

EXPLORING DENTAL STUDENT ATTITUDES TOWARD DENTIST-PATIENT
COMMUNICATION SKILLS LEARNING:
A MIXED METHODS APPROACH

by

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ABSTRACT

RATIONALE: Dentists' communication skills (CS) are linked to patient oral health outcomes. Communication skills learning (CSL) in dental education includes the formal and informal experiences that strengthen the CS of dentists. The present study sought to provide detailed accounts of dental student attitudes toward CSL in order to inform optimized CSL components and therefore offer upstream opportunities to promote patient health. **METHODS:** This mixed methods study employed three phases of data collection. A quantitative questionnaire adapted from the Dental Communication Skills Attitude Scale, along with qualitative survey questions was completed by dental students in one school (n=124). A subsample (n=13) of respondents later participated in qualitative interviews. A principal components analysis and analysis of variance were applied to the questionnaire data. Thematic analysis was conducted for the survey and interview data, respectively. All three datasets were later triangulated. **RESULTS:** Participants felt positively about their CSL, with differences based on year of study, gender, and ethnic/racial identity reported. Participants reported viewing CS as integral to practicing dentistry, succeeding in business, and having strong patient relationships. Participants had diverse ideas regarding how CSL should be implemented. **CONCLUSION:** Incorporating student needs and accommodating the competing demands of dental education in design and delivery of CSL activities shows promise for improving the CS of future dentists.

Keywords: dentist-patient communication, provider-patient relations, dental education, communication skills, student attitudes, oral health

LIST OF ABBREVIATIONS USED

ADCSAS – Adapted Dental Communication Skills Attitude Scale

ANOVA – Analysis of Variance

CS – Communication Skills

CSAS – Communication Skills Attitude Scale

CSL – Communication Skills Learning

DCSAS – Dental Communication Skills Attitude Scale

DDS – Doctor of Dental Surgery

GLM – General Linear Model

PCA – Principal Component Analysis

QP – Qualifying Program

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CHAPTER I: INTRODUCTION

The importance of communication in dental practice is becoming increasingly recognized for its role in promoting oral health (Gonzalez, Abu Kasim, & Naimie, 2013). Effective dentist communication skills (CS) are associated with improvements in the satisfaction and health outcomes of dental patients (Sondell, Söderfeldt, & Palmqvist, 2003). Communication skills learning (CSL) in dental education is effective at improving the CS of dental students (Haak et al., 2008). Studying student attitudes toward communication skills learning (CSL) and the training that imparts these skills is important for understanding how CS can be improved in future dentists (Nor, Yusof, & Shahidan, 2011). However, few studies have explored the attitudes of dental students specifically and none to date have taken a mixed methods approach or studied a Canadian dental school. To address these gaps, the current study undertook a pragmatic, mixed methods approach to exploring the attitudes of dental students toward CSL.

I) Problem Statement

Oral health affects entire populations. In Canada, 96% of adults have at least one missing, filled, or decaying tooth (Health Canada, 2010). Oral health concerns are also observed in 57% of Canadian children and can have serious implications for their quality of life (Health Canada, 2010; Piovesan et al., 2010). Indeed, surgical treatment of dental disease is among the most frequently-performed procedure in Canadian children (Schroth & Morey, 2007).

Oral health status can have impacts that reach far beyond the mouth. Oral disease is often associated with pain, which can prevent healthy eating and proper hygiene practices (Rozier & Pahel, 2008). Poor oral health can also be associated with difficulty speaking or breathing, and can hinder self-esteem or contribute to social isolation (Bennadi & Reddy, 2013). Periodontal disease while pregnant can have negative impacts on pregnancy outcomes (Xiong et al., 2006), such as low infant birthweight (Ide & Papapanou, 2013). In addition, oral disease has been linked to a diverse array of serious infections, chronic illnesses, and other health concerns, such as pneumonia (van der Maarel-Wierink et al., 2013), dementia (Noble, Scarmeas, & Papapanou, 2013), diabetes (Cinar, Oktay, & Schou, 2013), cardiovascular disease (Najafipour et al., 2013), and otitis media (Tapiainen et al., 2014).

Vulnerable and marginalized populations are disproportionately affected by dental disease (Adelson, 2005; Sgan-Cohen et al., 2013). While costs associated with accessing a dentist account for some of these disparities, many individuals experiencing poverty or marginalization still visit dental professionals wherever possible (Health Canada, 2010). As well, public health initiatives are underway to promote more equitable access to professional dental treatment (Mathu-Muju et al., 2016). Because access can be limited, it is critical that the effectiveness of dental visits and treatments be optimized (Yamalik, 2005).

Improving the CS of dentists offers cost-effective opportunities for health promotion by improving dentist-patient interactions and patient-centered care (Sondell et al., 2003). Communication skills can have a beneficial impact on patient health in a

variety of ways, such as by promoting patient understanding or treatment compliance (Street, 2013). For these reasons, the Association of Canadian Faculties of Dentistry has included communication as one of five key competencies for beginning general dentists (Association of Canadian Faculties of Dentistry, 2016). Therefore, promoting improvements in the CS of dentists is warranted.

II) Key Concepts

Communication Skills (CS). In the context of dentist-patient interactions, CS refers to the abilities of the dentist to interact with patients in ways that respect their values and experiences during the dentist-patient interaction (Feldman-Stewart et al., 2005). Verbal CS will be discussed in the current study as they are critical to tasks in the dentist-patient interaction such as ensuring informed consent and history-taking (Sondell, Soderfeldt, & Palmqvist, 2002). As in other patient-professional interactions, there are numerous important factors to consider in dentist-patient communication. Some of these are presented below:

Fear and Phobia. Dental examinations and treatments are associated with a high prevalence of patient anxiety and phobia, including a specific fear of dental pain (Hmud & Walsh, 2009). Dental phobic patients may be avoidant of proper oral health care (Kulich et al., 2000). Such patients must be treated and supported in an effective way by their dentists when they do seek treatment in order to manage this fear and promote their health (Kulich et al., 2000).

Delivery of Bad News. Dentists must be capable of delivering bad news to patients, such as the presence of oral cancers, or the need for treatment such as extractions or surgeries. Dentists must be able to prepare, explain, and review the reasons for this news with the patient in a way that is sensitive of patient concerns and needs (Newton & Fiske, 1999).

Cultural Safety. Dentists must be able to care for patients from diverse backgrounds in a way that respects cultural differences and is cognisant of patient needs. Dentists may also have to communicate with interpreters or family members of patients who do not speak their language and dentists must be able to present information in a clear and culturally respectful way (Rowland, 2008).

Trauma-Informed Care. Patients with a history of trauma, such as military involvement, sexual abuse, or neglect, are at an increased risk of having poor oral health (Raja et al., 2014). Dentists must be able to discuss the patient's oral health needs in a way that is sensitive to their experience and does not reinforce trauma or impart blame on the patient for their oral health status (Raja et al., 2014).

Age and Ability-Sensitive Care. Dentists must be able to care for patients of different ages and cognitive or physical abilities. Children, for example, frequently experience fear of dental interactions and treatments and must be managed in a way that encourages trust in their dentist (Nash, 2006). This is particularly important in the case of very young children or children who are deaf (San Bernardino et al., 2007). It is also

critical for children who experience developmental disabilities, as they tend to have poorer oral health than children without disabilities (Kleinert et al., 2007).

Communication Skills Learning (CSL). Learning CS in dental school incorporates both formal and informal curricular content and experiences (Hannah, Millichamp, & Ayers, 2004). CSL can be divided into two sources: *informal* CSL (often imparted through the social environment, or *informal curriculum* of a dental school), and *formal* CSL (eg. didactic components). CSL is highly variable among schools, with some having full courses devoted to CS and others favoring more informal CSL activities and experiences in their programs (Yoshida, Milgrom, & Coldwell, 2002). A systematic review of CSL programs found that both experiential and didactic, lecture-based methods are commonly used in dental schools (Carey, Madill, & Manogue, 2010). An example of an experiential CSL method involves creating simulated patient scenarios in which student CS and technical abilities are measured (Broder & Janal, 2006). Other methods include presentations, discussions, role-playing, or video-taped interactions with patients (Ahsin, Shahid, & Gondal, 2013; Alomairah, 2013). Interprofessional CSL between dentists and dental hygienists or physicians is also becoming more common (Lanning, Ranson, & Willett, 2008). Less common methods, such as structured student debates, have also seen success in improving student CS (Darby, 2007).

Student Attitudes. As the primary construct being studied in the current project, student attitudes refer to the beliefs and perceptions held by dental students toward their learning, including their opinions of its value, benefit to future practice, and satisfaction (Rees,

Sheard, & Davies, 2002). Attitudes may also include a description of motivators behind these beliefs.

Consulting students is an important process for several reasons (Marsh & Roche, 1993). Learning styles and concerns of students can be best captured by exploring their own attitudes and perspectives regarding their learning (Watchel, 1998). This exploration provides instructors with a means of tailoring curricular content and teaching strategies to best fit student needs. As well, dental students' attitudes are likely to be reflective of the behaviours they use in clinic (Laurence et al., 2012). Instructors can compare observed and desired attitudes to identify potential gaps in the learning and teaching process (Stukalina, 2012). Therefore, while student attitudes may not always agree with educational best practices (Marsh & Roche, 1993), they remain an invaluable source of information to promote optimal curricular development.

Patient Health Outcomes. In dentistry, patient health outcomes include measures such as satisfaction, adherence to dental treatments, and levels of stress, pain, and healing (Rouse & Hamilton, 1990; Sinha, Nanda, & McNeil, 1996; Sondell, Soderfeldt, & Palmqvist, 2002). These measures have been linked to general health and have been shown to improve in response to effective dentist CS (Yamalick, 2005).

III) Research Aims and Questions

The present study had several aims. The primary aim was to study attitudes toward CSL in dental students specifically, as the vast majority of the literature regarding CSL has examined medical school contexts (Laurence et al., 2012). The second aim was to

study attitudes toward CSL in a Canadian dental school, as evidence regarding Canadian environments is minimal in the literature. The third aim was to provide a mixed methods account of student attitudes toward CSL, as most evidence to date is solely quantitative in nature.

In line with the above aims, four research questions were designed to reflect the mixed-methods nature of the study (Creswell, 2013; Ivankova, Creswell, & Stick, 2006). The first two questions were addressed by the quantitative phase of the study (see Chapter IV). The third question was examined through two qualitative approaches (see Chapters V and VI). The final, overarching question was addressed by the resulting mixed methods triangulation of these three phases (see Chapter VI). As recommended by Creswell, the methods used in each phase were listed in the blended, mixed methods question (Creswell, 2013):

1. *How do dental students rate their attitudes toward communication skills learning?*
2. *Do the attitudes of dental students toward communication skills learning differ significantly among different demographic groups?*
3. *What are the beliefs and attitudes of students toward the process of learning to communicate in dental school?*
4. *Based on quantitative questionnaires and qualitative surveys and interviews, what are dental students' attitudes toward communication skills learning?*

As will be discussed further in Chapter II, women-identified students have tended to rate their attitudes toward CSL more positively than men-identified students (Nor et al.,

2011). In addition, students in earlier years of study who have had less clinical experience have been found to have more positive attitudes toward CSL (McKenzie, 2014). Therefore, these trends were hypothesized to be applicable to quantitative findings in the current study.

CHAPTER II: LITERATURE REVIEW

I) The Impact of Dentist Communication Skills (CS) on Health Outcomes

Strong clinician CS are essential for patient satisfaction (Hannah et al., 2004). A study of dental patient narratives illustrated that their satisfaction was critically tied to their dentist's communication of empathy, rapport, and understanding of pain and anxiety (Raja et al., 2015a). Dentists who are strong communicators have also been found to have fewer patient complaints, feelings of upset or frustration, or malpractice accusations (Mellor & Milgrom, 1995). For these reasons, clinician CS have come to be seen as a "main ingredient" in healthcare (Ong et al., 1995) and have been recommended as a core competency by several governing bodies of dentists (Plasschaert et al., 2005). This suggests that better dentist CS are associated with better patient satisfaction and perceived performance of their dentists.

In addition to patient satisfaction and experience, patient-centered communication is correlated with significant improvements in clinical patient health indicators (Oates, Weston, & Jordan, 2000). In a review of the medical literature, effective CS of physicians were linked to better control of pain, reduced blood pressure and blood sugar, improved mobility, relief of symptoms, and emotional health of patients (Stewart, 1995). Positive and empathetic CS also appear to be correlated with a reduction in complications associated with diseases such as diabetes (Del Canale et al., 2012). These findings have been observed in both medical and dental contexts (Rouse & Hamilton, 1990; Sinha et al., 1996; Sondell et al., 2003).

Several mechanisms have been proposed to explain the link between clinician CS and patient health outcomes. A systematic review found that physician CS which reflect supportive, patient-centered, and positive reinforcement-based approaches are associated with increased patient understanding and adherence to treatments, which may lead to improved health indicators (Beck, Daughtridge, & Sloane, 2002). One systematic review demonstrated that empathy in communication can support patient enablement and stress reduction, which could assist patients in taking control over their health-related behaviours (Derksen, Bensing, & Lagro-Janssen, 2013). This increased patient autonomy is a significant goal in health promotion. An additional review noted that strong clinical CS are able to alleviate stress and anxiety, which also positively impacts patient health and wellbeing (Street, 2013).

Taken together, research suggests that dentist CS are critical to supporting patient health outcomes, both for oral and general health. More recent studies have therefore recommended educating students in various communication topics, including how to deliver bad news or how to discuss patient uncertainty and concerns (Klitzman, 2006). An examination of the ways in which CS are imparted is therefore of benefit.

II) Improving Dental Student CS through Communication Skills Learning (CSL)

Experiencing CSL Improves Dental Student CS. Several studies have demonstrated that experiencing CSL components improves the CS of dental students. One study of a simulated patient module found that CS were improved and retained at follow-up one year later (Broder et al., 2015). Similarly, a pre- and post-test cohort study of dental students demonstrated significant improvements in student interpersonal skills, as

measured by trained observers, following a 35-hour training course (Hottel & Hardigan, 2005). Raja and colleagues found that a module concerning how to interact with patients who have experienced trauma improved student understanding of how to address these patient experiences and slightly improved confidence in their ability to do so (Raja et al., 2015b). Riga & Kossioni similarly found that a CSL module in body language and expression was linked to improved student self-reported CS (Riga & Kossioni, 2014). Finally, a study by Van der Molen and colleagues demonstrated that CSL had a significant impact on the behaviours of dental students, in addition to the self-reported confidence and understanding (Van der Molen, Klaver, & Duyx, 2004). Few studies in dental education literature have noted that CSL did not impact dental students positively in some way, however one such study was examining dental student attitudes toward CSL rather than their CS-related behaviours (McKenzie, 2014).

Two notable observations can be seen in the above literature. The first is that student self-reports are often used in assessing effects of CSL. The second is that the frequent use of pre-post, quantitative designs may have difficulty accounting for the effects of informal elements in the dental curriculum that might contribute to improvements in dental student CS. Two randomized controlled trials in dental schools were able to partially address the former concern. One trial found that students who participated in a role-play and case analysis workshop series had significantly better CS during real-patient interviews as measured by trained external observers than control students (Haak et al., 2008). Another randomized controlled trial examined the effectiveness of a newly-developed, five-session CSL component (Sangappa & Tekian, 2013). Ninety students in one university were assigned to either an experimental group

who received the CSL component or a control group who did not. Double-blind, calibrated observers measured the CS of students as they interacted with two real patients prior to and following the CSL component. The groups did not differ at pre-test but differed quite significantly following the module (Sangappa & Tekian, 2013). These randomized controlled trials were able to provide strong evidence that CSL is beneficial for dental students.

The Need to Develop CSL in Dental School. CSL is increasingly considered to be a critical component of the dental school curriculum (White, Krüger, & Snyman, 2008). This has been reflected in the inclusion of communication as one of the core competencies described by the Association of Canadian Faculties of Dentistry (Association of Canadian Faculties of Dentistry, 2016). Communication has also been named among the core competencies set out by the American Dental Education Association and other professional bodies, indicating recognition of its importance (American Dental Education Association, 2008).

As described above, most studies of CSL have found that it improves the CS of health professionals (Harlak, Dereboy, & Gemalmaz, 2008). Dentists, patients, and dental students surveyed in one study all strongly believed that CS were highly important for dental students (Woelber et al., 2012). Despite this, CSL has been highly variable among dental schools (Yoshida et al., 2002). One study of practicing dentists noted that interpersonal skills and CS were among the most valued, yet these skills have traditionally been given minimal attention in dental curricula (Kulich, Rydén, & Bengtsson, 1998). This discrepancy has prompted the development of various strategies

for practicing dentists to communicate effectively with patients (Freeman, 1999; Laidlaw, 2009; Newton & Brenneman, 1999). It has also been recommended that curricula be extensively reviewed and adjusted to incorporate a greater focus on CS (Loureiro et al., 2011). For example, more structured evaluations for CSL have been encouraged, as CSL tends to be optional or solely participation-based in its evaluation (Yeap, Beevi, & Lukman, 2008). Two approaches that focus on students can help improve CSL. The first is evaluation of dental student CS throughout the program in order to discover student CSL needs. McKenzie was able to use this approach to identify several gaps in dental student CS knowledge (McKenzie, 2016). The second approach is to explore dental student attitudes toward CSL in order to determine how these needs may best be met. Raja and colleagues noted the importance of this approach in their development of a module for improving dental student CS in response to patient trauma (Raja et al., 2015b).

The Development of CSL in Dental Education. CSL in dental education has been delivered in diverse ways (Yoshida et al., 2002). In contrast to medical education, in which CSL has been formally researched and developed for some time (Cegala, McClure, Marinelli, & Post, 2000), dental education has given far stronger curricular emphasis to perfecting technical skills required for dental practice (Gorter & Eijkman, 1997). In a review of the dental education literature, Carey and colleagues found variable use of didactic (lecture-based) and experiential (activity-based) CSL components among dental schools. One of the earlier studies of a formal CSL component was the work of Gorter and Eijkman, in which the CSL components were described and evaluated as positive and helpful by dental students (Gorter & Eijkman, 1997). Similarly, an evaluation by students

and faculty at a dental school in Japan concluded that a behavioural science course, including instruction in CS, was highly beneficial and relevant (Mataki et al., 1998). The number of studies examining and evaluating CSL components has grown in recent years to include simulated patient exercises, role-playing, case analysis, workshop discussions, self- assessments, and instruction on the use of technology (Carey et al., 2010; Quinn et al., 2016). While CSL development continues to expand, ongoing research into optimizing CSL is important at the level of individual dental schools, as well as at a broader, public health promotion level.

III) Determining Improvements for CSL in Dental Education

Assessment of CS in Dental Students. Assessing CS in dental students is important for addressing strengths and weaknesses to effective dentist-patient communication and relationships (McKenzie, 2016). Instruments to measure CS performance of dental students have been developed and applied (Theaker, Kay, & Gill, 2000; Wener, Schonwetter, & Mazurat, 2011). Using one such instrument, McKenzie found that instructor assessment and student self-assessment of CS showed relatively consistent interrater agreement (2016). Through these assessments, McKenzie found some common areas of weakness in student CS, such as identification of patient feelings, determining barriers to patient treatment adherence, and ensuring patient understanding of their condition and treatment options (2016). In contrast to McKenzie, Lanning and colleagues concluded that faculty tended to rate student CS as poorer than students did through comparison of their ratings of dental student CS (Lanning et al., 2011). Memarpour and colleagues also found discrepancies among the ratings of students, patients, and observers

in a cross-sectional study measuring dental student CS (Memarpour, Bazrafkan, & Zarei, 2016). These studies suggest that assessment of dental student CS performance is useful for curricular change and development . However, determining ways in which these needs can be addressed often requires consultation with educators, as well as the students themselves (Wener et al., 2011).

Exploring Student Attitudes Toward CSL. Rees and colleagues have provided the standard for quantitative exploration regarding CSL in health professions by developing the Communication Skills Attitude Scale (CSAS) instrument to measure medical student attitudes toward CSL (Rees et al., 2002). Numerous studies have taken place in medical schools using this instrument (Cleland, Foster, & Moffat, 2005; Rees & Sheard, 2003; Ullah et al., 2012b; Wright et al., 2006). The tool has also been translated for use in languages other than English (Ahn, Yi, & Ahn, 2009; Busch et al., 2015; Harlak et al., 2008; Molinuevo & Torrubia, 2011; Tóth et al., 2011).

The CSAS has been adapted for use in dentistry, with the 24-item Dental Communication Skills Attitude Scale (DCSAS) having been previously developed by Laurence and colleagues (2012). There are relatively few published studies using the DCSAS or similar instruments in dentistry (Laurence et al., 2012; McKenzie, 2014; Nor et al., 2011). A notable gap in the use of the DCSAS instrument in particular is the lack of use in a Canadian context, which could differ from international institutions. Because these differences may lead to reduced generalizability of findings from previous studies using the DCSAS, application of the instrument in more Canadian schools would make a useful contribution to the literature. Loureiro and colleagues have noted that monitoring

student attitudes toward CSL is important for maximizing its effectiveness (Loureiro et al., 2011). Shankar and colleagues reaffirm this by noting that student attitudes toward CSL may reveal highly important information and implications for curricular development (Shankar, Dubey, Balasubramaniam, & Dwivedi, 2013). Therefore, Canadian dental schools would benefit significantly from further applications of DCSAS and other measures of dental student attitudes toward CSL.

There are several notable trends in health professional student attitudes toward CSL as measured by the CSAS/DCSAS and similar instruments. While much of the evidence in this area has been taken from the medical literature, dental literature has also been included where available.

Positivity. Several studies note that medical student attitudes toward CSL tend to be positive (Cleland et al., 2005; Venkatesh, Soundariya, & Deepika, 2014; Wright et al., 2006). One study found that experiencing formal CSL improved medical student attitudes (Koponen, Pyörälä, & Isotalus, 2012). Positive attitudes have also been noted in dental students (Nor et al., 2011). However, one study did not observe a change in attitudes toward CSL following a formal training component (McKenzie, 2014). A qualitative study of medical students noted that negative attitudes toward CSL were also common and tied to beliefs that CS were “common sense” or should not require training (Rees, Sheard, & McPherson, 2002).

Gender. Most studies employing the CSAS/DCSAS have found that women-identified students tend to have more positive attitudes than men-identified students

(Anvik et al., 2008; Cleland et al., 2005; Koponen et al., 2012; Lumma-Sellenthin, 2012; McKenzie, 2014; Rees & Sheard, 2003; Ullah et al., 2012b). Cleland and colleagues also noted that women-identified students tend to perceive their CS as worse than their men-identified peers, though they may actually be better on average (2005). Conversely, some studies have found no significant difference between the attitudes of men-identified and women-identified medical students, though these appear to be less common in the literature (Marambe, Edussuriya, & Dayaratne, 2012; Shankar et al., 2013; Venkatesh et al., 2014). This variation may be due to cultural or environmental differences, making it especially important for dental schools exploring student attitudes toward CSL to thoroughly describe contextual factors.

Culture and Ethnicity. One study found that medical students in the United Kingdom with English as their second language and students of non-Western European descent tended to have more negative attitudes toward CSL than primarily English-speaking medical students of Western European heritage (Rees & Sheard, 2003). Another study reported the reverse finding (Laurence et al., 2012). Rees and Sheard noted that those with more difficulty communicating in the dominant language may perceive CSL in that language as less useful (2003). This highlights the importance of accounting for culture and language in dental school CSL curricula.

Year of Study. Cleland and colleagues found that medical students in their first year of study had significantly more positive attitudes toward CS than students in later years (Cleland et al., 2005). McKenzie supported this finding in a study of dental students (McKenzie, 2014). Wright and colleagues, however, found no difference in attitudes by

year of education in medical students, though did conclude that students in later years reported more confidence in their own CS (2006). Contrary to the findings of Cleland et al., a study of Egyptian medical students found that students in later years actually had more positive attitudes toward CSL (Khashab, 2006). Another study noted similar findings, stating that the differences may be due to the timing of clinical experiences in their education (Loureiro, Severo, & Ferreira, 2015). While the relationship between year of study and student attitudes toward CSL appears to vary somewhat (Morris, Donohoe, & Hennessy, 2013), it is likely that school environment and curricular structure affect the ideal timing of CSL (Ullah et al., 2012a). Because of this, additional study of dental student attitudes toward CSL between preclinical and clinical years would be of benefit.

Limitations in the Literature. While the CSAS and DCSAS remain well-used instruments for examining student attitudes, the wording of the items suggests they should be used for examining contexts in which CSL includes formal CSL components (eg. a course or workshop), rather than informal components integrated into the dental curriculum. No studies have described their CS curriculum as being more integrated or informal in nature. This limitation in the wording of the CSAS and other instruments, as well as the dearth of peer-reviewed literature from institutions with diverse CSL approaches presents a significant gap in the literature. Because CS can be learned both formally and informally, it is important to explore dental student attitudes toward both approaches.

An additional limitation to current research is the overreliance on quantitative data collection. Few studies have qualitatively explored student attitudes toward CSL (Rees et

al., 2002), with none to date using a mixed methods or qualitative-dominant approach. As qualitative data can provide important contextual details and enhance understanding of quantitative findings (Edmunds & Brown, 2012; Stewart et al., 2008), the literature would benefit from including more qualitative and mixed methodological evidence.

IV) Summary

The current literature review has illustrated several points that justify the significance of the current project. The first is that the dentist-patient relationship has a significant impact on patient health outcomes. The second is that the CS of dentists are related to the quality of the dentist-patient relationship. The third point is that dentist CS can be bolstered by CSL in dental school. The final point is that CSL can be improved by incorporating feedback from evaluations of CSL components and by exploring student needs and attitudes toward CSL. Because student attitudes toward CSL can have implications for dental education that lead to improved patient health outcomes, it follows that examination of dental student attitudes is beneficial and worthy of additional study.

CHAPTER III: METHODOLOGY

I) Overview

This study followed a pragmatic approach. Pragmatism has traditionally been the philosophical paradigm underlying mixed methods research and holds that problem-solving rather than preconceived ideas should be the guiding force behind research designs (Tashakkori & Teddlie, 2010). This perspective is based on the philosophical position that beliefs about and viewpoints on reality are diverse (Plano Clark & Ivankova, 2016). Therefore, pragmatic mixed methods research has been able to incorporate multiple perspectives, i.e. quantitative and qualitative methodologies, to address the questions at hand.

Mixed methods studies aim to answer complex questions using the different types of information generated by both quantitative and qualitative research (Johnson & Turner, 2003; Plano Clark & Ivankova, 2016). This study utilized a sequential, mixed methods design using a cross-sectional sample of dental students from all years of undergraduate study within a single Canadian dental school (Dalhousie University).

II) Timeline

Data were collected in one quantitative and two qualitative phases. A timeline of these phases is featured in Figure 1 below. The protocol for the current project was developed in consultation with members of the Dalhousie University Faculty of Dentistry and was approved by the Dalhousie University Health Sciences Research Ethics Board (REB #2017-3974; see Appendix H).

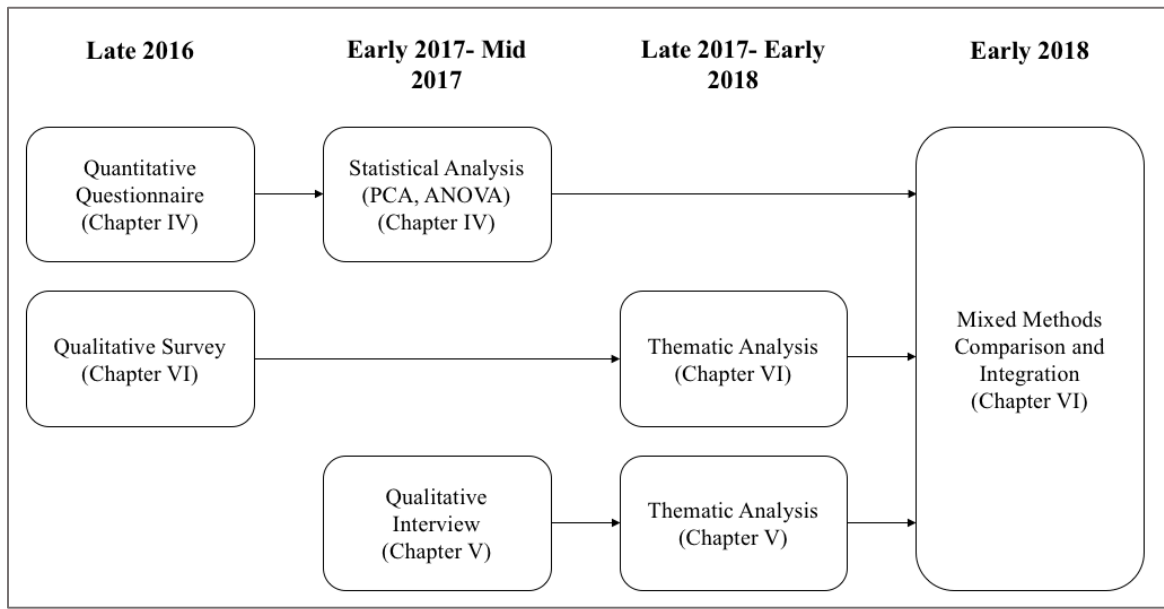


FIGURE 1: Timeline diagram outlining steps taken in the research design. Chapters containing findings from these phases are featured in brackets.

The protocol, findings, and relevant discussion for each of the three phases have been described in Chapters IV, V, and VI, respectively. The mixed methods triangulation is also featured in Chapter VI. These chapters have been formatted to approximate journal manuscripts and will be prepared for publication based on recommendations from the research supervisor and committee members.

III) Knowledge Translation

Davis (2006) argues that knowledge translation is paramount for putting research findings for professional education into action. Knowledge translation efforts will continue following completion of the current report. Creation of additional summary reports containing suggested guidelines and potential implications for education has been recommended (Davis, 2006). In keeping with this suggestion, an accessible report and presentation of summary findings will be produced and distributed to faculty members

within the institution under study. A copy will also be available for circulation to students. This report will be distributed at an opportune time, as the dental school participating in this has undergone substantial curricular and clinic renewal in recent years. It has been noted in the literature that knowledge translation initiatives coinciding with ongoing periods of change have found the most success (McWilliam, 2007).

While distribution of a summary report is a key component of knowledge translation in professional education, a more integrated knowledge exchange approach has been recommended in recent years (Zwarenstein & Reeves, 2006). The proposed project incorporated such an approach. Prior to initiating the project, key informant discussions took place with several members of the Faculty of Dentistry at the institution under study. During these personal communications, faculty members were asked how students were taught CS throughout the program, what research questions would be most beneficial to students and instructors, what interview questions faculty felt would be most appropriate and helpful to ask the students, and what kinds of knowledge sharing they believed would be most helpful. These personal communications provided the justification for the development of the qualitative, semi-structured interview guide, as well as the adjustments to the questionnaire instrument used in the quantitative phase. Two members of the Faculty of Dentistry also formed part of the research team and thesis committee for the project in order to optimize its relevance to the organization under study and provide greater understanding of the context. These committee members, as well as other Faculty members, were consulted throughout the research process. They will also be consulted regarding which knowledge dissemination practices would be of highest value in the dental education community.

CHAPTER IV: QUANTITATIVE QUESTIONNAIRE

Proposed Manuscript Title: Measuring attitudes of dental students in a Canadian university toward communication skills learning

I) Introduction

The communication skills (CS) of healthcare professionals can have a considerable impact on patient experience and health outcomes. In dentistry, there is a strong link between dentist CS and outcomes such as patient satisfaction (Hamasaki et al., 2017; Schouten, Eijkman, & Hoogstraten, 2003). A systematic review of randomized, controlled trials also found a significant relationship between patient-provider communication and objective patient health outcome measures such as blood pressure (Kelley et al., 2014).

Students who have experienced CSL in their programs have demonstrated stronger CS than students without such training (Mathew et al., 2015). Improving dentist CS through optimizing these dental school experiences offers a minimally resource-intensive approach to oral health promotion. Understanding student needs and perspectives is an important component of enhancing learning and teaching in dental school (Henzi et al., 2005). Therefore, the current study sought to assess dental student attitudes toward CSL in order to determine opportunities for enhancement of CS and associated promotion of oral health.

Based on previous studies, it was hypothesized that there would be variation in attitudes toward CSL according to demographic variables. In particular, it was anticipated

that students identifying as women would have more positive attitudes toward CSL than their men-identified counterparts. As well, being in an earlier year of study was expected to correspond to more positive attitudes. This study is the first phase of a larger, mixed-methods project examining student attitudes toward CSL, which used qualitative surveys and interviews to expand upon findings reported here.

II) Methods

Instrument. Data collection for this phase was conducted using a digitally-constructed questionnaire adapted from the Dental Communication Skills Attitude Scale or DCSAS (Laurence et al., 2012). Adaptations were made to ensure the instrument's relevance to the program under study based on key informant interviews with dental faculty, including consultation with the four course directors of the *Patient Care* course series and the Research Development Officer. The *instrument validity* of adaptations to the DCSAS and similar instruments has been examined previously (Anvik et al., 2008). Based on these key informant discussions, four of the items from the DCSAS were removed (eg. "I can't be bothered to turn up to sessions on communication skills") as students in the study population are expected to attend all classes. Additional items were reworded to make them more congruent with the program format and content. The resulting Adapted Dental Communication Skills Attitude Scale (ADCSAS) consisted of 20 multiple-choice Likert items, with answers ranging from 1 (strongly disagree) to 5 (strongly agree). The items, including how they were adapted, are listed in Appendix A. After piloting the questionnaire with a sample of health promotion graduate students, the instrument was observed to take approximately 5-10 minutes to complete.

Sample and Recruitment. A participation rate of 80% of the student population (n=130 students based on the total enrollment of 162 students) was the intended sample size. These figures were calculated based on previous iterations of this instrument and an *a priori* power analysis using *G*Power* software (Laurence et al., 2012; McKenzie, 2014).

All dental students in the Dalhousie University Doctor of Dental Surgery (DDS) program were eligible to participate. *External validity* and *statistical validity* were ensured by placing no additional restrictions on the sample and by using a brief, minimal risk design to encourage participation. Instructors of each of four *Patient Care* courses were first contacted to distribute the survey to their respective students and schedule an in-class visit. A brief study overview, consent form, and link to the online questionnaire were also given to the instructors for distribution. The in-class visits from the primary researcher took place during the three weeks following initial survey distribution. During these visits, the questionnaire was administered to all students who were present and wished to participate at that time. During administration of the instrument, the instructor stepped out of the room in order to prevent any perceived coercion to participate and to protect the privacy of the students. The questionnaire remained accessible for one week following the in-class visits by the researcher to allow potential participants time to complete the instrument at their own pace if desired.

Data Collection. The online questionnaire was delivered using *ObjectPlanet Opinio* software. The instrument began with a brief introduction to the study and a request for the participant to confirm consent (Appendix B). A link to the consent information (see Appendix D) was also included for review. The participant was informed there would be

an opportunity to include contact information in order to receive a small token of appreciation for participating in the survey (a chance to win a \$100.00 Amazon gift card) and/or be recruited for the follow-up qualitative interviews. The participant was assured that any identifying information would not be linked to the questionnaire responses to ensure privacy and confidentiality following completion of the draw and recruitment. The contact information was later destroyed.

Following confirmation of consent, participants were presented with six demographic items, followed by the ADCSAS items. Two open-ended, qualitative questions (see Chapter VI) were also included following the ADCSAS. Participants were able to skip questions and submit the questionnaire with missing items if they wished. Following completion of the data collection instruments, respondents were redirected to a separate page. On this page, participants could leave their contact information and fill in check boxes corresponding to a) their desire to be entered into the Amazon gift card draw, and/or b) be contacted at a later date to be recruited for a qualitative interview (see Appendix C). The responses on this page were not linked to the data collection instrument. This ensured all questionnaire responses remained anonymous. The participants were informed that not all who submit their contact information for qualitative interview recruitment would necessarily be interviewed. The participants were not required to include their contact information.

Data Analysis. The survey data was downloaded from the secure server associated with the *Opinio* software onto the password-protected laptop computer of the primary researcher. Using *IBM SPSS* software (Versions 22, 23) the data was first examined for

outliers and missing data. Outlier data points have the effect of skewing the mean of the data and may also have the confounding effect of making an instrument with poor reliability falsely appear reliable as measured by Cronbach's alpha (Liu, Wu, & Zumbo, 2010).

The *item-wise mean replacement approach* was used to impute missing data. In this approach, missing data are replaced with the calculated mean for the item in question (Carpita & Manisera, 2011; Wu, Jia, & Enders, 2015). The mean was not rounded to the nearest integer (i.e. *naïve rounding*), despite Likert item responses being confined to integer values, as this could otherwise have distorted the resulting mean of the data. The item-wise mean replacement approach is considered appropriate for results in which missing data constitutes less than 20% of the responses (Wu et al., 2015), as was the case in the current study.

To determine how students rated their attitudes toward CSL, the mode for each item was calculated. Mode rather than mean has been recommended to describe central tendency in single Likert items, as it is ordinal rather than continuous in nature (Subedi, 2016).

A *principal components analysis* (PCA) was applied to the dataset to distill the ADCSAS variables into a smaller number for data analysis, to thematically categorize the instrument, and to assess the content validity of the adapted questionnaire items (Field, 2013). Five assumptions were confirmed before performing PCA. The first assumption was that the data must be cardinal or *approximately continuous*. There is some debate

concerning the use of PCA for analysis of Likert-type ordinal data, however the inclusion of a larger number of options (such as the 5-scale options used in the current instrument) has been deemed appropriate for PCA in psychometrics and behavioural science as it generally approximates a normal distribution (Korhonen & Siljamäki, 1998). The second assumption was that of *data linearity*, verified using scatterplots in SPSS software. The third assumption was *adequate sampling*, which requires at least 5 observations per variable. As 20 items were contained in the final instrument, at least 100 observations were needed for the data to be considered minimally generalizable (MacCallum et al., 1999). This was achieved. The fourth assumption was *suitability for reduction*, in which the variables must be sufficiently correlated to allow them to be distilled into components. This assumption was confirmed using *Bartlett's test of sphericity* (Field, 2013). The final assumption was that no outliers be present, which was also achieved. As previous studies have found correlations between items within different components (Laurence et al., 2012), *direct oblimin rotation* was used for PCA in the current study. The resulting *Scree plot* was visually inspected to determine the appropriate number of principal components (Field, 2013).

Following PCA, the mean scores for each factor for different demographic groups were compared using *analysis of variance* (ANOVA). Three assumptions were verified prior to conducting the ANOVA. These assumptions are *normality*, *homoscedasticity*, and *independence of cases* (Field, 2013). The assumption of *normality* was assessed visually through examination of probability (PP or QQ) plots. As expected from Likert data, some of the distributions deviated from normal, therefore bootstrapped confidence intervals were applied (Chmiel & Gorkiewicz, 2012). *Homoscedasticity* was confirmed by

ensuring a result of $p > 0.05$ in *Levene's test for equal variances*. Where unequal variances were detected, *Welch's F* ratio (F_w) was used as it is robust to this violation (Field, 2013). *Independence*, the final assumption, requires that different treatment groups be comprised of different participants (eg. women and men). This assumption was reinforced by the completion of demographic questions in the instrument (Field, 2013).

In order to determine whether the components extracted from the ADCSAS consistently reflected the constructs (ie. features of student attitudes toward CSL), the *internal consistency reliability* of the instrument was measured by calculating *Cronbach's alpha* for each component. Previous studies have yielded appropriately-high alpha scores (ie. 0.7-0.8) in their factor analyses of the CSAS/DCSAS (Laurence et al., 2012).

ANOVA was used to make comparisons between genders, years of study, citizenship, and cultural/ethnic heritage of the students (see Appendix B for the items corresponding to these variables). There were also demographic items corresponding to age and whether students were in the qualifying program, however the sample sizes for these were heavily skewed and therefore not analysed. A previous study using the DCSAS instrument simplified this analysis by combining responses for each item such that there were only two groups per variable (Laurence et al., 2012). This was done in order to reduce the need for *post hoc* tests in the event that ANOVA yielded significant effects. This simplification was applied in the current study as well, in that the diverse options for ethnic/racial identity were simplified to Western and non-Western descent only. This reduction also helped prevent identification of any individuals who were

members of underrepresented groups in the student population. The year of study was not reduced, therefore *Bonferroni-corrected post-hoc* multiple comparisons were employed.

III) Results

Participants. The final participation rate in the quantitative survey was n=124 DDS students. The demographic distributions of these participants are featured in Table 1

TABLE 1: Demographic descriptors of quantitative questionnaire participants (n=124)

Gender	60 female-identified (48.4%) 64 male-identified (51.6%)
Ethnic Identity	35 non-Western descent (28.2%) 89 Western descent (71.8%)
Year of Study	24 DDS1 (19.4%) 31 DDS2 (25%) 28 DDS3 (22.6%) 35 DDS4 (28.2%) 6 Qualifying Program (4.8%)
Age	46 aged <24 (37.1%) 63 aged 25-29 (50.8%) 11 aged 30-34 (8.9%) 4 aged >35 (3.2%)
Citizenship	89 Canadian (71.8%) 35 non-Canadian (28.2%)

Item Scores. Participants expressed positive attitudes toward CSL. Table 2 displays the mode for each questionnaire item. Responses indicating agreement (4 or 5) were the most frequently reported for items expressing positive attitudes toward CSL (eg. that CSL would be interesting). The one exception to this trend was the item “Learning about communication skills is fun,” which had a mode expressing neutrality (3). Items expressing more negative attitudes toward CSL (e.g. that it is ‘too easy’) most frequently

yielded responses indicating neutrality (3) or disagreement (2), further indicating students' appreciation of the importance of CSL.

TABLE 2: Questionnaire items from the ADCSAS and resulting mode

<u>Item</u>	<u>Mode</u>
Learning communication skills is important because my ability to communicate is a lifelong skill	5
In order to be a good dentist, I must have good communication skills	5
More formal training in communication skills would help me respect patients	4
"... Improve my ability to communicate with patients"	4
"... Help me recognize patients' rights regarding confidentiality and informed consent"	4
"... Help me respect my colleagues"	4
"... Facilitate my team working skills"	4
More formal training in communication skills would be interesting	4
When applying for dentistry, I thought it was important to learn communication skills	4
I think it's really useful learning communication skills for dental practice	4
Developing my communication skills is just as important as developing my knowledge of dentistry	4
Learning communication skills is applicable to learning dentistry	4
Communication skills are already obvious	3
Learning about communication skills is fun	3
I haven't got time to formally learn about communication skills	3
Acquiring communication skills is too easy	2
I would find it difficult to take formal communication skills training seriously	2
My ability to pass exams will get me through dental school rather than my ability to communicate	2
I can't see the point in learning more about communication skills	2
Nobody is going to fail his or her dental degree for having poor communication skills	2

Principal Components Analysis. Prior to running the PCA, scores of negatively-worded items were reversed so that higher scores consistently signified more positive attitudes toward CSL. The analysis was first performed to extract components with *eigenvalues* greater than 1. This yielded a four-component solution, however the fourth component included only four items and had a weak internal reliability as measured by *Cronbach's alpha*. There was also significant levelling off of the *Scree plot* after three components according to visual inspection, thus the analysis was re-run to yield a three-component solution only. The loadings for each item are displayed in Table 3. The PCA solution accounted for 53% of the variance in the data, similar to the variance explained by factor solutions in previous iterations of the CSAS/DCSAS (Laurence et al., 2012).

TABLE 3: Pattern matrix yielded by PCA

Item #	Component		
	1	2	3
Q7	.862		
Q10	.823		
Q8	.810		
Q12	.749		
Q11	.747		
Q9	.745		
Q14	.739		
Q25	.606		
Q20		-.716	
Q19		-.628	
Q18	.415	-.600	
Q17		-.577	
Q21		-.488	
Q22		-.427	
Q15			.716
Q24			.697
Q26			.569
Q13			.496
Q23			.496
Q16			.495

To ensure the PCA method was appropriate for the current data set, additional assumptions of the test were verified. The correlation matrix was examined to ensure correlations greater than 0.3 were frequent in the dataset. This indicated that the data were sufficiently correlated to suggest that they measured the same construct. Simultaneously, the matrix indicated that multicollinearity was not present in the data set (no Pearson's *r* above 0.9 was detected). The determinant

of the correlation matrix was $>.00001$, meaning the variables were sufficiently related to one another to justify a PCA without being multicollinear. The *KMO measure of sampling adequacy* was 0.87 overall and was greater than 0.5 for each item in the instrument, indicating a sufficient sample size. *Bartlett's test of sphericity* was also significant, indicating that the identity and correlation matrices varied sufficiently for data reduction to be appropriate.

The items corresponding to each of the three final components are listed in Table 4. The first component, *Valuation/devaluation of learning and teaching*, contained nine items as per the pattern matrix (Table 3) and had high internal consistency reliability (Cronbach's $\alpha=0.908$). This component contained items that expressed students' perceived value of CSL for their development of CS. The second component, *Importance for dental practice*, contained six items (including one also listed in Factor 1) and had a Cronbach's α of 0.793. This component contained items that described how important CS were to the practice of dentistry. The third component, *Academic utility*, contained six components and had a Cronbach's α of 0.660. This component examined how useful students felt CSL learning was to their achievement or success in dental school itself. All components had an appropriate reliability as measured by Cronbach's α (Yashoda, & Puranik, 2016).

TABLE 4: Questionnaire items included in each component

<p><u>Component 1: Valuation/Devaluation of Learning and Training</u></p>
<p>More formal training in communication skills would help me respect patients (Item 7) More formal training in communication skills would help me respect my colleagues (Item 10) More formal training in communication skills would improve my ability to communicate with patients (Item 8) More formal training in communication skills would be interesting (Item 12) More formal training in communication skills would facilitate my team working skills (Item 11) More formal training in communication skills would help me recognize patients' rights regarding confidentiality and informed consent (Item 9) Learning about communication skills is fun (Item 14) I can't see the point in learning more about communication skills (Item 25)† I think it's really useful learning communication skills for dental practice (Item 18)*</p>
<p><u>Component 2: Importance for Dental Practice</u></p>
<p>In order to be a good dentist, I must have good communication skills (Item 20) Learning communication skills is important because my ability to communicate is a lifelong skill (Item 19) I think it's really useful learning communication skills for dental practice (Item 18)* When applying for dentistry, I thought it was important to learn communication skills (Item 17) Developing my communication skills is just as important as developing my knowledge of dentistry (Item 21) Learning communication skills is applicable to learning dentistry (Item 22)</p>
<p><u>Component 3: Academic Utility</u></p>
<p>Acquiring communication skills is too easy (Item 15)† My ability to pass exams will get me through dental school rather than my ability to communicate (Item 24)† Nobody is going to fail his or her dental degree for having poor communication skills (Item 26)† Communication skills are already obvious (Item 13)† I would find it difficult to take formal communication skills training seriously (Item 23)† I haven't got time to formally learn about communication skills (Item 16)†</p>
<p>* indicates item which loaded into two components † indicates items which were reversed scored before analysis</p>

Main Effects. To examine the relationship between demographic variables and these three components, Likert subscales were created. This was done by summing the scores of each of the items contained in each component, respectively. These subscales were then able to be analysed using some parametric statistics as they approximated a continuous variable (Field, 2013; Laurence et al., 2012). One-way ANOVA procedures (with bootstrapped confidence intervals) were conducted to determine the relationship between year of study, gender, citizenship, and ethnic identity, respectively, and each of the three component subscales (McKenzie, 2014).

There was a significant main effect of year of study detected for all three components ($F_{W(\text{valuation})}(3)=4.20$, $p=.009$; $F_{\text{importance}(3)}=4.12$, $P=.008$; $F_{\text{utility}(3)}=5.18$, $p=.002$). There was a small effect of year of study on the *Valuation/devaluation* subscale ($\omega^2=.08$), while a medium effect size was detected in the *Importance* ($\omega^2=.10$) and *Academic utility* ($\omega^2=.13$) subscales. Bonferroni-corrected post-hoc tests were used to examine differences in the mean scores for all three subscales by year of study (see below Figures).

Based on the Bonferroni-corrected multiple comparisons, students in DDS1 had significantly higher mean scores on the *Valuation/devaluation* subscale than students in DDS2 (I-J=5.04, $p=0.02$, [1.95, 8.21]) and DDS4 (I-J=4.25, $p=0.05$, [1.53, 7.10]); Figure 2). There were no significant differences observed when comparing DDS1-DDS3 (I-J=2.59, $p=0.76$, [0.33, 4.99]), DDS2-DDS3 (I-J=-2.45, $p=0.75$, [-5.63, 0.47]), DDS2-DDS4 (I-J=-0.79, $p=1.00$, [-3.84, 2.61]) or DDS3-DDS4 (I-J=1.65, $p=1.00$, [-0.82, 4.45]) students, respectively.

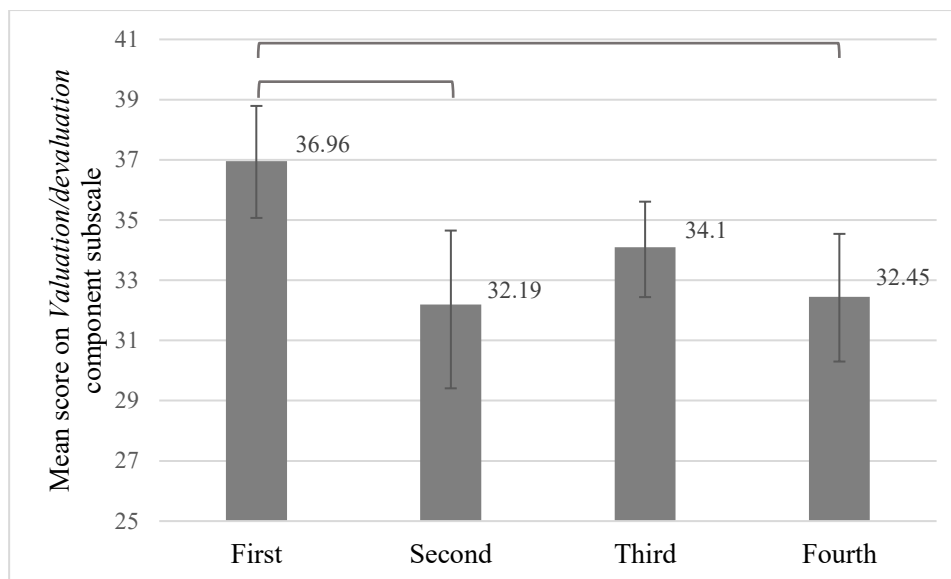


FIGURE 2: Bar chart displaying differences in mean *Valuation/devaluation of learning and training* subscale scores by year of study. Error bars indicate bootstrapped confidence intervals, vertical brackets indicate significant differences, and numerals indicate means.

As seen in Figure 3, the only significant difference detected on the *Importance for dental practice* subscale was between DDS1 and DDS2 students, with DDS1 students having significantly higher mean scores (I-J=2.75, $p=.006$, [1.27, 4.47]). No significant differences were detected among comparisons of DDS1-DDS3 (I-J=1.00, $p=1.00$, [-0.39, 2.37]), DDS1-DDS4 (I-J=1.65, $p=0.20$, [0.36, 2.90]), DDS2-DDS3 (I-J=-1.76, $p=0.14$, [-3.51, -0.13]), DDS2-DDS4 (I-J=-1.11, $p=0.74$, [-2.64, 0.44]), or DDS3-DDS4 (I-J=0.65, $p=1.00$, [-0.64, 2.02]), respectively.

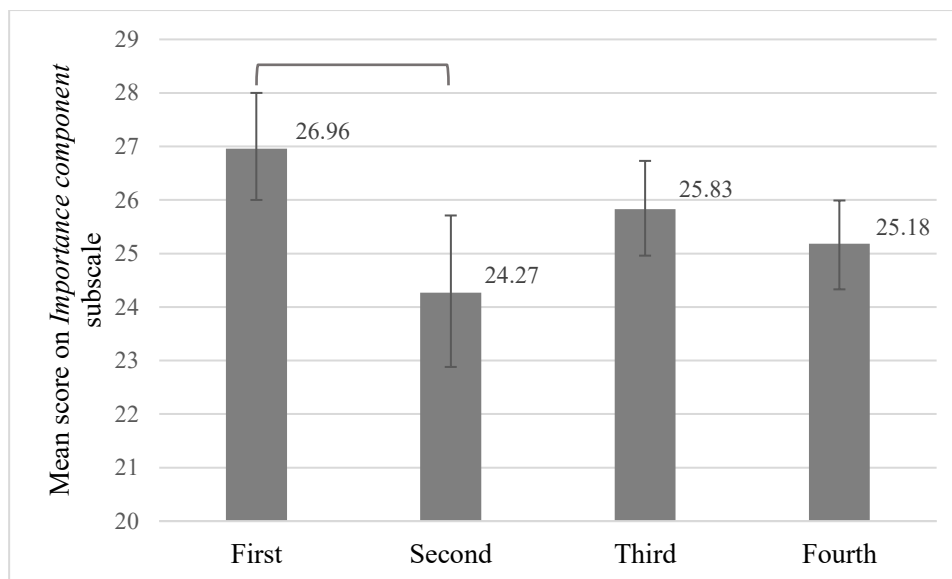


FIGURE 3: Bar chart displaying differences in mean *Importance for dental practice* subscale scores by year of study. Error bars indicate bootstrapped confidence intervals, vertical bracket indicates significant difference, and numerals indicate means.

Similar to the *Valuation/devaluation* subscale, significant differences on the *Academic Utility* subscale were detected between DDS1 and DDS2 students (I-J=3.33, $p=.003$, [1.53, 5.27]), as well as DDS1 and DDS4 students (I-J=3.01, $p=0.005$, [1.44, 4.68]). There was no significant difference detected among DDS1-DDS3 (I-J=2.26, $p=0.10$, [0.47, 3.85]), DDS2-DDS3 (I-J=-1.07, $p=1.00$, [-3.00, 0.62]), DDS2-DDS4 (I-J=-0.32, $p=1.00$, [-2.12, 1.27]), or DDS3-DDS4 (I-J=0.74, $p=1.00$, [-0.71, 2.40]), respectively.

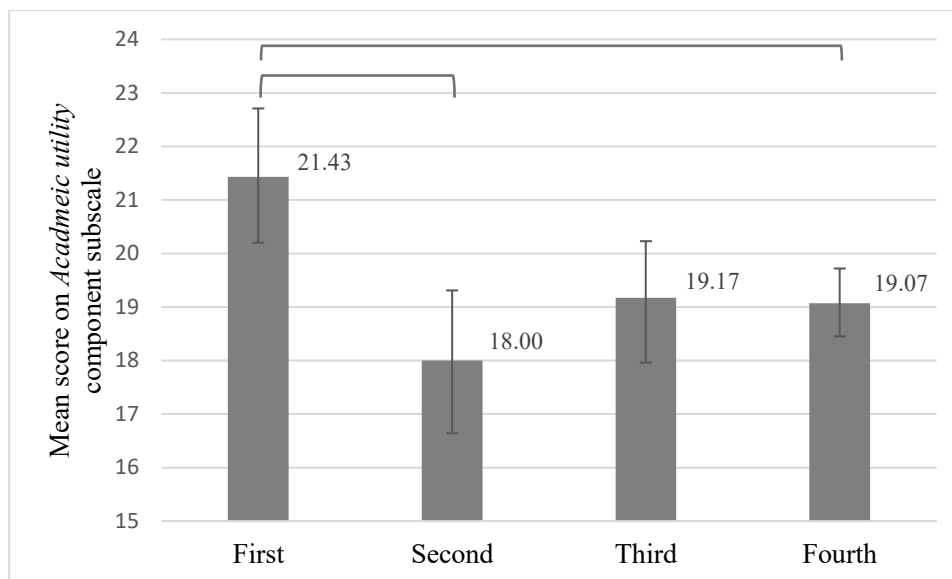


FIGURE 4: Bar chart displaying differences in mean *Academic utility* subscale scores by year of study. Error bars indicate bootstrapped confidence intervals, vertical brackets indicate significant differences, and numerals indicate means.

Women-identified students had significantly higher scores on the *Academic utility* subscale than men-identified students ($F_{\text{utility}(1)}=11.257$, $p=.001$), while students of Western European descent had higher scores on this subscale than non-Western European students ($F_{\text{utility}(1)}=4.539$, $p=.035$). There was a significant medium effect of gender ($\omega^2=.08$) and a significant small effect of ethnic identity ($\omega^2=.03$) on the *Academic utility* subscale. There were no significant effects of citizenship on any of the components.

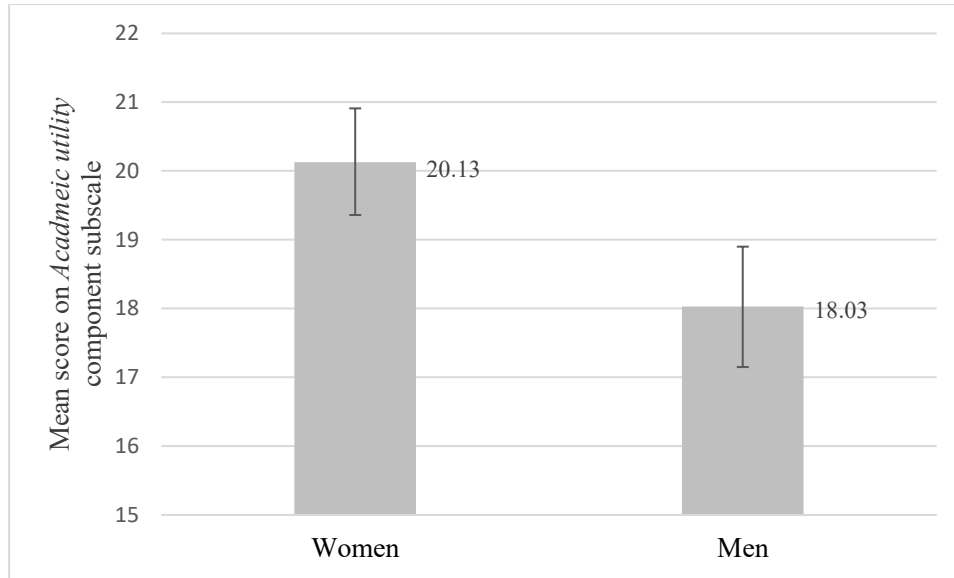


FIGURE 5: Bar chart displaying significant difference in mean *Academic utility* subscale scores between women- and men-identified students. Error bars indicate bootstrapped confidence intervals and numerals indicate means.

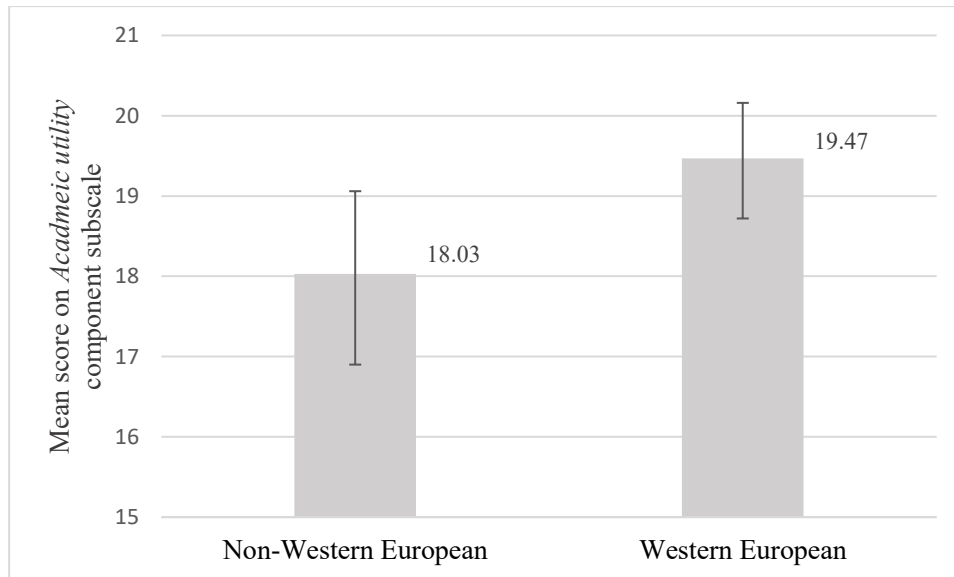


FIGURE 6: Bar chart displaying significant difference in *Academic utility* subscale scores between students of Western European and non-Western European descent. Error bars indicate bootstrapped confidence intervals and numerals indicate means.

Interaction Effects. In order to detect and analyse interaction effects, the general linear model (GLM) procedure was used, following the protocol implemented in a previous iteration of the DCSAS in a dental school (McKenzie, 2014, p. 1391). There were no significant interaction effects between demographics detected across any of the three components.

IV) Discussion

Instrument. The original CSAS instrument developed by Rees and colleagues was divided into two subscales based on an exploratory factor analysis (2002). These subscales were labelled as describing the positive and negative attitudes, respectively. While these subscales have been utilized extensively in subsequent studies (Koponen et al., 2012; McKenzie, 2014), adaptations and translations of the original instrument have yielded different subscales based on principal components analyses in different populations (Anvik et al., 2008; Laurence et al., 2012). The component solution yielded in the current study is similar to that reported by Laurence et al. (2012) in terms of thematic organization and item groupings within components. This suggests that an expansion of the instrument, as well as a reorganization of the subscales, might be appropriate for future iterations of the CSAS and derivative instruments.

Year of Study. To date, few studies applying the CSAS/DCSAS in dental school environments have been reported (Atteya, Saleh, & Essam, 2017; Laurence et al., 2012; McKenzie, 2014; Nor et al., 2011; Shetty & Al Rasheed, 2017). Of these, several explored and detected effects of year of study in relation to scores on the CSAS, which is

congruent with the findings in the present study. Laurence et al. found a significant decrease in attitudes toward CSL between years 1-3, with a slight increase in the final year of study (2012). Differences in scores based on year of study were also detected by McKenzie (2014). Studies in medical students have also shown a significant decrease in CSAS subscale scores coinciding with the onset of student clinical experience (Cleland et al., 2005). The variation in findings among studies may be associated with diverse ways in which CSL is implemented among institutions.

The current findings suggest that the initial delivery of CSL components should begin in early years of study prior to clinical experience, when it may be best received by students. One reason for the shift in attitudes between the first and subsequent years of study could be course load. One faculty member noted that dental student workload generally increases throughout the degree program, with a notable increase in DDS2. Integrating CSL into existing activities in a less formal yet standardized way could help assuage the perception of time constraints while still imparting valuable CSL content. For example, providing purposeful, calibrated instructor demonstrations or sample patient interactions along with new techniques or procedures learned may help students model their own CS in an appropriate manner.

Another potential reason for the change in attitudes toward CSL across years of study is student empathy. One study noted that the reported empathy of dental students tends to be greater in their first year of study than the remaining years in the program (Sherman & Cramer, 2005). As communication has been linked with empathy, additional activities that promote empathetic behaviour in students, such as community-based practice and

simulation exercises, should be encouraged (Bauchat, Seropian, & Jeffries, 2016). Future research into the relationship between empathy and communication skills may be of interest.

Gender. The current study adds further support to the gender-based discrepancy in attitudes toward CSL. Nor and colleagues previously noted that women-identified students had significantly higher scores on the scale of positive attitudes (2011). This finding was replicated by Laurence et al., who also found that women-identified students scored significantly higher on many items throughout the DCSAS instrument (2012).

This gender difference appears in other health professions as well. In a study of medical students, Cleland and colleagues noted that women-identified students tended to have more positive attitudes toward CSL than men-identified students (2005). Similar findings have been detected in studies of nursing and medical students in other countries and contexts (Busch et al., 2015; Molinuevo & Torrubia, 2011). While this gender-based discrepancy appears frequently in the literature, one study found no differences between genders (Marambe et al., 2012). This may be due to slight changes in the items inherent in translating the instrument to languages other than English.

The current study findings pertaining to gender have several implications. Because attitudes toward CSL are correlated with CS performance (Suzuki Laidlaw et al., 2006), it is important to support improvements in attitudes toward CSL in men-identified students. This may be addressed in part by promoting gender-balanced groups, particularly in earlier years of study (Wahlqvist et al., 2010). Having junior students shadow senior

students of a different gender may also expose them to more diverse communication styles.

A meta-analysis of studies examining gender discrepancies in physician interactions noted that women-identified physicians tended to have more communication with patients that could be considered patient-centered, such as counselling, discussion of emotions, and positive reinforcement, as well as patient visits that were about two minutes longer on average (Roter, Hall, & Aoki, 2002). In line with the current research, this suggests that students may benefit from additional training in motivational interviewing or positive reinforcement. Future research to determine the motivators behind men-identified students' lower perceived academic utility of CSL for dental practice could also prove useful for dental education.

Ethnicity. The current study noted that students of Western descent had higher scores in the *Academic utility* component than students of non-Western descent. These findings are in contrast to Laurence et al., who found that African American students scored higher on some components of the instrument (2012). Meanwhile, McKenzie found no difference in scores based on student racial identity (2014). The difference in findings may be due to differing linguistic backgrounds of the participants, as students from non-Western backgrounds may be more likely to have English as a secondary rather than primary language, and thus may find CSL in English less useful to their dental education (McKenzie, 2014; Rees & Sheard, 2003). One study noted that attitudes toward patient-centered communication may also vary based on cultural norms and/or beliefs, suggesting the need to promote cultural safety for students as well as patients in educational

environments (Hauer et al., 2010). As in the case of gender, it may be of use to have students of diverse backgrounds work together whenever possible in order to observe and have opportunities to model different CS with their own patients.

The variation reported in the literature suggests that the effects of ethnic or racial background on attitudes toward CSL are context-dependent and caution should be taken not to overgeneralize the findings. One study using an alternative instrument to measure medical student attitudes toward consultation skills noted that non-Western students actually valued CS more than their Western counterparts (Liddell & Koritsas, 2004). This raises the possibility that the ADCSAS instrument used in the current study, originally developed in a Western context, may not accurately address the ways other cultures perceive communication and CSL. Future research to expand upon and validate the instruments used in this area may be required.

Limitations. There were several limitations to the current study. While the sample size (n=124) was comparable to previous studies using CSAS/DCSAS, it was still slightly lower than the 80% intended sample size (n=130) calculated based on an *a priori* power analysis using *G*Power*. A *post hoc* power analysis noted that some of the smaller effect sizes were associated with low observed power ($1 - \beta_{\bar{x}}=0.73$ among significant effects, $1 - \beta_{\bar{x}}=0.54$ among all effects). Therefore, a possibility of missing significant effects in the current study due to the small sample size exists. Additionally, no information was collected regarding the first language of the participants, which may have provided additional relevant contextual information or significant effects.

It is important to note that PCA of ordinal data, such as Likert scale results, may overestimate the number of factors actually present in the data. Partly due to this overestimation, previous studies have yielded solutions with two to four factors, (McKenzie, 2014; Rees & Sheard, 2003; Anvik et al., 2008; Laurence et al., 2012). Nonetheless, the reliability of the components noted in the current study was measured and deemed accurate.

V) Conclusion

Communication skills in dental school are valuable for student development and patient health promotion. The current study found that students in one Canadian dental institution had positive attitudes toward CSL, with some demographic variation reported based on year of study, gender, and ethnicity/race. The current study has added to the existing body of evidence by adapting the DCSAS instrument to a dental school with an integrated model of CSL delivery. This study appears to be the first published set of findings from a Canadian university in this topic area.

These findings will be expanded upon through integration with qualitative findings from a subsample of the same population of dental students in order to enrich the inferences made from the quantitative data.

CHAPTER V: QUALITATIVE INTERVIEW

Proposed Manuscript Title: Student perceptions of learning and applying communication skills in dental school and practice

I) Introduction

Patient oral health outcomes are associated with the communication skills (CS) of their dentists (Kelley et al., 2014). CS of dentists can be improved through learning experiences in dental school (Mathew et al., 2015). These experiences in communication skills learning (CSL) can be optimized by delivering evidence-based curricular developments (Verma, Mohanty, & Talwar, 2018).

Included in an evidence-based CSL curriculum should be an understanding of student-identified perceptions and needs (Ayn et al., 2017). Primarily quantitative data has been published regarding student attitudes toward CSL in dentistry (Laurence et al., 2012; Shetty & Al Rasheed, 2017). However, qualitative data can provide a more detailed, nuanced understanding of educational needs and student suggestions (Edmunds & Brown, 2012). To date, there has been minimal qualitative research regarding health professional students' attitudes toward communication skills learning. The present chapter addresses this gap in the evidence through the use of a qualitative interview with dental students as part of a mixed-methods study.

II) Methods

Instrument. A semi-structured, qualitative interview guide was developed through key informant discussions with dental faculty members. Faculty discussed their perspectives regarding CSL and were asked which questions would be beneficial to ask student participants. The resulting list of questions was distilled into a final, semi-structured interview guide (see Appendix E).

Sample. A sample size of 6-10 participants *nest-sampled* from quantitative questionnaire respondents (see Chapter IV) was deemed appropriate for the current study (Collins, 2010; Creswell, 2013; Marshall, 1996; Robinson, 2014).

Recruitment. While completing an on-line questionnaire (see Chapter IV), participants were linked to a page where they could provide their contact information and express interest to be invited for an interview. Those who did so were asked via e-mail to respond with preferred date and time. They were given a copy of the consent form to review if they wished (see Appendix F). All who expressed interest in being interviewed were accepted into the study.

Data Collection. One-on-one, semi-structured interviews ranging approximately 20-60 minutes in length were conducted with participants at the time and on the date of their choosing (Creswell, 2013). A private room on campus was booked for the interviews, however the participants were also invited to select their own location for the interview if they wished. Upon arrival to the interview, written consent was obtained (Appendix G).

Interviews were recorded, and field notes taken before, during, and after the interview sessions to document any non-verbal and contextual information pertinent to the research (Creswell, 2013). Each participant was offered a small token of appreciation for their time (a \$10 Amazon gift card). Recordings were later transcribed by the primary researcher. While the interviews between the researcher and participants were inherently non-anonymous, all identifying information was removed during transcription in accordance with Tri-Council Policy standards in order to ensure confidentiality (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, Social Sciences and Humanities Research Council of Canada, 2014).

Data Analysis. The six-phase process of *thematic analysis* described by Braun and Clarke was applied to the interview transcripts (Braun & Clarke, 2006). Results from the two open ended questions included with the ADCSAS questionnaire (see Chapter IV), were also analysed using this protocol. *NVivo* software was used to conduct the analysis.

Familiarization took place by thoroughly reading and re-reading each interview transcript. The primary researcher transcribed the interview recordings to promote familiarity with the data (Johnson & Turner, 2003; Braun & Clarke, 2006).

Generation of initial codes occurred by distilling important concepts from each interview transcript into brief text descriptions, referred to as *codes*. Code generation was conducted in an inductive, *data-driven* fashion, meaning they were determined based on the ideas interpreted from the data rather than a pre-existing set of codes or ideas (Braun & Clarke, 2006).

Searching for themes took place once all individual interviews were coded. The list of codes and associated data (quotes) were then organized into possible meaningful sets (themes). The organization took place by printing excerpts and arranging these into sets based on their codes. These sets were then rearranged to generate potential themes within *NVivo*. Following this organization, a table including quotes and codes from each theme and a concept map relating themes was produced (Braun & Clarke, 2006).

Reviewing themes took place in two stages. The coded data within each theme were reviewed by the primary researcher to ensure that they were consistent with the thematic category to which they were assigned (referred to as *internal homogeneity*). This was done by reviewing each transcript and annotating the text using *NVivo*. Next, the thematic table and concept map produced were reviewed by both the primary researcher and research supervisor to ensure that they were representative of the dataset as a whole (referred to as *external homogeneity*). Themes were then reorganized and reviewed a second time resulting in subthemes within the data. The final concept map was reviewed to confirm external homogeneity by the research team (Braun & Clarke, 2006).

Defining and naming themes consisted of distilling each theme into the most important components and naming them. They were then given brief descriptions to outline the main findings within and significance of each theme (Braun & Clarke, 2006).

Producing the report included extracting exemplary pieces of data representative of the themes. This process also helped inform mixed methods data analysis detailed in Chapter VI (Braun & Clarke, 2006; Creswell, 2013).

Trustworthiness and Rigour. In contrast to quantitative research, in order to confirm the rigour of the study qualitative research must explicitly outline the ways trustworthiness is ensured (Thomas & Magilvy, 2011). The present study followed the trustworthiness criteria described by Lincoln & Guba (Lincoln & Guba, 1985).

Credibility, which describes the completeness and accuracy of the data, was ensured primarily through extensive note-taking throughout the data collection and analysis process. The interview process also followed semi-structured format in an environment conducive to open communication with the participants in order to ensure consistent discussion (Lincoln & Guba, 1985).

Transferability, the degree to which findings can be transferred to other contexts, was promoted in the current project by ensuring different demographics were represented in qualitative interviews and that descriptions of the demographics represented in the interviews were accounted for to allow future researchers to determine applicability of the current study results (Lincoln & Guba, 1985).

Dependability, the degree to which findings could be replicated in the same environment, was ensured by keeping notes regarding the process and through collection of data in multiple ways in order to ‘triangulate’ findings. To some extent, this criterion was inherently addressed by the mixed methods nature of the research, however, the qualitative phase was given additional consideration to ensure dependability via the review of the codes and preliminary themes (Lincoln & Guba, 1985).

Confirmability, the degree of neutrality in a study, was also supported in several ways. During the data collection process, a semi-structured interview guide was used. Peer review and data triangulation were used during data analysis. In addition to these strategies, ensuring *reflexivity* allowed potential biases of the researcher's approach to be identified and mitigated (Lincoln & Guba, 1985).

One component of reflexive research is describing the positionality, ie. the experience and perspective, of the researcher (Lincoln & Guba, 1985). The primary researcher approached this project from the perspective of an interested outsider with minimal initial knowledge of dental education or the typical practices therein. As a health promotion student and volunteer with patient and health-focused organizations, the researcher has considerable interest in patient-professional communication. It was felt that this approach, as well as the relatively neutral viewpoint, would be beneficial in exploratory research in dental education.

III) Results

Participants. Semi-structured interviews were conducted with 13 dental students between February and April of 2017. General demographic information was collected at the beginning of each interview solely to ensure different student groups were being represented in the interview phase (see Table 5). Interview length ranged from 20-60 minutes.

TABLE 5: Demographic descriptors of qualitative interview participants

Gender	7 female-identified (54%) 6 male-identified (46%)
Ethnic Identity	2 minority-identified (18%) 11 non-minority-identified (82%)
Year of Study	4 DDS1 (31%) 3 DDS2 (23%) 6 DDS3 (46%) 0 DDS4
Qualifying Program (QP)	2 QP students (18%) 11 non-QP students (82%)

Interview Findings. Following completion of the thematic analysis methodology, five latent themes were identified, as were several subthemes. The organization of themes and subthemes is depicted in the concept map in Figure 7.

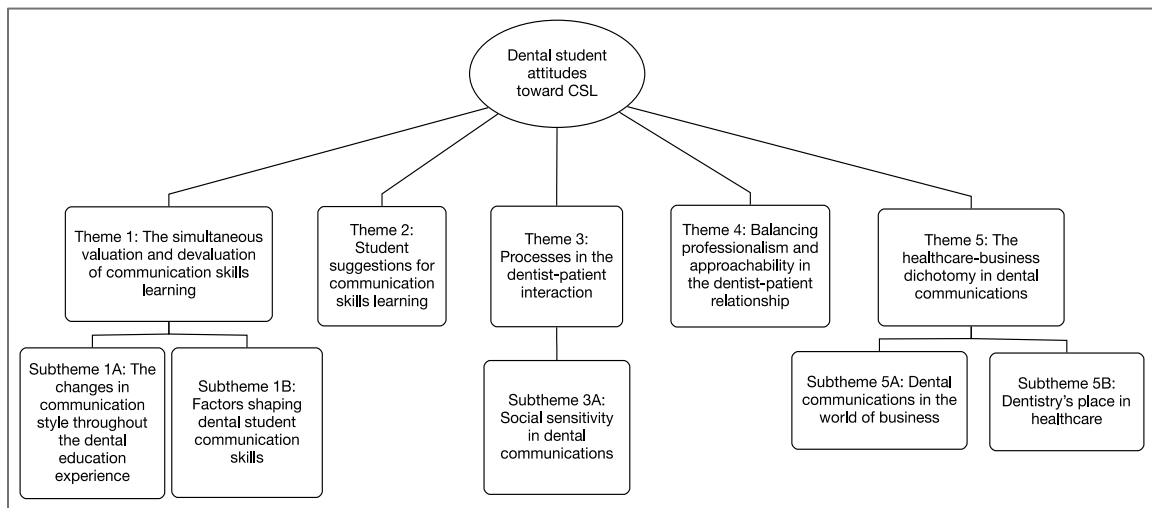


FIGURE 7: Concept map illustrating the themes and subthemes yielded by the qualitative interview study phase

Theme 1) The simultaneous valuation and devaluation of communication skills learning. Participants described the importance of learning and using CS in the dental profession, while sometimes simultaneously devaluing the learning process. This was

frequently expressed while comparing CSL and the learning process for clinical skills, sometimes called *hand skills*.

Nearly all of the participants in this study felt that CS were valuable to success in dentistry. The below quotation explains that CS are valuable in the dental interaction:

“The other aspects would be the clinical dentistry, which is absolutely necessary to be a dentist, but you cannot be a successful dentist if you were just good at your work inside the mouth and once the patient sits up and talks, they don’t understand what you did.”

Several participants noted that there were few formalized learning components targeting CS, sometimes implying this was negative:

“There’s not a lot of focus on communication that I can remember, which is not great because it’s such a big part of our career.”

However, while not explicitly asked whether or not they would prefer to have more formal content in the CSL curriculum, participants tended to state that it was less necessary or important than hand skill learning, or that there was insufficient time in the curriculum to learn CS. One participant described the contrast between learning CS and hard skills:

“A lot of the stuff we do in lecture is “here’s a disease, here’s a treatment.” We don’t tend to think about the communication a lot of the time until we have to sit there at a project or by the chair and it hits you.”

This suggests that, while they felt CSL was important, a distinction between the ways of learning CS and hand skills was such that formalized curricular content was not considered the most useful method for learning CS.

Subtheme 1A) The changes in communication style throughout the dental education experience. Most participants (9 of 13 interviewed) alluded to a common pattern of how attitudes toward CS and CSL appeared to change over the course of the four-year DDS program. This pattern is characterized in particular by two major shifts. The first shift takes place during the beginning of the program, as students adapt to working in a dental context and become more comfortable in their roles as future dental professionals. The second shift takes place later in the program, where the pressures and stresses of dental practice and completing dental school appear to impact the ways in which senior dental students communicate with their patients.

From the perspective of the participants, development of CS may begin even prior to the program itself through the admissions process, perhaps suggesting that CS are expected to be learned prior to dental school rather than during:

“I feel like for communication it’s more like a “learn on the job” kind of thing. I don’t know if there is really any standard or discipline on it... I think a lot of these skills

are developed through dental school, and that communication is a prerequisite for dental school exemplified in the interview stages.”

The next stage of this pattern was noted to take place at the beginning of the dental education program, with students feeling anxious or hesitant about their communication style. As one first-year student pointed out:

“I am in first year and you kind of have to be a little bit more careful about what you say... We kind of tiptoed around each other at first.”

As students become more exposed to their clinical experiences, participants described an expected increase in comfort with their CS. A third-year participant described the change by explaining her strategy for leaving phone messages for patients:

“Even when I first started having to leave messages- I like talking to people on the phone, but I get intimidated when I have to leave a voice mail. In the first few weeks, even a month or two, I used to have to type everything out but now I just freestyle and I feel a lot more comfortable that way.”

The below excerpt further alludes to this shift:

“When you see people with their first patients, they bumble around awkwardly, like just that physical awkwardness and you know you have to communicate with the patient to verbally compensate and give the impression you know what you’re doing when you’re

right at the start. I think that will be difficult and I think you can see the progression so clearly between third and fourth years.”

Subtheme 1B) Factors shaping dental student communication skills. A variety of sources for learning CS were cited by participants and included instructors, peers, senior students, and family. This theme captured the ways in which participants recognized these sources, as well as activities and curricular content, as having shaped their dental CS.

Faculty were cited most prominently as a source of CSL for students. In particular, several of the students noted the importance of modelling for advancing their own CS:

“I’ve got a lot to learn from faculty... they have analogies and ways to explain that they know works with patients in order to explain a procedure.”

This learning through modelling was experienced with senior students as well. Regarding a relatively novel shadowing component, one participant remarked:

“We need to shadow upper years at least five times during the year and they don’t tell us exactly how to communicate, but just by exposing us to that environment, I feel is an advantage to see how the upper year students communicate.”

Theme 2) Student suggestions for communication skills learning. This theme captured the ways in which students felt their CSL experience could be improved. It is interesting to note that students were not given many specific questions regarding how

they would like to see CSL imparted but would volunteer suggestions throughout the interviews.

The most common suggestion was to increase the use of standardized patients, role-plays, or other model interactions. Participants voiced an understanding that there may be some limitations to this approach, but seemed to feel that more exposure to different situations would be of benefit:

“Even a mock patient would help me then figure out what the dos and don’ts are and help me improve. That way, if I could learn that now, once I’m out in the real world or clinic with actual patients, it would benefit both you and the patient in the long run.”

Other common suggestions included a) providing feedback or evaluation on student-patient interactions, b) including more content regarding consideration of mental health concerns in the dental chair, c) having sessions or discussions on how to interact with emotionally difficult interactions or individuals, and d) having more opportunities for dental students to work with the dental hygiene students in clinical environments.

Theme 3) Processes in the dentist-patient interaction. This theme encompassed the techniques, traits, or procedures dental students felt they were required to include when communicating with patients. Some of these included listening to patients, ensuring informed consent is given, educating patients, and reinforcing positive behaviours. One of the most commonly discussed requirements of the dentist-patient interaction was ensuring communication was tailored to the abilities and knowledge of the patient. As one participant mentioned:

“You can’t just assume everyone has a Masters degree or knows what you mean if you get complicated.”

Navigating interactions with difficult patients was another common topic:

“If you have a difficult patient, you need to know how to navigate that conversation and tell them your rationale for why you are recommending something or not going with an option they wanted.”

Subtheme 3A) Social sensitivity in dental communications. Social and emotional sensitivity were highlighted by interview participants as particularly important for dentistry. This included a recognition of social variables such as gender identity, ethnic or racial heritage, or socioeconomic status. Participants emphasized the importance of communicating in a non-judgmental way that was compassionate toward patients with different social backgrounds. One participant said:

“There will be people who come into this clinic that you might not expect to see in this city, but you have to be empathetic and understand that there will be people outside of your bubble of privilege that you might not see on a regular basis.”

Theme 4) Balancing professionalism and approachability in the dentist-patient relationship. This theme described the ways participants felt their role as a dentist impacted their communication style and the dental interaction as a whole. In particular, participants described how patient rapport was required, but keeping professional distance from patients remained important:

“You need to draw the line between patient and friend.”

Some participants implied that this “line” could sometimes be difficult to navigate:

“You want to be confident, but you don’t want to be overly confident where they can’t relate to you, but then you also don’t want to be too relaxed to the point you look unprofessional and have them question if you know what you’re doing.”

Theme 5) The healthcare-business dichotomy in dental communications. All participants mentioned that the privatized nature of dental practice can colour how they communicate with their patients. Additionally, many participants discussed that this influence is rather unique to dentistry, partly due to the contrast with the universal medical healthcare system in Canada, to which participants often made comparisons.

Subtheme 5A) Dental communications in the world of business. Participants described the pressures of the business world as a challenge to overcome while communicating with patients:

“If you’re horrible at business, you can’t do your job.”

“I don’t want to say it’s more important for dentists, but in terms of business, you will lose patients if you don’t have good communication skills”

Subtheme 5B) Dentistry’s place in healthcare. Participants described how the dual healthcare-business nature of dentistry was expressed in dental communications,

including how this contributed to patient health. The below quotation mentions the difference between dentistry and the general healthcare system:

“I might have to extract a tooth, but should the government have to pay for a thousand plus dollar implant for aesthetic reasons? That might be outside of the realm of healthcare at that point. You need to communicate with patients in a way that physicians don’t really have to. You’re offering a service in addition to healthcare.”

Importantly, this unique position was not always seen as negative or challenging. Some participants highlighted ways in which patient general health could actually be bolstered by the unique role that dentists play and the communication opportunities in that role:

“I think we as dentists have more time one-on-one with the patient and can start talking to them if we find anything in the mouth. We can provide a foundation... for smoking prevention or if we see a white patch in the mouth. We have time while we are doing a filling, because their mouths are open, but their ears are open too”

IV) Discussion

Inclusion of student attitudes regarding CSL may reveal opportunities to enhance CSL curricular content and improve student CS (Botelho, Gao, & Bhuyan, 2018; Subramanian et al., 2013). The current study suggests several implications for dental education, which are outlined below.

Participants described frequent contrasts between CS and technical skills that may have contributed to the devaluation of CS by some participants, such as program time constraints or the “grey area” nature of learning CS. This suggests further emphasis on the equivalent importance and interrelated use of CS and hand skills in dental practice may be of benefit. Such an objective could be partly achieved through additional shadowing in dental clinics and practices where possible. To avoid time constraints, further discussions regarding the importance of CS could be integrated into pre-existing components in earlier years of study. Additionally, as new procedures, techniques, or common situations are described during coursework and clinic experiences, purposefully-developed, calibrated sample interactions could be imparted to students. These interactions could be described by instructors or demonstrated through videos or role plays to learn topics and approaches to include in patient interactions alongside procedural knowledge and hand skills.

Several participants noted that senior students tended to display less empathetic or patient-centered CS and behaviours, perhaps due to their numerous academic and clinical demands (see Subtheme 1A). Stress was also frequently described by the participants, eg. due to feeling pressured by both the business and healthcare demands in their roles (see Theme 5). Previous research in medical students suggests a benefit of stress management techniques which may help dental students, particularly in senior years of study, cope with competing demands and help reinforce positive, patient-centered CS (Shiralkar et al., 2013). Future research would be required to determine the effectiveness of such resources or interventions in terms of their impact on the CS of dental students.

There were mixed opinions in the current study regarding whether CSL should be primarily formal or informal (see Theme 2). Some participants suggested increasing the amount of formalized curricular content, eg. by adding a course to the program. Courses in CS have been found to be beneficial in other dental schools (Alvarez & Schultz, 2018). However other less modular options, such as feedback from patients, in existing clinical experiences have also found success (Coelho, Pooler, & Lloyd, 2018). Participants often expressed desire to increase modelling and practice opportunities, such as shadowing and simulation. These activities are ongoing in the institution under study, however promotion of additional opportunities may be of benefit.

Participants in this study identified several requirements in dentist-patient communications. These included ensuring informed consent, gauging patient moods, promoting patient understanding, balancing professional distance with approachability, and ensuring social and cultural sensitivity is integrated into dentist-patient communications (see Themes 3 and 4). McKenzie also reported dental students described a need to understand patient moods (McKenzie, 2016). Shadowing and modelling opportunities for dental students may bolster students' ability to 'read' patients during personal interactions. Shadowing in external dental clinics and practices, while logistically difficult, has seen success in previous research (Heitkamp, Rüttermann, & Gerhardt-Szép, 2018).

Tension. Noted throughout the study were sources of tension that affected communication. Theme 1, that of the simultaneous valuation and devaluation of CSL, was a clear source of tension. Participants described in detail the importance of CS for

success in dentistry as well as for patient outcomes, and often suggested ways in which this learning process could be more emphasized (see Theme 2). Yet, many of the same participants would describe how there was insufficient time to learn dental CS in the program, would explain that the “soft skill” nature of communications prevented them from being properly learned, or would state that CS were selected for during admissions and did not require additional practice or training.

Tension continued to be expressed in Theme 4 (balancing professionalism and trust). Participants discussed the desire to communicate in a friendly, relatable way with patients, but simultaneously felt held back from this approach by the responsibilities and professional duties required by their role as dentists. Navigating this boundary appeared to be a source of concern or even worry for some of the participants and would impact many aspects of their communication styles, from the use of wording or jargon, to the questions they need to ask patients about their social history, or the ways they would present information about treatment or conditions to a patient. These findings are congruent with a study which noted that dental students experienced challenges gauging patient abilities and communicating with them in a corresponding manner (Gupta et al., 2016).

A third source of tension reflected in dental student communications was the dichotomy between dentistry as a business or service provision and dentistry as healthcare. Participants tended to compare themselves and their profession to general medicine. In contrast to the universal medical healthcare system in Canada, dental care is primarily privatized. Participants noted that there were competing demands that were

expressed during dental communications and interactions with patients, such as having to ask for payment for treatment, having greater cosmetic demands from patients than may be expected of other healthcare professionals, or having to present various treatment options that may be beyond the financial reach of patients. Participants acknowledged that this tension is in contrast to fields such as general medicine, and while dentists may be expected to maintain all of the same patient CS as doctors and nurses, they may experience additional pressure as a result of their responsibilities as business owners or employees of private practices. Participants noted that poor communication could negatively impact business performance by driving away patients, making communication especially important in a dental context. This tension appears to impact the professional identity of dental students. There is minimal research to date contrasting dental and medical professionals' perspectives in this area, therefore further exploration may be of interest.

Taken together, these sources of tension affect the ways dental students communicate with their patients. There appears to be a notable amount of stress and/or uncertainty, for example, regarding how to incorporate business elements such as discussion of fees into conversations with patients. Additional stress management resources, as well as support and understanding from instructors regarding the difficulties of dental communication, may help to ease some of this tension and its potential effects on dentist-patient communication. Further research to determine in what ways this tension impacts patient experience and health outcomes should be considered.

Limitations. There were some limitations noted in the current study. As the primary researcher both conducted the interview and the primary analysis, there may have been an opportunity to introduce bias into the results. This potential was minimized through the use of a semi-structured interview guide, which was kept consistent between interviews, as well as the review of the coding and preliminary results by other members of the research team. While the interview participants may not be completely representative of the dental student population, particularly as no DDS4 students expressed interest in being interviewed, all those who wished to participate were interviewed in order to maximize the sample size and thus the generalizability of the findings to other contexts.

V) Conclusion

Participants in the current study discussed the importance of CSL for dental practice in depth throughout the current study. Simultaneously, they acknowledged the challenges inherent in learning these skills in dental school and their motivations for having the attitudes they expressed throughout the study. Student attitudes toward their CSL may also be reflective of their broader perceptions regarding their roles as healthcare professionals and service providers, as well as their other roles of employers, partners, and business people. The perspectives and needs described in this study may provide insight into educational practices or developments that can support both future clinician effectiveness and patient health outcomes. Minimal qualitative evidence regarding dental student attitudes toward CSL and related constructs has been published previously, highlighting the importance of current findings and additional qualitative exploration.

CHAPTER VI: QUALITATIVE SURVEY AND MIXED METHODS TRIANGULATION

Proposed Manuscript Title: Informing communication skills learning and teaching in dental schools using mixed methods research

I) Introduction

The fields of health promotion and health services can give rise to complex research questions and topics of study. The current study explored one such topic, as it sought to describe dental student attitudes toward their communication skills learning (CSL). Mixed methods research is becoming increasingly relied upon to address complex health promotion research topics and was therefore chosen for the current study (Plano Clark & Ivankova, 2016). For a discussion regarding the rationale for this study, please refer to Chapters I and II.

Three phases of data collection were included in the current study design, including a quantitative questionnaire, open-ended survey questions, and a qualitative interview. Findings from the questionnaire are discussed in Chapter IV, while interview findings are described in Chapter V. This chapter includes the findings for the open-ended survey questions and the mixed methods triangulation approach.

II) Methods

Survey Delivery and Analysis. Two open-ended, qualitative questions were part of an on-line quantitative questionnaire delivered to all dental students in one university during

the fall of 2016. These questions were a) “When you think about your future dental practice, how would you like to communicate with your patients? How do you think you can best learn to communicate this way?” and b) “Are there any other comments you would like to add?” Primary analysis of the open-ended survey questions was conducted using the six-stage thematic analysis framework proposed by Braun & Clarke (2006), which has been described in detail in Chapter V.

Mixed Methods Data Triangulation. Following completion of the data analysis for the individual phases of the study, a discussion was held with members of the research team, in order to confirm appropriate representation of the community and *face validity* of the findings. Following this, the primary researcher applied the framework proposed by Farmer et al. (2006) to the three individual datasets in order to conduct mixed methods triangulation. This framework contains several steps, which are described below.

Sorting took place by compiling each of the themes from the two qualitative datasets, as well as the components and main effects from the quantitative dataset. Findings were examined to determine which overlapped and which conflicted (Farmer et al., 2006).

Convergence coding and assessment was completed by re-examining the categories and their contents (ie. themes and qualitative codes, or components and quantitative questionnaire items) to arrange them in larger *metathemes* based on their latent meanings and prominence of the ideas they contained. The themes were then arranged in a convergence matrix. Areas of agreement and disagreement were noted according to the below criteria:

- i. *Agreement*: there is full congruence between the datasets regarding the concept in both latent meaning and example content (ie. codes or items).
- ii. *Partial Agreement*: there is agreement regarding either the latent meaning or specific examples of the concept, but not both.
- iii. *Silence*: there is representation of the concept in one dataset but not another.
- iv. *Dissonance*: there is disagreement between the datasets regarding the concept.

A *completeness comparison* was undertaken by examining the ways in which the different datasets contributed to the unified set of findings noted in the convergence matrix and by considering how any discrepancies may have been generated (Farmer et al., 2006)

Researcher comparison and feedback took place between the primary researcher and senior members of the research team. The primary researcher and research supervisor each completed a sample convergence matrix and resolved areas of discrepancy or uncertainty through three informal, consensus-based discussions. The final convergence matrix was reviewed by the remaining members of the research team, who provided insight regarding the findings from a dental faculty perspective (Farmer et al., 2006).

Choice of Framework. Originally, the mixed methods integration framework chosen was that of Onwuegbuzie and Teddlie (2003), which contains seven potential stages. However, following completion of the data analysis for the three individual phases of study, the framework was replaced with that of Farmer and colleagues (2006).

Three reasons justified the decision to alter the triangulation framework. First, Onwuegbuzie and Teddlie's framework provides a series of optional steps, including converting the data from each methodology to the other methodology in effort to yield one final set of mixed methods data (Onwuegbuzie & Teddlie, 2003). As the nature of the questions and items in each phase of the current study brought a different dimension to the overall project, it was felt that combining all three resulting data sets prior to reporting the results may to some extent oversimplify the findings.

The second reason for altering the mixed methods analysis framework was that the approach offered by Farmer and colleagues allowed for an additional level of triangulation between the three datasets. This promoted rigor by providing a means of identifying any discord between the different phases of study (Farmer et al., 2006).

The third reason for the framework change involved the methodologies of the three phases. Two phases were qualitative in nature. Additionally, the quantitative phase of the research included a principal components analysis, which effectively "qualitized" the questionnaire data by grouping items into thematic categories. This meant that a qualitative triangulation framework was most readily applicable to the three datasets. Given that the overall research question sought a description of student attitudes toward CSL, the framework proposed by Farmer et al. was most congruent with the requirements of the research and the nature of the research question (2006).

Rigor. As with solely qualitative research, mixed methods analysis also requires the explicit statement of and adherence to criteria of trustworthiness to support the rigor and

trustworthiness of the findings. Evaluating the quality of mixed methods research in sequential designs has previously tended to consist solely of two separate set of procedures for each of the quantitative and qualitative phases (Morse, 2010). In the current project the assessment of rigor also adhered to the mixed methods *legitimation* model outlined by Onwuegbuzie & Johnson (Onwuegbuzie & Johnson, 2006). This model contains nine criteria, which are outlined below.

Sample integration legitimation refers to the ability to generalize and transfer mixed methods findings to a wider audience. Qualitative research in particular is often criticized for failing to be generalizable to a wider context. Onwuegbuzie and Johnson suggest that this legitimation is achieved when both the qualitative and quantitative samples are sufficiently similar to the target population (2006, p. 56). Given that criterion and purposive sampling were used in the current research and that this research aims to be transferable to other dental school environments, sample integration legitimation was achieved by including all students who wished to participate, particularly in the qualitative interviews (Onwuegbuzie & Johnson, 2006)

Insider-outsider legitimation is achieved when the results are presented in a way that appropriately represents the viewpoints of the participants and is understood by outsiders. This is typically achieved through peer-review and member checking processes. Members of the research team other than the primary researcher examined preliminary findings to confirm their legitimacy. In addition, summarized findings will be presented to the Faculty of Dentistry to provide opportunities for feedback and member checking before knowledge is more widely disseminated (Onwuegbuzie & Johnson, 2006).

Weakness minimization occurs when the weaknesses of one research approach are compensated throughout the study by the strengths of the other. Given that three distinct phases of data collection were employed, there were ample opportunities to overcome quantitative weaknesses (such as a lack of detailed accounts) through qualitative exploration, as well as overcome weaknesses of qualitative research (such as lack of generalizability) using quantitative research. The data integration phase of analysis considered all three sets of data equally in determining overarching themes in the current study (Onwuegbuzie & Johnson, 2006).

Sequencing legitimation is achieved when the interpretations and inferences from the findings are consistent in sequential designs regardless of the order of the sequence. While a sequential research design was used, all phases were designed to explore the same construct, making it likely that the specific ordering would not overly affect study findings. It has been noted elsewhere that sequencing legitimation is difficult to measure within a single study in any case (Onwuegbuzie & Johnson, 2006; Onwuegbuzie, Johnson, & Collins, 2011).

Conversion legitimation occurs when qualitative data are meaningfully transferred to quantitative data and quantitative data are also transferred to qualitative data. These processes are referred to as *quantifying* and *qualifying*, respectively. This was evaluated using a principal components analysis to thematically categorize the data (Onwuegbuzie & Johnson, 2006).

Paradigmatic legitimation is achieved when the worldviews and assumptions of each of the research phases are reconciled and/or made explicit. A pragmatic philosophy was reflected throughout the research process. This philosophy ensures the research question is the driving force behind how the data was analysed. In addition, any conflicts that arose throughout the analysis were discussed and resolved with the help of the research supervisor (Onwuegbuzie & Johnson, 2006).

Commensurability legitimation is observed when the researcher is able to integrate and consider the findings from both a qualitative and quantitative lens. Researcher reflexivity (note-taking) and use of a triangulation matrix (Onwuegbuzie & Johnson, 2006) were used here.

Multiple validities legitimation refers to the appropriate reliance upon quantitative or qualitative rigor criteria when appropriate throughout the study. Rigor in the quantitative and qualitative phases, respectively, was ensured throughout each phase using clearly outlined criteria (Onwuegbuzie & Johnson, 2006).

Political legitimation is the final criterion of mixed methods rigor and refers to the ability of the findings and the researcher to overcome discrepancies in the viewpoints of both the research team and the readers of the findings. Multiple viewpoints at all stages of the research process through an *integrated knowledge translation* approach ensured members of the community under study were also responsible for the development of research questions and instruments. The findings of this research will be translated in an accessible way that highlights the strengths of each phase and will clearly explain in what

ways they are complementary rather than conflicting in nature (Onwuegbuzie & Johnson, 2006).

III) Survey Results

Participants. The quantitative instrument was completed by 124 students (77% of the population in the school under study). The first qualitative survey question was answered by 70 students (43% of the population) and the second question was answered by 26 students (16%). Thirteen students were later interviewed (8%). While demographic information was collected alongside the open-ended survey questions, the small sample sizes, particularly for the second question, did not warrant linking these demographic variables to participant responses.

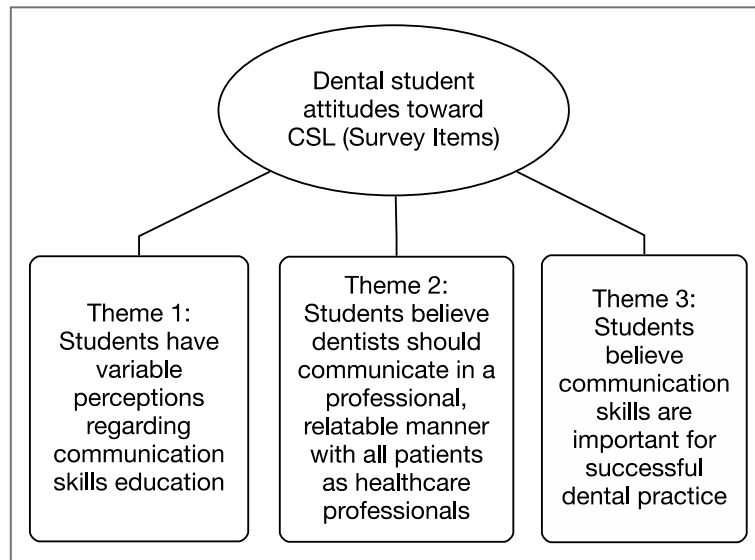


FIGURE 8: Concept map illustrating the themes extracted from the qualitative survey phase of study

Themes. Three themes were identified following thematic analysis of the open-ended survey item responses. These themes are visually represented in Figure 8 and described in further detail below.

Theme 1) Students have variable perceptions regarding communication skills education. This theme captured both the perceptions of students regarding the value of CSL, whether formal or informal, as well as some student suggestions for how CSL should be implemented in dental school.

Frequently noted in the survey responses were opinions regarding whether CSL should be presented to dental students in a formalized course format or other medium. Twenty-one respondents commented directly on the issue of formal vs. informal CSL. Of these respondents, 11 implied that formal training would be unnecessary. As one respondent noted:

“I don't believe that communication is not important in dentistry, however formal learning or training in communication will not make me respect people any more or any less.”

Some respondents cited time constraints and competing demands in dentistry as a reason for preferring informal training:

“I do think communication can be an additional skill that would make a dentist better. However, I think the dental curriculum is too packed to introduce it.”

In contrast to the respondents quoted above, 10 other respondents who directly discussed the necessity or value of formal training felt that it would be beneficial. One respondent noted:

“I think it would be beneficial for us to receive training here at the Faculty of Dentistry on effective ways to communicate with our patients when we are calling them on the phone to book appointments. We aren't really given much training in that sense, and when we were first starting out it was rather stressful.”

It is important to note that perceptions of what constituted “formal” CSL varied from a full course to a simple increase in evaluation and feedback of existing clinical interactions. As one senior student noted:

“It doesn't need to be long or drawn out, but at least touch on some issues that dentists will deal with when it comes to communicating with patients - better yet would be to have "communication" evaluated in some way during a clinic block when I have a real patient in my chair, just so that I am reminded and conscientious of my communication when interacting with patients.”

In addition to perspectives on the formality of CSL, there appeared to be consensus among respondents that practice and exposure were essential, with several students stating that shadowing experiences with both senior students and practicing dentists have been particularly helpful. Some students even suggested that further shadowing experiences would be useful to them:

“I think it would be helpful to shadow more dentists and observe their communication strategies.”

2) Students believe dentists should communicate in a professional, relatable manner with all patients as healthcare professionals. This theme discussed the importance of communicating with patients in a professional, yet friendly manner. The idea of having appropriate “chairside manner” in dentistry mirrors the bedside manner expected from general physicians or other patient-provider relationships. Most participants stressed the requirement that both professionalism and relatability be integrated into their communication approach:

“I think that there should be a professional approach with communication but that also takes into account being approachable and friendly to ensure patients feel comfortable and well taken care-of.”

Respondents often cited honesty, clarity, and understandability as integral to communicating in a professional manner and important for the promotion of patient oral health:

“I want to be open and candid and comprehensive in my communication with patients; I want to give them all relevant information so they can make informed choices about their dental care, and I want to feel like they leave the office having understood everything that was discussed.”

3) Students believe communication skills are important for successful dental practice. Survey respondents noted that CS were essential to practicing dentistry. There were several reasons participants gave for the importance of dental CS, including development of the patient-professional relationship, optimizing healthcare, and effective business management. The excerpts below offer examples of such rationale:

“Communication is an important part in developing a trust relationship between patient and dentist.”

“I believe proper communication is essential to providing great health care.”

“I think it’s important to be able to communicate clearly with patients so they understand their responsibilities, my responsibilities, the costs, expectations, how they can make a difference, and how I will be helping them”

IV) Mixed Methods Triangulation

Following the selected mixed methods triangulation framework (Farmer et al., 2006; O’Cathain, Murphy, & Nicholl, 2010), the components, main statistical findings, and themes from all three phases of the current study were collated. This resulted in several areas that were addressed by multiple phases of the study. Such areas of convergence are termed *metathemes*. A summary of categories from all phases of study, including metathemes, has been featured in the convergence matrix in Table 6 (labelled boxes denote metathemes, see Table 6). The subsequent assessments of convergence and completeness revealed several notable findings:

Agreement. A high level of congruence was observed amongst the three datasets following triangulation. Of the 20 categories (themes, components, or main effects) included in the convergence matrix in Table 6, 16 of these (80%) displayed at least partial agreement with a category found in at least one other phase of the study. Further, 11 categories (55%) were in agreement with findings from all phases of study. Five *metathemes* were observed and are described below:

- i. *Valuation and Devaluation:* The idea of valuing some components or constructs in CSL and devaluing others at the same time emerged repeatedly and found congruence between all three study phases. This metatheme captures that students value CSL in different ways, yet are conflicted due to time constraints or academic pressures. As many participants throughout the study expressed different levels of comfort with dental communication and different motivators for their attitudes toward CSL, these findings suggest individualized training or further experiential approaches to CSL may be of benefit.
- ii. *Development:* This metatheme described the change in attitudes toward CSL that takes place during the DDS program of study. The quantitative questionnaire findings reported a main effect of year of study on mean scores for each of three component subscales found via a PCA on the adapted Dental Student Communication Skills Attitude Scale (ADCSAS; Chapter IV), while the qualitative interviews described how students in earlier years of study approach communication in a more hesitant and careful way than senior students. This reiterates the need to ensure any CSL activities are appropriately timed to student clinical experiences in dental school.

- iii. *Academic Utility:* This metatheme captured how useful students felt CSL was for success in dental school itself, as well as which components of CSL were most important or valuable in their perspective. The metatheme found partial agreement between the three phases of study, with the questionnaires focusing more on the level of academic utility students felt CSL possesses, while the qualitative survey and questionnaire included a series of opinions and suggestions for CSL implementation.
- iv. *Professionalism:* This metatheme found partial convergence between the qualitative surveys and interviews and discussed the importance of and factors required for adequate “chairside manner” and a trusting dentist-patient relationship. Participants stressed the need to be empathetic toward the social situation and contexts in which their patients live, as well as ensure a balance of relatability and professional distance in their patient communication. While many participants felt their ability to be sensitive to patient needs was adequate, others recommended that additional emphasis on empathy and sensitivity would be of benefit to include in CSL.
- v. *Importance:* There was a strong belief among participants that learning to communicate as a dentist was important for succeeding in the profession. This metatheme and corresponding recommendations have been described in all three phases of the study.

TABLE 6: Convergence matrix of components and themes from each study phase (labelled boxes signify metathemes)

<u>Quan. Questionnaire</u>	<u>Qual. Survey</u>	<u>Qual. Interview</u>
Valuation/ Devaluation		
Component 1: Valuation/devaluation of learning and teaching	Theme 1: Students have variable perceptions regarding CSL implementation	Theme 1: The simultaneous valuation and devaluation of communication skills learning
Development		
Main Effect 1: Year of study		Subtheme 1A: The changes in communication style throughout the dental education experience
		Subtheme 1B: Factors shaping dental student communication skills
Main Effect 2: Gender		
Main Effect 3: Ethnicity		
Academic Utility		
Component 3: Academic utility	Theme 1: Students have variable perceptions regarding communication skills education	Theme 2: Student suggestions for communication skills learning
		Theme 3: Processes in the dentist-patient interaction
Professionalism		
	Theme 2: Students believe dentists should communicate in a professional, relatable manner with all patients as healthcare professionals.	Subtheme 3A: Social sensitivity in dental communications
		Theme 4: Balancing professionalism and approachability in the dentist-patient relationship
Importance		
Component 2: Importance for successful dental practice	Theme 3: Students believe communication skills are important for successful dental practice	Theme 5: The healthcare-business dichotomy in dental communications
		Subtheme 5A: Dental communications in the world of business
		Subtheme 5B: Dentistry's place in healthcare

Silence or Dissonance. There was no dissonance (direct disagreement or conflicting results) in the present study findings. However, there were several silent discrepancies detected. These discrepancies were generated primarily due to the different lenses and question approaches used in the different phases of study, particularly the increased specificity of the questions used in the qualitative interviews (see Appendix E).

The first notable case of silent discrepancy can be found in the *Development* metatheme, which was represented in the quantitative questionnaire and qualitative interview but was not identified in the qualitative survey. This silent discrepancy is likely due to the nature of the questions in the qualitative survey, which focused more on the dental students' futures as practicing dentists, rather than their previous experiences or attitudes toward CSL.

Another instance of silent discrepancy was detected in the *Professionalism* metatheme. This metatheme did not appear to have representation in the quantitative findings reported in Chapter IV. Four other examples of silent discrepancies were noted in the convergence matrix in Table 6. Subtheme 1B and theme 3 from the qualitative interviews, as well as main effects 2 and 3 found no major convergence with other phases of study. Further study may be needed to clarify how these categories are related to attitudes toward CSL.

V) Discussion

The current finding that students simultaneously valued and devalued CSL, noted in the survey Theme 1 and overall *Valuation and Devaluation* metatheme, supports previous

findings in medical education research. In a qualitative study by Rees and colleagues, medical students had mixed beliefs regarding whether CSL should be imparted in lecture-based or experience-based formats (Rees, Sheard, & Mcpherson, 2004). The current study furthers previous research by noting that both valuation and devaluation beliefs and attitudes can be expressed even by the same participant, suggesting that a mixture of both didactic and experiential learning methods would be of benefit to dental student CSL. If didactic learning components are developed, task-oriented rather than theory-based content may be most helpful for students, as Rees suggested the more passive acquisition of information may not be considered as beneficial as experiential learning (Rees et al., 2004).

The metathemes describing the changes in CS over the course of the dental education experience and participants' attitudes toward the academic utility of CSL also expand upon findings in the medical school environment. A qualitative study regarding medical student attitudes toward learning about doctor-patient relationships noted there was minimal reinforcement of the theory learned in pre-clinical years during later clinical experiences (Wright et al., 2006). The current study suggests that CSL must be timed to correspond to the clinical experience of dental students. Exposure to sample interactions and shadowing in the first year of study, followed by simulations in early clinical experiences, and finally a heavier emphasis on feedback provision for students in senior years of study may be a pragmatic method for CSL delivery based on current and previous findings (Ayn et al., 2017). Field and colleagues noted that CS and other patient care-focused competencies are among the least commonly-taught skills in dental education (Field et al., 2018). Whether course-based or experience-based, more explicit

CSL is likely needed in order to achieve the level of competency required by governing bodies of dentists and dental educators (American Dental Education Association, 2008; Association of Canadian Faculties of Dentistry, 2016).

Instructors are valuable sources for feedback on dental student CS. The current findings noted the importance of being able to learn more about CS from faculty. This is congruent with findings from a previous study in medical students who commonly expressed a desire to ask more questions of faculty regarding CS (Nogueira-Martins, Nogueira-Martins, & Turato, 2006). This implies that providing some faculty development may be beneficial, in order to ensure discussions with students and other methods of imparting CSL are standardized and reflective of the most current research and educational best practices (Licari, 2007). Indeed, a survey delivered to all health professional educators in one Canadian university found that teaching communications was the third most common professional development need, after evaluating and motivating learners (Schonwetter, Hamilton, & Sawatzky, 2015).

In addition to faculty members, giving patients opportunities to provide feedback on the CS of the dental students who treat them has shown success in promoting stronger CS (Coelho et al., 2018; Memarpour et al., 2016). Instruments have previously been developed to integrate patient feedback regarding student CS and wider use of such instruments could be implemented (Wener et al., 2011). However, as noted in Chapter V, the benefit of patient commentary in improving students' CS may be hindered if students feel their academic success is dependent on such feedback. It is therefore important to include academically "risk-free" opportunities for feedback as well.

The understanding that dental students must communicate in a socially-sensitive, professional, and reassuring manner was noted throughout the current study and is captured in the *Professionalism* metatheme. The two most commonly described concerns pertaining to social sensitivity were communicating in a culturally safe way and communicating sensitively about socioeconomic conditions. Participants in the current study noted that expressing cultural safety in CS was not always easy. This is in line with previous research suggesting cultural biases can be expressed covertly in physician-patient interactions or hinder cross-cultural patient communications (Lingard, Tallett, & Rosenfield, 2002). As described in Chapter IV, exposing students to diversity through shadowing may help to promote social sensitivity and empathy-based CS. One study also recommended that anti-racism content be incorporated into the curriculum (Gordon, McCarter, & Myers, 2016). Other opportunities to promote culturally-safe CS should be implemented wherever possible. Additionally, future research using the ADCSAS instrument may benefit from the addition of more content pertaining to professionalism and sensitivity in dental communications.

Participants expressed significant stress regarding communicating about socioeconomic concerns such as poverty, treatment availability, or marginalization. Previous research in dental student attitudes toward treating marginalized groups found that students felt marginalized patients were distinct from the rest of their patient population (Dos Santos et al., 2017). The current study recommends that promoting additional community-based work could promote more comfort and empathy in communicating with marginalized patients. Alternatively, one study found that a poverty simulation delivered to dental students helped promote an understanding of and empathy

towards those experiencing poverty (Lampiris et al., 2017). Further research to explore the link between understanding marginalization and communicating with patients experiencing poverty would be of benefit.

The importance of CS was reinforced in every phase of study. Both the needs of healthcare and business were emphasized as influencing dental student communication, with the business needs often being described as difficulties or challenges by participants. This suggests that additional resources in business management and how to communicate about the business of dentistry would be beneficial to students. Further research to articulate the relationship between dental communications and patient health would also be useful in determining health promotion strategies or implications for dental education and practice.

Limitations. There were limitations observed in the use of the qualitative survey as well as the triangulation protocol. While the open-ended survey questions were delivered in conjunction with a quantitative questionnaire, analysis of participant responses were not analysed according to demographics. This created a disconnect between the demographic-based analysis of the quantitative questionnaire and the thematic findings described earlier in this Chapter, which may have contributed to the silent discrepancies noted in the convergence matrix. While the small sample sizes of the survey question responses may not have yielded any additional useful conclusions from such analysis, future iterations of these instruments may benefit from linking questionnaire and qualitative survey responses.

The mixed methods triangulation framework, while most pragmatic for the purposes of the current study, is primarily qualitative in its approach. Future research examining student attitudes toward CSL may benefit from increasing the use of quantitative approaches in mixed methods data collection and analysis in order to further the generalizability of the findings.

VI) Conclusion

Student attitudes toward CSL were expressed in various ways throughout the course of this mixed methods study. While student perspectives on how CSL should be implemented in their dental education experience varied considerably, participants expressed consensus in their attitudes that dental CS were important for promoting patient health and having a successful business. Participants also expressed similar attitudes toward the necessity of socially sensitive and patient-centered CS, offering suggestions regarding how they felt their needs could be best met.

The mixed methods nature of the current study allowed findings from one phase of data collection to be corroborated and triangulated with other phases of data, lending additional credibility to the findings described throughout this chapter and previously (see Chapters IV and V). These findings have several implications for research and educational practice, which may be used to support CSL in dental schools to ultimately promote patient health.

CHAPTER VII: CONCLUSION

I) Revisiting the Research Questions

Question 1) How do dental students rate their attitudes toward communication skills learning? Students rated their attitudes toward CSL positively. They frequently agreed with statements expressing positive attitudes toward or beliefs about CS or CSL. Similarly, they disagreed with statements indicating negative beliefs about CS or CSL. This question was addressed via an instrument adapted to maximise relevance to the current study population (the ADCSAS). While no hypothesis was made regarding this question due to its exploratory nature, findings appear congruent with other research in this area.

Question 2) Do the attitudes of dental students toward communication skills learning differ significantly among different demographic groups? The reported attitudes toward CSL differed significantly between men- and women-identified students and between students of Western and non-Western descent. Attitudes also significantly differed based on year of study, with students in their first year of study having significantly more positive attitudes toward CSL than those in upper years. These observations are in agreement with the original hypotheses.

Question 3) What are the beliefs and attitudes of students toward the process of learning to communicate in dental school? Participants expressed diverse attitudes regarding how they believed CSL should be imparted in dental school, such as through formal content or additional experience-based activities. However, most agreed they were satisfied with their CSL. They pointed in particular to senior students and faculty as

strong resources for their learning, as well as activities such as shadowing for helping their CS development.

Question 4) Based on a quantitative questionnaire, a qualitative survey, and a qualitative interview, what are dental students' attitudes toward communication skills learning?

While students had varying ideas regarding how they felt CSL could best be included in their dental education, there was consensus that CS and CSL was important for the practice of dentistry as well as patient health promotion. Participants felt that there were a number of requirements in the dentist-patient interaction that they needed to meet, such as social sensitivity and gauging patient mood and understanding. In addition, participants felt that there was a strong influence of tension and competing demands on patient communication and relationships.

II) Implications for Dental Education

A number of implications for CSL in dental education have been described throughout the preceding chapters. A summarized list of these recommendations has been included in Table 7. Many of these recommendations are already in place to some extent in the institution under study, however they may be useful for curricular development in other dental schools and interprofessional education programs. Evaluation of any of these recommendations or strategies is recommended.

TABLE 7: Sample recommendations based on current study findings

<u>Recommendation</u>	<u>Source(s)</u>
<i>Content/Resource Recommendations</i>	
Emphasize the importance of CS in the first year of study	Year of Study Main Effect, Survey Theme 3, Interview Themes 1 and 5
Include CSL training pertaining to mental health	Interview Themes 2 and 3
Have discussions or sessions on communicating with emotionally difficult patients	Interview Themes 2 and 4
Provide additional resources regarding how to discuss the business elements of dentistry	Interview Theme 5
Provide stress management resources for students	Interview Themes 1 and 5
<i>Clerical/Organizational Recommendations</i>	
Include additional questions regarding CSL student needs and perspectives in course evaluations	Year of Study Main Effect, Survey Theme 1, Interview theme 1
Provide opportunities for ungraded feedback and/or evaluation	Survey Theme 1, Interview Themes 1 and 2
Have instructors provide feedback on student-patient communication	Interview Theme 2
Integrate CSL into existing activities	Year of Study Main Effect, Survey Theme 1
Include relevant sample patient interactions via instructor demonstration or video when learning about new techniques or treatment populations	Year of Study Main Effect, Interview Theme 3
Provide additional opportunities to debrief or share following experiences	Interview Theme 2
Include feedback from patients about the CS of students who treat them	Interview Theme 5
Provide faculty development to support them in imparting standardized and evidence-based CS	Survey Theme 1, Interview Themes 1 and 2
<i>Activity Recommendations</i>	
Provide additional training opportunities to encourage cultural safety in dental communications	Ethnicity Main Effect
Increase opportunities to practice CS in simulations, role plays, or other experiential activities	Interview Theme 3, Survey Theme 1
Provide additional opportunities to work with dental hygiene students	Interview Themes 2 and 5
Where possible, have students shadow and/or work with students of different cultures	Ethnicity Main Effect, Interview Theme 4
Provide additional training in motivational interviewing and/or positive reinforcement	Gender Main Effect
Where possible, have junior students shadow senior students of a different gender	Gender Main Effect
Increase opportunities for community-based practice	Interview Theme 4, Survey Theme 2
Increase opportunities for students to shadow in dental practices and clinics	Interview Themes 1 and 5

III) Recommendations for Additional Study

The current study has presented a novel approach to studying dental student attitudes toward CSL. As well, it has described a new version of a highly-validated instrument (the ADCSAS). Several recommendations directly follow from the findings presented throughout this report. In contrast to previous instruments, the ADCSAS can be used to measure student attitudes toward CSL in schools with integrated or more informal models of CSL delivery. The literature in this area will benefit from additional iterations of the ADCSAS, including use in other dental environments. Several adjustments are recommended, including an expansion of the number of items in the instrument. The addition and validation of items pertaining to social sensitivity and professionalism in communications is especially recommended. As the current study found that three components may be contained in the instrument, future iterations could be further enhanced by reorganizing the questionnaire items into subscales based on the most recent evidence. Qualitative, demographic-linked questions could also be added to the instrument to probe into the explanatory elements pertaining to the quantitative findings.

IV) Closing Remarks

The current project is among the first to have presented mixed methods evidence regarding Canadian dental student attitudes toward CSL. This study is also among the first to include qualitative evidence exploring this research topic. Participants in this study described the unique position of dentistry within the realm of health professions, highlighting the significance of this exploration in a dental context. The attitudes and beliefs described in this project can be used to strengthen CSL in dental school and may

be of benefit to other health professional educators as well. Improving CSL can lead to more positive interactions with patients and can ultimately promote patient oral and general health. While the current study has provided a significant contribution to the literature in dental CSL, it has also highlighted the importance of further research in this area.

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APPENDIX A: QUESTIONNAIRE AND SURVEY ITEMS

About this instrument:

The quantitative items below were adapted from the Communication Skills Attitude Scale, originally developed for medical education environments by Rees, Sheard, Davis, 2002 and translated for use in dentistry by Laurence et al., 2012. The first 20 questions are quantitative items and will be given responses on a 5-point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree). The remaining 2 questions are open-ended, qualitative survey questions.

Adapted Question Wording	Original Question Wording (Brackets denote item number used by Laurence et al., 2012)
QUESTIONS REGARDING COMMUNICATION WITH PATIENTS	
More formal training in communication skills would help me respect patients.	Learning communication skills has helped me or will help me respect patients. (Item 5)
More formal training in communication skills would improve my ability to communicate with patients.	Learning communication skills has improved my ability to communicate with patients. (Item 10)
More formal training in communication skills would help me recognize patients' rights regarding confidentiality and informed consent.	Learning communication skills has helped or will help me recognize patients' rights regarding confidentiality and informed consent. (Item 16)
QUESTIONS REGARDING COMMUNICATION WITH COLLEAGUES	
More formal training in communication skills would help me respect my colleagues.	Learning communication skills has helped or will help me respect my colleagues. (Item 14)
More formal training in communication skills would facilitate my team working skills.	Learning communication skills has helped or will facilitate my team-working skills. (Item 9)
QUESTIONS REGARDING STUDENT SATISFACTION WITH COMMUNICATION SKILLS LEARNING	
More formal training in communication skills would be interesting.	Learning communication skills is interesting. (Item 7)
Communication skills are already obvious.	Communication skills teaches the obvious and then complicates it. (Item 11)
Learning more about communication skills would be fun.	Learning communication skills is fun. (Item 12)

Acquiring communication skills is too easy.	Learning communication skills is too easy. (Item 13)
I haven't got time to formally learn about communication skills.	I haven't got time to learn communication skills. (Item 6)
QUESTIONS REGARDING THE IMPORTANCE OF COMMUNICATION SKILLS LEARNING TO DENTAL PRACTICE	
When applying for dentistry, I thought it was important to learn communication skills.	When applying for dentistry, I thought it was a really good idea to learn communication skills. (Item 18)
I think it's really useful learning communication skills for dental practice.	I think it's really useful learning communication skills for the dental degree. (Item 21)
Learning communication skills is important because my ability to communicate is a lifelong skill.	Unchanged (Item 25)
In order to be a good dentist, I must have good communication skills.	Unchanged (Item 1)
Developing my communication skills is just as important as developing my knowledge of dentistry.	Unchanged (Item 4)
QUESTIONS REGARDING THE APPLICABILITY OF COMMUNICATION SKILLS LEARNING IN DENTAL EDUCATION	
Learning communication skills is applicable to learning dentistry.	Unchanged (Item 23)
I would find it difficult to take formal communication skills training seriously.	I find it difficult to take communication skills learning seriously. (Item 24)
My ability to pass exams will get me through dental school rather than my ability to communicate.	Unchanged (Item 22)
I can't see the point in learning more about communication skills.	I can't see the point in learning communication skills. (Item 2)
Nobody is going to fail his or her dental degree for having poor communication skills.	Unchanged. (Item 3)
OPEN-ENDED QUESTIONS REGARDING GENERAL COMMUNICATION SKILLS ATTITUDES	
When you think about your future dental practice, how would you like to communicate with your patients? How do you think you can best learn to communicate this way?	
Are there any other thoughts you would like to add?	
QUESTIONS DELETED FROM THE PREVIOUS VERSION	
Question	Justification for deletion

I can't be bothered to turn up to sessions on communication skills. (Item 8)	There are no set "sessions" on communication skills, rather information is integrated throughout.
I find it difficult to trust information about communication skills given to me by non-clinical lecturers. (Item 15)	Much of the communication skills learning, formal or informal, comes from dental/clinical instructors.
Communication skills teaching would have a better image if it sounded more like a science subject. (Item 17)	Much of communication skills learning is integrated into the clinical experience.
Communication skills learning should be left to psychology students, not dental students. (Item 26)	Most communication skills learning, formal or informal, comes from dental/clinical instructors.

APPENDIX B: QUESTIONNAIRE INTRODUCTION AND DEMOGRAPHIC ITEMS

This brief survey will ask you some questions regarding communication skills learning in dental school. Communication skills learning refers to the formal and informal ways in which we learn how to communicate as dentists.

At the end of the survey, you will have an opportunity to enter your name and contact information if you wish to be recruited for a follow-up interview and/or if you are interested in entering a draw for a chance to win one of two \$100 Amazon gift cards. This information will not be stored with your answers.

By completing this survey, you acknowledge that you have agreed to participate in this study. Your individual responses will not be shared with anyone and will be compiled with the results from all other students in order to protect your privacy. For more information, please read the consent page [[Consent Page Hyperlink](#)]. If you have any questions, please contact Caitlyn (caitlynayn@dal.ca).

For each of the questions below, please select the response that best reflects your experience:

1. What is your year of study in the DDS program?
 - First Year
 - Second Year
 - Third Year
 - Fourth Year
 - Qualifying Program Year 1
 - Qualifying Program Year 2

2. What is your age?
- 24 or younger
 - 25 to 29
 - 30-34
 - 35-39
 - 40-44
 - 45-49
 - 50-54
 - 55 or older
3. By what gender do you identify?
- Woman
 - Man
 - Other (describe if you wish)
4. Which of the following best represents your heritage? Choose all that apply:
- Indigenous/ Aboriginal Descent
 - African Descent
 - Caucasian/European Descent
 - South Asian/ Indian Sub-continental Descent
 - West Asian/ Middle Eastern Descent
 - East Asian/ Asian Descent
 - Latin American/ Central American Descent
 - Other (describe if you wish)
5. What is your citizenship?
- Canadian
 - American
 - Other (specify if you wish)

APPENDIX C: APPRECIATION AND RECRUITMENT SURVEY

Thank you for your interest and participation in this study.

If you would like to be contacted for a possible interview at a later date and/or would like to enter for a chance to win one of two \$100 Amazon.com gift cards as a token of appreciation for your participation, please complete the following section.

1. Are you interested in entering a draw for a chance to win one of two \$100 Amazon.com gift cards?

- Yes
- No

2. Are you interested in being invited for a possible follow-up interview? (please note: this does not mean you are required to participate in the interview)

- Yes
- No

3. Please enter your name and contact information if you wish:

Name:

E-mail:

Phone:

Alternate E-mail:

Alternate Phone:

If you have any questions, please contact Caitlyn (caitlynayn@dal.ca). Thank you for your interest in this study.

APPENDIX D: QUESTIONNAIRE CONSENT INFORMATION

You are invited to take part in a research study being conducted by me, Caitlyn Ayn, a Masters student in the School of Health and Human Performance, as part of my thesis at Dalhousie University. The purpose of this research is to ask dental students to complete a brief questionnaire on their perspectives regarding communication skills and the process of learning these skills in dental school. The study is funded by the Nova Scotia Health Research Foundation (NSHRF) Scotia Scholar's Award and the Dalhousie University Faculty of Graduate Studies. The findings from this study will be included in my master's thesis.

As a participant in the research you will be asked to answer a few multiple choice questions in a secure, online survey (using Opinio software). All responses will be saved on a secure Dalhousie server and processed using SPSS statistical software. At the end of the survey, you will have an opportunity to include your name and contact information if you wish to receive a small token of thanks for participation (a \$10 Amazon gift card) or be contacted for a follow-up conversation, however this information will be removed from your answers and stored in a separate, secure document. Your personal information will not be shared with anyone. In order to protect your privacy, you do not need to sign a consent form to participate in this study. Instead, completion of the survey will be taken as implied consent.

Your participation in this research is entirely your choice. You do not have to answer questions that you do not want to answer, and you are welcome to stop the survey at any time if you no longer want to participate. All you need to do is close your browser.

I will not include your survey in my analysis unless you click “Submit.” However, if you do complete your survey, and if you change your mind later, I will not be able to remove the information you provided because the surveys are completed anonymously, so I would not know which one is yours.

Information that you provide to me will be collected privately. The IP address of the computer you use to complete the survey will not be recorded. While you will have the option to include your name and contact information if you wish to participate in future portions of this study, you are not required to leave this information. If you do want to leave your name and contact information, these will be removed from your survey results and stored separately in order to protect your privacy. Only my supervisor and I will have access to the survey results. I will describe and share general findings in publications and presentations, but none of your personal information will be shared. I will keep the anonymous survey data throughout my master’s degree so that I can learn more from it as I continue with my studies.

The risks associated with this study are not significantly greater than those you encounter in your everyday life. There will be no direct benefit to you in participating in this research, however you will have the opportunity to receive a \$10 Amazon gift card as a small token of thanks for your participation if you wish to leave your contact information. The research, might contribute to new knowledge on dentist communication skills. If you would like to see how your information is used, please feel free to contact me (Caitlyn) at caitlynayn@dal.ca.

You are welcome to discuss any questions you have about this study with me.

Please ask as many questions as you like. If you have questions later, please feel free to contact me (Caitlyn) at caitlynayn@dal.ca or my supervisor (Lynne) at lynne.robinson@dal.ca. If you have any ethical concerns about your participation in this research, you may also contact Research Ethics, Dalhousie University at (902) 494-1462, or email ethics@dal.ca. Thank you for your interest in this survey.

APPENDIX E: QUALITATIVE INTERVIEW GUIDE

About this instrument:

Questions included in this semi-structured interview guide are based on the foundation provided by three sources:

- 1) A qualitative study in medical student attitudes toward communication skills (Rees, Sheard, McPherson, 2002).
- 2) Questions adapted from the Dental Communication Skills Attitude Scale, a quantitative questionnaire (Laurence et al., 2012).
- 3) Personal communications with members of the Dalhousie University Faculty of Dentistry

Questions are presented below by topic. The justification for each question is presented in the right-most column

Question	Question Source/ Notes
DEMOGRAPHIC QUESTIONS	
i	What is your year of study?
ii	By what gender do you identify?
iii	Do you identify as a cultural, racial, or linguistic minority?
GENERAL/INTRODUCTORY	
1	When you hear “dental communication skills,” what comes to mind? (Rees, Sheard, McPherson, 2002)
DEVELOPMENT/COMPARISON	
2	What kinds of communication skills did you have before coming to dental school? (C. Andrews, personal communication, May 12, 2016)
3	In what ways (if any) have your communication skills changed since coming to dental school? (C. Andrews, personal communication, May 12, 2016; S. Seth, personal communication, May 17, 2016)
4	How do your communication skills compare with other experienced professionals or students that you know? <ul style="list-style-type: none"> • Classmates? • Students in other disciplines? • Faculty? Bullets refer to potential probes (C. Andrews, personal communication, May 12, 2016)
LEARNING PROCESS	
5	What have you learned formally about dental communication? Informally? (C. Andrews, personal communication, May 12, 2016)

6	Can you describe any ways that faculty have influenced how you communicate?	(C. Andrews, personal communication, May 12, 2016; C. Lee, personal communication, May 25, 2016)
7	What is your biggest challenge in learning communication skills?	(S. Seth, personal communication, May 17, 2016; F. Kraglund, personal communication, May 31, 2016).
8	Are you missing anything from your communication skills learning?	(S. Seth, personal communication, May 17, 2016; F. Kraglund, personal communication, May 31, 2016).
9	What changes would you like to see (if any) in your communication skills learning in dental school?	(S. Seth, personal communication, May 17, 2016; F. Kraglund, personal communication, May 31, 2016).
10	How do you feel about the process of learning communication skills in comparison to other dental skills? <ul style="list-style-type: none"> • How can challenges be addressed? • How can gaps be filled? 	Bullets refer to possible probes. (Laurence et al., 2012, Factor 4, Items 4 & 22).
SATISFACTION		
11	What aspects of dental communication are enjoyable? Unenjoyable?	(Rees, Sheard, McPherson, 2002, p. 291; Laurence et al., 2012, Items #7,12).
IMPORTANCE FOR DENTAL PRACTICE		
12	How (has/will) learning about communication helped you interact with patients?	Use “has” for clinical students and “will” for pre-clinical students (per S. Seth, personal communication, May 17, 2016). (Laurence et al., 2012, Item #10).
13	How important are communication skills for future dental practice? Why?	(Rees, Sheard, McPherson, 2002, p. 290; Laurence et al., 2012, Item #1).
14	When you think of practicing as a dentist, what communication skills will you need?	(C. Andrews, personal communication, May 12, 2016).

APPENDIX F: INTERVIEW CONSENT FORM

Exploring Dental Student Attitudes Towards Communication Skills Learning

Lead researcher: Caitlyn Ayn, School of Health and Human Performance,
caitlynayn@dal.ca

Other researchers: Lynne Robinson, School of Health and Human Performance,
lynne.robinson@dal.ca

Funding provided by: Nova Scotia Health Research Foundation (NSHRF) and
Dalhousie University Faculty of Graduate Studies

Introduction

You are invited to take part in a research study conducted by me, Caitlyn Ayn, a Masters student at Dalhousie University as part of my thesis project. Participation in this study is entirely voluntary. There will be no impact on your studies, performance, or any other aspects of your student life if you choose not to participate. You are welcome to discuss any questions with me (Caitlyn) by writing to the e-mail address above. Please ask as many questions as you like.

Purpose and Outline of the Research Study

This study aims to explore dental student perspectives toward the process of learning dental communication skills. A questionnaire was previously sent to all dental students at Dalhousie University to examine how students rate these perspectives, and now interviews with 6-10 students will take place in order to gain a better understanding of these perspectives.

Who Can Take Part in the Research Study

You may participate in this study if you are a *current* student in the DDS program at Dalhousie University. You may be in any year of the program, including the Qualifying Program.

What You Will Be Asked to Do

You will be asked to have one in-person interview with me (Caitlyn) at a time and in a location of your choice. This interview will take approximately 60-90 minutes and will be recorded. The recordings will later be destroyed. You will be asked a series of questions about your communication skills learning in dental school.

Possible Benefits, Risks and Discomforts

Benefits: There are few direct benefits for your participation in this study, though your participation may be of benefit to future dental students, faculty members, or others. You will receive a small token of appreciation for your participation in this study (\$30 Amazon gift card).

Risks: There is a minimal risk associated with your participation in this study. You will be asked about your experiences and perceptions of learning communication skills in dental school, however there will be no impact on your academic performance or relationships with peers and faculty as a result of your answers, as none of your personal information will be connected to your responses. Your participation in this interview is

entirely your choice. You do not have to answer any question you do not want to and you are free to withdraw from the interview at any time if you feel uncomfortable.

Compensation / Reimbursement: You will receive a small token of appreciation for your participation in this study (\$30 Amazon Gift Card).

How Your Information Will Be Protected

Privacy: You are welcome to choose the time and location of the interview that feels most comfortable to you in order to ensure your privacy and comfort.

You have the right to withhold any information you are not comfortable disclosing to the researcher. You have the right to refuse to answer any question during the interview that you are not comfortable answering. You also have the right to withdraw from the study at any time without consequence if you wish.

Your participation in this study will not be disclosed to anyone outside of myself (Caitlyn) and my supervisor (Lynne). This includes fellow students, members of the Faculty of Dentistry, and administrative staff. Your personal contact information will only be seen by me (Caitlyn) and will not be included in interview transcripts or any publications, presentations, or other media resulting from this study.

When you are contacted by e-mail about participation in this study, I will not disclose any details about your participation status in the subject line of the e-mail. Following completion of the data analysis for this study, your personal contact information and all e-mail exchanges will be destroyed to protect your privacy.

Confidentiality: Your personal information will not be shared with anyone, unless abuse or neglect is suspected. It is the duty of researchers to report any suspicion of abuse or neglect of children or adults in need of protection (physical, sexual and/or emotional) to the appropriate agency. In the event that abuse or neglect is suspected, personal information will be shared with the authorities and no other party.

If you want to participate in this study, you will sign a signature page at the end of this consent form. This signature page will not be seen by anyone besides you and me (Caitlyn). It will be stored in a locked file cabinet for two months following completion of your interview and then destroyed.

Your recorded interview will be transcribed into a digitally-written document and all audio recordings will be destroyed. Your name, contact information, personal details and all names, contact information, and personal details of others will be completely removed during transcription to anonymize the transcripts. There will be no way to reconnect your personal information to the transcripts. The transcripts will be stored on a password-protected computer that will be accessible only by me (Caitlyn). If a printout of the transcripts is required when analyzing the results, it will be stored in a locked file cabinet when not in use and destroyed immediately following completion of use.

Data Retention: As mentioned above, data will be stripped of names, contact information, and any other personal identifiers during transcription. It is common to retain data for up to five years. All copies of the data will be destroyed following this period.

General findings will be shared and described in my thesis, presentations, journal articles and other media, however none of your personal information will be included in these. As mentioned above, all data will be securely stored.

If You Decide to Stop Participating

You are free to leave the study at any time. If you decide to stop participating at any point in the study, you can also decide whether you want any of the information that you have already contributed up to that point to be removed or if you will allow us to use that information. You can also decide for up to two months following completion of your interview if you want your data to be removed. After that time, it will become impossible to remove it because it will likely already have been analysed.

How to Obtain Results

If study results will be made available to participants, describe what and how. For example: “If you wish, a short description of study results can be provided to you by e-mail when the study is finished. No individual results will be provided. You can obtain these results by contacting me (Caitlyn) at caitlynayn@dal.ca at least 6 months following your interview completion.

Questions

You are welcome to discuss any questions or concerns you might have about your participation in this study with me (Caitlyn) by e-mail at caitlynayn@dal.ca

If you have any ethical concerns about your participation in this research, you may also contact Research Ethics, Dalhousie University at (902) 494-1462, or email: ethics@dal.ca. Thank you for your interest in this study.

APPENDIX G: INTERVIEW SIGNATURE PAGE

Exploring Dental Student Attitudes Towards Communication Skills Learning

Lead Researcher: Caitlyn Ayn, Dalhousie University School of Health and Human Performance, caitlynayn@dal.ca

Prior to Interview:

I (the participant) have read the explanation about this study. I have been given the opportunity to discuss it and my questions have been answered to my satisfaction. I understand that I have been asked to take part in one interview that will occur at a location acceptable to me, and that this interview will be recorded. I understand direct quotes of things I say may be used without identifying me or anyone else. I agree to take part in this study. My participation is voluntary and I understand that I am free to withdraw from the study at any time, and can request that my data be removed from the study until 2 months AFTER my interview has been completed.

Name

Signature

Following Interview:

I confirm I have completed the interview and agree that direct quotes without my name, contact information, or the names and/or contact information of others may be used.

Signature

Date

APPENDIX H: RESEARCH ETHICS BOARD APPROVAL

Health Sciences Research Ethics Board Letter of Approval

October 05, 2016

Caitlyn Ayn Campbell
Health Professions\Health & Human Performance

Dear Caitlyn Ayn,

REB #: 2016-3974
Project Title: Exploring dental student attitudes toward communication skills learning: A mixed methods approach

Effective Date: October 05, 2016
Expiry Date: October 05, 2017

The Health Sciences Research Ethics Board has reviewed your application for research involving humans and found the proposed research to be in accordance with the Tri-Council Policy Statement on *Ethical Conduct for Research Involving Humans*. This approval will be in effect for 12 months as indicated above. This approval is subject to the conditions listed below which constitute your on-going responsibilities with respect to the ethical conduct of this research.

Sincerely,

Dr. Tannis Jurgens, Chair