

Communication Practices
in Dental Providers in California

A THESIS SUBMITTED TO THE FACULTY OF THE
UNIVERSITY OF MINNESOTA
BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE IN DENTAL HYGIENE

Dr. Christine Blue, Advisor

October 2020

ACKNOWLEDGEMENT

I would first like to thank God who gave me strength, ability and provision. I had two advisors. Dr. Christine Blue and Ms. Michelle Arnett whose patience, knowledge and creativity helped through this research study. Thank you to Dr. Blue for your careful evaluation and continual motivation to the end. I would also like to thank the faculty I work with at Western University College of Dental Medicine DM, colleagues, friends and family for their admirable support of me.

DEDICATION

I would like to dedicate this thesis to my loving husband Jaroslav for your loving-kindness, supportive and positive demeanor in this and all of my endeavors; and to Boženka D, Jaroslav Aaron, and J. Faith my beautiful God given gifts and children.

ABSTRACT

Purpose: The purpose of this study was to investigate the association between current communication practices used by California (CA) dentists and the Theory of Planned Behavior (TPB) constructs: attitude, social norms, and perceived behavioral control.

Methods: A mixed methods study was conducted using a sample of CA dentists. The California Dental Providers Communication Survey (CDPCS) was sent electronically and via the postal service to dentists in five counties in southern CA.

Results: Out of 2,500 surveys, 103 responding via paper surveys (response rate: 21%) and 5 responding via email survey (response rate: 0.3%). Findings suggest dentists are using a variety of communication methods with their patients. Participant attitudes suggest strong intent for engaging in discussions with patients about oral health behaviors and their communication practices are influenced by professional norms. However, participants question whether these discussions will result in behavior change and often delegate this responsibility to allied dental team members, suggesting a lower level of perceived behavioral control.

Conclusion: The CA dental providers in this study reported using a variety of communication techniques while communicating OHB, with the majority employing strategies of motivational interviewing.

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LIST OF ABBREVIATIONS

ADA	American Dental Association
ATT	Attitudes
CA	California
CE	Continuing Education
CDPCS	California Dental Providers Communication Survey
DCA	Department of Consumer Affairs
E-PCC	Empathy Patient Centered Care
IOM	Institute of Medicine
L-PCC	Low Patient Centered Care
MI	Motivational Interviewing
OHB	Oral Hygiene Behavior
OHK	Oral Hygiene Knowledge
OHRQoL	Oral Health-Related Quality of Life
RALOC	Relative Autonomous Locus of Causality
PBC	Perceived Behavioral Control
PCC	Patient Centered Communication
TCDS	Tri-County Dental Society
TSD	Tell-Show-Do
TBM	Teach-back-Method

TOHE	Traditional Oral Hygiene Education
TPB	Theory of Planned Behavior
SN	Social Norm
UMN	University of Minnesota
U.S.	United States

SECTION 1

INTRODUCTION

Communication is a reciprocal exchange of information between two parties (1,2). Through active listening and responding, verbal and non-verbal cues, language is decoded and ambiguity and uncertainty are reduced (3–8). In dentistry, effective interpersonal communication has contributed to positive oral health outcomes, including a lower incidence of caries and improvement in gingival and periodontal health (9–12). Yet, despite the efforts of oral health providers, oral diseases such as gingivitis, periodontal diseases, and caries, are still on the rise (13–15). The most current statistics from the Centers for Disease Control (CDC) on dental caries in the United States (U.S.) reported caries prevalence for ages 2-19 at 45.8%, with untreated caries at 13%, and for adults ages 20 to 64 at 89% ,with untreated caries at 26% (19). Prevalence of caries for geriatric patients ages 65 and older has been reported at 96%, with 15% untreated decay (16). Concurrently, 46% of the population in the U.S. suffer from periodontal disease (17). Oral diseases such as periodontal disease and caries are largely preventable and research has shown communication practices that support behaviors such as biofilm removal to prevent and reduce both of these diseases (9,10,13,25,26). However, these statistics on the prevalence of oral diseases suggest compliance with oral health recommendations is low and communication strategies used by oral health professionals may be ineffective (13–15,20–22).

There are many reasons why a breakdown in communication during a patient-provider encounter might occur. Barriers cited in the literature include: patient misperception of how behaviors and lifestyle choices impact health, lack of knowledge, and the quality of the material being presented (11,23–26). Other barriers include low

health literacy, fear, and anxiety (27–30). On the provider side, dentists have self-reported using inconsistent communication practices due to lack of training in evidence-based communication strategies and lack of time (31). Attitudes towards engaging in education and behavioral-based counseling also affect communication practices, as a lower outcome expectancy due to patient non-compliance was found to impede effective communication among dentists (31). Additionally, some dentists have reported lacking confidence in their ability to engage in effective oral hygiene discussions with their patients (29).

The need for effective communication practices by oral health care providers was emphasized in the 2000 Surgeon General’s Report on Oral Health in America. Improving oral hygiene self-care practices and life style behaviors was identified as critical for health promotion and oral disease prevention (32). Knowledge of dentists’ current communication practices and barriers encountered with regard to oral health counseling is the first step in understanding how patient/provider communication may be improved. An understanding of dentists’ attitudes toward oral health counseling, their perceptions of professional expectations in this area and personal competence will inform dental education curricula and continuing education programming.

Purpose of the Study

The purpose of this study is to investigate the association between current communication practices used by California (CA) dentists and the Theory of Planned Behavior (TPB) constructs: attitude, social norms, and perceived behavioral control.

Statement of the Problem

A variety of communication methods have been shown to be effective with regard to improving oral health (13,14,33,34). Despite available resources for effective patient communication, oral hard and soft tissues diseases are still prominent in the U.S. (7,16). Research is needed to understand current communication practices of dentists. Baseline knowledge of current communication practices in the dental setting, and providers' attitudes and self-efficacy regarding patient/provider communication is a first step in improving communication aimed at preventing and treating oral disease.

Significance of the Study

The CA Department of Public Health Oral Health Programs 2018-2018, adopted frameworks from Healthy People 2020, which assert that evidence-based communication practices should be used to promote behavioral preventative oral self-care practices (1). Inasmuch as the local governmental agencies and dental providers have pressed preventive communication efforts, oral diseases such as gingivitis, periodontal diseases, and caries, are still on the rise (15,25). The California Department of Health notes that nearly 1/3 of all children in CA are plagued with caries (34). Furthermore, Eke projected 47% of people in CA are estimated to have periodontal disease (17). While oral diseases are multi-factorial, these statistics imply patients may: 1) lack knowledge, 2) are non-compliant with oral health recommendations and/or, 3) are ambivalent to changing their oral self-care behaviors (36,37). The level of oral disease also suggests current communication practices are not affecting behavior change with regard to oral self-care. To date, only one study investigating communication methods and/or or behavior change strategies used by practicing dentists in the U.S. has been conducted (38). Since little is

known about the level of knowledge and attitudes regarding communication practices among dentists in the U.S., further exploration and research is required and could feasibly be investigated within the state level.

California (CA) dental health care providers comprise nearly 1/3 of the U.S dental work force. There are 200,419 dental offices nationwide, and CA workforce is comprised of 22,000 dental hygienists, and 30,773 (39,40). Understanding dentists' communication practices, their attitudes toward patient/provider communication and their perceived self-efficacy of using behavior change strategies will provide baseline knowledge needed for driving change in this area. The TPB approach to behavioral prediction will be used for this purpose and provides the framework for the study. Applied to communication, TPB posits that a dental provider's decision to engage in a discussion about oral self-care behaviors with a patient is based on his/her attitude about the effectiveness of the interaction, perceived behavioral control, and social norms. Acquiring this baseline knowledge can then be used to develop interventions addressing these three constructs of TPB which may serve to improve communication practices and lower the prevalence of oral diseases.

Research Question

What is the association between CA dental providers' communication practices and the TPB constructs: attitude, social norms, and perceived behavioral control?

SECTION 2

REVIEW OF THE RELATED LITERATURE

For the purpose of investigating communication practices of CA dental providers, a review of the literature was conducted using Medline search engines that included PubMed, Cinahl, Ovid, and Google Scholar. The following search terms were used: a) interpersonal patient centered communication and dental health, b) patient centered care and dentistry, c) communication in dental students and interpersonal communication curriculum in dental schools, d) motivational interview, teach-back methods, tell-show-do, and advice-giving method, e). theory of planned behavior and communication, f). health literacy and dental patient centered communication in dentistry. Additional MeSh terms used in key searches were: Patient centered care, patient centered communication, autonomy and medical providers, autonomy in the dental field, patient empowerment, communication in health literacy, communication and patient trust, patient satisfaction and dentistry, patient satisfaction and communication, the theory of planned behavior and dentistry, theory of planned behavior and communication, and patient satisfaction in patient centered care. The MeSh terms used from 2008 to 2019 yielded approximately 5,465 studies which were refined using limits for English language, humans only, peer reviewed articles, academic journals, and date range for 10 years(41).

Patient and Provider Perspective

Patients often judge the standard of their healthcare on nontechnical aspects, such as a healthcare practitioner's communication and "soft skills." Most are unable to evaluate a practitioner's level of technical skill or training, so the qualities patients *can* assess, carry the utmost importance in patient satisfaction and the provision of patient-centered care (1,75,84,85). Thus, the patient/provider relationship provides the context for

communication within dental settings (42,43). Effective communication relies heavily on a patient's and a provider's perceptions, attitudes, and behaviors exhibited during interactions (44–50). Ultimately patient/provider relationships influence patients' health behaviors and health outcomes (8,30,37,51). Positive patient/provider relationships include attributes such as knowledge sharing, empathy, and autonomy (46,47,52). Yaffe, Hovey and Rodriguez examined 186 notes and letters from patients to a physician over the span of 40 years in order to uncover what patients value in a relationship with their provider (53). One hundred and seven out of 186 notes and letters identified specific themes including, competence, emotional support, spiritual impact, physical presence and personal traits (53). Among the top attributes were “good/ excellent care” and “caring;” other attributes were patience and kindness (53).

Patient perspectives on provider attitudes are often rated during patient care, and they serve to inform institutions on how well care is being delivered by individual providers (54). In a study that evaluated dental student providers to veteran patients, Rai et al. found that student providers exhibited positive attitudes when communicating, and consequently their patients gave high ratings in the areas of patient respect (85.7%), supportive explanations regarding dental procedures 84%, and listening to their complaints 82.7% (51). Cheng et al. investigated patients' perceptions of dentists' communication skills and found a positive association with appointment attendance and level of patient rapport (103). Communication variables that were most significant were taking the time to provide clear explanations of the procedures (87.7%), and the dentist listening to their concerns (89.7%) (55). Additionally, patients reported higher value in provider communication and attitudes, as compared to their expertise and skills (55).

Sbaraini et al. investigated patients' perspectives of their clinical outcomes in two dental offices – one with a preventive framework and one that was not focused on prevention (n=17)(56). Patients in the non-preventive group had higher rate of caries and a lower level of trust in preventive recommendations (56). Patients in the non-preventive group reported having a deep desire to keep their teeth, but had very little past or present experiences with preventive agents and therefore, accepted having their teeth restored (56). This group also reported being lazy regarding personalized oral hygiene self-care behaviors (OHB) (56). In contrast, patients in the dental office with the preventive framework reported feeling empowered towards self-management and felt in control of their oral health (56). They reported having past and present experiences with preventive agents, and regularly performed personalized OHB (56). Additionally, this group expressed feeling satisfied with the costs associated with preserving their teeth (56). Patients in both groups reported uncertainty about whether preventive recommendations would work and reported lack of time was a barrier in performing OHB (56). However, the patients that followed the preventative recommendations had better outcomes which further motivated them to maintain compliance with dental appointments and recommendations (56). Increased knowledge sharing, autonomy in treatment choices, feeling respected and empowered were found to motivate patients towards positive oral health outcomes (56).

Effective communication practices have shown to reduce dental anxiety (8,30,37). Kheir found the association between clear explanations for dental procedures and anxiety was significant ($p < 0.008$) (37). Provider characteristics that lessened anxiety were respect and dignity, the dentist's ability to listen, and patient's ability to obtain

comprehensible answers (37). The investigators concluded that patients treated with low regard gave lower ratings with regard to provider competence, which further resulted in low compliance towards treatment modalities and dental appointment attendance (37). A study by Fico and Lagoe, found negative communication by dentists (DDS) and dental hygienists (DH) were linked with poor dental relationships and caused patients to feel annoyed and uncomfortable (8). Negative behaviors such as “disregard for patient concerns and feelings” were noted by 45% of the participants towards the DDS and 21% towards the DH (8). Conversely, positive communication was shown to make patients feel valued and understood, increasing patient retention and paralleled positive patient/provider relations (8).

Providers have the responsibility to establish the patient/provider relationship and engage a patient in a mutual exchange of information (8,36,57). However, the literature suggests negative behaviors of patients hinder positive relationships from developing. Difficult patient behaviors included, a lack of engagement or overly engaged in consultations, and/or a poor understanding of dental concepts (42). Patients’ dental anxiety has also been identified as a barrier to provider engagement in communication (8). Poor attitudes with regard to oral health was perceived by providers as distrust (8). Nowak et al found patient behaviors such as a lack of respect towards dentists and their recommendations often hindered mutual communication (36). Patients’ lack of comprehension of dental explanations, patient’s dental anxiety, as well as their inability to describe their symptoms also were barriers to effective communication (36). Dentists attributed patients’ indifference to their oral health to socio-economic differences including a mediocre education (61). A study by Asimakopoulou, Gupta and Scambler

found patient choice was aligned with dentists' perception and allowance to proceed with "sensible clinical treatment" (42). The dentists in the study further explained that giving the "illusion of choice made patients more compliant" (42). For the area of patient compliance, the dentists reported the following: "...if patients feel they are involved, they don't become dissatisfied, they don't become detached from the process" (42).

Lack of time to perform patient education communication was frequently cited as a barrier (36,37,58). Marcus found a main barrier cited by nurses was "time needed to listen and to teach patients and their families" (58). The investigator concluded, that oral patient education discussions needed to be supplemented with materials (58). Kheir et al, showed that adequate time to discuss dental health and dental anxiety were significantly associated with lower dental anxiety ($p < 0.006$) (37). Forty-eight percent of the participants reported low anxiety to treatment when adequate appointment time was given, and 22% reported high anxiety when time for a patient/provider discussion was inadequate (37). The investigators did not express what the appropriate time spent during dental consultation was (37). However, participants reported characteristics of time as 'getting answers that could be understood', 'given enough time to discuss own oral health,' and 'listen to me when I explain a problem' (37). Similar study results support sufficient time be given for knowledge sharing characterized by clear and easy to understand information (59–62).

Patient Centered Care

The Institute of Medicine (IOM), as well as other studies in the literature, defines patient-centered care (PCC) as: "providing care that is respectful of and responsive to individual patient preferences, needs and values, ensuring that patient's values guide all

clinical decisions” (4,47,52,63–67). The overarching goal of PCC is to empower patients to become active participants in their care to achieve positive health outcomes that improve quality of life (2,44,52,74). This requires health care providers to develop good communication skills so they can address patient needs effectively. For this reason, PCC is viewed as an essential element in achieving the goals of the Triple Aim: 1) improving the experience of care, 2) improving the health of populations, and 3) reducing per capita costs of health care (4,52). PCC is enveloped in a patient provider relationship characterized by trust, effective knowledge sharing and autonomy in decision-making (66,67).

Patient/Provider Relationship

Communication that encompasses trust is a foundational characteristic of the PCC model (4,54,70). Effective communication builds trust, increasing patient autonomy which leads to greater patient satisfaction (4,12,40). Trust within a patient/provider relationship has also been found to increase patient confidence in their providers (37). Additionally, adherence and compliance to treatment and preventive recommendations increases when patients trust their provider (52,57,64,66,72). Several studies suggest patients associate trust with listening skills that incorporate validation of their concerns, along with clear and understandable explanations (54,71,73,74). In the systematic review by Mills et al., patients views regarding attributes of patient centered care in the dental office were reported and trusting in the dentist had been placed with high importance (54). Trust was also evidenced by the patients’ continuity of care by the same dentist(54).

Expressions of trust are expressed by the patient when their feelings are valued (8) and their symptoms are taken into account (8,75). Fico and Lagoie found participants’

mistrust of the dentists was attributed to a lack of acknowledgement of their concerns, fears and/or worries (8). But those participants who reported a more positive communication experience, reported higher levels of trust ($p < 0.002$) (8). Pettit, Rattray and Wang, collected 18 patients' statements describing physicians' attitudes during their emergency room experiences (48). The positive attributes and practices the participants valued most was trusting the physician and good listening skills (48). Trust in the physician was described as "the doctor talking to you, and not over you" (48).

Trust in the provider can be a result of supportive patient autonomy as is seen in the study by Lee and Lin who investigated whether or not patients preferred autonomy within the patient/provider relationships within the PCC model (74). One of the hypotheses in the study was that perceived patient autonomy within a patient/provider relationship was correlated with trust and satisfaction in their physicians that would ultimately be linked to health outcomes (74). This hypothesis was guided by past studies that revealed physicians that involved patients in their treatment resulted in a more cooperative self-management behavior (74). Lee and Lin studied 614 participants ($n=614$) with type 2 diabetes who had seen the same physician for 6 months. The primary outcome measured was glycosylated hemoglobin (HbA_{1C}) at baseline (time 1), and 12 months (time 3) (74). Trust was analyzed via a questionnaire to determine its correlation with autonomous support defined as "decisional preference", and "information preference" (74). The results showed a positive link to trust when autonomy was supported. Specifically, trust was correlated when patients were able to make their own decisions, revealing an increase in a positive patient/provider relationship ($p < 0.05$) (74). The authors also found a significant higher correlation in perceived autonomy support

when they were able to make their own decisions about treatments and information that was important to them and trust in the provider ($p < 0.01$) (74). However, the investigators found autonomous support did not have a strong impact on health outcomes as was evidenced by insignificant relationship with HbA_{1C}. (74).

Zwingman et al., investigated patients' perception of trust in a physician in a German University hospital ($n=97$). Participants were randomly selected to view one of two videos of interventions that consisted of physician's delivery of a cancer diagnosis (76). One of the videos included communication that exhibited low levels of the traits that align with PCC models (L-PCC) (76). The second video exhibited high levels of PCC, that included empathy (E-PCC) (76). At the end of the study, it was found that all of the participants reported more trust in the physician that exhibited E-PCC ($P = 0.000$) (76). Phrases that exemplified trust were "physician's acknowledgement of patient's experiences, and physician offering genuine encouragement(76).

Muirhead, Marcenas and Wright investigated the association of provider/patient relationships and oral health-related quality of life (OHRQoL) among geriatric patients (2). Investigators measured the impact of trust, experiences with communication, empathy and respect in the Oral Health Impact Profile (OHIP) survey instrument, as related to OHRQoL (2). The participants, 65 years and older ($n=731$), were given the OHIP questionnaire along with an oral examination and their clinical conditions were recorded. Higher scores in OHIP that were correlated to the OHRQoL translated to poor health outcomes and lower quality of life. The results indicated higher scores in OHIP (12.32) expressed low confidence and trust in their provider, and lower scores in OHIP (5.42) reported greater confidence and higher trust in their providers ($p=0.005$). The

investigators found a significant association with trust and OHRQoL (2). Low trust and confidence were statistically significant in higher OHIP with OHRQoL ($P=0.04$), and was most reported by women ($P=0.006$), denture wearers ($P=0.001$), and older people ($85<$) with unmet dental needs ($p<0.001$) (2). Overall, patients reported being treated with dignity and respect (97 %) and reported having trust and confidence in their providers (93.2%) (2). Additionally, some patients reported not being shown respect (μ 9.07) by the dentist; their problems were not discussed (μ 7.2) and the patient was not involved in the decision-making process (μ 6.69). These negative attributes led to reduced trust in the dentist (μ 12.32), lowered regular dental attendance, and non-compliance (2). The authors concluded that these associations revealed a lowered OHRQoL in these patients, increasing the likelihood of dental diseases (2).

In a systematic review, Järvinen et al., evaluated the impact of various behavioral interventions on self-care behaviors in adults with periodontitis (71). The authors reported on three characteristics which were, clinical outcomes, patient self-reported self-care behaviors and practices, and patient's perception on the intervention received (71). Among the six studies evaluated, the control groups in each study received traditional/conventional patient education techniques, and the experimental/intervention groups were given various evidenced-based behavioral interventions such as MI and the self-care commitment model (71). These interventions were further accompanied by goal setting, patient diary of self-care practices, self-care and plaque demonstrations using plaque disclosing solution (71). Clinical outcomes in the form of decreased plaque and gingival bleeding, and reduction of periodontal pockets, showed to have better outcomes in the intervention groups (71). Oral self-care practices such as interdental cleaning in

increased in both the control and intervention groups. However, daily compliance and adherence to both brushing and interdental cleaning, was noted mostly in the intervention group (71). Patients' evaluations of the intervention suggested satisfaction with the use of video tape demonstrations of brushing and interdental cleaning, and goal setting (71). Additionally, in the studies reviewed, patients in the intervention groups reported having more knowledge and understanding about their oral status (71). Gou et al, also reported that higher levels of dental communication correlated with higher levels of OHB, and regular "dental seekers" which were associated with oral health ($P=0.01$) (30).

Empathetic communication that empower patients to make best decisions towards positive oral health behaviors also promotes trust in a provider (8). Empathy is the ability to "understand patients perspectives, concerns and feelings" (48). Empathy encompasses a non-judgmental and unbiased response to the suffering of another (6). Other attributes of empathy are active listening, along with recognition, interpretation and translation of emotional, verbal and non-verbal communication (6,48,51). Michael, Dror and Karnieli-Miller, conducted a cross-sectional study among medical and dental students in a university communication course (77). The investigators sought to link communication attitudes within the PCC framework to empathetic behaviors among medical and dental students (77). They defined empathy as behavior that willingly notices and addresses the emotions of patients (77). Effective communication was defined as listening to patients, creating an atmosphere of trust, and being non-judgmental (77). The results of the investigation found that attitudes towards performing communication in a PCC model was significantly directly mediated and associated by empathetic behaviors ($p<0.001$) (77).

Pettit, Rattray, and Wang, studied patients, caretakers and patient advocates' perceptions of physician empathetic attitudes and practices during emergency room experiences via patients, caretakers and patient advocates which had experiences in the emergency room departments(48). Physician attitudes that reflected empathetic behaviors included physician transparency, defined as providing explanation of the disease process, or the steps towards treatment, and patient education(48). One of the statements cited by the participants was, 'shares what he's thinking'(48). The least mentioned was treating the disease at 1.7% (48). Similar findings were reported by Rai et al. when military veterans were asked about empathy displayed by their dental student providers (51). Participants reported 83% satisfaction with student provider's empathetic service and defined empathy as listening to complaints, giving clear explanations, and having knowledge of the treatment rendered (51).

Another construct of empathy is immediacy behaviors (5,48,59). Descriptions of immediacy have been described as provider behaviors that are manifested with non-verbal communication, via gestures such as eye contact, smiling, and distance or proximity to the patient (6). These behaviors are viewed by patients as positive and enhance better relations between provider and patient (8,60,71). In the study by Pettit, Rattray, and Wang, who evaluated participants experiences in the emergency room, immediacy was also reported by patients (48). The participants reported physician immediacy 12% of the time (48). Participants described immediacy as the physician's disposition shown by their position and proximity to the patient and included non-verbal greetings, such as eye contact(48). Other examples cited that determined immediacy by patients in the study, were sitting by the bed, and hand shaking (48).

Knowledge Sharing

Dental diseases are multifactorial and consequently, knowledge sharing of disease processes, preventive agents such as fluoride, and oral self-care education have aided in the decline of oral diseases (28,79,80–82). A systematic review found four studies that “demonstrated statistical significance in the reduction of plaque and gingivitis” as the result of only one episode of professional oral hygiene instruction (18). Patel et al., investigated the relationship between patient compliance and adherence to oral hygiene behaviors (OHB) and oral hygiene knowledge (OHK) (n=543) (81). Knowledge was shared via verbal instruction, modeling, demonstration and videos (81). Findings revealed that knowledge was statistically correlated with OHB ($P < 0.05$) and OHK was the number one predictor of intent to perform among women ($P < 0.001$) and university graduates ($P < 0.001$) (81). The authors found the influence of interpersonal relationships was the number one predictor of intent to perform OHB (81). However, OHB was stronger in younger participants 31-40, than those aged 61-70 ($p < 0.001$) (81). Patel et al attributed expected social outcomes (ESO) as the reason for the differences, citing that older patients did not consider the opinions of others as important as the younger participants, therefore they did not feel the need to brush as frequently(81). Amoo-Achampong et al., studied 227 periodontal patients in the span of one year in a dental school in Pittsburg, and found that knowledge sharing that was specific to patient’s oral hygiene needs had an impact on their personalized oral hygiene practices (82). Patient’s oral hygiene practices were increased, resulting in a decrease of gingival bleeding and plaque indices; however, there were fluctuations in their performances (82).

Effective and efficient knowledge sharing is accomplished via verbal and written communication (82). The PCC model emphasizes the dissemination of information that is easy for patients to understand and builds patient-provider rapport (42,46,59). Evidence indicates patient's expectations of effective provider communication reflects clear instructions, explanations of treatment (55,83) and efficiency in knowledge sharing (65), which also aligns with empathy (6,8). Ineffective communication is characterized by speaking too quickly and giving unclear explanations (37,84). Nàpoles et al. evaluated the association of patient satisfaction with knowledge sharing across various ethnic groups in nine university-based practices in San Francisco (84). Of the total participants (n=1,664), 66% thought physicians spoke too quickly and used words that were difficult to understand, and 79% felt their concerns were heard (84). Spanish speaking patients reported dissatisfaction with the physician due to lack of clarity during interpersonal communication ($p < 0.005$) (84).

According to the systematic review used by Healthy People 2020, knowledge improves comprehension(1). Health related knowledge increases awareness and patient literacy with regard to self-management skills, and the capacity of making better choices in disease prevention (85). Many studies point to the need to identify patients level of understanding, knowledge, and their capacity for asking questions (8,27,36,66). Patient friendly materials often supplement knowledge sharing and have shown to enhance patient understanding and increase knowledge about their diseases and treatment procedures (58,81). Visual aids and assisting patients with their oral self-care include radiographs, videos, teeth models, intra-oral cameras and brochures (86,87). Flynn et al., in evaluating dental hygienist's communication methods in patients, found that dental

hygienists' reported using printed materials on the scale of "always" 3% of the time, videos were reported being used 5% of the time, and radiographs were reported 16% of the time (27). In the study performed by Rozier, Horowitz, and Podschun who performed a nationwide survey on dentist's routine communication methods, the use of visual aids were also inquired of the participants (38). Dentist's reported using printed materials, on the scale of "always" 28.3% of the time, videos 5.6% of time, and radiographs 25% of time (38).

Rantanen et al. performed a qualitative study on dental hygienist's perspective on providing knowledge via electronic platforms, such as social media, vs traditional methods (88). Dental hygienist's used computer-generated patient education materials mostly in public health ($P=0.001$). The dental hygienists that participated in the study reported using computer enhanced patient education 17% of the time, and videos 4% of the time (88). Other methods of patient education reported by dental hygienists were via demonstrating (98%), talking (99%) and advising (97%) (88). The authors of this study asserted patient education should use more contemporary methods such as social media or electronic devices to meet modern standards to communicating knowledge (88).

Williams et al. studied compliance in personal oral hygiene instruction such as brushing and flossing after periodontal treatment and patient education (89). In this study, patient education was given to two groups (89). One group was given patient education via a self-care instructor that used an electronic device (tablet) with visual aids (89). The other group received patient education via a computer-assisted format with eight minutes of visual/auditory aids including power point slides (89). The study revealed that both groups showed significant improvement in the reduction of plaque and bleeding scores

with computer generated patient education ($p < 0.005$), and/or verbal self-care instructors ($p < 0.001$) (89). The authors concluded that either format [electronic or verbal] significantly provided knowledge resulting in health behavior change and was evidenced by reduced plaque and bleeding scores. (89).

Health literacy is an important aspect of patient centered communication (72,90), and is defined as the capacity to obtain, process and mitigate health information. Health literacy and patient centered communication can be summed up in a statement made by the Health and Human Services (HHS) which said, “Often times, there exists a chasm of knowledge between what professionals know and what consumers and patients understand” (91). Studies have shown patient’s with low literacy of technical dental terms (31,92), and/or procedures, expect dental and medical providers (60,92) to assume the role of educator and explain procedures using terms they understand. In a study by Hom et al., the investigators performed an observational study on 119 (N=119) first time pregnant women in Northern Carolina correlating the level of oral health literacy (OHL) to oral health knowledge (OHK) (90). In the study, OHL was determined by using a validated health literacy instrument (REALD-30), and OHK was evaluated using a validated survey to determine understanding of dental terms (90). The mean results for REALD-30 was a mean 16 ± 5 ; with numbers closer to 30 showing higher OHL(90). The OHK scores ranged from 45-98%. The results significantly correlated higher OHK with higher OHL(90). One of the conclusions drawn from the investigation was that the women were perceived to have been low oral health literacy, did not self-seek health information (90). They also concluded that oral health care providers did not use health education adequate to their patients level of understanding (90).

There exists a gap in patients understanding of information that is delivered from health providers, who are tasked with educating and counseling patients and their parents about dental health (92). In North Carolina, Into the Mouth of Babes (IMB), is an agency charged with educating pediatric physicians about dental jargon with the goal of closing the gap in parents with low dental health literacy creating awareness and knowledge of their children's dental needs (92). A pilot study by Kranz et al., evaluated knowledge and understanding of parents (n=13) with low health literacy after pediatric physicians discussed dental health during a medical office visit (92). Of the participants, 13 (n=13) had minor difficulty with verbal and written information, but all spoke English (92). The intervention included, a baseline survey questionnaire given to parents prior to the medical visit which gauged their understanding and perceptions of their child's oral. The parents were queried regarding their knowledge that pertained to importance of deciduous teeth, association of sugar and fluoride to the dentition, oral infections, and importance of regular dental attendance (92). During the medical visit, the consultation was recorded via audio tape, and the parents were given a follow-up survey questionnaire at the end of the medical visit (92). Also during the consultation, the Pediatric physician used limited dental jargon from educational resources from the Academy of Pediatric Dentistry (92), for 4:40 to 17:03 minutes (92). Kranz et al. concluded that the gap in low dental literacy can be closed when the physician uses limited dental jargon in straightforward sentences in an interactive manner. For example, patients were given the opportunity to recall information back to the physician which allowed for higher interaction (92). They also reported that physicians that received training in dental

preventative education, felt more confident and prepared to provide dental preventative education to the parents of pediatric patients (92).

Low health literacy has been associated with an increase in plaque biofilm, lower frequency in brushing and flossing which increase risk factors for hard and soft tissue diseases (23,90,93). Low health literacy is a silent barrier to oral health, and may be associated with socio economic status (SES) (90), lack of knowledge (93), and misunderstanding the facts (23).

Shared Decision-Making

Shared decision making is defined as the process in which the provider and the patient make choices towards treatment options together (94) and is opposite to the paternalistic approach where the provider has sole decision-making power (94,95). Providing effective patient education, and giving them choices builds confidence in patients to participate in shared decision and choice towards procedures, treatment and behaviors that best fit them (42,43,57,66). Numerous research studies support shared decision making in procedures, treatments and behaviors because it engages the patient towards shared responsibility that lead to positive oral outcomes (42,57,66,86,94). Légaré and Wittman reported that patients that did not take a passive role towards decisions had better overall health outcome goals (94). Entwistle, reported that patients were enabled to share in decisions, when they were given interventions and treatment options that met their specific and personal needs (66,96).

The American Dental Association (ADA) defines patient autonomy as “self-governance”, emphasizing the need for dentists to communicate information regarding procedures and self-care behaviors, in order that patients would share in the decision

(97). Autonomy is a reflection of perceived confidence, control and motivation to perform a given behavior (98). Autonomy is also reflective on oral health providers responsibility to educate and guide patients towards better choices (5,81). Cook emphasized that patient autonomy is a patient's moral right and the providers moral obligation (99). Many other studies agree that autonomy has to be as important a motivator to the provider as it is to the patient (8,43,57,66,74). However, patients may pass on autonomous decision making (36,66).

In 2012 Halvari et al. performed a study investigating whether personally perceived motivated autonomy increased choice towards performance of oral hygiene behaviors (OHB) in 141 participants (n=141) (66). In the study the intervention group received an added 10 minutes of autonomous patient education that included goal setting towards personalized OHB choices, and the control group was given traditional patient education (66). In the study, perceived autonomy support was high ($r = .70$; $p < 0.001$), meaning that the participants reported been given choices(66). While supportive autonomous, patient education was statistically associated with participants perceived autonomy ($p < 0.01$), the investigators found that autonomy did not influence changes in OHB ($p < 0.001$) (66). Halvari et al, reported plaque reduction in both the control and intervention groups (Cohen's $d = .19$ & $d = .64$, 95% CI) at the 2nd (5.5 months) visit, but the Gingival index (GI) scores had not changed (66). It was concluded that the patients were motivated, and demonstrated perceived competence and perceived autonomy (66). Nonetheless, according to the investigators, it seemed that the participants had only brushed the night before the appointment(66), suggesting that patients behaviors had not fully changed (66).

Among the characteristics of interpersonal communication, supportive patient autonomy has been widely studied and has shown to aid patients make better decisions towards positive oral health behaviors in conjunction with patient education (57,66,98). Some of those behaviors include choosing to participate in regular dental visits, also expressed as dental attendance (57). However, some studies suggest that choice via autonomy has to be internally motivated or driven (57,74). In other words, patients can choose to be autonomous, and participate in making decisions towards dental health behaviors (57,74). In 2017 Halvari et al. investigated “caries competence” in patient education during regular dental visit with the dental hygienist, on autonomy and evaluated patients choice on regular dental attendance (57). More specifically, Halvari et al. investigated the influence of knowledge with patient education on personally internally motivated autonomy towards patients behaviors to regularly attend dental appointments (57). To test for the perceived internal motivator to perform a behavior, an instrument, Relative Autonomous Locus of Causality (RALOC) was utilized(57). In this instrument, higher scores are translated into engagement towards performance of the behavior (57). All of the participants (n=138) were students at the University in Oslo and were given the RALOC questionnaire (T1;baseline), an exam, a cleaning, as well as routine patient education by the dental hygienist (57). The exam was performed by the dentist, and the questionnaire was given again at the end (T2, 5.5 months) (57). The experimental group received extra time for autonomous supportive patient education regarding the etiology of caries that included the role of plaque, calculus, gingival diseases, and importance of fluoride (57). The participants also received demonstrations on brushing and flossing, and were given treatment options, and choices towards self-care

that reflected autonomy (57). To assess patient decision making and choice/autonomy they were evaluated on their competency/understanding of caries, and whether or not they made return dental appointments (57). The results indicated that of the 65.2% participants (n=90) that were diagnosed with caries, 57% made follow-up dental appointments (57). In the intervention group, autonomy-supported patient education was found to increase caries competence ($p < 0.001$), as compared to the control group ($p < 0.10$) (57). Perceived internal autonomous motivation used in the RALOC tool, was found to predict dental attendance ($p < 0.01$), and the investigators concluded that use of RALOC was associated with positive “caries competence” that indirectly influenced dental attendance (57).

In the studies by Halvari et al., it was observed that patients that did not change their behaviors was due to their own perception and their own personal support of autonomy (57,66). And in the study performed on 2017, Halvari et al., concluded that patients were more likely to “show” autonomous behaviors when they experienced a desired effect on perceived outcomes (57). This same result was observed in the study performed in 2012, where it was reported, that patients that had high internal autonomous motivation, changed their OHB (66). Studies indicate that providers have the responsibility of educating patients that empower them towards making better choices (5,57,66). Creating instances of shared decisions embrace autonomy (60,100) and respect (100) when given the choice towards change (101).

Often, patients have personal barriers that may hinder acceptance of a specific procedure or behavior, and offering options, whenever possible, provides adherence to the treatment plan, as was noted with use of decision aids (94). Yet, many other studies

agree that autonomy has to be as important a motivator to the providers as it is to the patient (8,43,57,66,74). Nonetheless, as mentioned earlier, patients may pass on autonomous decision making (36,66) emphasizing that decision making should be left to the provider (36). Additionally, Nowak et al reported that patients may not be aware of their autonomy in making decisions and may not be willing to take that role (36). In their study, regarding choices in OHB, dentists reported, ‘I can do absolutely nothing if the patient sees me...one time for two or three years, or don’t brush their teeth...’ (36). Dentists also reported, that many patients left decision-making to the dentist because they felt the dentist was the expert (36).

In other instances, while patients may be motivated to choose the best treatment options, there may be hindrances as noted in the study by Dodd, who evaluated oral health perceptions of adolescents in a rural area of the United States (23). In the study while 25% of the respondents had not been to the dentist in 1 year, through patient education efforts by the researchers, the participants had realized dental visits were important (23). However, their choice to seek dental care was impaired by transportation, finances, parents, fear, and limitations with Medicaid (23).

Conversely, in medical settings where choosing the wrong treatment poses a threat to the patient, autonomy is suppressed (74,89). Other examples where autonomy is suppressed and where patients are required to follow recommendations that lead to health promotion can be seen in antenatal settings, and patients that are bound to a medical/skilled nursing facility (96). Additional instances of suppression of autonomy include patients that depend on the provider’s decisions about medications and treatment procedures that involve a more severe outcome (64,99,103,104). In those instances

patients are more inclined to forfeit their right for autonomy (64,99,103,104). Another reason they may forfeit that right is if they are not given enough information to choose (36,42,64). Lastly, in some of the studies that Scambler et al reviewed, it was noted that not all patients want to have control of their care and make decisions (42). And in other studies, such as Lee & Lin, and Halvari patients may not choose autonomy (66,74).

Current Communication Techniques/ Methods

Although few studies were found on current communication strategies used in dentistry (38) three methods are cited most frequently in the literature: tell-show-do (TSD), teach-back method (TCM), and motivational interviewing (MI). These strategies have been shown to support patients' understanding and influence compliance with provider recommendations that results in positive behavior change and positive oral health outcomes (14,66,71,105).

Motivational Interviewing

MI is a person centered guide of communication that elicits intrinsic motivation to change (106). MI spirit focuses on four elements: collaboration, evocation, compassion, and autonomy (107). Although widely used in medicine, MI has only recently been used in dentistry. Studies of MI in dentistry have reported mixed results with regard to change in OHB, and adherence towards self-management practices that increase optimal outcomes (10,108–114). Current studies have also indicated that MI may not be the sole motivator for patients to perform personalized oral self-care (72,110,112). MI helps people resolve ambivalent feelings and find the internal motivation needed to change their behavior (57,104). Ambivalence is seen in internal reasoning, fluctuations, concerns or confusions, and arguments that individuals possess towards committing to a behavioral

change (57,104). The counselor uses open-ended questions, affirmations, reflective listening, and summaries to help reduce ambivalence in patients (57). In dental settings where length of time is a consideration, a brief MI (BMI) session has been successful in promoting change with regard to oral self-care (39,61,116).

Gao et al. performed a systematic review on randomized controlled trials in the use of MI in oral health (10). Gao et al. reviewed 16 studies out of twenty that were found to meet inclusion criteria for MI, which was use of MI in a single or more session (10). In five of the studies reviewed, MI was compared to or added with conventional education (CE) that included talking, printed materials, advice/giving or videos (10). Those five studies reviewed the improvement of periodontal health based on clinical indicators such as bleeding on probing, gingivitis, plaque, frequency of behaviors, and increased knowledge (10). When comparing patient education methods, MI outperformed CE by displaying periodontal and behaviors improvement in at least one clinical outcome (10).

Freudenthal et al., performed a study utilizing MI evaluating the perception of parents' knowledge and behaviors of pediatric dental care (116). The treatment included 40 minutes of MI, followed by a 4-week phone call. The study that showed significant increase in parental behaviors and competence towards their child's dental health evidenced by a reduction of shared utensils between caregiver and child ($p=0.035$), and increased frequency in brushing their child's teeth ($p=0.001$)(116).

Brand et al., evaluated oral health outcomes with a single session of brief motivational interviewing (BMI) in 58 patients ($n=58$) (110). The investigators reported no statistical differences between the test and control groups in BOP ($p<0.001$), PI ($p=0.019$), and pocket reduction ($p=0.0001$) (110). This study also reported no differences in

OHB between the two groups ($p < 0.001$), where one of the participant groups were given BMI with periodontal procedures, and the other was not (110). Examples of the use the MI can be seen by Stenman et al. in 2012, who evaluated the influence on OHB, by providing MI as an adjunct to periodontal therapy (72). In this study, MI was performed by a clinical psychologist in the test group prior to patients having periodontal cleaning and traditional oral hygiene patient education (72). The results of the study showed that there was no statistical difference between the control (no MI), and the test group with motivation to perform OHB ($p < 0.05$) (72). There was also no statistical differences between marginal bleeding index (MBI) and plaque index (PI) between the two groups, which were reduced in both the control and intervention groups ($p < 0.05$) (72). The investigators concluded that a single session of MI compared to traditional patient education showed no significant difference in OHB (72).

In another study, Stenman, Wennström & Abrahamson, performed a 3 year follow-up on the participants from their previous study (72), who had received the intervention with MI as compared to those who had only received traditional oral hygiene patient education (112). The participants in the follow-up study ($n=26$) had been continually visiting the dental hygienist (112). The provider, a dental hygienist, had no prior knowledge of the previous study, and had only performed traditional patient education along with periodontal procedures (112). Also, no MI techniques had been given in the three year gap between studies (112). In the study the participants were found to be performing OHB and was evidenced by decreased MBI and PI scores (112). Of statistical significance, was decreased MBI scores in the present study which lead the investigators to believe there was an increase in interdental cleaning (112). In the current

study Stenman et al., concluded that use of single MI did not have an influence on long term effects on patient's personalized OHB, but attributed patients consistency in OHB to dental hygienists' traditional and consistent preventative patient education practices (112).

Tell-Show-Do

In dentistry, Tell-Show-Do (TSD) is a method used to teach oral hygiene self-care techniques such as toothbrushing and interdental cleaning (117). According to the American Academy of Pediatric Dentists, TSD is defined as giving verbal explanations about a procedure, followed by demonstration, and finally the procedure is executed (117). TSD includes an explanation to patients about the etiology of plaque and best practices to remove dental plaque, demonstration of brushing technique, and then allowing the patient to practice (10,57,109,110,112–114). Research studies that include communicating patient education regarding OHB that include the use of TSD in dental providers, have been compared with other forms of communication such as Motivational Interviewing, or use of electronic resources (10,113,118). Other studies do not include this method as in the study performed by Rozier evaluating the communication methods/techniques used by dentists in the United States where TSD was not one of the methods listed (38).

Traditional oral hygiene education (TOHE), in the form of TSD has been suggested to do little for motivating OHB (71,110). Thus far, it seems to be the form of communicating OHB in the dental setting (10,57,113). In adults it has been utilized in creating awareness of specific areas in the oral cavity that need improvement evidenced by clinical symptoms, as in the study by Brand et al. (110). TSD was evaluated on

patient's motivation to perform OHB by analyzing periodontal outcomes such as bleeding, plaque levels, and pocket reduction. When comparing TSD to MI with respect of performing OHB, the investigators found few differences in the group. When they measured the clinical outcomes, it was noted that patients in the TSD intervention group, had a significant decrease in bleeding ($p= 0.001$), and reduction in 4-6mm pockets over 4 week and 12-week time ($p=0.001$). The investigators concluded that TOHE had as much impact on patient performance of OHB, as MI. (110)

TSD traditionally used among pediatric patients as behavior guidance to reduce anxiety (119,120). Other uses for TSD in pediatric dentistry has been in the form of modelling the use of dental equipment, and how procedures are performed to reduce dental anxiety, fear, and increase cooperation in patients, which also aids in behavior management (121–124). In a study performed by Sharma et al., TSD was used as live modeling by using parents of the children as a model, while evaluating the patient's heart rate to control for reduction of patient anxiety (120). They found a significant correlation with TSD/live modeling and reduction of patient anxiety as evidenced by a reduction of heart rate ($p<0.05$), better patient management, and cooperation (120).

In a similar study, measuring compliance of children and levels of anxiety to dental procedures, investigators compared patient education methods TSD and an electronic application called Little Lovely Dentist (APP) (119). Anxiety levels were correlated to heart rate that were recorded using a finger pulse oximeter (119). Anxiety levels were recorded before the interventions, in the groups that were assigned to TSD or use of the APP (119). Heart rate measures were also recorded during the prophylaxis procedure and after. Anxiety was found to be statistically reduced in participants that had been

educated using the APP before, during ($p \leq 0.001$) and at the end ($p = 0.007$) as compared to traditional TSD (119). In a similar study, methods other than TSD in relation to behavioral management and patient compliance were studied in pediatric patients. Kharouba et al. evaluated pediatric patients comfort amplified by relaxation attitudes, anxiety, and cooperation by comparing TSD as a behavioral method to television distraction (118). In examining children's perception during treatment, anxiety was evaluated using Facial Image Scales, as well as pulse and oxygen (118). Cooperation was evaluated on Frankl scale (118). The results of the study indicated that television distraction significantly improved participants cooperation ($P < 0.001$), and significantly reduced anxiety ($P < 0.001$), over the use of TSD (118).

TSD has also been mentioned to be the least aggressive form of behavior management as positive reinforcement in children, and widely accepted by parents (120–127). Chang, Badger, Achary et al. in 2018 investigated behavioral management preferences in parents of their pediatric patients of various ethnicities (125). The parents were most satisfied with TSD as positive reinforcement towards their child's behavior management as compared to voice control and protective stabilization ($P < 0.001$) (125). It was concluded that TSD had been among the most acceptable forms of behavioral management in most countries with the least amount of aggression on the part of the provider (125). However, when conducting a similar study on parental preferences of pediatric guidance among ethnic groups by Martinez et al., TSD was not the most preferred (128). In the study by Martinez et al., Hispanic parents accepted voice control over TSD, and black and white races accepted TSD as a form of behavioral guidance in the dental office (128).

Teach-Back Method

The teach back method (TBM) is a form of communicating verbal information to patients, and asking them to repeat the information back to the provider in order to assess their understanding (27,31,129–131). As patients recall the information given to them, knowledge and confidence increase in treatment comprehension and self- management behaviors (129). This allows for an exchange of information between provider and patient, preventing misunderstanding (58,130,132). Studies show that this technique has been successfully used in giving patient post-op care instructions, medication and self-care instructions (132) in both the medical and the dental setting (27,132). Using this method patients from both the medical and dental sectors are more compliant with procedures and follow-up care (132). Marcus' study on communication in healthcare, emphasized the use of the TBM as an assessment towards patient understanding and retention of treatment, along with self- management behaviors (58). Dinh et al., performed a systematic review (N=21), and found two studies that showed statistical improvement in patient self-efficacy in self-management to diet ($p<0.026$) and medication ($p<0.001$) in patients with Type 2 diabetes ($p<0.001$)(133). Dinh et al., concluded that the TBM was an effective method of communication to engage patient participation in interpersonal communication, and perceived patient comprehension of knowledge on self-management (133). However, the investigator sited that actual effective patient comprehension was difficult to ascertain (133). Both studies reflected patient understanding as they reflect back to the providers, what had been explained to them (58,133).

TBM is thought to engage patients and providers towards perceived understanding of their concerns and recommendations (58,121,133,134). According to the literature patients that benefit most from TBM are patients with low health literacy or a different language other than the provider (31,135,136). In the study by Chang, Barker, Hoeft et al., the retention and comprehension of preventative dental education given to parents that were non English speaking migrant farm workers, was investigated (135). The dental providers who participated in the study utilized the TBM on the parents during communication of OHB to their children(121). The investigators reported high comprehension of the OHB explained to the parents, as 25 out of 30 participants showed ability to recall and teach back the information to the providers (135).

Theoretical Framework

The TPB posits that behavioral intent may be predicted by three domains: attitudes (ATT), social norms (SN), and perceived behavior control (PBC) (137). There have been studies in dentistry that have used the TPB to understand behavioral intent with regard to oral self-care behaviors (138). Attitudes to perform a behavior are tied to intention and are defined as the behaviors, beliefs, and emotions a person has toward performing communication practices (138,139). Social norms (SN) are the expectations to perform given behaviors from an individual's circle of influence (140). The circle of influence may be professional colleagues, the public and/or patients that expect an individual to perform a behavior in a specific way (138,140). Perceived behavioral control (PBC) is defined by the ability to perform a behavior (141). PBC involves perceptions of confidence and competence and asks the question, can the behavior be achieved? Similar to self-efficacy, performance of behavior is dependent on volition (desire), personal

beliefs about ability, availability of fluid resources, and perceived difficulty (111,141,142).

The literature suggests effective interpersonal communication improves patient understanding and motivation resulting in patients adopting behaviors that lead to optimal oral health outcomes (5,9,17,70). To reduce the level of oral disease, oral health professionals must be competent and confident in using evidenced based communication techniques. Few studies have examined practicing dental providers' specific communication practices and their attitudes toward engaging patients in discussions about oral health behaviors. Understanding this phenomenon is the first step in improving communication aimed at preventing and treating oral disease. TPB posits that a dental provider's decision to engage in a discussion about oral self-care behaviors with a patient is based on his/her attitude about the effectiveness of the interaction, perceived behavioral control, and social norms. Acquiring this baseline knowledge can then be used to develop interventions addressing these three constructs of TPB which may serve to improve communication practices among CA dentists. Therefore, the purpose of this study is to investigate the association between current communication practices used by CA dentists and the Theory of Planned Behavior constructs: attitude, social norms, and perceived behavioral control.

SECTION 3

MANUSCRIPT

This manuscript will be submitted to the Journal of California Dental Association.

Introduction and Review of the Literature

In dentistry, effective communication has been associated with positive oral health outcomes, including a decrease in the incidence of caries, gingival, and periodontal diseases (9–11). Although oral diseases can be prevented, they remain at epidemic levels in the United States (U.S.) (1,32). Current statistics from the Centers for Disease Control and Prevention (CDC) show caries prevalence in ages 2-19 at 45.8%; 89% for ages 20-64, and those aged 65 and older at 96 % (16,21). The 2009-2014 National Health and Nutrition Examination Survey (NHANES) revealed 42% of U.S. adults have periodontal disease (19). Research has shown communication practices that support oral self-care behaviors such as biofilm removal reduce and prevent oral diseases (9,10,13,25,26). However, U.S. statistics on the prevalence of oral diseases suggest compliance with oral health recommendations is low and communication strategies used by oral health professionals are ineffective (13–15,20–22).

The 2000 Surgeon General’s Report asserted effective patient/provider communication is key to the adoption of positive oral hygiene behaviors and disease prevention (32). Effective communication practices include knowledge sharing and shared decision-making in the context of a trusting patient/provider relationship (9,18,19,59) is at the heart of patient-centered care. The concept of patient-centered care (PCC) is transforming the relationship between providers and patients. Traditionally, a care provider prescribed the same treatment for most patients with similar diagnoses or conditions; a patient-centered care model considers treatment options based on a patient’s

unique concerns, preferences, and values. The goal of PCC is to empower patients to become active participants in their health care to achieve positive health outcomes that improve quality of life (2,44,52,74). For this reason, PCC is viewed as an essential element in achieving the goals of the Triple Aim: 1) improving the experience of care, 2) improving the health of populations, and 3) reducing per capita costs of health care (4,52). The achievement of these goals requires health care providers to develop good communication skills so care may be delivered in an empathetic and effective manner.

There are many reasons why a breakdown in communication during patient-provider encounters might occur. For patients, these barriers include: misperceptions of how behaviors and lifestyle choices impact health, lack of knowledge, and the quality of the material being presented (11,23–26). Other barriers include low health literacy, fear, and anxiety (27–30). On the provider side, barriers cited by dentists include lack of training in evidence-based communication strategies and lack of time (31,36,37). Additionally, some dentists have reported lacking confidence in their ability to engage in effective oral hygiene discussions with their patients and questioned whether discussions about oral hygiene behaviors (OHB) result in behavior change (29,58). Knowledge of dentists' current communication practices and barriers encountered with regard to oral health counseling is the first step in understanding how patient/provider communication may be improved.

Although there are a paucity of studies on the specific patient education counseling techniques used in dentistry, three methods stand out in the literature: tell-show-do (TSD), teach-back method (TBM), and motivational interviewing (MI) (27,38). Research has shown these strategies support patients' understanding of treatment

procedures, disease processes, and preventative behaviors (58,105). Additionally, all three methods have shown to be effective in behavior change with regard to oral hygiene practices (10,113). The traditional methods, tell-show-do and the teach-back method, encourage active participation by having patients demonstrate or ‘repeat back’ self-care instructions in order to assess comprehension (10,66). TSD is a well-documented communication approach accepted by patients and is most often used by a dental provider to teach oral self-care techniques using verbal explanations and visual aids. TSD is often used as a means of behavior management in pediatric care (14,38,121,143). Studies on the use of TSD, have found the method reduces anxiety in pediatric patients and increases cooperation during dental procedures (120–125). The TBM is a reciprocal form of communication focusing on delivering verbal information to the patient and having them repeat the information (144,145). In both the medical and dental literature, evidence suggests using this technique uncovers misunderstandings in care instructions, use of medications and treatment procedures (28,76,132,144).

Motivational interviewing (MI) is a directive, client-centered counseling style for eliciting behavior change by helping clients to explore and resolve ambivalence. (146). Ambivalence is defined as internal reasons, fluctuations, concerns and arguments individuals make to maintain the status quo (146). MI encompasses provider collaboration, compassion, evocation, and autonomy to support the “spirit of MI.” MI strategies include open-ended questions, affirmations, reflective listening, and summaries to strengthen intrinsic motivation for change (146). In contrast to provider centric models such as TBM and TSD, MI asserts behavior change cannot be externally motivated, but

rather results from a patient or client's internal motivation (10,57). Given MI is newer to dentistry, research studies in dentistry have shown mixed results (10,113).

While communication techniques and methods are important, they are juxtaposed to dental providers' attitudes, values and beliefs about their personal communication practices. The theory of planned behavior (TPB) posits that behavioral intent and action can be predicted by attitudes (ATT), social norms (SN), and perceived behavior control (PBC). Studies in dentistry and dental hygiene have used the TPB to understand behavioral intent with regard to oral self-care behaviors (81,84,105,111,138,147). Applied to communication, TPB theorizes that a dental provider's decision to engage in a discussion about oral self-care behaviors with a patient is based on his/her attitude about the effectiveness of the interaction, perceived behavioral control, and the influence by societal norms and expectations (138). The Theory of Planned Behavior (TPB) was used as a framework for this study, and the constructs were explored in the context of dentists' discussions about oral hygiene behaviors with their patients.

To date, only one study investigating communication methods and/or or behavior change strategies used by practicing dentists in the U.S. has been conducted (38). Since little is known about the level of knowledge and attitudes regarding communication practices among dentists in the U.S., further exploration and research is needed and could feasibly be investigated within the state level. California (CA) dental health care providers comprise nearly 1/3 of the United States U.S. dental work force, with 204,000 dental offices, 22,000 dental hygienists, and 30,773 dentists (39). The CA Department of Public Health Oral Health Programs 2018-2018, adopted frameworks from Healthy People 2020, which assert that evidence-based communication practices should be used

to promote behavioral preventative oral self-care practices(1). Yet, despite efforts of local governmental agencies and dental providers, oral diseases such as gingivitis, periodontal diseases, and caries, are still on the rise (15,25). The CA Department of Health notes that nearly 1/3 of all children in CA are plagued with caries (34). Furthermore, Eke projected 47% of people in CA are estimated to have periodontal disease (17). While oral diseases are multi-factorial, these statistics imply patients may: 1) lack knowledge, 2) not adhere to oral health recommendations and/or, 3) be ambivalent to changing their oral self-care behaviors. Additionally, the level of oral disease suggests current communication practices are not affecting behavior change with regard to oral self-care. The identification of current communication practices used by CA dentists, an understanding of their attitudes toward patient/provider communication and their perceived self-efficacy of using behavior change strategies may provide baseline knowledge needed for driving change in this area.

The literature is clear that specific communication techniques raise patient understanding, and awareness of diseases assists patients in making choices towards health (9,13,28,59,61). An understanding of dentists' attitudes, values, and beliefs toward oral health counseling, their perceptions of professional expectations in this area, and personal competence is needed to develop interventions that strengthen dentist's communication abilities and inform dental education curricula and continuing education programming. Therefore, the purpose of this study was to explore CA dentists' knowledge of communication methods and attitudes towards patients' OHB.

Methods and Materials

The University of Minnesota (UMN) Institutional Review Board (IRB) determined this study was exempt from review (STUDY00006467). The study took place at the University of Minnesota between July 2019 – July 2020 and dentists in five counties in southern California comprised the study sample. The CA Tri-City Dental Society (TCDS) agreed to send the survey to all their 2,000 members residing in Riverside county, South East Los Angeles, and San Bernardino counties. To maintain proximity to these three counties, San Diego and Orange Counties were also included in the sample population. A list of 6,628 licensed dentists was obtained from the California Department of Consumer Affairs (CA DCA) for Orange County, and San Diego County. Of the 6,628 licensed dentists on the list from CA DCA, 500 dentists were randomly selected using the RAND function in Excel. A RAND number was generated to a dentist in a row of data. The data rows were sorted by the random numbers and the 500 out of the 6,628 having the smallest random numbers were selected. A total of 2,500 dentists comprised the study sample.

Dentists from the CA DCA list were mailed paper surveys; members of the TCDS were asked to complete the survey electronically via Qualtricssm. Both paper and electronic surveys included a cover letter describing the purpose of the study, procedures, confidentiality, and contact information for the study investigators. The electronic survey included a “yes” or “no” question in the introduction letter, for participants to consent for participation. The cover letter and the link to the survey in Qualtricssm was emailed to the executive director of TCDS who placed the request for participation and link to the survey in the organization’s monthly member newsletter. A function in Qualtricssm

disallowed members to answer the survey more than once. A follow-up request to participate was emailed two weeks after the initial electronic survey was sent to the members of TCDS. The paper survey was mailed to 500 participants along with a cover letter and a stamped envelope with a return address. Survey envelopes were coded to keep track of non-responders. Two weeks after the initial surveys were mailed, follow-up surveys were sent to 300 non-responders. Follow-up surveys were limited to 300 non-responders to limit the cost of the study, as well as experiential knowledge of lack of survey responses. The first 300 non-responders, in numerical order of the list were chosen.

A raffle to win a \$50.00 Starbucks gift card was offered to incentivize dentists to participate in the study. Those that received the paper survey were sent a separate raffle ticket to be returned with their completed survey. Those that participated via email, were asked a separate question in Qualtricssm at the end of the survey, requesting for their office name and address to be placed in the pool for raffle tickets. The gift cards were given to three randomly chosen participants.

Instrument

To align with the purpose of evaluating CA dental providers' communication procedures, study investigators modified the instrument designed by National Advisory Committee on Health Literacy in Dentistry (NACHLD) (13). The original instrument was developed by Rozier et al., to analyze communication techniques used by dentists in the U.S. with regards to oral health literacy (38). The original instrument used in the study by Rozier et al., was validated by pilot testing in a workgroup by 188 attendees to an American Dental Association (ADA) meeting in 2007.

For the purpose of this study, additional survey questions were added to query communication practices aligning with motivational interviewing. Additionally, using the constructs of the TPB questions were modified to investigate dentists' attitudes about patient communication, the influence of social norms, and effects of perceived behavioral control on current communication practices and behaviors. One approach to validate an instrument is by pilot testing via focus groups outside of the study population, which answer the questions and immediately provide feedback (41,148). Given the descriptive nature of this study, psychometric analysis was not needed. Feedback was solicited from a focus group that included five UMN dental hygiene faculty, two Western University dental faculty members, and three licensed CA dentists, revisions to the questions were made for the purpose of clarity. The survey included a total of 38 questions. Six questions pertained to demographics, including age, gender, length of time in dental practice, dental practice location and employment status. Remaining questions used a four-point Likert scale to query dentists' current communication methods, strategies used to enhance patient/provider communication and where initial communication training occurred. Ten questions were based on the TPB constructs and queried participants attitudes (ATT) toward patient/provider communication, perceptions of professional expectations (social norms (SN), and their confidence in engaging in conversations about OHB perceived behavior control (PBC).

Data Analysis

Descriptive statistics were used to summarize continuous and categorical variables using means and standard deviations and counts and percentages, respectively. The four-point Likert scale items were reported using counts and percentages for each

category, as well as overall means and standard deviation calculated using the ordering (e.g. 1=Strongly disagree, 2= Disagree, 3=Agree, 4=Strongly agree). Associations between demographics TPB constructs (*dental provider attitudes, social norms, and perceived behavior control*) were tested using a one-way ANOVA, or two-sample t-test as appropriate, with an alpha level of 0.05. No corrections were made for multiple testing. All statistical analyses were performed in R version 3.6.1.

Results

A total of 108 licensed CA dental providers participated in this study, 103 responding via paper surveys (response rate: 21%) and 5 responding via email survey (response rate: 0.3%). Table 1 shows participant demographics. Of the 108 participants, 58% (n=60) were female, 41% (n=42) were male; 1% reported other or declined to report their gender. The majority of the participants were white (45%) and Asian/Pacific Islander (37%). Other races represented were Hispanics (5.8%), American Indian/Native Alaskan (2.9%), 11% reported other, and some of the participants chose multiple races. Among participants, 84 were general dentists (n=84; 80%), nine were pediatric dentists (8.6%), four were orthodontists (n=4;3.8%), three were oral and maxillofacial surgeons (n=3;2.9%) and two were prosthodontists (n=2;1.9%). The rest were represented by 1% of the following: endodontist, periodontist, and dental public health. Most of the participants fell in the age ranges of 41-50 (n=31;30%) and 51-59 (n=26;25%). Other participants ages included 31-41(n=21;20%), 60 years and older (n=22;21%), and 21-30 were the least (n=4;3.8%). The majority of participants have been practicing 15 years or longer (67%), followed by those practicing between 5-10 years (18%), 11-15 years (8.6%), and less than 5 years (6.7%). Seventy-five percent of participants worked full-

time; 4.8% worked between 31-39 hours per week and 19% worked less than 30 hours per week. Remaining participants reported being retired or declined to answer (Table 1).

Current communication practices are reported in Table 2. Dentists' communication practices aligned most closely with the principles of motivational interviewing (1= never, 2=rarely, 3=very often, 4=always). Participants reported they make an effort to show compassion ($\mu 3.5 \pm 0.59$); try to motivate their patients to adopt positive oral self-care behaviors ($\mu 3.2 \pm 0.54$); desire to establish collaborative relationships and support their patients' autonomy in decision making ($\mu 3.2 \pm 0.62$, $\mu 3.1 \pm 0.64$). Use of interpersonal communication techniques reported by participants also support MI principles as evidenced by consistently making eye contact ($\mu 3.7 \pm 0.55$), listening to patient's needs ($\mu 3.6 \pm 0.50$), encouraging the patient to ask questions ($\mu 3.6 \pm 0.55$), and encouraging the patient to make their own decision/choices about OHB ($\mu 2.8 \pm 0.90$). To a lesser extent, participants reported using methods consistent with TSD ($\mu 2.8 \pm 0.81$), and the TBM ($\mu 2.1 \pm 0.80$). Seventy-two participants (67%) indicated they very often or always give advice, demonstrate oral self-care techniques and ask the patient to demonstrate the technique to assess comprehension. Additionally, 26 participants (24.6%) reported they always or very often ask patients to repeat back information that had been given. Although communication practices used by dentists aligns mostly with MI, only 35% of participants were taught this technique in dental school. The majority of participants learned TSD in dental school (78 %, n=84) with 43% reporting they were taught TBM in dental school. To a lesser degree, training in communication was obtained via continuing education (See Table 2).

Table 3 associates the TPB to the dental providers communication practices (1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree). The majority of participants hold positive attitudes toward patient/provider communication practices and found ethical fulfillment when communicating OHB with their patients (96%; $\mu 3.4 \pm 0.56$). Most participants felt discussions about OHB will lead to a change in behavior and disagreed with the statement, “discussion about oral self-care will *not* lead to behavior change” (87%; $\mu 1.9 \pm 0.74$). Participants respected patient’s oral hygiene choices ($\mu 2.9 \pm 0.65$) and valued their patient’s opinions about communication techniques ($\mu 1.6 \pm 0.63$). Participants also employ strategies to enhance patient comprehension as evidenced by 83% using study models, radiographs or intraoral cameras ($\mu 3.1 \pm 0.75$) and 64% using printed materials and drawing pictures ($\mu 2.7 \pm 0.84$). Videos, DVDs, or internet resources ($\mu 2.0 \pm 0.75$) (Table 2) are used to a lesser extent and fewer than 30% include a family member in discussions regarding personalized self- care practices ($\mu 2.1 \pm 0.76$).

Social norms appear to influence participants’ communication practices (1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree). Findings revealed that dentists engage in patient discussions about OHB because their patients expect them to and feel it is their professional responsibility. ($\mu 2.8 \pm 0.73$, $\mu 2.8 \pm 0.74$) (Table 5). Participants reported they communicate about OHB whether their patients ask them to or not ($\mu 3.2 \pm 0.70$). However, some participants’ feel their patients will not follow their instructions no matter how well explained ($\mu 2.5 \pm 0.88$). Additionally, the majority prefer their dental hygienist or other staff member engage in communication about OHB ($\mu 2.7 \pm 0.90$). Too little time, ($\mu 2.2 \pm 0.83$) and the lack of interpreters ($\mu 2.0 \pm 0.85$) were not found to be major

barriers to patient/provider communication and the majority of participants did not feel they needed additional training in communication ($\mu 2.1 \pm 0.74$).

Tables 4 and 5 show associations between demographic variables and TPB constructs. Dental providers' attitudes and gender showed a statistically significant association (Table 5). Female dentists showed a slightly higher affinity to communicating OHB due to ethical fulfillment, respect of patient choices, belief that a patient can change, and valued their patients' opinions about their communication techniques ($p = 0.03$). There was a statistically significant association between age category and ethical fulfillment from engaging in OHB conversations with patients with 51-59-year old's reporting the most ethical fulfillment ($p = 0.01$). Female participants were influenced more than men by the dental community perceptions of communication practices ($p = 0.02$) (Table 4). Participants who have been in practice 5 years or less appear to be less confident in their communication abilities ($p = 0.03$) (Table 5).

Discussion

This study investigated CA dentists' communication practices and the association between the TPB constructs: attitude, social norms, and perceived behavioral control. Study results revealed dentist participants do not adhere to one particular communication method, but rather use a variety of strategies and techniques when discussing oral self-care behaviors with patients. Overall, participants in this study have positive attitudes toward patient/provider communication and feel it is their professional responsibility to engage in discussions about OHB. The communication method most learned in dental school was TSD (78%), followed by TBM (43%) and MI (35%), so it was not surprising that the majority of participants continue to use aspects of these traditional patient

education methods (9,35,42,152). Rozier et al. and Flynn et al. found TBM the least used method by dentists and dental hygienists (27,31). Participants reported they often use visual aids such as models, radiographs or intraoral cameras, and “show” oral hygiene behaviors to their patients, then ask their patients to demonstrate oral self-care techniques to assess understanding.

MI has been used in dentistry for a little more than a decade, and many of the participants’ communication practices aligned with MI principles (10). Participants voiced a strong desire to: 1) evoke patients’ motivation to change, 2) support patient autonomy and, 3) collaborate with patients to support positive behaviors. Adoption of MI strategies may be due to the recent emphasis placed patient centered care (PCC). To a great extent, MI closely aligns with the core elements of patient-centered care and both the IOM and the Surgeon General have made PCC a standard in health care (32,52). For example, participants in this study reported they encourage collaboration, listen, and try to evoke their patient's motivation for positive behavior change. Additionally, participants encouraged their patients to make their own decisions and are empathetic with the challenges that comes with behavior change.

A provider’s willingness to accept a patient’s decisions inspires trust and confidence in the provider and encourages acceptance of advice given. Many studies confirm that offering treatment options increases patient compliance with treatment and self-care recommendations (8,149). Embedded in the PCC model is a responsiveness to patient preferences and a philosophy that a patients’ expected health outcomes should guide treatment decisions (52). One aspect of PCC that was not evident in this study was collaboration with family members, as 48% of the participants “rarely” asked if their

patients would like a friend or family member to join in discussions about OHB. This is an important finding because family members often advocate for the patient-family member who may be struggling with comprehension, may help motivate, and help hold the patient accountable for their behaviors. Reasons for this finding are unknown and should be explored in future research studies.

Participants that had practiced five years or less appear to have less confidence in communicating OHB to their patients yet reported they do not prefer to have another staff member to communicate OHB. Given that the profession of dental hygiene is rooted in prevention, dental hygienists are often given a preventative role on the dental team. Pediatric dentists also prefer to personally communicate OHB with patients, instead of having a team member follow-up ($\mu 3.1 \pm 0.78$; $p=0.09$) (Table 4). This may be attributed to the fact that teaching oral hygiene is often part of behavior management of pediatric patients. Additionally, parents' expectations may motivate pediatric dentists to personally communicate specific brushing or interdental techniques.

According to the TPB, people intend to perform a behavior when they evaluate it positively (attitudes), when they believe others think they should perform an action (social norms) and whether they feel they have the abilities to perform the action (perceived behavior control). Using this framework for analysis, study results suggest participants' hold favorable attitudes toward engaging in discussions about OHB with their patients. Participants in this study were influenced by social norms, as they reported a sense of professional responsibility and obligation to engage in discussions about OHB with their patients. Interestingly, participants in this study reported they give oral health recommendations even if their patients don't ask. This finding revealed a disconnect, in

that, the majority of participants agreed on the importance of allowing patients to make their own decisions nevertheless, they provided recommendations irrespective of patients' desires or motivation. This communication practice does not support patient autonomy. Perhaps participants feel professional expectations mandate they discuss OHB regardless of their patients' preferences. Another reason may be dentists may have a difficult time watching risky behaviors that lead to dental disease without voicing their concern and recommendations- even if patients are not interested. Furthermore, dental providers may not have complete understanding of the psychological beneficence that autonomy support offers a patient.

Our study participants' attitudes and social norms suggest intent to engage in patient/provider communication with the goal of improving their patients' oral health, however, over half of the participants seem to doubt whether they can be successful in motivating patients toward improved oral self-care. Despite believing oral self-care discussions will lead to behavior change, over half of the participants felt that no matter how well they explained concepts of OHB, patients did not follow their instructions ($\mu 2.5 \pm 0.88$). Nowak et al. had similar findings, as study participants reported that "there was only so much they could do if patients don't follow their recommendations" (36). A number of participants delegated oral self-care discussions to other team members. These results suggest lower self-efficacy (perceived behavioral control) with regard to patient/provider communication and may prevent participants from fully acting on their intentions to engage in patient-provider communication. Yusuf et al., used the TPB to predict dentist's intention to counsel preventative patient education regarding diet, tobacco cessation, and alcohol abuse in relation to dental health (138). Specifically,

Yusef et al. found the more positive the attitude, the more the engaged the dentists were on the *intention* to give advice on preventative behaviors (138). Both attitudes and perceived behavioral control significantly predicted the *intent* on counseling, but they did not move the dentist to actual performance (138). Fischer et al., hypothesized that the TPB, is a predictor on the *willingness* to provide preventative counseling by students and faculty to diabetic patients in a teaching institution and found attitudes and perceived control had the greatest predictive value in performance, with social norms to a lesser extent (67).

In our study, participants' attitudes and social norms suggest strong intentions to engage in oral health discussions with patients. However, intention and action are two different things. Over half of the participants had low expectations with regard to patient compliance with oral self-care recommendations. The perception that their communication efforts are in vain may explain why a high number of participants do not feel they need additional training in communication. When poor compliance is noted in patients, healthcare providers often stop promoting, especially when advice-giving falls on deaf ears (36). Nowak et al. also found dentists restrained themselves from making recommendations because patients didn't comply with pertinent personal oral self-care habits (36). Rozier et al., found dentists that did not communicate preventative behaviors was due to low expectancy and patient non-compliance in the performance of OHB (31).

The findings in our study suggest that communication practices are influenced by personal attitudes, values and beliefs, as well expectations of others. However, there seems to be a divide between believing what is ideal and actual implementation. For example, participants' personal beliefs and sense of responsibility influence their delivery

of oral self-care recommendations, irrespective of the patients' interests or desires. This action disrupts patient's autonomy and decision-making and may decrease the level of compliance with recommendations. Contradictory statements were made about achieving behavior change. Participants indicated they believed discussions about OHB with patients will lead to behavior change yet have low expectations with regard to patient compliance. Despite their expectation for low compliance, there is not the desire to improve their communication by additional training. These findings do not bode well for improving communication practices and lowering the prevalence of oral diseases. This study has the potential to lay groundwork for future research studies in provider/patient communication. More knowledge is needed with regard to patient non-compliance and behavioral-based models and theories need to be tested. Finally, since, definitions vary in dentistry regarding patient/provider relationships within the patient centered care model, further research here may help narrow the definition and close the gap between patient expectations and provider attitudes towards performance.

There were several limitations to this study. First of all, a sample of selected counties in CA yielded a low response rate, and therefore results cannot be generalized to all CA dental providers. Since data was collected by self-reporting versus observation, response bias is a limitation. Social desirability bias was also a limitation, as participants may have chosen responses they believed were more socially desirable or acceptable rather than choosing responses that are reflective of their true thoughts or feelings.

Conclusion

CA dentists are using a variety of communication techniques, methods and strategies when discussing oral health behaviors with patients. In the context of the TPB,

participants' attitudes suggest a favorable view of engaging in discussions about oral health behaviors with their patients. Both patients' and the dental community's expectations strongly influence dentists' communication practices. Over half of participants have low expectations with regard to their patients' compliance with oral self-care recommendations.

SECTION 4

TABLES

Table 1: Demographics

Gender	
Female	60 (58%)
Male	42 (41%)
Other	1 (1.0%)
Race²	
White	46 (45%)
Black	1 (1.0%)
Hispanic	6 (5.8%)
Asian/Pacific Islander	38 (37%)
American Indian/Native Alaskan	3 (2.9%)
Other	11 (11%)
Age	
21-30 years old	4 (3.8%)
31-41 years old	21 (20%)
41-50 years old	31 (30%)
51-59 years old	26 (25%)
60 years or older	22 (21%)
Length of dentistry practice	
Less than 5 years	7 (6.7%)
5-10 years	19 (18%)
11-15 years	9 (8.6%)
Greater than 15 years	70 (67%)
Dental practice area	
General dentistry	84 (80%)
Oral and maxillofacial surgery	3 (2.9%)
Endodontics	1 (1.0%)
Orthodontics and/or dentofacial orthopedics	4 (3.8%)
Pediatric dentistry	9 (8.6%)
Periodontics	1 (1.0%)
Prosthodontics	2 (1.9%)
Dental public health ³	1 (1.0%)
Employment status	
Part-time (30 hours or less)	20 (19%)
Part-time (31-39 hours)	5 (4.8%)
Full-time (40 hours or more)	78 (75%)
Retired	1 (1.0%)
County of practice	
Los Angeles	5 (4.9%)
Orange	47 (46%)
Riverside	2 (2.0%)
San Bernardino	4 (3.9%)
San Diego	44 (43%)

1. Summaries are n (%) where percent is of non-missing data. All variables were missing for <6% of respondents.
2. Respondents were able to select more than one category.
3. This respondent also indicated practicing in general dentist

Table 2 : Communicating domains regarding communication methods and techniques

Techniques when communicating	Never	Rarely	Very Often	Always	Mean (SD)
Listen to my patient's needs.	0 (0%)	1 (1.0%)	38 (35%)	69 (64%)	3.6 (0.50)
Encourage the patient to ask questions.	0 (0%)	3 (2.8%)	36 (34%)	68 (64%)	3.6 (0.55)
Encourage the patient to make their own decisions/choices about oral hygiene behaviors.	8 (7.5%)	28 (26%)	43 (41%)	27 (25%)	2.8 (0.90)
Consistently make eye contact with the patient.	1 (1.0%)	2 (1.9%)	23 (21%)	81 (76%)	3.7 (0.55)
Strategies to enhance communication	Never	Rarely	Very Often	Always	Mean (SD)
Draw pictures or use printed material.	9 (8.3%)	30 (28%)	51 (47%)	18 (17%)	2.7 (0.84)
Use videos, DVDs, or internet resources.	29 (27%)	53 (50%)	23 (21%)	2 (1.9%)	2.0 (0.75)
Use models, radiographs or intraoral camera to explain oral hygiene behaviors.	3 (2.8%)	15 (14%)	54 (50%)	36 (33%)	3.1 (0.75)
Ask patients whether they would like a family member or friend in the discussion about oral hygiene behaviors.	24 (22%)	52 (48%)	30 (28%)	2 (1.9%)	2.1 (0.76)
Communication methods	Never	Rarely	Very Often	Always	Mean (SD)
I ask patients to repeat back information or instructions.	24 (22%)	57 (53%)	20 (19%)	6 (5.6%)	2.1 (0.80)
I will provide instructions on how to perform an oral hygiene technique, show a patient how to do it, and have the patient demonstrate the technique.	6 (5.6%)	29 (27%)	51 (48%)	21 (20%)	2.8 (0.81)
I collaborate with my patient to support positive oral hygiene behaviors.	0 (0%)	11 (10%)	59 (56%)	35 (33%)	3.2 (0.62)
I support my patient's autonomy for their oral hygiene behavior choices.	0 (0%)	17 (17%)	60 (58%)	26 (25%)	3.1 (0.64)
I evoke my patient's motivation for positive oral hygiene behaviors.	0 (0%)	6 (5.7%)	70 (67%)	29 (28%)	3.2 (0.54)
I show compassion of my patient's challenges about behavioral change.	0 (0%)	5 (4.8%)	47 (45%)	53 (50%)	3.5 (0.59)

Communication methods learned in Dental School.	Dental School	Continuing Education Course	Dental School and/or Continuing Education Course
Teach-Back method	46 (43%)	17 (16%)	58 (54%)
Tell-Show-Do	84 (78%)	20 (19%)	93 (86%)
Motivational Interviewing	38 (35%)	27 (25%)	59 (55%)

Summaries are mean (standard deviation [SD]) or n (%) where percent is of non-missing data. All variables were missing for <6% of respondents. Means were calculated using 1=Never, 2=Rarely, 3=Very often, 4=Always

Table 3: Association between demographics and communication techniques/methods

Domain: Patient/Provider Communication Attitudes	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean (SD)
I feel a sense of ethical fulfillment when I communicate oral hygiene behaviors with patients.	0 (0%)	4 (3.7%)	59 (55%)	44 (41%)	3.4 (0.56)
I dislike communicating about oral hygiene behaviors with patients.	62 (58%)	40 (37%)	4 (3.7%)	1 (1.0%)	1.5 (0.62)
I feel communicating with my patient about oral hygiene behaviors will not lead to behavioral change.	33 (31%)	60 (56%)	11 (10%)	4 (3.7%)	1.9 (0.74)
I respect my patients' oral hygiene behavior choices.	3 (2.9%)	16 (16%)	68 (66%)	16 (16%)	2.9 (0.65)
Patient's opinions about my communication technique is not important to me.	53 (49%)	47 (44%)	8 (7.4%)	0 (0%)	1.6 (0.63)
Domain: Social Norms	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean (SD)
I communicate with my patients about oral hygiene behaviors because it's my patients' expectation.	4 (3.7%)	31 (29%)	58 (54%)	15 (14%)	2.8 (0.73)
How the dental community perceives my communication technique with patients about oral hygiene behaviors is important to me.	6 (5.6%)	23 (21%)	63 (59%)	15 (14%)	2.8 (0.74)
I give recommendations to patients about their oral hygiene behaviors even if they don't ask.	3 (2.8%)	9 (8.3%)	61 (56%)	35 (32%)	3.2 (0.70)

Domain: Perceived Behavioral Control	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean (SD)
There is too little time.	20 (19%)	49 (45%)	32 (30%)	7 (6.5%)	2.2 (0.83)
I don't have an interpreter.	35 (34%)	42 (40%)	23 (22%)	4 (3.8%)	2.0 (0.85)
The patient does not follow my instructions, regardless of how well I explain.	16 (16%)	32 (31%)	44 (43%)	10 (9.8%)	2.5 (0.88)
I prefer a dental hygienist, assistant, or other office staff to follow up with patients for oral hygiene behaviors.	13 (12%)	24 (23%)	50 (47%)	19 (18%)	2.7 (0.90)
I feel I need training in communication to be effective in discussing oral hygiene behaviors with patients.	23 (21%)	57 (53%)	24 (22%)	3 (2.8%)	2.1 (0.74)

Summaries are mean (standard deviation [SD]) or n (%) where percent is of non-missing data. All variables were missing for <6% of respondents. Means were calculated using 1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree.

Table 4: Associations between demographics and dental provider attitudes, values and beliefs

	N	Too little time ²	Patient autonomy ³	Ethical fulfillment ⁴	Prefer office staff follow up ⁵	Patients' opinions unimportant ⁶	Patients' expectations important ⁷	Dental community's perception important ⁸
Gender		p=0.99	p=0.94	p=0.02	p=0.44	p=0.18	p=0.64	p=0.02
Female	60	2.2 (0.78)	2.9 (0.68)	3.5 (0.57)	2.7 (0.98)	1.5 (0.60)	2.7 (0.78)	3.0 (0.77)
Male	42	2.2 (0.84)	2.9 (0.64)	3.2 (0.52)	2.8 (0.81)	1.7 (0.65)	2.8 (0.65)	2.6 (0.71)
Age		p=0.47	p=0.28	p=0.01	p=0.33	p=0.18	p=0.43	p=0.42
21-41 years old	25	2.5 (0.77)	3.1 (0.53)	3.3 (0.54)	2.8 (0.80)	1.6 (0.58)	2.7 (0.68)	2.8 (0.69)
41-50 years old	31	2.2 (0.75)	2.9 (0.67)	3.4 (0.56)	2.9 (0.87)	1.4 (0.56)	2.9 (0.75)	3.0 (0.84)
51-59 years old	26	2.2 (0.98)	2.8 (0.71)	3.6 (0.49)	2.6 (0.87)	1.7 (0.74)	2.6 (0.70)	2.8 (0.71)
60 years or older	22	2.1 (0.83)	2.7 (0.68)	3.1 (0.56)	2.5 (1.1)	1.7 (0.63)	2.9 (0.71)	2.6 (0.74)
Length of dentistry practice		p=0.10	p=0.30	p=0.37	p=0.33	p=0.94	p=0.85	p=0.64
Less than 5 years	7	2.9 (0.90)	2.7 (0.81)	3.4 (0.53)	3.1 (0.69)	1.7 (0.76)	2.9 (0.90)	2.9 (0.69)
5-10 years	19	2.5 (0.70)	3.1 (0.52)	3.2 (0.54)	2.9 (0.81)	1.6 (0.61)	2.6 (0.68)	2.9 (0.52)
11-15 years	9	2.2 (0.67)	2.7 (0.43)	3.2 (0.67)	2.4 (1.0)	1.6 (0.73)	2.8 (0.67)	2.6 (0.88)
Greater than 15 years	70	2.1 (0.86)	2.8 (0.70)	3.4 (0.56)	2.6 (0.94)	1.6 (0.63)	2.8 (0.74)	2.8 (0.80)

	N	Too little time ²	Patient autonomy ³	Ethical fulfillment ⁴	Prefer office staff follow up ⁵	Patients' opinions unimportant ⁶	Patients' expectations important ⁷	Dental community's perception important ⁸
Dental practice area		p=0.96	p=0.91	p=0.94	p=0.09	p=0.89	p=0.47	p=0.21
General dentistry	84	2.2 (0.77)	2.9 (0.65)	3.4 (0.53)	2.6 (0.91)	1.6 (0.61)	2.7 (0.70)	2.8 (0.71)
Pediatric dentistry	9	2.3 (1.0)	2.9 (0.49)	3.3 (0.71)	3.1 (0.78)	1.7 (0.71)	2.7 (0.71)	3.2 (0.67)
Other	12	2.2 (1.1)	2.8 (0.86)	3.4 (0.67)	3.1 (0.90)	1.6 (0.79)	3.0 (0.95)	2.8 (1.0)
Employment status		p=0.93	p=0.55	p=0.59	p=0.98	p=0.48	p=0.55	p=0.57
Part-time	25	2.2 (0.72)	2.8 (0.63)	3.3 (0.63)	2.7 (1.0)	1.6 (0.70)	2.7 (0.63)	2.9 (0.6)
Full-time	78	2.3 (0.84)	2.9 (0.66)	3.4 (0.54)	2.7 (0.89)	1.5 (0.60)	2.8 (0.77)	2.8 (0.8)

1. Summaries are mean (standard deviation) with p-values calculated from a one-way ANOVA or two-sample t-test, as appropriate.
2. Response to "There is too little time" (1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree).
3. Average of responses to "Encourage the patient to make their own decisions/choices about oral hygiene behaviors" (1=Never, 2=Rarely, 3=Very often, 4=Always) and "I respect my patients' oral hygiene behavior choices" (1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree).
4. Response to "I feel a sense of ethical fulfillment when I communicate oral hygiene behaviors with patients" (1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree).
5. Response to "I prefer a dental hygienist, assistant, or other office staff to follow up with patients for oral hygiene behaviors" (1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree).
6. Response to "Patient's opinions about my communication technique is not important to me" (1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree).
7. Response to "I communicate with my patients about oral hygiene behaviors because it's my patients' expectation" (1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree).
8. Response to "How the dental community perceives my communication technique with patients about oral hygiene behaviors is important to me" (1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree)

Table 5: Associations between demographics and dental provider attitudes, social norms, and perceived behavioral control

	N	Dental provider attitudes ²	Social norms ³	Perceived behavioral control ⁴
Gender		p=0.03	p=0.11	p=0.96
Female	60	3.4 (0.38)	3.0 (0.51)	2.3 (0.50)
Male	42	3.2 (0.37)	2.8 (0.46)	2.3 (0.52)
Age		p=0.31	p=0.32	p=0.16
21-41 years old	25	3.2 (0.39)	2.9 (0.41)	2.4 (0.50)
41-50 years old	31	3.3 (0.43)	3.1 (0.50)	2.4 (0.44)
51-59 years old	26	3.4 (0.33)	2.9 (0.53)	2.2 (0.54)
60 years or older	22	3.2 (0.38)	2.8 (0.48)	2.2 (0.55)
Length of dentistry practice		p=0.17	p=0.88	p=0.03
Less than 5 years	7	3.0 (0.48)	2.8 (0.54)	2.7 (0.36)
5-10 years	19	3.2 (0.35)	2.9 (0.36)	2.5 (0.51)
11-15 years	9	3.2 (0.52)	2.9 (0.56)	2.3 (0.28)
Greater than 15 years	70	3.3 (0.36)	2.9 (0.51)	2.2 (0.52)

	N	Dental provider attitudes ²	Social norms ³	Perceived behavioral control ⁴
Dental practice area		p=0.80	p=0.35	p=0.28
General dentistry	84	3.3 (0.38)	2.9 (0.45)	2.3 (0.47)
Pediatric dentistry	9	3.2 (0.35)	3.1 (0.43)	2.5 (0.66)
Other	12	3.3 (0.48)	3.1 (0.72)	2.2 (0.63)
Employment status		p=0.25	p=0.58	p=0.71
Part-time	25	3.2 (0.34)	2.9 (0.35)	2.3 (0.46)
Full-time	78	3.3 (0.39)	2.9 (0.53)	2.3 (0.52)

1. Summaries are mean (standard deviation) with p-values calculated from a one-way ANOVA or two-sample t-test, as appropriate.
2. Average of responses to “I feel a sense of ethical fulfillment when I communicate oral hygiene behaviors with patients” (1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree), “I dislike communicating about oral hygiene behaviors with patients” (1=Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree), “I feel communicating with my patient about oral hygiene behaviors will not lead to behavioral change” (1=Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree), “I respect my patients’ oral hygiene behavior choices” (1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree), and “Patient’s opinions about my communication technique is not important to me” (1=Strongly agree, 2=Agree, 3=Disagree, 4=Strongly disagree).
3. Average of responses to “I communicate with my patients about oral hygiene behaviors because it’s my patients’ expectation”, “How the dental community perceives my communication technique with patients about oral hygiene behaviors is important to me”, and “I give recommendations to patients about their oral hygiene behaviors even if they don’t ask” (1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree for all items).
4. Average of responses to “There is too little time”, “I don’t have an interpreter”, “The patient does not follow my instructions, regardless of how well I explain”, “I prefer a dental hygienist, assistant, or other office staff to follow up with patients for oral hygiene behaviors”, and “I feel I need training in communication to be effective in discussing oral hygiene behaviors with patients” (1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree for all items).

SECTION 5

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SECTION 6

APPENDICES

Appendix A: Practical Applications

A strong patient provider relationship begins with comprehensive communication skills. Understanding the needs of the patient always creates the best measure for personalized treatment options, and reciprocal trust. Dental diseases may not be as prevalent today as they were before preventative measures have been implemented, but they are still prevalent and need to be dealt with. Studies show that patients are satisfied when they are given preventative methods, which also increases optimal dental health. Numerous studies show that patients prefer shared decision making and choices, which evokes internal motivation to perform as well as adherence to recommendations. The dental providers in our studies see the benefits to patient communication practices, however; we found a gap between perception and implementation in some of the concepts. These were patient autonomy, respect for their choices, and choosing to communicate self-care behavior recommendations.

Our study used constructs from traditional and current methods of communication found in research studies that aligned with the perspective of a patient centered care model. We also included characteristics of behaviors that parallel with attitudes, values and beliefs about communication practices found in the theory of planned behavior. Moving forward, training in practices that are geared towards incorporating psychosocial behaviors that teach dental providers how to incorporate shared decision making, respect patient's choices, and learn how to investigate patient's perspectives may help increase optimal oral health in patients. Lastly, aligning and calibrating the definitions of the

patient centered care model with the dental community may bring sentience to communication practices and increase patient/provider relationships.

This study offers practical applications in determining the use of traditional and current communication practices which include psychological behavioral methods such as motivational interviewing. We know that communication methods are being taught in dental and dental hygiene schools. This study can serve as a mirror as to what is being done in 108 private clinical practices in CA and is perceived to be important. The information obtained in this study can be used to further develop dental and dental hygiene curriculum and perhaps standardize these methods.

Appendix B: IRB Determination Letter

Approved

STUDY00006467: ECPDC

Entered IRB: 4/27/2019 12:59 PM
Initial approval: 5/16/2019
Initial effective: 5/16/2019
Effective: 7/5/2019
Approval end:
Last updated: 7/5/2019 12:20 PM

Principal Investigator / Advisor: Michelle Arnett
Submission Type: Initial Study
Primary Contact: Josephine Franc
IRB Analyst: Cynthia McGill
Regulatory Authority: 2018 Requirements
Social / Medical: Social / behavioral / educational
Meeting Date/Time (if applicable):
Review Level: Exempt

Letter: [Correspondence_for_STUDY00006467.pdf](#)

My Current Actions

Appendix C: Initial Invitation and Second Letter for Paper Surveys



Dear California Dentist

My name is Josephine Franc and I am currently completing my Master of Science in Dental Hygiene at the University of Minnesota School of Dentistry. I am asking for your participation in a survey that is part of my thesis research.

The purpose of the survey is to identify current communication methods used by California dentists and their knowledge and attitudes about patient oral health behavioral change. Results will be used to enhance communication techniques that are taught in dental schools.

Participation in this survey is voluntary and all responses will be confidential. This survey consists of 37 questions and will take approximately 5-10 minutes of your time. The University of Minnesota Institutional Review Board determined this study is exempt from oversight STUDY0006467. If you have any questions, please contact Josephine Franc (franc706@umn.edu).

Thank you for your participation.

Josephine Franc
Assistant Professor, Western University of Health Sciences, College of Dental Medicine
2020 Master of Science in Dental Hygiene Candidate
franc706@umn.edu

Michelle Arnett, RDH, BS, MS
Assistant Professor, University of Minnesota School of Dentistry
marnett@umn.edu

Appendix D: Initial Invitation and Second Letter for Electronic Survey



Dear California Dentist,

My name is Josephine Franc and I am currently completing my Master of Science in Dental Hygiene at the University of Minnesota School of Dentistry. I am asking for your participation in a survey that is part of my thesis research.

The purpose of the survey is to identify current communication methods used by California dentists and their knowledge and attitudes about patient oral health behavioral change. Results will be used to enhance communication techniques that are taught in dental schools. Please use the link (https://umn.qualtrics.com/jfe/form/SV_3UlkauRzcg3eiWJ) to access the full informed consent.

Participation in this survey is voluntary and all responses will be confidential. This survey consists of 37 questions and will take approximately 5-7 minutes of your time. The University of Minnesota Institutional Review Board determined this study is exempt from oversight (STUDY00006467). If you have any questions, please contact Josephine Franc (franc706@umn.edu).

Thank you for your participation.

Josephine Franc
Assistant Professor, Western University of Health Sciences, College of Dental Medicine
2020 Master of Science in Dental Hygiene Candidate
franc706@umn.edu

Michelle Arnett, RDH, BS, MS
Assistant Professor, University of Minnesota School of Dentistry
marnett@umn.edu

Appendix E: Paper and Electronic Survey & Electronic Raffle Tickets

For questions 1-7, please provide information about yourself.

1. What gender do you identify with?
 - Female
 - Male
 - Other
 - Prefer not to disclose

2. How do you describe your race or ethnicity?
 - White
 - Black
 - Hispanic
 - Asian/Pacific Islander
 - American Indian/Native Alaskan
 - Other

3. Please indicate your age group.
 - 21-30 years old
 - 31-41 years old
 - 41-50 years old
 - 51-59 years old
 - 60 years or older

4. How long have you been practicing dentistry?
 - Less than 5 years
 - 5-10 years
 - 11-15 years
 - Greater than 15 years

5. Please indicate your area of dental practice.
(Select all that apply)
 - General dentistry
 - Oral and maxillofacial surgery
 - Endodontics
 - Orthodontics and/or dentofacial orthopedics
 - Pediatric dentistry
 - Periodontics
 - Prosthodontics
 - Oral and maxillofacial pathology
 - Dental public health
 - Oral and maxillofacial radiology

6. Please indicate your employment status.
 - Part-time (30 hours or less)
 - Full-time (40 hours or more)
 - Other _____

7. Please indicate your practice zip-code: _____

Please place an "X" in the box that best aligns with your answer.

The following are <i>challenges</i> for me when communicating with a patient about his/her <i>oral hygiene behaviors</i> .	Strongly Disagree	Disagree	Agree	Strongly Agree
8. There is too little time.				
9. I don't have an interpreter for a non-English speaking patient.				
10. The patient does not follow my instructions, regardless of how well I explain.				

I use the following <i>techniques when communicating</i> with a patient about his/her <i>oral hygiene behaviors</i> .	Never	Rarely	Very Often	Always
11. Listen to my patient's needs.				
12. Encourage the patient to ask questions.				
13. Encourage the patient to make their own decisions/choices about oral hygiene behaviors.				
14. Consistently make eye contact with the patient.				

I use the following to <i>enhance communication</i> with a patient about his/her <i>oral hygiene behaviors</i> .	Never	Rarely	Very Often	Always
15. Draw pictures or use printed material.				
16. Use videos, DVDs, or internet resources.				
17. Use models, radiographs or intraoral camera to explain oral hygiene behaviors.				
18. Ask patients whether they would like a family member or friend in the discussion about oral hygiene behaviors.				

I utilize the following <i>communication methods</i> with patients about his/her <i>oral hygiene behaviors</i> .	Never	Rarely	Very Often	Always
Teach-Back is a form of communication of asking the patient to repeat back information or instructions.				
19. I ask patients to repeat back information or instructions.				
Tell-Show-Do is a communication technique for clinicians to provide instructions, demonstrate techniques to the patient and asks the patient to demonstrate what they learned.				
20. I will provide instructions on how to perform an oral hygiene technique, show a patient how to do it, and have the patient demonstrate the technique.				
Motivational Interviewing is a patient-centered counseling approach to support positive health behavior change.				
21. I collaborate with my patient to support positive oral hygiene behaviors.				
22. I support my patient's autonomy for their oral hygiene behavior choices.				
23. I evoke my patient's motivation for positive oral hygiene behaviors.				
24. I show compassion of my patient's challenges about behavioral change.				


During dental school or a continuing education course (CE), I was taught the following method/s: (Check all that apply)	Dental School	CE Course	Unsure
25. Teach-back method			
26. Tell-Show-Do			
27. Motivational Interviewing			
Other:			

<i>Attitudes when communicating with a patient about his/her oral hygiene behaviors</i>	Strongly Disagree	Disagree	Agree	Strongly Agree
28. I feel a sense of ethical fulfillment when I communicate oral hygiene behaviors with patients.				
29. I dislike communicating about oral hygiene behaviors with patients.				
30. I feel communicating with my patient about oral hygiene behaviors will not lead to behavioral change.				
31. I prefer a dental hygienist, assistant, or other office staff to follow-up with patients for oral hygiene behaviors.				

<i>Attitudes as they relate to your values or beliefs when communicating with patients about his/her oral hygiene behaviors.</i>	Strongly Disagree	Disagree	Agree	Strongly Agree
32. Patient's opinions about my communication technique is not important to me.				
33. I communicate with my patients about oral hygiene behaviors because it's my patients' expectation.				
34. How the dental community perceives my communication technique with patients about oral hygiene behaviors is important to me.				
35. I respect my patients' oral hygiene behavior choices.				
36. I give recommendations to patients about their oral hygiene behaviors even if they don't ask.				
37. I feel I need training in communication to be effective in discussing oral hygiene behaviors with patients.				

If you would like to be entered in a raffle to win a \$50.00 gift card to Starbucks Coffee, please provide your name and email address.

Appendix F: Raffle Ticket for Paper Survey



STUDY00006467: Evaluating Communication Practices of Dentists in California (ECPDC)

If you would like to be entered in a raffle to win a \$50.00 gift card to Starbucks Coffee, please provide your name and mailing address: