in collaborative educational programs that enable students to synergize their knowledge and skills for the purpose of delivering high quality patient-centered care (Christenson, 2014). In Christenson’s study, the participants commented that they found the IPE program was valuable and it significantly clarified the DH and nursing students’ professional role in oral cancer care.

Role clarification is elucidated in the Bruan-Wimmer and Ruiz-Skol (2012) study conducted in a RCF in the GTA in which the authors—a RN and a dental hygienist collaborated in an effort to determine the impact of an OHCE program on the oral care practices of unregulated HCPs under the direction of RNs. Out of nine participants, four were RNs. The findings revealed that participants lacked OHK on the relationship between oral and general health, as 100% of the RNs incorrectly answered the question relating to the awareness of medical treatments effect on oral health status. The authors argued that this knowledge deficit is compounded by nurses’ lack of clarity regarding their role and responsibility for provision of oral care. It has serious implications for who is accountable for oral care delivery in RCFs, as in the last decade the use of

unregulated HCPs has increased and at the same time the nurses' role has expanded to include teaching and supervising unregulated PSWs. Personal support workers provide the majority of oral hygiene care under the supervision of a nurse, but ultimately it is the RNs who are accountable for the delivery of the oral care in RCFs. The findings revealed that all nursing staff were unclear regarding their role in the maintenance of patients' oral care and only 50% of the RNs were aware that they were accountable for the oral care delivery of their patients and for the care provided by unregulated HCPs they supervise. The study findings revealed that a nurse and dental hygienist collaboration in an OHCE intervention program for nursing staff improved the participants' knowledge, attitudes, and oral care practices and clarified the RNs role and responsibility in oral care provision (Bruan-Wimmer & Ruiz-Skol, 2012).

The Christenson (2014) study discovered that participants' knowledge of their roles and responsibility in oral care delivery scores had the largest significant increase after the IPE program. Infante (2012) found that the two professions agreed or strongly agreed that understanding the roles of unrelated professions was important. Role and responsibility for oral care provision was also highlighted in the Grant et al. study (2011), which is described in the IPE section. Grant et al. (2011) reported that nursing and DH students increased their awareness of their own role as well as each other's role and scope of practice after participating in an oral health IPE program. For example, student nurses were aware of their role and in fact were able to articulate their role in oral care to the DH students. Additionally, nursing students who were unaware of the scope of practice of dental hygienists increased their awareness after participating in an IPE program. For example, student nurses learned that DH students' scope of practice includes taking blood pressure and pulse measurements.

Increased role awareness due to IPE was also found in all of the participants in the Derbyshire and Machin (2011) qualitative study that surveyed eight nurses' views on their pre-

qualification IPE experience six months after graduating. One nurses stated, “IPE definitely helped me to understand the different roles” (p. 241). Another nurses stated, “Through having an understanding of professional roles I realized in practice that there are others out there more equipped than me to do certain jobs” (p. 241).

A salient acknowledgement by participants in the study college study was how much they learned from each other and that a large set of skills were common to both professions (Grant et al., 2011). Similar acknowledgements were made by participants in the Macdonal et al. (2010) qualitative study, which focused on the knowledge of the professional role of others, as the researchers asserted that understanding the role of others will help educators and students gain an enriched IPE and learning experience. Due to the overlapping CCs of students in the study, role blurring can occur, as reported by the educator of the IPE: “They all had their little areas of expertise but I think they found they actually had more commonalities” (McDonald et al., 2010, p. 240). A student stated, “We learn that it is such an asset to have support from other professions and team members who may have many of the same skills as ourselves, and that the client is having his/her needs met” (p. 240). This perspective aligns with the WHO (2010) statement that HCPs who have an understanding and appreciation for the role of different professions, including their own, are better prepared to participate in IPE and collaborative practice prior to and post graduation. However, all of the elements that can promote IPE and IPC, such as possessing a professional identity, understanding of roles and responsibilities that are exclusive or shared among students, and improved communication, are not enough for IPC to succeed—it is important to address the attitudes of students in the health science programs (McIntyre & McDonald, 2014, p. 265) which is the next topic of the topic to be reviewed for research question four.

#### **Literature Review for Research Question Four**

A review of the literature was conducted to help answer research question four: What is the impact of an oral health IPE program on BScN students' attitudes and perceptions toward IPE? Below is the literature reviewed to address this research question.

### **Attitudes and perceptions toward interprofessional education.**

Students' attitudes toward IPE are formed by existing cultural norms of the program, the quality of the program, and the clinical experience (Hood et al., 2014; McIntyre & McDonald, 2014, p. 186). All students commence their studies with preconceived notions and attitudes based on their individual values and belief system. These attitudes are changeable according to how an individual evaluates something or someone as a favorable or unfavorable experience (Hood et al., 2014). Interprofessional education promotes collaborative practice by minimizing the less than ideal attitudes and perceptions students from different health disciplines harbor for one another (MacEntee, 2011; Robben et al., 2012). This is not surprising given that the health care workforce is more resistant to change and embracing creativity and innovation, and given the elevated autonomy of some of the professions, they can be difficult to manage (Leatt & Porter, 2003). Medical doctors are the gatekeepers of the health care system, and their evaluated status can overpower other HCPs. This imbalance of power is particularly keen between nurses and doctors, and to some extent, between doctors and dentists (MacEntee, 2011) and dentists and dental hygienists (Cobban, 2012). Cobban (2012) used the term "professional territorialism" to describe these relationships, which according to MacEntee (2011), are fuelled by how HLIs educate HCPs—learning in silos prevents the scholastic collegiality necessary for building effective health care teams. Interprofessional learning can help alleviate negative attitudes and stereotypes HCPs may hold toward unrelated HCPs (MacEntee, 2011). Consequently, it is important to examine the BScN students' views on IPL, their readiness to participate in IPE, and attitudes and perceptions toward participating in IPE. These topics will be addressed in the next study to be reviewed.

Hood et al. (2014) surveyed 741 students from six undergraduate programs—including second and third year nursing students prior to their IPE modules to examine students' attitudes toward IPL. The teamwork and collaboration Likert-scale statements evaluated participants' attitudes toward IPC as well as communication, trust, and respect. The findings revealed that prior IPE experience was on average generally low, as only 32.4% of students had prior IPE. Students with prior IPE had stronger attitudes toward IPE programs. In nursing, by senior year, 52% had experienced IPE. Student nurses had positive attitudes and support for IPE (mean attitude score was 72%) and also held strong attitudes toward teamwork and collaboration. The nurses' seniority had no impact on their attitudes. The highest rated item reported for all disciplines was that IPE helps students develop the skills required to be part of a health care team. The other top four items selected by all participants were that IPE helps to: 1. develop trust and respect with other students 2. deliver quality care for patients 3. become more effective team members 4. improve relationships in the workplace.

The results from Christenson (2014) study also revealed that the nursing and DH students' attitudes toward teamwork and collaboration were already high prior to the IPE program, and there was only a small but significant increase after the IPE program. Coster et al. (2008) also found that the students' readiness for IPL was high in year one but declined significantly over time for all disciplines except for nursing students. Nursing students were the only professional group whose attitudes toward IPL did not change significantly over the course of four years. Honan et al. (2015) stated, "It is conceivable that students possessing these attitudes might be drawn to the nursing profession – nurses have long been viewed as collaborators and coordinators in the health care field (p. 47)". The latter was also the Year One Program Director (YOPD), S. Wiesenthal's belief that that is how nurses are generally perceived (personal communication, November 17, 2015). Additional findings revealed that attitudes are a measure a student's readiness for IPE and

they are linked to when IPE is introduced, thus providing support for introducing IPE at the beginning of students' health care education to maximized on the students' positive attitudes (Coster et al., 2008).

Infante (2012) reported that students had very positive attitudes toward IPE and collaboration prior to participation in IPE program, which were enhanced after they participated in the program, as they "overwhelmingly" agreed or strongly agreed that: students in different health professions should have educational training a clinical experience together to prepare them for patient care after we graduate; collaborating on a health care team will prepare them to contribute to collective decision-making; IPE helped them understand what students form other disciplines are saying when they are communicating about their patients. The literature supports implementing IPE and IPC to improve students' attitudes and perceptions toward oral care and an oral health IPE program is beneficial for delivery of quality health care. The literature review will address the challenges and benefits of IPE and conclude with a chapter summary. Thus, the next section will review the benefits and challenges of IPE.

### **Benefits and Challenges of Interprofessional Education**

Indeed, the benefits of implementing an IPE program are well supported in the literature. Although there are gaps in IPE research, over five decades of research findings reported that IPE is beneficial in improving the safety and quality of health care delivery (Sommerfeldt, 2013). Challenges, however, in developing and synchronizing an IPE initiative exist (Hays, 2013). According to Gilbert (2010), there is a general agreement that scheduling IPE can be problematic. Scheduling students and faculty from two different campuses and two disciplines at the same time and ensuring lab availability is one of the main issues. Determining the appropriate time to initiate IPE is another issue. Bennett et al. (2011) conducted a scoping review and the findings revealed that for maximum learning benefits, it is best to integrate IPE initiatives early in a student's

program. Research findings recommend early implementation of IPE programs to help fully develop future HCPs, as students in their first year of their program are the most receptive to IPE (Williams & Webb, 2015). Implementing IPE programs early in the curriculum “sends a strong message to all learners that the institution is serious about IPE and sets the scene for future IPE activities” (Hays, 2013, p. 340). Early implementation may also reduce negative attitudes and stereotypes among HCP students (Hood et al., 2014).

Another challenge relates to the difficulty of developing the curricula, as minimal data exist to support which topics are conducive for IPE (Bennett et al., 2011). To ease the challenge of curricula development, Grant et al. (2011) recommended theoretical knowledge should precede clinical components in IPE initiatives. Hays (2013) added that to ensure students are serious about taking IPE, it is important to provide them with relevant IPE content that is congruent with learning outcomes and assessment. Lastly, as many of the HCPs discipline-specific CCs overlap (Hahn et al., 2012), Tse, Iwaishi, King, and Harrigan (2006) stated educators can concentrate on the CCs required for all health professions to ensure graduating HCPs are collaborative-ready. Overlapping CC in the curriculum fosters IPE and can provide students from various disciplines an opportunity to be collaborate-ready members of a medical professional team, which in summary is the goal of IPE (Bressler & Persico, 2015). The summary below concludes the literature review.

### **Summary**

A collaborative-ready medical profession is the main IPE guiding principle in ensuring Canadians receive optimal patient-centered health care (CIHC, 2010; Bressler & Persico, 2015). This may be achieved if the educational sector implements a curriculum that provides students with the knowledge, skills, CCs, and values students will need to work with other HCPs (McHarg & Kay, 2010). The current level of OHCE nurses receive is inadequate and given the demographic and profile trends of Canada’s population there is serious concern about whether the

increasing demand for oral health care provision in RCFs can be met (Compton et al., 2013).

Neglecting oral care can place vulnerable older adults in RCFs at increased risk of morbidity and mortality from oral and systemic diseases and diminish their quality of life. Nurses have identified their need for OHCE and want to improve their oral care practices (RNAO, 2008). Embedding an oral health IPE program into the BScN curricula will ensure the curriculum is fit for purpose and will then best address the unmet oral health care needs of this population (McHarg & Kay, 2010).

An oral health IPE program has the potential to create collaborative ready BScN students. Nursing students who participated in an oral health IPE program have improved KAPs toward oral health care and will have an appreciation of working collaboratively with DHs (Grant et al., 2011). An IPE trained nurse will have a sense of identity and will in turn help students develop their identity (McIntyre & McDonald, 2014). This will help students gain an understanding of their professional role as a nurse and of their responsibility in ensuring oral care is delivered according to best practice guidelines (RNAO, 2008). Additionally, the knowledge gleaned from the IPE program will give nurses the foundational knowledge and practical experience to perform regular oral health assessments and daily oral hygiene care to maintain oral health, as they will understand that oral health is an important aspect of systemic health and quality of life for older adults in RCFs (Pudwell, 2013).

An IPE program can be embedded into existing curricula, as demonstrated by the study and NYU colleges. Developing common CCs for BScN and DH students is likely to be an effective approach in improving oral and systemic health outcomes (Tse et al., 2006). Financial support, academic leadership, and an organizational culture that promotes IPE activities are fundamental features of sustaining IPE programs (Mackenzie et al., 2014). Canada is championing IPE, and Ontario has invested \$30 million in IPE activities (Gilbert, 2010). Currently, only 15% of medical schools have IPE programs (Infante et al., 2015) but Jaecks (2009) predicted that IPE will become



an educational standard in the curricula of all health care disciplines. Colleges educate 70% of HCPs currently working in the health care sector. Colleges are well poised to offer IPE as they are specialists in applied learning, have a myriad of diploma courses and certificate programs to bridge the existing deficiencies in the educational and health care sectors, and they have only one academic leader to report to, which can facilitate implementation of IPE programs (Shekter-Wolfson, 2007).

Given that colleges can facilitate implementation of IPE and that the DH and the BScN Programs are both taught at the community college level, this can facilitate the integration of an oral health IPE programs into existing curricula (Shekter-Wolfson, 2007). According to Henson (2005), both professions are parallel professions that share CCs. Both professions have to ensure their education meets the needs of the population, as their primary goal is to serve the needs of their communities. For example, many dental hygienists are advocates for oral health care for underserved and vulnerable populations, and they are trying to collaborate with RNs and other HCPs in IPE programs in the educational and health care sectors to decrease oral health disparities (Canadian Dental Hygienists Association, 2012). Thus, BScN students who participate in IPE oral health programs with DH students may help improve the oral care older adults currently receive in health care settings. Furthermore, through an oral health IPE program, RNs learned that their role includes assessing the oral cavity (Gil-Montoya et al., 2006). After an IPE program, RNs had a clearer sense of what their role and accountability was in oral care provision: directly or indirectly supervising PSWs provision of oral care delivery (Bruan-Wimmer & Ruiz-Skol, 2012).

Improved communication and collaboration—foundational aspects of IPE—between RNs and dental hygienists and other HCPs may result after an IPE program, and may lead to coordinated client-centered oral care delivery and increases patient safety (Zwarenstein et al., 2009). Improved communication among HCP teams can eliminate about 50% of communication-

related errors (Christenson, 2014). Thus, improved communication and safe delivery of oral care can be beneficial for RNs, as an RN may be the first HCP to assess a resident's oral cavity in RCFs (Gil-Montoya et al., 2006), and the skills and knowledge gleaned from IPE may help RNs identify common oral disorders found in older adults living in RCFs. This positions RNs in the important role of ensuring oral care is performed and enables them to collaborate with dental professionals when dealing with clients who require examinations (RNAO, 2008). Lastly, collaboration between dental hygienists and RNs can decrease the residents' risk of developing oral and systemic diseases associated with poor oral hygiene care and improve residents' quality of life.

### **Chapter Three: Methods of Research**

In chapter two, the literature review revealed the need for improving the oral health status of older adults living in RCFs. This could be accomplished by increasing the level of OHCE nurses receive in their formal training as well as ensuring they are ready to work in a collaborative environment upon graduation. Sommerfeldt (2013) stated that a collaborative ready workforce is dependent on whether students in the health science disciplines participate in IPE programs, and the WHO endorsed IPE between RNs and dental hygienists as a means of achieving improved oral health outcomes (Monajem, 2005). The study college responded to these recommendations and implemented IPE into the Health Sciences curricula. Answering the questions and statements posited in this study will be beneficial for the study college, as it has not had a formal evaluation since the program was implemented 10 years ago. The findings from this study may provide the study college with the BScN students' KAPs of the oral health IPE program. In this chapter, the research methodology used to help answer the research questions will be discussed.

#### **Research Methodology**

Each methodological section of the study will be discussed under its own heading. The following is a list of the headings included in this study's research methodology: site, design, sample, measurement tool/data source, research procedure, data analysis, and ethical review. The measurement tool/data source section will list the survey items used to answer the research questions. Accordingly, the first section to be discussed is the site of the study.

#### **Site**

The site was a large urban community college in the GTA. The college's Community Services and Health Sciences Programs are housed at one location in a state-of-the-art building designed to promote the principles of IPE for health sciences students. The campus offers several

dental programs, including DH and the BScN degree in partnership with a local university. The next section to be discussed is the design of the study.

### **Study Design**

The researcher used a quantitative cross-sectional survey using an oral health assessment tool designed to evaluate the impact an oral health IPE program at the study college had on nursing students' KAPs after they participated in the program. The post-test survey design was used as the YOPD stated that having a pre-test would be ineffective, as the majority of year one students are not expected to have prior OHK and IPE experience before week 11—the week of the oral health IPE program (S. Wiesenthal,) personal communication, September 22, 2015).

As the researcher's opinions and biases can influence the process of questionnaire construction, only validated tools used in previous studies were adapted and used in the study. The researcher endeavored to use questions that were relevant to the sample and the study's purpose. To promote clarity for the participants, the survey questions were specific, simple to read, and orderly. This study design was selected as it can be advantageous when evaluating the current attitudes and perceptions of a program. The findings from the study might provide useful information about the program to the school's administrators (Creswell, 2012, p. 381). This design can minimize the amount of time to administer the survey and collect the data (Creswell, p. 380). The researcher used this method to maximize and facilitate the participants' attendance, as IPE research is challenging to perform due to the nature and context of how colleges and their programs are organized. The nature and context of the students' schedules make it problematic to conduct rigorous study designs and probability sampling in this population (Anderson et al., 2011). The study's sample will be the next section to be discussed.

### **Sample**

This study targeted first year students enrolled in the BScN program at the study college.

The nature of IPE does not lend itself well to randomization of participants (Bennett et al., 2011) or control groups, as the IPE program is mandatory for first year BScN students (Anderson et al., 2011). Therefore, the participants were a convenience sample of first year students enrolled in the BScN program at the study college who participated in an oral health IPE program. This sampling method was chosen to foster a sense of voluntariness in the students and to remove any sense of obligation students might feel toward the researcher or the YOPD who will be facilitating the study. Voluntary participation limited the amount of disruption to participants' schedules (S. Weisenthal, personal communication, September 22, 2015). Selecting first year students was important because research findings recommended that the best time to implement IPE is early in nursing students' curricula (Coster et al., 2008). Wang et al. (2015) recommended that more IPE studies should include undergraduate nursing students because according to Olson and Bialocerkoski (2014), the results of studies that do not include them are unlikely to be applicable to undergraduate students.

The BScN program at the study college accepted 180 students for the fall 2015 semester (A. Jones, personal communication, July 10, 2015). The YOPD arranged a meeting with the researcher on November 17, 2015 to meet with 50 nursing students to introduce the study and invite them to participate in the study. The researcher predicted a sample size of approximately 25 to 30 participants, which for the scope of this study was sufficient (M. Stacey, personal communication, August 8, 2015). The inclusion criteria for participation in the study was that students had to be enrolled in the first year of the BScN program at the study college and had to have participated in an oral health IPE program with DH students. The participants were asked to complete a survey that served as the study's measurement tool and data source, which is discussed in the next topic.

### **Measurement Tool/Data Source**

All participants completed an education and oral health data sheet form made up of six questions (see Appendix C). Four questions related to their educational profile, and these included a question relating to previous IPE experience, as previous IPE experience has been found to have an effect on attitudes (Hood et al., 2014). The last two questions related to students' personal oral care patterns, as they have been found to influence students' attitudes toward oral care provision (RNAO, 2008). The questions were close-ended questions and they were easy to answer, as the respondents were able to check the appropriate box from a list.

The oral health assessment tool (see Appendix D: Parts A, B, and C) was made up of a three-part quantitative paper-based survey. The oral health assessment tool was created based on information gleaned from the literature on topics related to oral hygiene care covered in the IPE program at the study college. The researcher used sections of part A and B in a previous study (AG, 2013). Part A of the instrument was a validated and reliable OHK assessment tool adapted to assess the OHK of the participants. It was pre-tested and revised for content validity (Le, 2011). Permission to use the OHK assessment tool was given by its developer (P. Le, personal communication August 3, 2013). Its purpose was to assess the nurses' level of OHK following the IPE program. For added reliability and validity of the survey, the researcher consulted the YOPD, who examined the survey and requested two OHK questions be deleted, as the topics were not covered in the IPE program. The YOPD (personal communication, September 22, 2015) stated that the rest of the survey items were salient to the IPE program, particularly question 10 of the OHK part, as the video *Oral Care for Residents with Dementia* was included in the students' theoretical component prior to the IPE program. Parts B and C of the survey were made up of Likert-type statements, as they can minimize biased results and provide quick access to results that are easy to analyze and present (Pudwell, 2013).

Part B of the survey consists of 10 Likert-type statements to assess attitudes and

perceptions toward oral care delivery. Wårdh et al. (1997) developed the statements and tested them for validity and reliability. They were used with permission and were adapted for this study (I. Wårdh, personal communication, July 2, 2013). Part C of the survey relates to the attitude and perceptions toward IPE and collaborative oral health care delivery. It consists of 10 Likert-type statements that were adapted from the Infante study (2012) and used with permission (A. Infante, personal communication, August 5, 2014). The statements were grouped into three domains. The first domain evaluated professional identity—negative and positive. It includes statement two, which is a negative professional identity statement, and statements three, six, and seven, which are positive professional identity statements. The second domain evaluated roles and responsibility and includes statements four and five. The third domain evaluated attitudes toward IPE and includes statement one, eight, nine, and 10. The domains for the statements were adapted from the Christenson (2014). The following section details how the survey items will be used to address each of the research questions.

A set of questions was developed to measure the participants’ basic OHK by means of a knowledge test and a set of Likert-scaled statements was developed to assess their attitudes and perceptions toward oral care delivery. Both sets of the survey items relating to oral health KAPs are linked to the study’s research question one: What is the impact of an oral health IPE program on BScN students’ KAPs toward oral health provision—especially oral hygiene care and oral health assessments?

**Oral health care knowledge test questions.**

- 1. A mouth swab is a good alternative to a toothbrush for cleaning clients’ teeth...**True     False**
- 2. It is natural for healthy gums to bleed when brushed with a toothbrush.....**True     False**
- 3. In general, research confirms that poor oral health conditions can have an effect on an individual’s general health and quality of life.....**True     False**

4. Soaking dentures in water with a denture tablet is an ideal way to ensure dentures are clean.....**True False**
5. Plaque and tartar do not form on dentures because they are made of acrylic..... **True False**
6. It is natural to lose your teeth as you get older.....**True False**
7. The **BEST** way to remove plaque and debris from a resident's mouth and tooth surfaces is
- rinse the mouth with an over-the-counter mouthwash
  - brush the teeth using a toothbrush and toothpaste
  - brush the teeth using a foam-tipped swab (toothette)
  - rinse the mouth with an over-the-counter mouthwash for at least 10 minutes
8. Persons with no teeth...
- require daily mouth cleaning and denture cleaning
  - require mouth cleaning only once a week
  - do not require mouth cleaning, since they have no teeth
  - only require mouth cleaning before family visiting time
9. The **BEST** way to treat "dry mouth" is to
- provide frequent sips of juice to moisten the mouth
  - provide frequent sips of water to moisten the mouth
  - give the patient a sugar candy to put in his/her mouth
  - use lemon or glycerin swabs
10. It has been found that clients/patients with dementia have
- decreased saliva flow
  - greater accumulation of biofilm on teeth and dentures
  - increased care responsive behavior during oral care provision
  - higher levels of dental caries, missing teeth, and periodontal disease
  - (a) and (c)
  - (b) and (c)
  - all of the above

**Attitudes and perceptions toward oral health statements.**

- Seeing as most old people lose their teeth, brushing is not as important for them as for younger people
- I will perform ongoing regular oral health assessments on my patients



3. I am accountable for the oral care delivered by unregulated health care providers (personal support workers)
4. If I am really busy, my patients do not mind not getting their mouths cleaned
5. It is my responsibility to ensure patients' daily oral hygiene care and assessments are performed and documented
6. I feel more comfortable brushing a client's mouth than I do with most other kinds of personal care
7. I have the knowledge and skills required to perform an oral health assessment on my patients
8. If a patient does not cooperate during oral care, I do not have perform oral care
9. Providing oral care to my patients is as important as all other care I give my clients/patients
10. If clients/patients' gums bleed, I should probably stop brushing their teeth altogether

A set of statements was developed to measure the participants' attitudes and perceptions toward IPE and their sense of professional identity. The statements in this domain are listed below. They are in support of research question two: How are BScN students' attitudes and perceptions toward their professional identity influenced by an oral health IPE program?

**Professional identity statements.**

1. Working with other health profession students got in the way of my own learning
3. It is important for students in health professions to understand each other's skills, roles, and responsibilities in patient care
6. IPE will help me to become part of the oral health care team in my workplace
7. IPE helped me to communicate the oral health concerns of my patients to other health care providers

A set of statements was developed to measure the participants' attitudes and perceptions toward their role and responsibility in collaborative oral health care delivery. The statements in

this domain are listed below. They are in support of the study's research question three: How are BScN students' attitudes and perceptions toward their role and responsibility in oral health care influenced by an oral health IPE program?

**Role and responsibility statements.**

4. IPE better prepared me to perform an oral health assessment on my clients/patients when I graduate

5. IPE better prepared me to perform oral hygiene care on my clients/patients when I graduate

A set of statements was developed to measure the participants' attitudes and perceptions toward IPE and collaborative oral care delivery. The questions in this domain are listed below.

They are in support of the study's research question four: What is the impact of an oral health IPE program on BScN students' attitudes and perceptions toward IPE?

**Attitudes and perceptions toward interprofessional education statements.**

1. Students from different health professions should have educational and clinical experience to prepare them for patient care after graduation

8. IPE helped me to develop rapport and trust with dental hygiene students

9. IPE helped me to learn how to contribute to collective decision-making

10. Participating in an IPE program increased my overall oral health care knowledge

**Research Procedure**

Prior to the IPE program, the researcher consulted with the study college's BScN program's administrators to inform them of the upcoming study. Before students completed the IPE course, the researcher visited the YOPD to discuss the study. The YOPD has overseen the Nursing – Dental IPE since its inception, and she was happy to facilitate the study (S. Wiesenthal, personal communication, September 22, 2015). The YOPD helped the researcher determine the best time to meet the students to introduce the study, schedule and administer the survey, and

deliver the findings to the participants. The proposed dates were November 17, 2015, November 24, 2015, and March 1, 2016. The researcher was aware of the importance of finding spare time for both students and faculty and adhered to the proposed dates for meeting with the students. To make it easy for students to meet with the researcher, all meetings took place in the students' regularly scheduled classroom setting.

Accordingly, on November 17, the researcher met with the YOPD, who introduced the researcher to the students. The students were invited to participate in the study. The researcher discussed the details of the study and the students had an opportunity to ask questions and have them answered by the researcher. The students were informed that the information provided to them was outlined in a printed introduction letter. The introduction letter detailed what students could expect if they participated in the study. Letters were left for the students' consideration, and the YOPD posted the letter on Blackboard (see Appendix A). The letter contained the location, date, and time when the survey was to be administered. The letter explained the ethical considerations of the anonymity and confidentiality of the participants. This included their ability to drop out of the study at any time and that whether or not they chose to participate in the study, it would have no effect on their academic relationship with the institutions involved. In addition, the letter provided the students with contact information. This enabled them to contact the advisor and the researcher if they had any questions or concerns regarding the study prior to the survey date.

On November 24, 2015, shortly after the students completed the oral health IPE program, the YOPD facilitated a meeting between the students and the researcher. The researcher then oversaw the administration of the survey. To maximize students' participation in the study, participants had a choice of two sittings to complete the survey—the first sitting was at 11:00 a.m. and the second sitting was at 2:00 p.m. Each participant was given a survey, a pen, and an envelope. The researcher asked the participants to place their completed survey into the envelope

and seal it. The researcher then collected the surveys, placed them in a briefcase and locked it, and stored them in a safe location. Although 15 minutes was allocated to complete the survey, the participants completed the survey in approximately 10 minutes. On the day the participants completed the survey, they received a \$10 Tim Card as a token of appreciation for their participation. On March 1, 2016, after the data analysis was complete, the researcher met with the YOPD and the participants for 20 minutes to present and discuss the highlights of the study's results and findings (see Appendix E). The next section will discuss the how the data was analyzed.

### **Data Analysis**

After the surveys were completed, the researcher began data analysis in consultation with her faculty advisor, Dr. Stacey. The researcher allowed two to three weeks to complete statistical analysis. After statistical analysis was done, the results were represented graphically. Descriptive statistics, including frequencies, percentages, and averages, were used to analyze the data. The purpose of descriptive statistics is to display data in a concise and clear format (Treasury Board of Canada, 1991). The data from the OHK test of Part A of the survey instrument was displayed in tabular format and included the test questions and the participants' overall score and percentage for each question. Each correct answer was given one point, for a total possible score of 10 points. Once the participants' individual scores for each question were summed, the researcher performed percentage analysis. Percentage scores fell into one of three categories that were adapted from Sharbatti et al. (2013). Scores ranging from 10% to 59% were categorized as low; scores ranging from 60% to 79% were categorized as average; and scores ranging from 80% to 100% were categorized as high. Summary statistics were also computed—median, mode, and mean; the latter reported the overall knowledge of the participants.

Part B and C of the survey instrument were made up of 10 close-ended Likert-type statements. As the researcher could not guarantee that the responses to the statements had equal distance among them, the Likert scale was reported as an ordinal scale (Creswell, 2012, p. 165). The participants had four responses in each of the Likert-type statement as options (Creswell, 2012, p. 165). Each Likert-type statement was scored using descriptive statistics according to these agreement categories: strongly agree, agree, disagree, and strongly disagree. The frequency of each response was scored and the scores for each question were summed quantitatively and each sum was given a corresponding percentage value. All statistical analysis was done with Microsoft Excel. The next topic to be discussed is the researcher's ethical responsibility toward the study's participants. The ethical review process is the last section of the methodology section.

### **Ethical Review**

The researcher has successfully completed the Collaborative Institutional Training Initiative (CITI) program and the Tri Council Policy Statement: Ethical Conduct for Research Involving Humans Course on Research Ethics (TCPS 2: Core). As the study involves data collection from human subjects, the researcher followed the review process used at Central Michigan University (CMU). The researcher obtained a letter of permission from the study college to ensure the study was feasible prior to seeking ethical approval from the study college. Upon securing these approvals, the researcher duly completed the required application forms and documentation and submitted the forms to the Capstone Advisor. The advisor reviewed the documents and when the documents were properly completed, the advisor sent the application to CMU Institutional Review Board for approval. Upon ethical approval from CMU, the documents were sent to the study college for ethical approval. The study college approved the study and stated that the researcher did not need a signed consent form because completing the survey

constituted consent. The letter of approval was forwarded to the Capstone Advisor and the CMU Institutional Review Board granted the researcher permission to begin data collection.

All participants were informed of the study's purpose in writing via a letter (see Appendix A) that welcomed them and introduced them to the study. The letter described how the survey would be administered and it included the contact information of the capstone advisor and researcher. The researcher provided clear information on voluntary informed consent to the participants and informed them that there was minimal risk in participating in the study—mainly the potential loss of study time from regularly scheduled academic activities. The participants were assured of confidentiality and anonymity, as no identifiable data were collected on the survey. Only the researcher and faculty adviser opened and reviewed the completed surveys. Upon completion of data analysis and with the faculty advisor's permission, all surveys were destroyed.

### **Chapter Four: Data Analysis and Results**

In chapter three, the methodology used in the study was outlined. The methods used were specifically chosen to address the purpose of the study, which was to evaluate the KAPs of BScN students toward an oral health IPE program. In this chapter, the results of the research will be reported. The goal of the study was to collect and analyze data via a survey after the students participated in an oral health IPE program on the following topics:

- Students' KAPs toward oral health care delivery for older adults
- Students' attitudes and perceptions toward oral care delivery in collaboration with DH students
- Professional identity and IPE
- Role and responsibility and IPE

The researcher recruited the sample for the study through the support of the YOPD, who facilitated a meeting between the researcher and 50 students. At the meeting, the students were duly informed about the study and were invited to participate in the study by completing a paper based-survey. On the day the survey was administered, 48 students participated and completed the survey. After the survey was administered to the participants according to the methodology outlined in the previous chapter, the data collected were analyzed, and the findings and results will be presented in this chapter. The first section will report findings from the participants' education and oral health profile (see Appendix C). Following this section will be the research question analysis that will report the findings and results according to each of the research questions. All survey responses were analyzed using descriptive statistics. Accordingly, below is the first section, which provides the survey findings from the participants' education and oral health data.

#### **Participants' Education and Oral Health Data**

The findings are from the participants' education and oral health data profile. Questions one and two were necessary to ensure students met the inclusion criteria to participate in the study. The findings from question one revealed that the 48 participants were enrolled in the BScN program. Question two findings revealed that 47 participants were year-one students, and one of the participants was a third year student. The data collected from that participant was not included in the final analysis. Of the 47 participants who met the inclusion criteria, 100% had completed an oral health IPE session with DH students as revealed by question three. Question four revealed that only 2 (4%) of the participants had prior IPE before enrolling in the BScN program. Questions five and six pertained to participants' oral health data profile and included questions on their usual pattern for visiting dental professionals and their oral health status. Respondents were instructed to choose all that applied; thus, the percentages are greater than 100%. Question five revealed that 36 (76.5%) participants visit a dental professional once a year or more. Eleven (23.4%) visit when something bothers them, 5 (10.6%) visit when a filling or tooth breaks, 7 (14.8%) visit when they have a toothache, and 3 (6.3%) chose other and one comment given under *please specify* was "not unless I have to." Question six revealed that 46 (97.8%) participants have their own teeth. One (2.1%) participant selected other and under *please specify*, commented, "two teeth removed for braces."

The participants were not asked to provide their age, gender, or ethnic/cultural background, but the researcher and the YOPD observed that the sample was culturally diverse, predominantly female, and of traditional student age. The above information relating to the sample may enable the researcher to gain a deeper understanding of the findings as related to the research questions, as the female gender and ethnicity are positively correlated with positive IPE attitudes (Coster et al., 2008), whereas age is not (Hood et al., 2014). The following section provides the research questions and the results from the data survey items.



### Research Questions Analysis

This section will present the data analysis and findings from the data collected from the 47 participants. The researcher will report the findings from the survey questions that were developed to answer the research questions. Each research question will be followed by results of the data analysis, which will be displayed in tabular format. For research question one Part A, the data will also be displayed in tabular format according to the OHK percentage score categories. For research question one Part B, the data from the individual statements will also be grouped in tabular format according to the participants' level of agreement with the statements. The analysis will begin with research question one.

**Research question one: What is the impact of an oral health IPE program on BScN students' KAPs toward oral health care provision—especially oral hygiene care and oral health assessments?**

Two sets of questions and statements were developed to answer this research question. Each set contains 10 items. First, the results of the set of questions relating to OHK (see Appendix D: Part A) will be presented and displayed in tabular format. This will be followed by the results of the set of statements relating to oral health attitudes and perceptions (see Appendix D: Part B). Thus, below are the results for research question one: part A.

***Research question one: part A.***

The results from the OHK assessment tool portion of the survey questions are displayed in Table 1.

Table 1. Oral Health Care Knowledge Survey Questions	
<i>Note. n = 47</i>	
Questions	Score/47 %
1. A mouth swab is a good alternative to a toothbrush for cleaning clients' teeth...(T/F)	45 95.7
2. It is natural for healthy gums to bleed when brushed with a toothbrush...T/F	35

	74.4
3. In general, research confirms that poor oral health conditions can have an effect on an individual's general health and quality of life...(T/F)	47 100.0
4. Soaking dentures in water with a denture tablet is an ideal way to ensure dentures are clean...(T/F)	19 40.4
5. Plaque and tartar do not form on dentures because they are made of acrylic... T/F	46 97.8
6. It is natural to lose your teeth as you get older... T/F	17 36.1
7. The <u>BEST</u> way to remove plaque and debris from a resident's mouth and tooth surfaces is...(brush the teeth using a toothbrush and toothpaste)	47 100.0
8. Persons with no teeth...(require daily mouth cleaning and denture cleaning)	47 100.0
9. The <u>BEST</u> way to treat "dry mouth" is to...(provide frequent sips of water to moisten the mouth)	44 93.6
10. It has been found that clients/patients with dementia have...(all of the above)	22 46.8

Tables 2, 3, and 4 will report the results according to the OHK percentage score categories.

Accordingly, Table 2 details the OHK score results that were categorized as high scores.

The results, as shown in Table 2, revealed that the participants had high scores—93.6% to 100%— on questions one, three, five, seven, eight, and nine.

Table 2. Oral Health Care Knowledge: Questions with High Scores	Score/47 %
1. A mouth swab is a good alternative to a toothbrush for cleaning clients' teeth...(T/F)	45 95.7
3. In general, research confirms that poor oral health conditions can have an effect on an individual's general health and quality of life...(T/F)	47 100.0
5. Plaque and tartar do not form on dentures because they are made of acrylic... T/F	46 97.8
7. The <u>BEST</u> way to remove plaque and debris from a resident's mouth and tooth surfaces is...(brush the teeth using a toothbrush and toothpaste)	47 100.0
8. Persons with no teeth...(require daily mouth cleaning and denture cleaning)	47 100.0
9. The <u>BEST</u> way to treat "dry mouth" is to...(provide frequent sips of water to moisten the mouth)	44 93.6

The next section details the OHK scores that were categorized as average scores.

As shown in Table 3, the participants scored an average of 74.4% on question two.

Table 3. Oral Health Care Knowledge: Questions with Average Scores	Score/47 %
2. It is natural for healthy gums to bleed when brushed with a toothbrush...T/F	35 74.4

The next section details the OHK scores that were categorized as poor scores.

As shown in Table 4, the participants had poor scores—36.1% to 46.8%—on questions four, six, and 10.

Table 4. Oral Health Care Knowledge: Questions with Poor Scores	Score/47 %
4. Soaking dentures in water with a denture tablet is an ideal way to ensure dentures are clean...(T/F)	19 40.4
6. It is natural to lose your teeth as you get older...T/F	17 36.1
10. It has been found that clients/patients with dementia have...(all of the above)	22 46.8

Additional descriptive statistics of the data set are reported in the next section.

Descriptive analysis of the data set, as showed in Table 5, revealed that the data set from the OHK scores ranged from six to 10 out of 10, and summary statistics demonstrated a normal distribution, as the score for the mean, median, and mode was eight.

Table 5. Oral Health Care Knowledge Test: Summary Statistics Scores				
Total Number of Questions	Mean	Median	Mode	Range
10	7.8	8	8	6 to 10

The next section will report the findings pertaining to research question one: part B.

***Research question one: part B.***

Using descriptive statistics, the scores for each statement in the attitudes and perceptions toward oral health care (see Appendix D: Part B) were counted and summed and their corresponding percentage calculated. The data is displayed in Table 6.

Statements	Frequency %			
	Strongly Agree	Agree	Disagree	Strongly Disagree
1. Seeing as most old people lose their teeth, brushing is not as important for them as for younger people	1 2.1	0 0	3 6.3	43 91.4
2. I will perform ongoing regular oral health assessments on my patients	35 74.4	12 25.5	0 0.0	0 0.0
3. I am accountable for the oral care delivered by unregulated health care providers (personal support workers)	9 20.0	27 60.0	6 13.3	3 6.6
4. If I am really busy, my patients do not mind not getting their mouths cleaned	0 0.0	2 4.2	8 17.0	37 78.7
5. It is my responsibility to ensure patients' daily oral hygiene care and assessments are performed and documented	38 80.8	9 19.1	0 0.0	0 0.0
6. I feel more comfortable brushing a client's mouth than I do with most other kinds of personal care	2 4.2	24 51.0	20 42.5	1 2.1
7. I have the knowledge and skills required to perform an oral health assessment on my patients	7 14.8	34 72.3	6 12.7	0 0.0
8. If a patient does not cooperate during oral care, I do not have perform oral care	1 2.1	1 2.1	23 48.9	22 46.8
9. Providing oral care to my patients is as important as all other care I give my clients/patients	37 78.7	10 21.2	0 0.0	0 0.0
10. If clients/patients' gums bleed, I should probably stop brushing their teeth altogether	1 2.1	5 10.6	28 59.5	13 27.6

The results of the statements will be grouped in tabular format in Tables 7, 8, 9, and 10 according to the participants' level of agreement with the statements. The first grouping of statements are detailed in Table 7. The results from the survey relating to attitudes and perceptions toward oral health care revealed that on statements two, five, and nine, 47 (100%) of the participants agreed or strongly agreed. A closer look at the findings revealed the participants' responses for each statement. On statement two, 12 (25.5%) agreed and 35 (74.4%) strongly agreed; on statement five, 9 (19.1%) agreed and 38 (80.8%) strongly agreed; and on statement nine, 10 (21.2%) agreed and 37 (78.7%) strongly agreed.

Table 7. Attitudes and Perceptions Toward Oral Health Care
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Level of Agreement for Statements 2, 5, and 9				
Statements	Frequency %			
	Strongly Agree	Agree	Disagree	Strongly Disagree
<i>Note. n = 47</i>				
2. I will perform ongoing regular oral health assessments on my patients	35 74.4	12 25.5	0 0.0	0 0.0
5. It is my responsibility to ensure patients' daily oral hygiene care and assessments are performed and documented	38 80.8	9 19.1	0 0.0	0 0.0
9. Providing oral care to my patients is as important as all other care I give my clients/patients	37 78.7	10 21.2	0 0.0	0 0.0

The next section will report the data results in tabular format of the second grouping of statements according to participants' level of agreement.

As showed in Table 8, most of the participants agreed or strongly agreed with statements three and seven. A closer look at the findings revealed that on statement three 27 (60.0%) agreed, 9 (20.0%) strongly agreed, 6 (13.0%) disagreed, and 3 (6.6%) strongly disagreed. On statement seven, 34 (72.3%) agreed, 7 (14.8%) strongly agreed, and six (12.7%) disagreed.

Table 8. Attitudes and Perceptions Toward Oral Health Care Level of Agreement for Statements 3 and 7				
Statements	Frequency %			
	Strongly Agree	Agree	Disagree	Strongly Disagree
<i>Note. n = 47 except Statement 3 n = 45</i>				
3. I am accountable for the oral care delivered by unregulated health care providers (personal support workers)	9 20.0	27 60.0	6 13.3	3 6.6
7. I have the knowledge and skills required to perform an oral health assessment on my patients	7 14.8	34 72.3	6 12.7	0 0.0

The next section will report the data results in tabular format of the third grouping of statements according to participants' level of agreement.

As shown in Table 9, the majority of the participants disagreed or strongly disagreed with

statements one, four, eight, and 10. A closer look at the findings revealed the participants' responses for each statement. On statement one, 1 (2.1%) of the participants strongly agreed, 3 (6.3%) disagreed, and 43 (91.4%) strongly disagreed. On statement four, 2 (4.2%) of the participants agreed, 8 (17.0%) disagreed, and 37 (78.7%) strongly disagreed. On statement eight, 1 (2.1%) participant agreed, 1 (2.1%) strongly agreed, 23 (48.9%) disagreed, and 22 (46.8%) strongly disagreed. On statement 10, 5 (10.6%) agreed, 1 (2.1%) strongly agreed, 28 (59.5%) disagreed, and 13 (27.6%) strongly disagreed.

Statements	Frequency %			
	Strongly Agree	Agree	Disagree	Strongly Disagree
1. Seeing as most old people lose their teeth, brushing is not as important for them as for younger people	1 2.1	0 0.0	3 6.3	43 91.4
4. If I am really busy, my patients do not mind not getting their mouths cleaned	0 0.0	2 4.2	8 17.0	37 78.7
8. If a patient does not cooperate during oral care, I do not have perform oral care	1 2.1	1 2.1	23 48.9	22 46.8
10. If clients/patients' gums bleed, I should probably stop brushing their teeth altogether	1 2.1	5 10.6	28 59.5	13 27.6

The next section will report the data results in tabular format of the fourth grouping of statements according to participants' level of agreement.

As shown in Table 10, the results revealed that on statement six there was a divide between the scores as 24 (51.0%) of the participants agreed, 2 (4.2%) strongly agreed, 20 (42.5%) disagreed, and 1 (2.1%) strongly disagreed.

Statements	Frequency %			
	Strongly Agree	Agree	Disagree	Strongly Disagree
6. If a patient does not cooperate during oral care, I do not have perform oral care	1 2.1	2 4.2	20 42.5	24 51.0

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
6. I feel more comfortable brushing a client's mouth than I do with most other kinds of personal care	2 4.2	24 51.0	20 42.5	1 2.1

The next section will report the data results related to research question two.

**Research question two: How are BScN students' attitudes and perceptions toward their professional identity influenced by an oral health IPE program?**

Four survey statements—two, three, six, and seven (see Appendix D: Part C) from the first domain were used to analyze the data pertaining to research question two. As shown in Table 11, the findings revealed that for statement two, which is a negative professional identity statement, 11 (23.4%) of the participants disagreed, 31 (65.9%) strongly disagreed, 1 (2.1%) agreed, and 4 (8.5%) strongly agreed. The rest of the statements are positive professional identity statements. Most of the participants agreed or strongly agreed with these statements. A closer look at the findings revealed that on statement three 11 (23.4%) of the participants agreed and 36 (76.5%) strongly agreed. On statement six, 23 (48.9%) agreed, 19 (40.4%) strongly agreed, and 5 (10.6%) disagreed. On statement seven, 26 (55.3%) agreed, 18 (38.2%) strongly agreed, 2 (4.2%) disagreed, and 1 (2.1%) strongly disagreed.

Statements	Frequency %			
	Strongly Agree	Agree	Disagree	Strongly Disagree
<i>Note. n = 47</i>				
Negative Professional Identity				
2. Working with other health profession students got in the way of my own learning	4 8.5	1 2.1	11 23.4	31 65.9
Positive Professional Identity				
3. It is important for students in health professions to understand each other's skills, roles, and responsibilities in patient care	36 76.5	11 23.4	0 0.0	0 0.0
6. IPE will help me to become part of the oral health	19	23	5	0

care team in my workplace	40.4	48.9	10.6	0
7. IPE helped me to communicate the oral health concerns of my patients to other health care providers	18 38.2	26 55.3	2 4.2	1 2.1

The next section will report the data results related to research question three.

Research question three: How are BScN students' attitudes and perceptions toward their role and responsibility in oral health **care influenced by an oral health IPE program?**

Two survey statements—four and five (see Appendix D: Part C) from the second domain were used to analyze the data pertaining to research question three. As shown in Table 12, the findings revealed that all of the participants agreed or strongly agreed with both statements, and the same number of participants agreed or strongly agreed—21 (44.6%) and 26 (55.3%) respectively—with each of the statements.

Notes. <i>n</i> = 47	Frequency %			
	Strongly Agree	Agree	Disagree	Strongly Disagree
Statements				
4. IPE better prepared me to perform an oral health assessment on my clients/patients when I graduate	26 55.3	21 44.6	0 0	0 0
5. IPE better prepared me to perform oral hygiene care on my clients/patients when I graduate	26 55.3	21 44.6	0 0	0 0

The next section will report the data results related to research question four.

**Research question four: What is the impact of an oral health IPE program on BScN students' attitudes and perceptions toward IPE?**

To answer research question four, four survey statements—one, eight, nine, and 10 (see Appendix D: Part C) from the third domain were analyzed. The findings from the survey relating to the impact of an oral health IPE program on students' attitudes and perceptions toward IPE are displayed in Table 13. As shown in Table 13, none of the participants strongly disagreed with the



statements and most of the participants agreed and strongly agreed with these statements. A closer look at the findings revealed that on statement one, 12 (25.5%) agreed and 35 (74.4%) strongly agreed. On statement eight, 25 (53.1%) agreed, 18 (38.2%) strongly agreed, and 4 (8.5%) disagreed. On statement nine, 20 (42.5%) agreed, 18 (38.2%) strongly agreed, and 9 (19.1%) disagreed. On statement ten, 16 (34.0%) agreed, 30 (63.8%) strongly agreed, and 1 (2.1%) disagreed.

Table 13. Attitudes and Perceptions Toward Interprofessional Education

Statements	Frequency %			
	Strongly Agree	Agree	Disagree	Strongly Disagree
1. Students from different health professions should have educational and clinical experience to prepare them for patient care after graduation	35 74.4	12 25.5	0 0	0 0
8. IPE helped me to develop rapport and trust with dental hygiene students	18 38.2	25 53.1	4 8.5	0 0
9. IPE helped me to learn how to contribute to collective decision-making	18 38.2	20 42.5	9 19.1	0 0
10. Participating in an IPE program increased my overall oral health care knowledge	30 63.8	16 34.0	1 2.1	0 0

This concludes the reporting of the study's data analysis and results. The implications of the results and findings will be discussed in the next chapter. The summary, conclusion, recommendations, and limitations will also be discussed in chapter five.

### **Chapter Five: Summary, Conclusion, and Recommendations**

Chapter five will cover a summary of the study's defined problem, highlights of the literature review pertaining to the defined problem, the methodology used to conduct the research and the data findings, and analysis from the collected data. This chapter will also include a discussion of the findings and conclusions, from which some recommendations will be made, and will conclude with the study's limitations. Accordingly, below is the study's summary.

#### **Summary**

Chapter one defined the problem of the poor oral hygiene and health status of older adults living in RCFs as a longstanding universal problem that remains unresolved (Miguel & Watchel, 2009) and has an adverse effect on quality of life as it negatively impacts people's ability to chew, communicate, and socialize (RNAO, 2008). In this population, oral diseases can be managed or prevented through daily oral hygiene care and regularly scheduled oral health assessments. In RCFs, both of these responsibilities are within the scope of practice of RNs. For example, oral care is the responsibility of RNs; they need to be able to perform and or delegate and supervise oral hygiene two times per day for dependent clients (RNAO, 2008). There is a lack of consistency, however, in nurses' clinical practices with regards to oral health assessments and frequency of oral care (Chan & Ng, 2012), as RNs are unsure of their responsibility and role in oral health maintenance (Bruan-Wimmer & Ruiz-Skol, 2012). Furthermore, although nurses acknowledge the importance of oral health, they play a minor role in oral health's maintenance due to insufficient OHCE in their formal training (RNAO, 2008). Some nursing staff also found performing oral care to be the most disagreeable care they provide, and as a result they have negative attitudes and perceptions toward oral care delivery (MacEntee et al., 2011).

Additionally, the existing curricula for students in health professions in HLIs are as fragmented as the health care system, as they have not kept up with the increasing complexity of

health care delivery that requires HCPs from unrelated professions to collaborate and deliver coordinated patient-centered care. The ability to work collaboratively with unrelated HCPs and provide interprofessional care is considered the best model of care for vulnerable older adults in RCFs (Ho et al., 2008). Introducing IPE at the undergraduate level is recommended as an educational strategy to improve the quality of patient care (Anderson & Dean, 2005). The *OHA* (Dolce et al., 2012), the *IOM* (Hahn et al., 2012), and the *Canadian Perspective Reports* (Grant et al., 2011) supported the foremost strategy of providing nursing and DH students with oral health IPE. The WHO (2013) endorsed IPE and stated that to achieve optimal outcomes, HCPs who work together should be trained together, and in particular, the WHO endorsed IPE between nurses and dental hygienists as a means of achieving improved oral health outcomes (Monajem, 2005).

In Canada, the educational system responded by implementing IPE initiatives (Kearney, 2008). Most IPE research, however, has been conducted at the university level between medical and nursing graduate students (Olson & Bialocderkiski, 2014), and minimal studies have been conducted between DH and BScN students (Coleman, 2012). The study college is one of the colleges that responded to these recommendations and implemented IPE into the health sciences curricula. The researcher wanted to conduct research at the study college for the purpose of evaluating the BScN students' KAPs toward oral health care delivery and their attitudes toward an IPE with DH students after they participated in the IPE program. In keeping with the study's purpose, the researcher developed four research questions and conducted a literature review on the topics related to the research questions. The topics reviewed in the literature are listed below:

- Students' KAPs toward oral health care delivery for older adults
- Professional identity and IPE
- Role and responsibility and IPE

- Students' attitudes and perceptions toward oral care delivery in collaboration with DH students

The literature gleaned from the review was described in chapter two, which is the next topic of the summary.

Chapter two described the review of the literature, which confirmed that despite a plethora of literature in professional journals dedicated to increasing awareness of how HCPs may best address the unmet oral health care needs of older adults living in RCFs, this problem still persists (Cobban, 2012; Frenkel et al., 2001; Frenkel et al., 2011; MacEntee et al., 2007; Wårdh et al., 2012; Weening-Verbree, et al., 2013). This is concerning given that the changing systemic and oral health profiles and demographics of Canada's population will exacerbate the problem. Canadians are aging and living longer. Older adults admitted into RCFs are more likely to be dentate and have complex cognitive and physical health problems (Cobban, 2012). Consequently, never before have HCPs been responsible for providing care to such a large proportion of people over the age of 65 (Yellowitz & Schneiderman, 2014).

The literature review revealed that RNs lack OHK because BScN students have minimal OHCE integrated into the curriculum (Frenkel et al., 2011, p. 191; RNAO, 2008). Traditionally, most health care education models are conducted in a siloed environment with minimal opportunity to collaborate with students from unrelated health professions, which ill prepares newly licensed HCPs for the realities of what is expected of them in the workplace (Hendricson, 2001; Wilder et al., 2008). Students can no longer learn in a siloed environment, as it does not build the CCs necessary for effective teamwork and collaborative practice (Summerfeldt, 2013) and does not adequately prepare future HCPs for continued IPE and IPC in the workplace (Falk, 2013). King et al. (2013) stated that the need for IPE is critical to ensure HCPs have the skills needed to deal with the complexities of health care delivery. Consequently, embedding IPE into

BScN students' curricula is posited as the best strategy in progressing nursing education (Bressler & Persico, 2015). An IPE program would prepare BScN students to provide oral care in a collaborative team approach (Wang et al., 2015). The review highlighted that IPE and collaboration between HCPs is essential due to the rise of chronic diseases and the rapidly changing and growing body of knowledge—no one profession or discipline can meet the demands facing the health care system (Bridges et al., 2010; Wilhelmsson et al., 2013).

The literature stated that IPE is a relatively new educational strategy and research examining the outcomes of IPE intervention in the health profession is limited (Olson & Bialocerkowki, 2014). Limited IPE data can be challenging when developing curricula and implementing IPE programs (Bennett et al., 2011). Other challenges identified in the literature include synchronizing and scheduling IPE to accommodate two or more different health science professions (Hays, 2013), as well as determining the appropriate time to initiate IPE (Bennett et al., 2011). Despite challenges in incorporating IPE into existing curricula, over five decades of research findings reported that IPE is beneficial in improving the safety and quality of health care delivery (Sommerfeldt, 2013). Furthermore, even though the literature review concluded that there are gaps in the research and more research needs to be done to overcome challenges associated with IPE, overall, embedding IPE in the health sciences curricula has been found to be a positive educational strategy that can lead to improved IPC, communication, health outcomes, patient safety, and provider satisfaction (Bennett et al., 2011; Grant et al., 2011; Lapkin et al., 2013; Olson & Bialocerkowki, 2014; Sommerfeldt, 2013; Thistelwaite, 2012; Zwarenstein et al., 2009). Specifically for BScN students, the research found that IPE can help them develop a sense of professional identity and clarify their role and responsibility and improve their ability to participate in IPC as compared to students who did not participate in IPE (Wilhelmsson et al., 2013). Thus, the researcher of this study wanted to build on the body of IPE literature relating to

oral health by evaluating the impact of an oral health IPE program on BScN students' KAPs toward oral care delivery as well as their attitudes and perceptions toward IPE with DH students. The methodology used in the research is described in chapter three, which is the next topic of the summary.

Chapter three described the methodology used in this study. A quantitative descriptive design was used to survey BScN students after the IPE program. The survey, which was deemed reliable and valid by previous researchers (I. Infante, personal communication, August 5, 2014; 2012; P. Le, personal communication, August 3, 2013; I. Wårdh, personal communication, July 2, 2013), was used as the measurement and data collection tool. The sample was a convenient sample drawn from 50 students enrolled in year-one of the BScN program at the study college in the GTA. The researcher met with the students to outline the details of the study and personally invite them to participate in the study. Students received an introduction letter and a consent form, which were also posted on Blackboard. To ensure participants had minimal disruption to their schedule and maximum opportunity to complete the survey, participants had a choice of two sittings to complete the survey in their regularly scheduled classroom. On the day the survey was administered, 48 participants volunteered to participate and they completed a paper-based survey that served as the study's measurement tool and data source. All of the participants but one met the inclusion criteria and the data from their surveys were analyzed and the results and findings were described in chapter four, which is the next topic of the summary.

Chapter four described the data collected from the study according to each of the four research questions. Each of the research questions has a set of corresponding survey questions and statements. The findings and results from the survey questions and statements were reported narratively, and the result highlights were displayed in tabular format. The format for reporting the findings followed the following pattern. Each research question was followed by its results

and findings, which were followed by a table displaying the scores, frequencies, and percentages of the survey questions and statements. Descriptive statistics were used to report the data results. This concludes the summary section from previous chapters, and the next topic is the chapter five summary, which will present a discussion of the significance and implications of the findings, from which conclusions and recommendations can be made. Lastly, the chapter will discuss the limitations of the study. The next section will begin with the discussion portion of this chapter.

### **Discussion of the Findings**

The purpose of this quantitative study was to evaluate BScN students' KAPs of an oral health IPE program. To conduct the evaluation, the four research questions listed below were developed. The discussion will begin with research question one.

1. What is the impact of an oral health IPE program on BScN students' KAPs toward oral health care provision—especially oral hygiene care and oral health assessments?
2. How are BScN students' attitudes and perceptions toward their professional identity influenced by an oral health IPE program?
3. How are BScN students' attitudes and perceptions toward their role and responsibility in oral health care influenced by an oral health IPE program?
4. What is the impact of an oral health IPE program on BScN students' attitudes and perceptions toward IPE?

**Research question one: What is the impact of an oral health IPE program on BScN students' KAPs toward oral health care provision—especially oral hygiene care and oral health assessments?**

Recall that research question one has a set of questions and a set of statements and each set has 10 items. The results of the set of questions relating to OHK (see Appendix D: Part A) will be

discussed, followed by the set of statements relating to oral health attitudes and perceptions (see Appendix D: Part B). Accordingly, the next topic will discuss research question one: part A.

***Research question one: part A—oral health care knowledge.***

This part of the research question will discuss the OHK findings and compare them to study findings involving registered and student nurses. The mean OHK score of the participants in this study was 78.8%. This score is higher than scores reported for RNs in the review of the literature. In particular, Sharbatti et al. (2013) reported that nurses had an average OHK score below 56% in the domain of oral conditions and 50% in the domain of indicators of a healthy mouth. Additionally, the participants in the Chan and Ng (2012) study had OHK scores that were below 60%, and only 43% of them had scores that the researchers categorized as good. The Lin et al. (2011) study findings reported that nurses' mean OHK score was 58%. The next section will discuss studies involving student nurses.

Generally, the results revealed that the OHK scores in this study are higher than the scores reported in the reviewed literature. For example, Chan and Chin (2015) stated that the mean OHK score of the participants was 52.6%. Rwakatema et al. (2015) reported that student nurses had poor OHK, as only 47.2% had adequate OHK. The next section will look at the findings of the survey's OHK questions, beginning with the questions the participants scored highest on.

Overwhelmingly, the BScN students scored 100% on OHK questions relating to the oral-systemic link and quality of life. The literature review reported that the education of nurses in the importance of the oral-systemic link has been inadequate (Dolce, 2012), as demonstrated in the Braun-Wimmer and Ruiz-Skol (2012) study, in which none of the RNs were aware of the oral-systemic link prior to an OHCE program. This study's findings, however, indicate that the participants are aware of the research that confirms that older adults who receive daily denture cleaning and toothbrushing, including brushing of the oral mucosa if edentulous, are less likely to



develop oral-systemic diseases (Grant et al., 2011). Similar findings were found in the Howard (2010) study in which 95% of the nursing staff knew that people who are edentulous require oral care and 89% of the participants correctly stated that biofilm on teeth can affect systemic health. The majority of BScN students (97.8%) knew that tartar forms on dentures, which was higher than was found by Howard (2010), who reported that 75% of the participants knew that biofilm and tartar can form on dentures.

The majority of BScN students (93.6%) were knowledgeable on xerostomia, which can cause adverse oral-systemic complications (CDA, 2008). This is a higher percentage than reported in the literature. For example, Howard (2010), found that 72% of nursing staff had xerostomia-related OHK. The finding in this study is inconsistent with the reviewed literature, as Coleman (2005) stated “nurses do not appreciate the dry mouth potential and other oral sequelae of seniors’ medication regime” (p. 34). The implication is that IPE can help nursing students increase their OHK knowledge on xerostomia and the oral systemic link. For example, Christenson (2014) found that student nurses’ knowledge of oral cancer related oral health complications such as xerostomia increased after an IPE program.

All of the BScN students stated that toothbrushing is the best way to remove plaque from the oral cavity, and the majority of the students (95.7%) correctly stated that mouth swabs are not a good alternative to toothbrushing. The latter finding is inconsistent with the findings gleaned from the literature review. For example, Lin et al. (2011) reported that nurses chose foam swabs 70% of the time for performing oral care and Dyck et al. (2012) reported that the use of swabs was not entirely eliminated even when nurses knew they fell below the standard of oral hygiene care. Nearly 75% of BScN students stated that healthy gums generally do not bleed upon toothbrushing. This result is inconsistent with the literature review findings. For example, Howard (2010) stated that only 49% knew that bleeding was a sign of periodontal disease and Rwakatema et al. (2015)

reported that less than 35% had knowledge related to bleeding gums and less than 10% had knowledge on the causes of bleeding gums. The findings in this study imply that an oral health IPE program between BScN and DH students may account for the higher scores related to evidence-based oral hygiene protocols to maintain a healthy mouth (WHO, 2013). The next section will discuss the OHK questions that participants scored poorly on.

Although 98% of the BScN students correctly stated that plaque and tartar can grow on dentures, only 19 (40.4%) of them knew that soaking dentures in water with a denture tablet is not an ideal way to ensure dentures are clean. This score is higher than the participants' score in the Howard (2010) study, where only 24% correctly answered the question. The low score on this question is a surprise since oral hygiene for denture care was demonstrated in the IPE program. However, the low score of 36.1%—only 17 BScN students chose the right answer—on question six is no surprise as Howard (2010) stated many non-dental professionals do not know that tooth loss is not part of the aging process. This finding was reflected in the Howard (2010) study, in which a comparable number of participants, 40%, said that tooth loss is always a natural part of the aging process. These findings suggest that these topics need to be reinforced during the IPE program as students might have confused the concepts (S. Wiesenthal, personal communication, March 1, 2015). Nursing students need to be aware that although chronic dental diseases can lead to loss of teeth, they are not part of the aging process; however, the risk of developing them increases with age (RNAO, 2008).

Similarly, only 46.8% of the BScN students selected the correct answer relating to oral health care for older adults with dementia, even though the YOPD stated that the students covered the topic in theory class prior to the IPE (S. Wiesenthal, personal communication, March 1, 2015). Reinforcing OHK for older adults with dementia would help students meet the challenges of providing oral care to this population during their practicum placement and post graduation

(Cobban, 2012). Otherwise, this can have implications in the oral care older adults may receive given that dementia is the prevalent disorder in RCFs and is the primary reason an individual is admitted to a RCF (RNAO, 2008). The next topic to be discussed is research question one: part B.

***Research question one: part B.***

This part of the research question will discuss the participants' attitudes and perceptions toward oral care delivery. All BScN students agreed or strongly agreed that they will perform oral health assessments and that performing oral health assessments and daily oral hygiene is as important as other nursing duties. All of them agreed or strongly agreed that nurses are responsible not only for ensuring oral care and assessments are performed, but that they are documented as well. However, fewer students—87%—agreed or strongly agreed that they had the knowledge and skill to perform an oral health assessment. The first finding is consistent with the Clemmens et al. (2012) study in which 97% of BScN students believed they had a strong understanding of the components of an oral health assessment. The second finding is inconsistent, as in that study, fewer participants—only 25%—had the skills to recognize the components of oral health assessment. The difference between the study findings may be due to IPE—students in the Clemmens et al. (2012) study received traditional nursing curricula with minimal opportunity to collaborate with DH students. The IPE program in this study gave the students an opportunity to learn *with* and *from* each other *about* oral health—fundamental words of IPE, thus providing an enriched learning experience. Additionally, the literature reviewed stated that 50% of nursing schools do not require students to assess the cavity and provide no theoretical or clinical components on how to conduct an oral health assessment (Hein et al., 2011). One of the consequences of inadequate OHK relating to oral assessments is that RNs miss recognizing 50% of oral disorders (Frenkel et al., 2011, p. 192), but with exposure to comprehensive OHCE, RNs only missed identifying 5% of oral disorders (Thema & Singh, 2013). Oral health assessments are

within the RNs scope of practice (RNAO, 2008); therefore, this knowledge is critical to ensure older adults do not suffer needlessly from undetected oral disorders that can significantly diminish quality of life and increase their risk of systemic and oral diseases.

The majority of BScN students in this study were aware of their role in oral care delivery as 80% agreed or strongly agreed that they were accountable for the oral care delivered by unregulated health care providers. These findings are higher than the findings reported in the Bruan-Wimmer and Ruiz-Skol (2012) study in which only 50% of RNs were aware that they were accountable for the oral care delivery of their patients and for the care provided by unregulated HCPs they supervise. Although in health care settings, PSWs provide up to 90% of oral care under the supervision of RNs, it is ultimately RNs who are responsible for ensuring oral hygiene care and oral health assessments are performed (RNAO, 2008). Bruan-Wimmer and Ruiz-Skol (2012) stated that nursing staff's lack of clarity regarding whose role and responsibility is it to provide oral care provision has serious implications on whether or not oral care is performed. Consequently, the RNs lack of awareness of their role and responsibility in oral care provision contributes to the low priority oral care receives, as they seldom hold PSWs accountable for its delivery (Finkleman, 2009).

The literature review reported that OHCE programs delivered in collaboration with dental professionals can not only improve the nurses' OHK, but they can improve nurses' attitudes and perceptions toward oral care delivery (Wårdh et al., 1997; Wårdh et al., 2012). Simons et al. (2000) found that comprehensive OHCE programs that include evidence-based oral health theory such as the oral-systemic link may positively influence nurses to modify their behavior. This was the case in a study conducted by Nitschke et al. (2010). Based on the findings, the researcher concluded that when nursing staff participate in OHCE, they increase their awareness of the importance of mouth care in relationship to the overall health and quality of life of the residents

and they are more likely to be empowered and motivated to change their behavior and attitudes, improving their own mouth care practices as well as their clients. In the Bruan-Wimmer and Ruiz-Skol (2012) study, the OHCE program improved nurses' KAPs of oral care practices and clarified the RNs role in the maintenance and provision of patients' oral care. Accordingly, the experience of an oral health IPE program can help BScN students develop and clarify their professional role in oral health care delivery and can lead to the development of more positive attitudes oral care delivery and IPC (Christenson, 2014; Infante, 2012). The impact of IPE on professional roles and IPC in this study will be discussed in more detail in research questions three and four.

The findings in this study revealed that BScN students had positive attitudes and perceptions toward oral health care after they participated in IPE. The majority of students (95.7% to 97.7%) disagreed or strongly disagreed that brushing is not as important for older adults as it is for younger people, as they are more likely to lose teeth, that older adults do not mind forgoing oral care if a nurse is busy, and that care resistive behavior is an excuse for not performing oral care. These findings indicate that almost all of the participants had positive attitudes and perceptions toward oral care for older adults and that being busy is not an excuse to forgo oral care delivery even if they encounter clients who are uncooperative. Accordingly, 100% of the students agreed or strongly agreed that providing oral care to their clients is as important as all other care they give to their clients. These scores are higher than the findings in the Howard (2010) study in which 80% of the participants perceived oral care to be as important as other duties. In the Wårdh et al. (1997) study, the findings revealed that oral health attitudes are related to levels of nursing education. This may explain why the finding in the Howard (2010) study was lower, as only 33% of the nursing sample was made up of RNs. Additionally, the RNAO (2008) stated that the value a nurse places on the importance of self-oral care and how the care delivery is perceived can influence the nurses' attitudes and perceptions toward oral care, and in turn this can influence the

quality of care they provide to their clients. For example, the findings in this study revealed that 76.5% BScN students had a regular checkup once a year or more, whereas Howard (2010) reported that 49% of the participants had a regular checkup once a year more and Bruan-Wimmer and Ruiz-Skol (2012) reported that after an OHCE program, 100% of the RNs had positive attitudes toward personal oral care and 100% had positive attitudes toward maintaining the oral health of patients under their care.

Further analysis of data revealed that the BScN students in this study had positive attitudes regarding maintaining their clients' oral health, as 87.1% disagreed or strongly disagreed that they would stop brushing if gums bled during the procedure. In the Rwakatema et al. (2015) study, only 31.8% of the student nurses knew how to prevent bleeding gums and 9.8% were knowledgeable on the etiology of bleeding gums. Clearly, in this study the BScN students were aware that bleeding is a sign that gums are diseased and that toothbrushing helps to reduce gingival bleeding. Recall that in the OHK test in Part A, 74.4% of the participants knew that it is not normal for healthy gums to bleed during oral care delivery. The increase in OHK gained from the IPE program may have positively influenced their attitudes and perceptions toward oral care delivery (Wårdh et al., 1997). Thus, this indicates that there is congruency between the students' OHK and their attitudes and perceptions scores. This may lead to behavioral changes that improve their clinical practices, as positive attitudes and perceptions may bridge what Forsell et al. (2011) refer to as the gap between knowledge and behavior that is influenced by attitudes and perceptions toward oral care. This is in line with the general purpose of OHCE programs because according to Mason (2005, p. 40), OHCE should improve KAPs and for the intervention to be successful, education should result in behavioral changes.

A potential impediment to improving oral care clinical practices found in this study relates to the students' comfort level in performing oral care. The findings revealed diverse opinions

regarding the students' comfort level in performing oral care in relationship to other nursing care activities, as 51% of the BScN students agreed and 4.2% strongly agreed that they felt more comfortable in providing oral care, while 42.5% disagreed and 2.1% strongly disagreed that they were more comfortable. This may indicate that there was some negativity concerning students' perception of their comfort level in performing oral care. These findings are comparable to the Howard (2010) findings, but more participants were uncomfortable in this study than in Howard (2010) study. The difference in the findings may be related to the level of experience as students in this study had no prior oral care delivery experience and in the Howard (2010) study the participants were experienced nursing staff. Additionally, the perception that oral care is an unpleasant and difficult task may underlie these findings. For example, Chan and Ng (2012) reported that 60% of registered and student nurses found oral care to be a difficult task and 15% also found it to be disagreeable. Traditionally, oral health care has not been part of the holistic total care offered by RNs. Therefore, it is conceivable students would not be as comfortable as they would be with core nursing duties especially when coupled with lack of experience in providing oral care. Overall, the result of this study revealed the oral health knowledge of the students was high, which suggests that the IPE program had a positive impact on the BScN students' attitudes and perceptions toward oral health care provision. Therefore, the findings and results from this study helped answer research question one. The next topic to be discussed is research question two.

**Research question two: How are BScN students' attitudes and perceptions toward their professional identity influenced by an oral health IPE program?**

The statements in the professional identity domain evaluated the participants' attitudes and perceptions toward working and learning with other health profession students. Overall, the results from the study findings revealed that the oral health IPE program had a positive influence

on the BScN students' attitudes and perceptions toward their professional identity. Consequently, most of the respondents (65.9%) strongly disagreed or (23.4%) disagreed, while only (2.1%) agreed or (8.5%) strongly agreed that working with other health profession students got in the way of their learning. The high percentage of students who disagreed with the statement is indicative of the value students place on learning with students of other health professions, and this was confirmed by their agreement on the rest of the statements in this domain. Most of the students (76.5%) strongly agreed and the rest (23.4%) agreed that it is important for students in the health professions to understand each other's roles and responsibility in patient care. The majority of students (55.3%) agreed or (38.2%) strongly agreed that IPE helped them communicate the oral health concerns of their patients to other HCPs. The remaining students disagreed (4.2%) and strongly disagreed (2.1%) that IPE helped them communicate the oral concerns of their patients to other HCPs. The latter finding is particularly important as improved communication can improve patient safety, as it eliminates approximately 50% of the 80% of medical errors that are due to miscommunication among HCPs (Christenson, 2014). Grant et al. (2011) reported that the IPE program gave students the opportunity to experience and understand each other's professional language and increased their awareness of the importance of cross-disciplinary communication to avoid misunderstandings between HCPs.

These results are consistent with the findings reported in the research reviewed in this paper. For example, the Wilhelmsson et al. (2013) study findings showed that BScN students who attended an IPE university reported that IPE helped them meet their goal of gaining a sense of identity that enabled them to work as a nurse. It also better prepared them to participate in interprofessional collaborative practice and to communicate effectively with patients as compared to students who attended non-IPE universities and received a traditional curriculum.



Infante (2012) reported that students generally had positive attitudes toward the statements in the professional identity domain. Most of the students agreed or strongly agreed that learning and working with students from other health professions in an IPE program would improve communication among HCPs, improve understanding of each other's roles in patient care, and prepare them for working on an oral health care team in the workplace. The results revealed that for the positive identity statements there was no significant change among the respondents before or after the program. There was a significant change in the negative professional identity statement. Prior to the IPE, the participants' mean score value of four signified that they disagreed that working with students from other professions got in the way of their learning, but after the IPE the mean score value increased to five signifying that they strongly disagreed with the statement. Infante (2012) stated that the IPE program positively influenced students' attitudes toward working and learning with students from other health professions.

The Christenson (2014) study reported similar findings, but in this study the IPE program significantly improved both the positive and negative professional statements related to students understanding of professional identity. These findings imply that BScN students who are in the process of developing their professional identity may benefit from participating in IPE programs to uphold or improve their positive attitudes and lessen their negative professional identity attitudes. The positive outcomes from the Wilhelmsson et al. (2013) study exemplify the benefit of an IPE university curricula. The importance of participating in ongoing IPE education throughout the nursing program to maintain a positive professional identity is discussed in the next section. The discussion will include how important it is for RNs to participate in ongoing continuing IPE in the workplace.

Coster et al. (2008) surveyed nursing students throughout their four-year program and found that professional identity scores declined by the last year. In particular, the decline in

identity was statistically significant in years two and four. Coster et al. (2008) attributed this phenomenon to students' unrealistically high expectations at the start of their program coupled with disillusioned clinical experiences in year two. For example, McAuliffe (2007) highlighted that for year-two nursing students, having positive role models is critical to their socialization process and developing a professional identity. Student nurses placed RNs in the position of role models, and they practiced the same way as RNs even though 73% reported RNs used oral care practices that fell below the standard of care. The participants stated they were discouraged from implementing evidence-based oral care practices by the senior nurses. Instead they modeled the oral health care practices the RNs already had in place so they could fit in, and fitting in was essential to their socialization process and developing a professional identity. Consequently, based on Coster et al. (2008) hypothesis and the importance of having positive role model relationships between students and RNs in clinical environments (McAuliffe, 2007; McIntyre & McDonald, 2014, p. 186), one can deduce that students who had high expectations about implementing evidence-based oral health care may have been disillusioned by their clinical experiences and in the process of trying to build a professional identity, weakened it instead. This paper highlighted that RNs have inadequate OHK (RNAO, 2008). The main implication arising from this is that RNs need to have continuing oral health IPE so they can fulfill their role as role models to BScN students during their practicums, service learning, and clinical field placements (McAuliffe, 2007). Other implications include the need to conduct longitudinal studies to assess changes in the professional identity of nursing students (Coster et al., 2008), and the need to add ongoing IPE courses into the BScN curricula (Wilhelmsson, et al., 2013).

Overall, the results of this study revealed that BScN students' had positive attitudes and perceptions toward their professional identity, which suggests that they were positively influenced

by an oral health IPE program. Therefore, the findings and results from this study helped answer research question two. The next topic to be discussed is research question three.

**Research question three: How are BScN students' attitudes and perceptions toward their role and responsibility in oral health care influenced by an oral health IPE program?**

Positive professional identity is fundamental to developing secure professional roles and responsibility (Coster et al., 2008). The statements in the role and responsibility domain evaluated the participants' attitudes and perceptions both toward their role as a nurse and the role of other health profession students. The main finding from the role and responsibility domain was that overwhelmingly the students had excellent attitudes and perceptions toward IPE that positively influenced their role and responsibility in oral health care delivery. The same number of participants agreed (44.6%) and strongly agreed (55.3%)—with both statements in this domain; all of the participants stated that IPE prepared them to perform oral health assessments and oral hygiene care on their patients when they graduate.

These results are comparable with the findings reported in the research reviewed in this paper. For example, research findings reported from Grant et al. (2011) revealed that nursing students who participated in an oral health IPE program had an increased awareness of their own role and were able to articulate their role to DH students, and during the program they increased their awareness and appreciation of the DH students' role. Christenson (2014) reported similar findings and in particular the role and responsibility scores revealed that the participants' awareness of their roles and responsibility had the largest significant increase—more so than the professional identity and attitudes toward IPE domains—after the IPE program. Derbyshire and Machin (2011) and McDonald et al. (2010) also reported that nurses had increased role awareness after an IPE intervention.

The findings from the literature overall reported that after an IPE program, participants had increased role awareness and appreciation for the role of professions other than their own, as well as the ability to articulate each other's roles. A benefit from these findings as reported by a participant in the McDonald et al. (2010) study is exemplified by this statement: "We learn that it is such an asset to have support from different professions and team members who may have the same skills as ourselves, and that the client is having his/her needs met" (p. 240). Meeting the needs of the client and providing patient-centered care is one of the goals of IPE (CIHC, 2007). Another benefit reported by an IPE educator is that the nursing students "had their little areas of expertise but I think they found they actually had more commonalities" (McDonald et al., 2010, p. 240).

Underpinning these benefits is the premise that the health care professions share similar CCs. According to Henson (2005), the nursing and DH professions not only share CCs, but they are parallel professions. This view was shared by BScN and DH students in the Grant et al. (2011) study in which the students acknowledged how much they learned from each other and that a large set of skills were common to both professions. The positive outcome in this study and particularly in this domain may be due to the fact that the study college maximized the two professions' shared competencies when the IPE initiative was implemented. The study college adopted four of the six CCs the National Interprofessional Competency Framework developed to promote effective IPC and IPE (Grant et al., 2011).

One area, however, that requires attention as reported in the study by Bruan-Wimmer and Ruiz-Skol (2012) is the need for continuing IPE, as RNs do not have the same clarity regarding their role and responsibility in oral care delivery as the student nurses. The study findings revealed that unregulated HCPs and RNs were unclear regarding their role in the maintenance of patients' oral care and only 50% of RNs were aware that they were accountable for the oral care

delivery of their patients and for the care provided by unregulated HCPs they supervise. The study findings revealed that after an OHCE intervention program delivered collaboratively by an RN and a dental hygienist, 100% of the RNs were aware of their oral care role and responsibility. Thus, continuing IPE can clarify the RNs role and responsibility in oral care provision (Bruan-Wimmer & Ruiz-Skol, 2012). The implication is that when HCPs collaborate and are clear in their roles and responsibility for oral care delivery, it can benefit the older adults living in RCFs who depend on the nursing staff for oral care. An added benefit would be that HCPs would be exemplary role models for student nurses to emulate during their field placements (McAuliffe, 2007).

Undeniably, the results of this study revealed that BScN students had positive attitudes and perceptions toward their role and responsibility, which suggests that they were positively influenced by the oral health IPE program. Therefore, the findings and results from this study helped answer research question three. The next topic to be discussed is research question four.

**Research question four: What is the impact of an oral health IPE program on BScN students' attitude and perceptions toward IPE?**

The statements in the attitudes and perceptions toward IPE domain evaluated the participants' attitudes and perceptions toward IPC with unrelated health profession students. Overall, the study findings revealed that the oral health IPE program had a positive influence on the BScN students' attitudes and perceptions toward IPE. The majority of students stated that the oral health IPE program enabled them to increase their overall OHK, as 63.8% strongly agreed, 34% agreed, and only 2.1% disagreed with the statement. The majority of respondents had positive attitudes and perceptions toward the rest of the statements. Accordingly, the majority of students (74.4%) strongly agreed and 25.5% agreed that students from different health professions should participate in IPE to better prepare them for caring for patients after graduation. In fact, the results showed that participating in IPE also helped the nursing students develop rapport and trust

with DH students, as 38.2% of the sample strongly agreed and 53.1% agreed. There were some students (8.5%) that disagreed that IPE helped them build rapport and trust with DH students. The same number of students (38.2%) that strongly agreed with the previous statement also strongly agreed that IPE enabled them to contribute to collective decision-making, and another 42.5% agreed with the statement. A few students (20%) disagreed that IPE helped them contribute to collective decision-making.

This study did not survey students prior to the IPE program, as the majority of year-one students were not expected to have OHK and IPE experience prior to the oral health IPE program (S. Wiesenthal, personal communication, September 22, 2015). Indeed this was the case as only 2 (4%) of the students in this study had prior IPE experience. However, students do have preconceived attitudes and perceptions at the start and throughout the course of their programs (Hood et al., 2014). These attitudes and perceptions, however, can change depending on the educational experience and the cultural climate of the learning environment (Hood et al., 2014; McIntyre & McDonald, 2014, p. 182). For example, Hood et al. (2014) found that students preparing to participate in IPE supported IPE and they had positive attitudes toward IPE and IPC prior to their IPE program. The researcher assumes that given the findings reported by Hood et al. (2014) and the study college's leadership role in championing and promoting IPE and IPC for its health sciences students (Shekter-Wofson, 2007), the BScN students likely had positive attitudes and perceptions toward IPE prior to the program. Additionally, this study did not ask the participants to provide their age, gender, or ethnic/cultural background, but the researcher and the YOPD observed that the sample was culturally diverse, predominantly female, and of traditional student age. The observed demographics in this study align with findings from the literature reviewed in this study. For example, Coster et al. (2008) reported that the female gender and

ethnicity are positively correlated with positive attitudes toward IPE and IPC and Hood et al. (2014) reported that age had no bearing on attitudes toward IPE and IPC.

Nevertheless, the results from the study findings revealed that overall the oral health IPE program had a positive influence on the BScN students' attitudes and perceptions toward IPE. These results are congruent with the findings reported in the research reviewed in this paper. For example, Infante (2012) and Christenson (2014) reported that nursing students had positive attitudes toward IPC and IPE that improved after the IPE program. Specifically, the findings from Infante (2012) reported that IPE should be part of students' training and that working together helps them prepare for teamwork and collaborative decision-making when they graduate. Christenson (2014) reported that improvement in communication throughout the program enabled students to complete the IPE program. The Grant et al. (2011) study findings align with the findings in this study. The researchers reported that the IPE program increased the students' knowledge and gave the students increased awareness and respect for each other's expertise and language and overall the participants enjoyed learning and working with students from a different profession. Coster et al. (2008) reported students' readiness and attitudes for IPL were high in year one, as they were in this study, but their findings revealed that this declined over time except for nursing students, who maintained their positive attitudes over the four years.

The implication from the findings in this study is that BScN students who participate in IPE in a learning environment that promotes a culture of interprofessionalism can help students develop positive attitudes and perceptions toward IPE (Hood et al., 2014). Higher learning institutions that promote a positive IPE culture can help minimize negative attitudes and perceptions students from different health disciplines may have for one another (MacEntee, 2011; Robben et al., 2012). In this study, the IPE program helped BScN students increase their OHK and develop the skills they will need to work collaboratively, which will help them to deliver

fiscally responsible, quality, and safer patient-centered oral care (Grant et al., 2011; Bressler & Persico, 2015).

Overall, the results from this study revealed that the BScN students had positive attitudes and perceptions toward shared learning and IPC, which suggests that they were positively influenced by the IPE. Therefore, the findings and results from this study helped answer research question four. The next topic to be discussed is the conclusion.

### **Conclusion**

In this study, the overall results from the survey's three sets of questions and statements appear to be congruent. The BScN students had a comprehensive oral health IPE program that gave them OHK scores higher than reported in the literature review. This may have influenced their attitudes and perceptions toward oral care delivery to be positive, as indicated by their overall level of agreement with statements in this domain. Furthermore, the influence of an IPE oral health program may have helped them to develop a sense of their identity, as their level of agreement in that domain indicated that the program enabled them to learn and work collaboratively with DH students, which may have helped them understand, develop, and articulate their role as a nurse. The students' positive level of agreement with the attitudes and perceptions in the professional identity domain may have contributed to the positive level of agreement relating to their professional role and responsibility in oral care delivery and to their readiness to participate and learn with DH students in an IPE program, as Coster et al. (2008) reported that a stronger sense of identity can help mitigate role insecurity and improve readiness for IPL.

Therefore, the findings in this study support the literature review findings that for maximum benefit it is best to introduce IPE early in the BScN curricula to capitalize on the students' readiness for IPE, to develop their sense of identity (Honan et al., 2015; Hood et al.,



2014), and to promote ideal attitudes between nursing and DH students (Hays, 2013). This is particularly important for the nursing profession, which is in the process of articulating its identity and role in IPE (Summerfeldt, 2013). Bachelor of science nursing students who graduate with these competencies and skills will be capable of joining the workforce and being part of the oral health care team (Pardue, 2013) and they will be able to respond to the changing economic conditions in the health care system and to the changing demographic and health profiles of Canadians (Falk et al., 2013). The WHO (2013) endorsed IPE and stated that HCPs who work together should be trained together, and in particular, the WHO endorsed IPE between nurses and dental hygienists as a means of achieving improved oral health outcomes (Monajem, 2005). Interprofessional education will enable BScN students to transition to collaborative health care teams in the workplace and will help them provide coordinated health care services to improve oral health outcomes and the overall well-being and quality of life of Canadians living in RCFs (Summerfeldt, 2013; WHO, 2013). The next topic to be discussed is the recommendations for this study.

### **Recommendations**

The results of this study revealed that BScN students had a mean OHK score of 78%, which was higher than in the reviewed literature. Overall, students had good OHK except for three survey questions in which the OHK scores were below 50%. Two of the areas participants scored poorly on pertained to tooth loss and denture cleaning. A low score of 47% was also obtained on an OHK question relating to older adults with dementia. Thus, the researcher recommends that the topics of tooth loss, denture hygiene, and dementia have to be reinforced. First, a clear distinction must be made between the fact that tooth loss increases with age due to dental diseases, but it is not a natural part of the aging process. Dental diseases and their neglect are responsible for tooth loss. Teeth are meant to last a lifetime—most dental diseases can be

prevented or managed in this population with daily oral hygiene and oral health assessments.

Secondly, students need to have the theoretical knowledge prior to the IPE that teeth, dentures, and soft tissue need to be brushed daily to maintain a healthy and clean mouth. Soaking dentures in water with a tablet does not remove bacteria and places wearers at the same risk of developing systemic diseases, such as pneumonia, as bacteria that is present on teeth. Thirdly, students need more theoretical knowledge on dementia in the IPE program as dementia is the most prevalent disorder in RCFs and many clients with dementia are dependent on HCPs for oral care delivery. It is possible that one IPE session is not enough to cover such a broad topic as dementia.

The second part of the survey findings revealed that generally students had positive attitudes and perceptions toward delivering oral care and conducting oral health assessments. Most of them knew they were accountable for these procedures and most of them knew that they were accountable for the oral care delivered by unregulated HCPs. There was some negativity concerning students' perception of their comfort level in performing oral care as 44.6% disagreed or strongly disagreed that they were more comfortable brushing a client's mouth than they were with most other personal care. Thus, the researcher recommends reinforcing the importance of oral care for this population to first-year students and throughout the rest of their education by linking its importance in maintaining systemic health and quality of life.

The third part of the survey was made up of three domains. The results in the first domain revealed that the oral health IPE program positively influenced the students toward their professional identity. Thus, the first recommendation by the researcher is that IPE should be embedded into all nursing programs to help students develop their professional identity. Second, IPE programs need to be an ongoing part of the nurses' curriculum to foster and develop students' professional identities. Third, the literature revealed that professional identity scores declined in years two and four; more research needs to be conducted in year two of the nursing program to

study this phenomenon and examine if weakened professional identity scores are due to students' unrealistic expectations or due to disillusionment with their clinical experiences. In particular, further research in this field of study could evaluate the students' attitudes toward their professional identity after their practicum experiences in RCFs to see how they compare with the results from this study. Fourth, the educational and health care sector need to implement a continuing IPE program for RNs that focuses on bridging the gap between education and practice. An example of an IPE program that is bridging the education to practice gap is the continuing IPE—OHNEP Program, which includes the *Smiles for Life* curriculum. This curriculum is an ideal program to adopt as it may promote positive role model relationships between BScN students and RNs in clinical environments. This program would be welcomed by RNs as they want to have more OHCE. Fifth, qualitative as well quantitative studies should be conducted to get an in-depth look at the impact of role models on students' socialization process and professional identity development.

The results of the survey's second domain revealed that 100% of the students agreed or strongly agreed that the IPE program positively influenced the students toward their role and responsibility in oral care. Thus, the researcher recommends that IPE should be standardized in the BScN curricula and that RNs have continuing IPE in their workplace to help clarify their role and responsibility in oral care provision. Registered nurses who are secure with their roles and responsibilities will be able to help student nurses articulate their role and responsibility during their clinical placements.

The results of the survey's third domain revealed that the majority of the students agreed or strongly agreed that the IPE program positively impacted the students' attitudes and perceptions toward IPE and IPC. All of the students stated that students from different professions should have shared educational and clinical experience to prepare them for patient care after graduation.

They stated that the IPE program increased their OHK. It also improved their ability to communicate, build rapport and trust, contribute to decision-making, and develop respect with unrelated HCP students. These are the competencies that will enable BScN students to collaborate with dental professionals once they graduate to help improve the quality of oral care older adults currently receive in RCFs. Thus, the researcher recommends that a mandatory oral health care IPE program should be included in the curricula of BScN and DH students in HLIs and IPE courses should be ongoing throughout the duration of the nursing program. More research should be conducted at the undergraduate level on how IPE influences the attitudes and perceptions BScN students hold toward their role, their identity, and IPC. The research should be ongoing throughout the duration of the nursing program and post graduation and consideration should be giving to conducting research prior to participation in IPE and should include demographic data. In particular, more research should be conducted on professional identity, as its development appears to be paramount for nurses to develop their professional persona and work as a nurse. Additionally, professional identity research suggests that developing a positive professional identity is necessary for nurses to understand their role as well as the role of unrelated health profession students and is correlated with willingness to participate in IPE. Research should be both quantitative and qualitative, and the latter should have a reflection journal in which students can piece together their thoughts and make meaning from the shared learning process.

The study college's IPE program should be a model for all Ontario colleges that train students in the health sciences. To meet the oral health challenges of this silent epidemic the health care sector and the educational sector—including HCPs and students in the health professions and their governing bodies—must lobby all levels of government and other important stakeholders such as community partners to implement oral health IPE programs in schools and in the workplace to improve the oral health care of older adults living in RCFs. Higher learning

institutions should engage health care leaders who can help champion IPE and IPC and build a positive organizational culture.

### **Limitations**

One limitation of the study is that the researcher conducted the research at one large college in the GTA with well-established IPE for the health science programs. The college's Community Services and Health Sciences Programs are housed at one location in a state-of-the-art building designed to promote an environment that champions the principles of IPE and IPC into their programs (Shekter-Wofson, 2007). The positive organizational culture and climate for IPE and IPC at the study college is evident in the number of students who participated in the study. The researcher reached out to 50 students, and 48 students volunteered to participate, which is a 96% response rate. Besides the positive organizational culture, housing the health profession programs under one roof allows students from unrelated health professions to have plenty of opportunity to interact formally and informally with each other, which may have contributed to the overall positive findings in this study (Coster et al., 2008).

A second limitation is that the participants were a convenience sample and they may not be representative of students as a whole. Additionally, convenience samples can fall prey to selection bias (Cobban, 2012), as they suffer from the risk that volunteers tend to be the informal leaders and smarter members of the class who may already have good OHK. Also, the participants who chose to participate in the study may have been students who had more positive or negative beliefs toward IPE and therefore could bias the findings (Honan et al., 2015). This limitation was mitigated by the high response rate (96%), which resulted in a much larger sample size than the researcher anticipated. According to Cobban (2012), the higher the percentage of students participating in the study, the more likely positive changes can occur.

A third limitation is that there was no control group as the IPE program is mandatory for all BScN year-one students. An unknown factor besides the IPE could have positively influenced the participants' oral health KAPs and their attitudes and perceptions toward IPE and IPC (Anderson et al., 2011). Consequently, given the abovementioned limitations, the findings from this study must be interpreted with caution and cannot be generalized to other IPE programs.

### References

- Adair, P., & Ashcroft, A. (2007). Theory based approaches to the planning and evaluation of oral health education programs. In C. Pine, & R. Harris (Eds.), *Community Oral Health*. London: Quintessence Publishing Company Ltd.
- Alacqua Gow, M. (2013). *An evaluation of an oral health care education program on the personal support workers' knowledge, attitudes, and perceptions*. Practicum Project. Department of Health Services Management, Ryerson University, Toronto, Ontario, Canada.
- Anderson, J., Ateah, C., Wener, P., Snow, W., Mitge, C., MacDonald, L., Fricke, M.,...Davis, P. (2011). Differences in pre-licensure interprofessional learning: Classroom versus practice settings. *Journal of Research in Interprofessional Practice and Education*, 2(1), 1–22. Retrieved from <http://www.jripe.org>
- Anderson, J., & Dean, H. J. (2005). A tempest of change: Toward interprofessional undergraduate education. *Canadian Journal of Diabetes*, 29, 80–81. Retrieved <http://www.journalofdiabetes.com>
- Babbie, E., & Benaquisto, L. (2010). *Fundamentals of social research*. Canada: Nelson.
- Bennett, P. N., Gum, L., Lindeman, I., Lawn, S., McAllister, Richards, J.,...Ward, H. (2011). Faculty perceptions of interprofessional education. *Nurse Education Today*, 31, 571–576, doi:10.1016/j.nedt.2010.09.008
- Bressler, T., & Persico, L. (2015). Interprofessional education: Partnerships in the educational proc. *Nurse Education in Practice*, 1–4. doi: <http://dx.doi.org/10.1016/j.nepr.2015.07.004>
- Bridges, D. R., Davidson, R. A., Odegard, P. S., Maki, I. V., & Tomkowiak, J. (2011). Interprofessional collaboration: 3 best practice models of interprofessional education. *Medical Education Online*, 16, 1–10. doi: 10.3402/meo.v.16i0.6035

- British Columbia Dental Association (2011). *Oral care delivery in residential care facilities: A report of the seniors' secretariat*. Retrieved from <http://www.journals1.scholarsprotal.info>
- Bruan-Wimmer, J. A., & Ruiz-Skol, P. (2012). Impact of an oral hygiene education initiative on the practice of oral care by unregulated care providers guided by registered nurses. *Canadian Journal of Dental Hygiene*, 46(4), 223–230. Retrieved from <http://www.search.proquest.com>
- Canadian Dental Association. (2008). *Optimal health for frail adults: Best practice along the continuum of care*. Ottawa: Author. Retrieved from <http://www.cda.ca>
- Canadian Dental Hygienists Association (2012). *Letter to the Premiers*. Retrieved from <https://www.cdha.ca>
- Canadian Interprofessional Health Collaborative. (2007). *Interprofessional education & core competencies. Literature review*. Retrieved from <http://www.cihc.ca>
- Canadian Interprofessional Health Collaborative. (2010). *A national interprofessional competency framework*. Retrieved from <http://www.cihc.ca>
- Canadian Nurses Association (2011). *Position Statement. Interprofessional Collaboration*. Retrieved from <http://www.cna-aiic.ca>
- Centre for the Advancement of Interprofessional Education. (2002). Resources. Defining IPE. Retrieved from <http://www.caipe.org.uk/about-us/defining-ipe/>
- Chan, J. C. Y., & Chin, L. S. H. (2015). Oral health knowledge and psychological determinants of oral health behavior of nursing students. *Journal of Health Psychology*, 1–10.  
doi: 10.1177/1359105315595122
- Chan, E., & Ng, I. (2012). Oral care practices among critical care nurses in Singapore: a questionnaire survey. *Applied Nursing Research*, 25, 197–204.  
doi:10.1016/j.apnr.2010.12.002



- Chalmers, J., & Pearson, A. (2005). Oral hygiene care for residents with dementia: a literature review. *Journal of Advanced Nursing*, 52(4), 410–419. Retrieved from <http://www.ncbi.nlm.nih.gov>
- Christenson, S. (2014). Interprofessional education for oral care for cancer patients in dental hygiene and nursing. *EWU Master Thesis Collection*. Paper 261. <http://dc.ewu.edu/thesis>
- Clements, D., Dault, M., & Priest, A. (2007). Effective teamwork in health care: Research and reality. *HealthcarePapers*, 7. doi:10.12927/hcpap.2013.18669
- Clemmens, D., Rodriguez, K., & Leef, B. (2012). Knowledge, attitudes, and practices of Baccalaureate nursing students regarding oral health assessment. *Journal of Nursing Education*, 51(9), 532–535. doi:10.3928/01484834-20120820-01
- Cobban, S. J. (2012). Improving oral health for elderly residents in long-term care. *Proquest Dissertations and Theses*. Retrieved from <http://www.searchproquest.com>
- Coleman, P. (2005). Opportunities for nursing-dental collaboration: Addressing oral health needs among the elderly. *Nurse Outlook*, 53, 33–39. doi:10.1016/j.outlook.2004.06.008
- Coleman, P., Hein, C. & Gurenlian, J. R. (2006). The promise of transdisciplinary nurse-dental hygienist collaboration in achieving health-related quality of life for elderly nursing home residents. *Grand-Rounds Oral-Systemic Medicine*, 3, 4–49
- Coleman, P., & Watson, N. M. (2006). Oral care provided by certified nursing assistants in nursing homes. *The American Geriatric Society*, 54, 138–154.  
doi: 10.1111/j.1532-5415.2005.00565.x
- College of Nurses of Ontario. (2014). *Competencies for entry-level registered nurse practice*. Retrieved from <http://www.cno.org>
- Colleges Ontario. (n.d.). *Dental Hygiene programs at Ontario colleges*. Retrieved from <http://www.collegesontario.org>

- Compton, S. M., Cobban, S. J., & Kline, L. A. (2013). Practicum experience to socialize dental hygiene students into long term care setting. *Canadian Journal of Dental Hygiene* 47(2), 61–70. Retrieved from <http://www.search.proquest.com>
- Coster, S., Norman, I., Murrells, T., Kitchen, S., Meerabeau, E., Sooboodoo, E., & dAvray, L. (2008). Interprofessional attitudes amongst undergraduate students in the health professions: A longitudinal questionnaire survey. *International Journal of Nursing Studies*, 45, 1667–1681. doi: 10.1016/ijnurstu.2008.02.008
- Creswell, J. (2012). *Educational research. Planning, conducting, and evaluating quantitative and qualitative research*. Nebraska: Pearson Education Inc.
- Dahm, T. S., Bruhn, A., & LeMaster, M. (2015). Oral care in the long-term care of older patients: How can the dental hygienist meet the need? *The Journal of Dental Hygiene*, 89(4), 229–237. Retrieved from <http://www.odha.org/jdeh>
- De Visschere, L., de Baat, C., Schols, J. M. G. A., Deschepper, E., & Vanobbergen, J. (2011). Evaluation of the implementation of an ‘oral hygiene protocol’ in nursing homes: A 5 - year longitudinal study. *Community Dentistry and Oral Epidemiology*, 39(5), 416–425. doi:10.1111/j.1600-0528.2011.00610.x
- Derbyshire, J. A., & Machin, A. I. (2011). Learning to work collaboratively: Nurses’ view of their pre-registration interprofessional education and its impact on practice. *Nurse Education in Practice*, 11, 239–244. doi: 10.1016/j.nepr.2010.11.010
- Dharamsi, S., Jivani, K., Dean, C., & Wyatt, C. (2009). Oral care for frail elders: Knowledge, attitudes, and practices of long-term care staff. *Journal of Dental Education*, 73(5), 581–588. Retrieved from <http://www.jdental.org>
- Dolce, M. C., Haber J. & Shelley, D. (2012). Oral health nursing education and practice program. *Nursing Research and Practice*, 2012, 1–5. doi: 10.1155/2012/149673

- Dyck, D., Bertone, M., Knutson, K., & Campbell, A. (2012). Improving oral care practice in long-term care. *Canadian Nurse, 108*(9), 20–24.
- Engel, J., & Prentice, D. (2013). The ethics of interprofessional education. *Nursing Ethics, 24*(4), 426–435. doi: 10.1177/09669733012468466
- Falk, A. L., Hult, H., Hopwood, N., & Dahlgren, M. A. (2013). One size fits all: A student ward as a learning practice for interprofessional development. *Journal of Interprofessional Care, 27*(6), 476–481. doi:10.1091/13561820.2013.807224
- Finkleman, G. (2009). The impact of integration of dental services on oral health in long-term care. *Proquest Dissertations and Theses*. Retrieved from <http://www.searchproquest.com>
- Frenkel, H. F., Harvey, I., & Needs, K. M. (2002). Oral health care and its effect on caregivers' knowledge and attitudes: a randomized controlled trial. *Community Dentistry and Oral Epidemiology, 30*, 91–100. Retrieved from <http://www.journals.2scholarsportal.info>
- Frenkel, H. F., Harvey, I., & Newcombe, R.G. (2001). Improving the oral health in institutionalized elderly people by educating caregivers: a randomized controlled trial. *Community Dentistry and Oral Epidemiology, 29*, 289–297. Retrieved from <http://www.journals.2scholarsportal.info>
- Frenkel, H., Mathews, D. C., & Nitschke, I. (2011). Prevention of oral diseases for a dependent population. In M. MacEntee, F. Muller, & C. Wyatt, (Eds.), *Oral health care and the frail elder: A clinical perspective* (pp. 187–210). U.S.A.: Blackwell Publishing Limited.
- Forsell, M., Sjogren, P., Kullberg, E., Johansson, O. Wedel, P., Herbst, B., & Hoogstraate, J. (2011). Attitudes and perceptions toward oral hygiene tasks among geriatric nursing homes. *International Journal of Dental Hygiene, 9*, 199–203. doi: 10.1111/j.1601-5037.2010.00477.x.

- George Brown College. (2013). *Interprofessional education (IPE) in action*. Retrieved from <http://www.georgebrown.ca>
- Gilbert, J. H. V. (2010). The status of interprofessional education in Canada. *Journal of Allied Health, 39*(3), 216–223. Retrieved from <http://www.media.proquest.com>
- Gil-Montoya, J. A., de Melo, A. L. F., Cardenas, C. B., & Lopez, I. G. (2006). Oral health protocol for the dependent institutionalized elderly. *Geriatric Nursing, 27*(2), 95–101. Retrieved from <http://www.scholars.portal.info>
- Grant, L., McKay, L. K., Rogers, L. G. Weisenthal, S., Cherney, S. L., & Betts, L. A. (2011). An interprofessional education initiative between students of Dental Hygiene and Bachelor of Science in Nursing. *Canadian Journal of Dental Hygiene, 45*(1), 36–44. Retrieved from <http://www.search.proquest.com>
- Gum, L. F., Lloyd, A., Lawn, S., Richards, J. N., Lindemann, I., Sweet, L.,...Bramwell, D. (2013). Developing an interprofessional capability framework for teaching health care students in a primary health care settings. *Journal of Interprofessional Care, 27*(6), 455–460.  
doi: 10.3109/13561820.2013.807777
- Hahn J. E., FitzGerald, L., Markham, Y. K., Glassman, P., & Guenther, N. (2012). Infusing oral health care into nursing curriculum: Addressing preventive health in aging and disability. *Nursing Research and Practice, 2012*, 1–10. doi:10.1155/2012/157874
- Haumschild, M. S., & Haumschild, R. J. (2009). The importance of oral health in long-term care. *American Medical Director's Association, 10*(9), 667–671. Retrieved from <http://www.journals1.scholarsportal.info>
- Hays, R. (2013). Interprofessional education. *The Clinical Teacher, 10* (5), 339–341. Retrieved from <http://www.onlinelibrary.wiley.com>

- HealthForce Ontario. (2009). *Interprofessional education curricula models for health care providers in Ontario*. Retrieved from <http://www.healthforceontario.ca>
- Hein, C., Schonwetter, D. J., & Iacopino, A. M. (2011). Inclusion of oral-systemic health in predoctoral/undergraduate curricula of pharmacy, nursing, and medical schools around the world: A preliminary study. *Journal of Dental Education*, 75(9), 1187–1198. Retrieved from <http://www.jdental.org>
- Hendricson, W. D., & Cohen, P. A. (2001). Oral health care in the 21st century: Implication for dental and medical education. *Academic Medicine*, 67(12), 1181–1206. Retrieved from <http://www.journals.lww.com>
- Henson, H. A. (2005). Parallel professions: Dental hygiene and nursing. *Contemporary Oral Hygiene*.
- Ho, K., Jarvis-Selinger, S., Bourda, F., Hall, P., Handfield-Jones, R., Hardwick, D. F., ...Rouleau, M. (2008). Making interprofessional education work: The strategic role of the academy. *Academic Medicine*, 83(10), 934–940. Retrieved from <http://www.journals.lww.com>
- Hoffman, S. J., Rosenthal, D., & Nasmith, L. (2009). What attracts students to interprofessional education and other health care reform initiatives? *Journal of Allied Health*, 38(3), e75–78. Retrieved from <http://www.ncbi.nlm.nih.gov>
- Honan, L., Fahs, D. B., Talwalkar, J. S., & Kayingo, G. (2015). Interprofessional learning: Perceptions of first year students. *Journal of Nursing Education and Practice*, 5(6), 39–49. doi: 10.5430/jnep.v5n6p39
- Hood, K., Cant, R., Baulch, J., Gilbee, A., Leech, M., Anderson, A., & Davies, K. (2014). Prior experience of interprofessional learning enhances undergraduate nursing and health care students' professional identity and attitudes to teamwork. *Nurse Education in Practice*, 14, 117–122. doi.org/10.1016/j.nepr.2013.07.013

- Howard, R. M. (2010). Survey of oral health knowledge and practice among Mississippi nursing home staff. *Proquest Dissertations and Theses*. Retrieved from <http://www.searchproquest.com>
- Infante, T. D. (2012). Realizing enhanced student interprofessional education through clinical teamwork (RESPECT): An interprofessional education project. *Proquest Dissertations and Theses*. Retrieved from <http://www.searchproquest.com>
- Infante, T. D., Arevalo-Flechas, L. C., Ford, L. A., Partida, M. N., Ketchum, N. S., Pollock, B. H., & Infante, A. J. (2015). Community service learning: An effective vehicle for interprofessional education. *Journal of Research in Interprofessional Practice and Education*, 5(1), 1–11. Retrieved from <http://www.jripe.org>
- Jablonski, R. A. (2012). Oral health and hygiene content in nursing fundamental textbooks. *Nursing Research and Practice*, 2012. doi:10.1155/2012/372617
- Jablonski, R. A., Munro, C. L., Grap, M. J., & Ligon, M. (2009). Measuring the oral health of elders in nursing homes. *Clinical Nursing Research* 18(3), 200–217. doi:10.1077/1054773809335306
- Jablonski, R. A., Munro, C. L., Grap, M. J., Schubert, C. M., Ligon, M., & Spigelmeyer, P. (2009). Mouth care in nursing homes: Knowledge, beliefs, and practices of nursing assistants. *Geriatric Nursing*, 30(2), 99–107. Retrieved from <http://www.journals.elsevier.com>
- Jaecks, K. S., (2009). Current perceptions of the role of dental hygienists in interdisciplinary collaboration. *Journal of Dental Hygiene*, 83(2), 84–91. Retrieved from <http://www.galegroup.com>
- Jiang, C. Y. W. (2012). The implementation of oral health regulation in long-term care facilities. *Proquest Dissertations and Theses*. Retrieved from <http://www.searchproquest.com>

- Kaira, L. S., Srivastava, V., Giri, P., & Chopra, D. (2012). Oral health-related knowledge, attitudes, and practice among nursing students at Rohilkhand Medical College and Hospital: A questionnaire survey. *Journal of Orofacial Research*, 2(10) 20–23.  
doi: 10.5555/jp-journals-10026-1005
- Kearney, A. (2008). Facilitating interprofessional education and practice. (2008). *The Canadian Nurse*, 194(3), 22–26. Retrieved from <http://www.canadiannurse.com>
- King, S., Drummond, J., Hughes, E., Bookhalter, Huffman, D., & Ansell, D. (2013). An inter-institutional collaboration: transforming education through interprofessional simulations. *Journal of Interprofessional Care*, 27(5), 429–431. doi: 10.3109/13561820.2013.791260
- Lapkin, S., Levett-Jones, T., & Gilligan, C. (2013). A systematic review of interprofessional education in health professional programs. *Nurse Education Today*, 33, 90–102.  
doi:10.1016/j.nedt.2011.11.006
- Lasker, R.D., Miller, R., Weiss, E.S. (2001). Promoting collaborations that improve health. *Education for Health*, 14(2), 163–172. Retrieved from <http://www.ebcohost.com>
- Lawlor, S. (2013). Interprofessional practice: Enhancing the dental hygienist's role. *Journal of Dental Hygiene*, 47(1), 11–12. Retrieved from <http://www.search.proquest.com>
- Lawrence, H., & Leake, J. L. (2001). The U. S. General report on oral health in America: A Canadian perspective. *Journal of the Canadian Dental Association*, 67(10), 1–9.
- Le, P. (2011). Efficacy of mouth care education to improve the oral health of residents in long term care homes. *Proquest Dissertations and Theses*. Retrieved from <http://www.searchproquest.com>
- Le, P., Dempster, L., Limebak, H., & Locker D. (2012). Improving residents' oral health through staff education in nursing homes. *Special Care in Dentistry*, 32(6), 242-250. Retrieved from <http://www.journals1.scholarsportal.info>

- Leatt, P., & Porter, J. (2003). Where are the health care leaders? The need for investment in leadership development. *HealthcarePapers*, 4(1), 14–31. doi:10.12927/hcpap.2003.16891
- Lin, Y., Chang, J., Chang, T., & Lou, M. (2011). Critical care nurses' knowledge, attitudes and practice or oral care for patients with oral endotracheal intubations: a questionnaire survey. *Journal of Clinical Nursing*, 20, 3204–3214. doi: 10.1111/j.1365-2702.2011.03819x
- Lindemark, U., Hakeberg, M., Hugoson, M. (2011). Sense of coherence and its relationship with oral health-related behavior and knowledge and attitudes toward oral health. *Community Dentistry and Oral Epidemiology*, 39, 542–553. doi: 10.1111/j.1600-0528.2011.00627.x
- Olson, R. & Bialocerkoski, A. (2014). Interprofessional education in allied health: A systematic review. *Medical Education*, 48(3), 236–246. doi: 10.1111/medu122290
- MacDonald, M. B., Bally, J. M., Ferguson, L. M., Murray, B. L., Fowler-Kerry, S. E., & Anonson, J. M. S. (2010). Knowledge of the professional role of others. *Nurse Education in Practice*, 10, 238–242. doi: 10.1016/j.nepr.2009.11.012
- MacDonald, L., Sutter, E., Lait, J., Law, R., Wener, P., Khalili, H., & McCarthy, P. (2011). Interprofessional collaboration, a community of practice and research capacity building: just how and where to begin for the dental hygienist involved in interprofessional care. *Journal of Dental Hygiene*, 45(3), 65–178. Retrieved from <http://www.searchproquest.com>
- MacEntee, M. (2011). Muted dental voices on interprofessional health care teams. *Journal of Dentistry*, 39(s2), s434–s40. doi:10.1016/j.jdent.2011.10.10.017
- MacEntee, M. I., MacInnis, B., McKeown, L., & Sarrapuchillo T. (2008). Dignity with a Smile. Oral health care for elders in residential care. A report for the federal dental advisory committee. *FDCA Committee Report on Frail Elders*. Retrieved from <http://www.fptdwg.ca>



- MacEntee, M. I., Thorne, S., & Kazanjian, A. (1999). Conflicting priorities: oral health in long-term care. *Special Care in Dentistry*, 19(4), 164–172. Retrieved from <http://www.onlinelibrary.wiley.com>
- MacEntee, M. I., Wyatt, C.C. L., Beattie B. L., Paterson, B., Levy-Milne, R., & McCandless, L.,... et al. (2007). Provision of mouth care in long-term care facilities: an educational trial. *Community Dentistry and Oral Epidemiology*, 53, 25–34. Retrieved from <http://wwwscholarsportal.info>
- MacGiolla, P. C., Guerin S., & Nunn J. (2013). Train the trainer? A randomized controlled trial of a multi-tiered oral health education programme in community-based residential services for adults with intellectual disability. *Community Dentistry Oral Epidemiology*, 41(2), 182–192. doi:10.1111/cdoe.12006
- MacKenzie, D. E., Doucet, S., Nasser, S., Godden-Webster, A. L., Andrews, C., & Kephart, G. (2014). Collaboration behind-the-scenes: key to effective interprofessional education. *Journal of Interprofessional Care*, 28(4), 381–383. doi:10.3109/13561820.2014.890923
- Mason, J. (2010). *Concepts in dental public health*. Maryland: Lippincott Williams & Wilkins.
- Mathews, D. C., Clovis, J. B., Brilliant, G. S., Filiaggi, M. J., McNally, M. E., Kotzeret I,...(2012). Oral health status of long-term care residents—a vulnerable population. *Journal of the Canadian Dental Association*, 78(3), 1–10. Retrieved from <http://www.jcda.ca>
- McAuliffe, A. (2007). Nursing students’ practice in providing oral hygiene for patients. *Nursing Standard*, 21(33), 33–59. doi: <http://dxdoi.org/107748/ns2007.04.21.33.35c4546>
- McGregor, M. J., & Ronald, L. A. (2011). *IRRP. Residential long-term care for Canadian seniors: Nonprofit, for profit or does it matter?* Retrieved from <http://www.irrp.org>
- McHarg, J. & Kay, E. J. (2009). Designing a dental curriculum for the twenty-first century. *British Dental Journal*, 207(10), 493–497. doi: 10.1038/sj.bdj.2009.1011

McIntyre, M., & McDonald, C. (2014). *Realities of Canadian Nursing*. Philadelphia, PA.:

Lippincott Williams, & Wilkins.

McNally, M., Martin-Misener, R., Wyatt, C. C. L., McNeil, K.P., Crowell, S. J., Matthews, D. C.,

& Clovis, J. B. (2012). Action planning for daily mouth care in long-term care: the

brushing up on the mouth care project. *Nursing Research and Practice*, 2012, 1–11.

Retrieved from <http://www.ncbi.nih.gov>

Miguel, K., & Watchel, T. (2009). Improving the oral health of older people in long-term

residential care: a review of the literature. *International Journal of Older People Nursing*,

4(2), 97–113. Retrieved from <http://www.wileyonline.library.com>

Monajem, S. (2005). Integration of oral health into primary care: the role of dental hygienists and

the WHO stewardship. *International Journal of Dental Hygiene*, 4, 47–5. Retrieved from

<http://www.3interscience.com>

Nitschke, I., Majdani, M., Sobotta, B. A. J., Reiber, T., & Hopfenmuller, W. (2010). Dental care

of frail older people and those caring for them. *Journal of Clinical Nursing*, 19, 1882-

1890. Retrieved from <http://www.onlinelibrary.wiley.com>

Pardue, K. T. (2013). Not left to chance: Introducing an undergraduate interprofessional

education curriculum. *Journal of Interprofessional Care*, 27, 98–100.

doi: 10.3109/13561820.2012.721815

Preston, A. J., Kearns, A., Barber, M. W., & Gosney, M. A. (2006). The knowledge of

health care professionals regarding elderly persons' oral care. *British Dental Journal*,

201(5), 293–295. Retrieved from <http://www.nature.com>

Pudwell, K. (2013). *Oral education for nursing home staff: minimum data set 3.0*. Retrieved from

<http://www.de.ewu.edu/theseses>

Rantanen, M., Johansson, K., Honkala, E., Leino-Kilpi, H., Saarinen, M., & Salantera, S. (2009).

Dental patient education: a survey from the perspective of dental hygienists. *International Journal of Dental Hygiene*, 8(2), 121–127. doi: 10.1111/j.1601-5037.2009.00403.x

Registered Nurses' Association of Ontario. (2008). *Oral health: Nursing assessment and interventions*. Toronto: Author.

Registered Nurses' Association of Ontario. (n.d.). *Long-term care best practice toolkit*. Retrieved from <http://www.rnao.ca>

Reeves, S. (2009). An overview of interprofessional education. *Journal of Continuing Education in the Health Professions*, 29(3), 142–146. Retrieved from <http://www.scholar.google.ca>

Robben, S., Perry, M., van Nieuwenhuijzen, L., van Achterberg, T., Rikkert, M. O., Schers, H.,...Melis, R. (2012). Impact of interprofessional education on collaboration, attitudes, skills, and behavior among primary care professionals. *Journal of Continuing Education in the Health Professions*, 32(3), 196–204. doi:10.1002/chp.21145

Rwakatema, D. S., Ananduni, K. N., Katiti, V. W., Msuya, M., Chugulu, J., and Kapanda, G. (2015). Oral health in nursing students at Kilimanjaro Christian Medical Centre teaching hospital in Moshi, Tanzania. *BMC Oral Health*, 15(23), 1–9. doi: 10.1186/s12903-015-0008-8

Ryerson University. (2014). *Other IPE centre's, offices and initiatives*. Retrieved from <http://www.ryerson.ca/ipe/Links.html>

Samson, H., Berven, L. & Strand, G. V. (2009). Long-term effect of an oral health care programme on oral hygiene in a nursing home. *European Journal of Oral Science*, 117, 575–579. doi: 10.1111/j.1600-0722.2009.00673.x.

Samson, H., Iverson, M. M., & Strand, G. V. (2010). Oral care training in the basic education of care professionals. *Gerodontology*, 27, 121–128. doi:10.1111/j.1741-2358.2009.00304.x

- Sharbatti, S. A., Sadek, M., Sreedharan, J., & Muttappalluymyalil, J. (2013). Nurses' knowledge of oral health among old people in Ajman, United Arab Emirates. *Asian Journal of Gerontology & Geriatrics*, 8(2), 1–6. Retrieved from <http://www.ajgg.org>
- Shekter-Wofson, L. (2007). Interprofessional education: A college perspective. *Health Care Quarterly*, 10(4), 8–9. Retrieved from <http://www.longwoods.com>
- Simons, D., Baker, P., Jones, B., Kidd, E.A.M., & Beighton, D. (2000). An evaluation of an oral health training programme for carers of the elderly in residential care. *British Dental Journal*, 188(4). Retrieved from <http://www.nature.com>
- Sims-Gould, J., Brondani, M.A., Bryant, S. R., & MacEntee, M. I. (2011). Theories and significance of oral health in frailty. In M. I. MacEntee, F. Muller, & C. Wyatt, (Eds.), *Oral health care and the frail elder: A clinical perspective*. U.S.A.: Blackwell Publishing Limited.
- Sommerfeldt, S. C. (2013). Articulating nursing in an interprofessional world. *Nurse Education in Practice*, 13, 519–523. Retrieved from <http://www.dx.doi.org/1016/j.nepr.2013.02.014>
- Statistics Canada. (2011). *Population estimate, age distribution and median age as of July 1, 2011, Canada, provinces and territories*. Retrieved from <http://www.statcan.gc.ca>
- Stein, P. S., & Henry, R. G. (2009). Poor oral hygiene in long-term care. *American Journal of Nursing*, 109(6), 44–50. doi: 10.1097/01.NAJ.0000352472.70993.3b
- Stewart, S., L. (2013). Daily oral hygiene in residential care facilities. *Canadian Journal of Dental Hygiene*, 47(1), 25–30. Retrieved from <http://www.searchproquest.com>
- Tepper, L. M. (2008). Educating the dental profession. In I. B. Lamster & M. E. Northridge (Eds.), *Improving oral health for the elderly. An interdisciplinary approach* (pp. 55–75). New York: Springer.

- Thema, L. K. & Singh, S. (2013). Integrated primary oral health services in South Africa: the role of the PHC nurse in providing oral health examination and education. *African Journal of Promotion of Health Care*, 5(1), 1–4. doi: <http://dx.doi.org/104102/phcfm.v51.413>
- Thistlethwaite, J. (2012). Interprofessional education: a review of context, learning and the research agenda. *Medical Education*, 46, 58–70. doi: 10.1111./j.1365-2923.2011.04143.x
- Thompson, W. M. (2014). Epidemiology of oral health conditions in older people. *Gerodontology*, 31(S1), 9–16. doi: 10.1111.ger.12085
- Treasury Board of Canada. (1991). *Program evaluation methods*.  
Retrieved from <http://www.tbs-sct.gc.ca>
- Tse, A. M., Iwaishi, L. K., King, C. A., & Harrigan, R. C. (2006). A collaborative approach to developing a validated competence-based curriculum for health professions. *Education for Health*, 19(3), 331–334. doi: 10.1080/13576280600938307
- Tzountzouris, J. P., & Gilbert, J. H. V. (2009). Role of educational institutions in identifying and responding to emerging health human resources needs. *Healthcare Papers*, 9(2), 6–19.  
Retrieved from <http://www.longwoods.com>
- Van der Putten, G., de Visschere, L., de Baat, C., & Vanobbergen, J. (2010). Supervised versus non-supervised implementation of an oral health care guideline in residential care home: a cluster randomized controlled clinical trial. *BMC Oral Health*, 10(17), 10–17. doi: 10.1186/1472-6831-10-17.
- Wang, R., Shi, N., Bai, J., Zheng, Y., & Zhao, Y. (2015). Implementation and evaluation of an interprofessional simulation-based education program for undergraduate nursing students in operating room nursing education: a randomized controlled trial. *Medical Education*, 1–7. doi: 10.1186/s12909-015-0400-8

- Wårdh, I. (2002). *Oral health care in nursing: Attitudes, priorities and education*. Thesis. Faculty of Odontology. Sweden: The Sahlgrenska Academy at Göteborg University.
- Wårdh, I., Andersson, L., & Sörensen, S. (1997). Staff attitudes to oral health care. A comparative study of registered nurses, nursing assistants and home care aids. *Gerodontology, 14*(1), 28–32.
- Wårdh, I., Jonsson, & Wilström (2012). Attitudes to and knowledge about oral health care among nursing personnel – an area in need of improvement. *Gerodontology, 29*, e787–e792. Retrieved from <http://www.interscience.wiley.com>
- Weening-Verbree, L., Huisman-de-Waal, G., van Dusseldorp, L., van Achterberg, T., & Schoonhoven, L. (2013). Oral health care in older people in long term care facilities: A systematic review of implementation strategies. *International Journal of Nursing, 50*, 569–582. Retrieved from <http://www.scholarsportal.info>
- Wilder, R. S., O'Donnell, J. A., Barry, M., Galli, D. M., Hakin, F. F., Holyfield, L. J., & Robbins, M. R. (2008). Is dentistry at risk? A case for interprofessional education. *Journal of Dental Education, 72*(11), 1231–1237. Retrieved from <http://www.journaled.org>
- Wilhelmsson, M., Svensson, A., Timpka, T., & Faresjo, T. (2013). Nurses' views of interprofessional education and collaboration: A comparative study of recent graduates from three universities. *Journal of Interprofessional Care, 27*, 115–160. doi: 103109/13561820.2012.711787
- Wilkins, E. M. (2009). *Clinical Practice of the Dental Hygienist*. Baltimore: Lippincott.
- Williams, B., & Webb, V. (2015). A national study of paramedics and nursing students' readiness for interprofessional learning (IPL): Results from nine universities. *Nurse Education Today, e31–e37*. doi: <http://dx.doi.org/10.1016/j.nedt.2015.05.007>

- World Health Organization. (2010). *Framework for action on interprofessional education & collaborative practice*. Geneva: World Health Organization. Retrieved from <http://www.who.int>
- World Health Organization (2013). *Transformative scale up of health professional education*. Geneva: World Health Organization. Retrieved from [http://whqlibdoc.who.int/hq/2011/WHO\\_HSS\\_HRH\\_HEP2011.01\\_eng.pdf?ua=1](http://whqlibdoc.who.int/hq/2011/WHO_HSS_HRH_HEP2011.01_eng.pdf?ua=1)
- Yakiwchuk, C. (2013). A multi strategy approach for RDHs to champion change in long term care. *Canadian Journal of Dental Hygiene*, 47(2), 84–88. Retrieved from <http://www.searchproquest.com>
- Yellowitz, J. A. (2008). Access, place of residence and interdisciplinary opportunities. In I. B. Lamster & M. E. Northridge (Eds.), *Improving oral health for the elderly. An interdisciplinary approach* (pp. 55-75). New York: Springer.
- Yellowitz, J., & Schneiderman, M. T. (2014). Elder's oral health crisis. *Journal of Evidence Based Dental Practice*, 14S. doi: 10.1016/j.jebdp.2014.04.011
- Yeung, K. Y., & Chui, Y. Y. (2010). An exploration of factor affecting Hong Kong ICU nurses in providing oral care. *Journal of Clinical Nursing*, 18, 3063–3072.  
doi: 10.1111/j.1365-2702.2010.0334.x
- Zwarenstein, M., Goldman, J., & Reeves, S. (2009). Interprofessional collaboration: effects of practice-based interventions on professional practice and health care outcomes. *Cochrane Database Systematic Reviews*. 8(3), Article Number: CD000072.



## Appendix A: Introductory Letter

November 24, 2015

Dear Nursing Student,

My name is Mary, and I am a student at Central Michigan University in the Master of Arts in Education program. The last course of my program is Issues in Education, and the course requires me to complete a Capstone research project. The purpose of my research is to investigate the BSCN students' knowledge, attitudes, and perceptions toward collaborative oral healthcare education. Questionnaires have been designed for this purpose. I will conduct this research by inviting you to participate in the study by completing the paper-based questionnaires. Your responses will remain anonymous and confidential. All of the responses will be reported as a whole and not individually.

The first questionnaire has four questions relating to your education and two questions relating to your own oral health practices. The second questionnaire consists of 30 questions: 10 relate to oral health knowledge, 10 relate to oral health attitudes and perceptions and 10 relate to attitudes and perceptions toward interprofessional education. The questions will consist of multiple choice, true or false, and Likert-type questions (*strongly agree to strongly disagree*). The questionnaires will take approximately 20 minutes to complete.

This is a sample of a true or false question:

**Please circle your answer**

1. Oral health is related to general health.....True      False

The questionnaires will be administered on November 14, 2015 in room 402. The first group of participants will complete the questionnaires at 11:00 a.m. and the second group of participants will complete the questionnaires at 2:00 p.m.

If you decide to participate in the study, on November 14, you will read and sign the consent form and place it in the enclosed self-adhesive envelope. Next, you will complete the demographic data form and the questionnaires. Upon their completion, you will seal them in a self-adhesive envelope. The researcher will collect the sealed envelopes.

There is no known harm or risk for participating in the study except for loss of class time. Individual participants may benefit by reflecting on one's attitude and perceptions regarding collaborative oral health care education and delivery. As a token of appreciation for your participation, you will receive a \$10 Tim Card® on the day the questionnaires are administered.

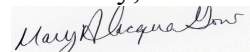
Please contact the faculty advisor or me if you have any questions. You are free to refuse to participate in this research project or to withdraw your consent and discontinue participation in the project at any time. Your participation will not affect your relationship with the institutions involved in this project. If you are not satisfied with the manner in which this study is being



conducted, you may report (anonymously if you so choose) any complaint to Jahzara Mayes Otoo at Central Michigan University MA in Education program at 899-774-3784 or send an email to [mayes1de@cmich.edu](mailto:mayes1de@cmich.edu). You can also address concerns with the Faculty Advisor, Michael Stacey, at 413-207-5299 or send an email to [stace1mj@cmich.edu](mailto:stace1mj@cmich.edu)

Thank you very much in advance for your consideration. Your support is greatly appreciated.

Sincerely,



Mary Alacqua Gow

416-993-0539 or [alacq1m@cmich.edu](mailto:alacq1m@cmich.edu)



Appendix B: Consent Form: Deleted as REB said it is not needed

I, \_\_\_\_\_, consent to participate in the study to evaluate nursing students oral health knowledge, perceptions and attitudes toward oral healthcare and interprofessional education after attending an interprofessional education program.

I understand that I am under no obligation to participate in the study. My participation is voluntary and I can withdraw at any time during the study. However, because of the anonymous nature of the questionnaires it will not be possible to remove your data once submitted. All data collected will be kept confidential. There will be no identifiable data collected. Collected data will be kept secure in a locked briefcase and available only to Dr. Stacey and the researcher. I understand that data will be reported as group data only. Once data analysis is complete, and with the faculty’s advisor’s approval, all surveys will be shredded. I understand that I can request a copy of the study’s findings.

I understand that it will take 15 to 20 minutes of my time to answer questions regarding oral health knowledge, attitudes, and perceptions toward oral health and interprofessional education after attending an interprofessional education workshop with dental hygiene students.

I understand that there is no known harm or risk for participating in the study except for loss of class time. Participants may benefit by reflecting on their attitudes and perceptions regarding collaborative oral healthcare education and delivery. My participation may benefit students who will participate in interprofessional education programs and the administrators who design the programs.

I understand that there is no financial compensation for participating in the study. I will receive a \$10 Tim Card® as a token of appreciation for my participation in the study on the day the questionnaires are administered.

I understand the details of the study, as they have been fully explained to me. I may request information about the study at any time.

\_\_\_\_\_  
(print your name)

\_\_\_\_\_  
(sign your name)

Date \_\_\_\_\_



### Appendix C: Education and Oral Health Data

1. Are you enrolled in the Bachelor of Science in Nursing Program at George Brown College?

Yes                       No

2. What year of your program are you in?

First                                       Second

3. Did you participate in an interprofessional oral healthcare education session with dental hygiene students?

Yes                       No

4. Have you had previous Interprofessional education experience in other courses or programs?

Yes                       No

If yes, please  
explain \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**For questions 5 and 6, please tell me about your own oral health care and practices. Please select all that apply.**

5. What is your usual pattern of visiting the dentist?

I have a regular check up once a year or more

I feel something is starting to bother me

When a filling/tooth brakes off

When I have a toothache

Other (Please  
specify) \_\_\_\_\_

—

6. I have

All my own teeth (can include crowns, bridges, and implants)

My own teeth and denture(s)

Complete Dentures

Other (Please specify) \_\_\_\_\_



## Appendix D: PART A–Oral Health Care Knowledge Test

Please circle your answer

1. A mouth swab is a good alternative to a toothbrush for cleaning clients' teeth... **True**      **False**
2. It is natural for healthy gums to bleed when brushed with a toothbrush..... **True**      **False**
3. In general, research confirms that poor oral health conditions can have an affect on an individual's general health and quality of life..... **True**      **False**
4. Soaking dentures in water with a denture tablet is an ideal way to ensure dentures are clean..... **True**      **False**
5. Plaque and tartar do not form on dentures because they are made of acrylic..... **True**      **False**
6. It is natural to lose your teeth as you get older..... **True**      **False**
  
7. The **BEST** way to remove plaque and debris from a resident's mouth and tooth surfaces is
  - a) rinse the mouth with an over-the-counter mouthwash
  - b) brush the teeth using a toothbrush and toothpaste
  - c) brush the teeth using a foam-tipped swab (toothette)
  - d) rinse the mouth with an over-the-counter mouthwash for at least 10 minutes
  
8. Persons with no teeth...
  - a) require daily mouth cleaning and denture cleaning
  - b) require mouth cleaning only once a week
  - c) do not require mouth cleaning, since they have no teeth
  - d) only require mouth cleaning before family visiting time
  
9. The **BEST** way to treat "dry mouth" is to
  - a) provide frequent sips of juice to moisten the mouth
  - b) provide frequent sip of water to moisten the mouth
  - c) give the patient a sugar candy to put in his/her mouth
  - d) use lemon or glycerin swabs
  
10. It has been found that clients/patients with dementia have
  - a) decreased saliva flow
  - b) greater accumulation of biofilm on teeth and dentures
  - c) increased care responsive behaviour during oral care provision
  - d) higher levels of dental caries, missing teeth, and periodontal disease
  - e) (a) and (c)
  - f) (b) and (c)

(g) all of the above



### Appendix D: PART B—Attitudes and Perceptions Toward Oral Health

Please indicate how strongly you agree or disagree with the statements by ticking the box that most closely reflects your own feelings about oral care provision for older adult clients.

*Please tick one box  in each row*

	Questions	Strongly Agree	Agree	Disagree	Strongly Disagree
1.	Seeing as most old people lose their teeth, brushing is not as important for them as for younger people				
2.	I will perform ongoing regular oral health assessments on my patients				
3.	I am accountable for the oral care delivered by unregulated health care providers (personal support workers)				
4.	If I am really busy, my patients do not mind not getting their mouths cleaned				
5.	It is my responsibility to ensure patients' daily oral hygiene care and assessments are performed and documented				
6.	I feel more comfortable brushing a client's mouth than I do with most other kinds of personal care				
7.	I have the knowledge and skills required to perform an oral health assessment on my patients				
8.	If a patient does not cooperate during oral care, I do not perform oral care				
9.	Providing oral care to my patients is as important as all other care I give my clients/patients				
10.	If clients/patients' gums bleed, I feel I should probably stop brushing their teeth altogether				



### Appendix D: PART C—Attitudes Toward Interprofessional Education

Please indicate how strongly you agree or disagree with the statements by ticking the box that most closely reflects your own feelings after participating in an interprofessional education (IPE) program

*Please tick one box  in each row*

	Questions	Strongly Agree	Agree	Disagree	Strongly Disagree
1.	Students from different health professions should have educational and clinical experience to prepare them for patient care after graduation				
2.	Working with other health profession students got in the way of my own learning				
3.	It is important for students in health professions to understand each other's skills, roles, and responsibilities in patient care				
4.	IPE better prepared me to perform an oral health assessment on my clients/patient when I graduate				
5.	IPE better prepared me to perform oral hygiene care on my clients/patients when I graduate				
6.	IPE will help me to become part of the oral health care team in my workplace				
7.	IPE helped me to communicate the oral health concerns of my patients to other health care providers				
8.	IPE helped me to develop rapport and trust with dental hygiene students				
9.	IPE helped me to learn how to contribute to collective decision making				
10.	Participating in an IPE program increased my overall oral health care knowledge				