

RESEARCH

Assessing Dental Hygienists' Communication Techniques for Use with Low Oral Health Literacy Patients

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Abstract

Purpose: This primary aim of this study was to assess communication techniques used with low oral health literacy patients by dental hygienists in rural Wisconsin dental clinics. A secondary aim was to determine the utility of the survey instrument used in this study.

Methods: A mixed methods study consisting of a cross-sectional survey, immediately followed by focus groups, was conducted among dental hygienists in the Marshfield Clinic (Wisconsin) service area. The survey quantified the routine use of 18 communication techniques previously shown to be effective with low oral health literacy patients. Linear regression was used to analyze the association between routine use of each communication technique and several indicator variables, including geographic practice region, oral health literacy familiarity, communication skills training and demographic indicators. Qualitative analyses included code mapping to the 18 communication techniques identified in the survey, and generating new codes based on discussion content.

Results: On average, the 38 study participants routinely used 6.3 communication techniques. Dental hygienists who used an oral health literacy assessment tool reported using significantly more communication techniques compared to those who did not use an oral health literacy assessment tool. Focus group results differed from survey responses as few dental hygienists stated familiarity with the term "oral health literacy." Motivational interviewing techniques and using an integrated electronic medical-dental record were additional communication techniques identified as useful with low oral health literacy patients.

Conclusion: Dental hygienists in this study routinely used approximately one-third of the communication techniques recommended for low oral health literacy patients supporting the need for training on this topic. Based on focus group results, the survey used in this study warrants modification and psychometric testing prior to further use.

Keywords: oral health literacy, communication techniques, dental hygienists

This study supports the NDHRA priority area, **Health Promotion / Disease Prevention:** Assess strategies for effective communication between the dental hygienist and client.

INTRODUCTION

Oral diseases remain widespread despite improvements in preventive strategies, and are particularly common among individuals with low socioeconomic status.¹ While multiple factors contribute to oral disease, oral health literacy has gained increased recognition as a strong social determinant of health, reflecting multiple constructs inherent in culture/society, education, and health systems.² Oral health literacy is defined as "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate oral health decisions."³ Because health literacy has been identified as a more robust predictor of an individual's health status than demographic factors (e.g., age, income, employment, education, and race/ethnicity),² the American Dental Hygienists Association and other national organizations have identified improving patient oral health literacy as a top priority.¹⁻⁶

Noting that oral health literacy is a multifactorial construct, the American Dental Association supports the use of a theoretical framework designed to improve oral health literacy at 3 points of intervention: culture and society, the educational system, and the health system.⁴ The health system holds promise as an intervention point for dental providers as there is strong evidence that patients usually identify their dental team as their most trusted source of oral health information.^{2,7} Further, recent reports purport that the oral health team bears a significant responsibility to improve oral health literacy in their patients.⁸⁻¹⁰ This is noteworthy because effective communication skills of clinical care providers are critical to improving patient health outcomes.^{1,7-16} Three recent studies, conducted at the national and state levels, measured dental teams' use of 18 communication techniques shown to be effective with low literacy patients. All 3 studies used a variation of the same survey and reported

limited use of these recommended communication techniques.⁸⁻¹⁰

State and national studies of dental clinicians' communication techniques are helpful in detecting broader trends, but are less relevant at regional or systems levels where, due to organizational differences that affect provider-patient interactions during clinical encounters, oral health improvement interventions are most likely to occur.¹⁵ No published studies to date have examined dental hygienists' communication techniques within an integrated health care system. This is an important research gap to address in order to guide subsequent interventions designed to increase dental hygienists' use of effective communication techniques, particularly for low literacy patients. The primary aim of this study was to assess the routine use of communication techniques recommended for use with low oral health literacy patients by dental hygienists in the Marshfield Clinic Health System and general Marshfield area, as well as to identify indicators of routine use of these communication techniques. The results will determine the need for an intervention for dental hygienists regarding communication techniques used with low literacy patients.

The survey instrument used in this study was adapted from an instrument used in 3 previous studies measuring provider communication techniques with low oral health literacy patients.¹⁰ Although the survey instrument was pilot tested on a large number of individuals, no psychometric test results have been reported on the survey instrument. One method of assessing the validity of a survey (i.e., to assure that the instrument measures what is intended) is to ask participants their thought processes as they answered items immediately after survey completion.^{17,18} While a comprehensive psychometric analysis was beyond the scope of this research project, the face validity of questions specific to oral health literacy were of interest. A secondary aim of this study, therefore, was to determine the utility of the survey instrument. To accomplish this aim, focus groups were conducted immediately after administration of the survey.

METHODS AND MATERIALS

Design and Sample

This study used a mixed methods approach that consisted of a cross-sectional survey followed by focus groups with dental hygienists. Participants were recruited from 8 of 9 dental centers within the Marshfield Clinic Health System and operated by the Family Health Center of Marshfield, Inc., as well as one independent dental center in the city of Marshfield, Wisconsin (not affiliated with Marshfield Clinic). All Marshfield Clinic Health System dental centers are Federally Qualified Health Center (FQHC) clinics that provide subsidized care based on financial need. Eligible individuals for this study were dental

hygienists, part-time or full-time, from the total of 9 centers. Study procedures were reviewed and approved by the Marshfield Clinic Institutional Review Board (IRB) and deemed exempt by the University of Minnesota Institutional Review Board.

Recruitment and Procedures

An email invitation was initially sent from the study coordinator to eligible individuals that described study procedures, including the location of the focus group scheduled at each clinic. One day prior to the scheduled focus group, a reminder email invitation was sent to eligible individuals that included an electronic link to the study survey. Where reliable internet connections were unavailable, participants had the option of completing the study survey on paper prior to participating in the focus group. All study data were collected during the first quarter of 2014.

Quantitative Measures

The survey used in this study was adapted from an instrument drafted by the National Advisory Committee on Health Literacy in Dentistry and used in one national¹⁰ and 2 state studies.^{8,9} The survey included 18 communication techniques recommended by the American Medical Association as effective for communicating with low literacy patients.¹⁹ Questions were grouped into 2 domains: interpersonal communication (5 techniques) and teach-back (2 techniques). The additional 11 items are techniques shown to be useful to enhance patient communication and were grouped into 3 additional domains: patient-friendly materials and aids (3 techniques), assistance (5 techniques), and patient-friendly practice (3 techniques).¹⁰

A small representative group of Minnesota and Wisconsin dental hygienists reviewed the survey instrument for face validity. When face validity of survey questions has not been evaluated, researchers cannot be certain that participants understand each item. Concern was expressed that dental hygienists in the study's geographic area may not be familiar with the term "oral health literacy" or with the assessment methods to measure patient oral health literacy referred to in the survey. A pilot survey among a convenience group of practicing dental hygienists in Minnesota and Wisconsin (n=6) confirmed that most were not familiar with these terms. As a result, one question was added that used the term "communication techniques" in place of the term "oral health literacy." In addition, the study added focus groups following survey administration to evaluate the utility of the survey. Specifically, a discussion of several survey questions was used to explore comprehension and trace the social processes that influenced participants' responses.¹⁸ The intent was to determine if additional terms used in the survey needed further

clarification or definition, and if other communication techniques used by dental hygienists were missing from the instrument.

In addition to the communication technique questions, demographic information, questions about oral health literacy familiarity, past communication skills course participation and ascertaining interest in future intervention participation were included.¹⁰ Response options were on a 5-point Likert scale, and each item contained a sub-question on perceived effectiveness of the technique. Based on the scoring methodology designed for the survey, the dependent variable in this study was the average number of routinely used communication techniques.¹⁰ For a given communication technique, "routine use" was operationalized as a response of "most of the time" or "always." The number of routinely used techniques was then summed to create an index score of 0 to 18. Indicator variables included region of practice within the Marshfield Clinic service area (i.e., North, Central or South), age, number of years as a dental hygienist, familiarity with, use of oral health literacy assessment and previous participation in a communication skills course.

Qualitative Measures

The purpose of the focus groups was to determine utility of the current survey. Eight separate focus groups were held at all but one dental clinic (participants at this clinic completed the survey but declined focus group participation). The focus group discussion guide was designed by the principal investigator. Focus groups were conducted by either the principal investigator or the study coordinator, both of whom had prior focus group facilitation experience. An initial training session was held to calibrate adherence to the discussion guide, and both researchers were present at the first focus group to improve subsequent fidelity. Focus groups were 30 to 45 minutes in length and typically included 2 to 8 participating dental hygienists at each clinic. Each session included a brief introduction of procedures and participation guidelines, followed by a series of qualitative, semi-structured questions from the facilitator to guide the discussion. Participants answered freely and responses were audio-video recorded. Focus groups included discussions of the following general topics:

- Dental hygienists' understanding of the terms "oral health literacy" and "motivational interviewing"
- Methods of assessing patient oral health literacy
- Impact of oral health literacy assessment on hygienist's communication techniques
- Other recommended oral health literacy resources that might be helpful, if available

Analyses

All quantitative analytical procedures were conducted with SAS Version 9.3 (Cary, NC). Participant characteristics were reported descriptively. Given the small sample size and exploratory nature of this study, no attempts were made to impute missing variables or conduct multivariable modeling. Univariate linear regression models were created to examine the association between each indicator variable separately and the number of communication techniques used routinely. The number of communication techniques used routinely was modeled as a continuous outcome variable.

Qualitative analyses were conducted with NVivo qualitative data analysis software (QSR International Pty Ltd. Version 10, 2014). Digital audio files were transcribed by an independent firm. The content was mapped to an initial set of codes corresponding to the communication domains represented in the survey (i.e., assistance, interpersonal communication, teach-back, patient-friendly materials and patient-friendly practice).²⁰ Content emerging from the discussion that could not be mapped to the initial set of codes was assigned new codes with standard definitions created to assure consistency by the researchers. The study team (principal investigator and study coordinator) individually coded each of the 8 transcripts. Each coded transcript was subsequently reviewed by the study team, discrepancies were discussed, and final codes were assigned by consensus.

RESULTS

Survey Findings

Invitations were sent to 40 eligible dental hygienists with 38 (95%) agreeing to participate in the survey and 35 (92%) attending a focus group. Sample characteristics are reported in Table I. All participants were female and the majority were non-Hispanic White with 1 American Indian/Alaskan Native and 2 Asian participants. The mean (\pm SD) number of communication techniques used routinely was 6.3 ± 2.1 (range 3 to 11). The detail of responses to each item on communication techniques is reported in Table II. Limiting the number of concepts, using simple language, and speaking slowly were techniques used routinely by the majority of respondents. Communication techniques least used were asking patients if they would like a family member or friend involved in the discussion, drawing pictures or using printed illustrations including underlining key points on printed materials, and following-up with patients by telephone or asking office staff to call. The technique that was used least was asking patients how they learn best. Communication techniques that were used more routinely were also generally perceived to be more effective.

As reported in Table III, findings from the regression analyses indicated that geographic practice region and the use of oral health literacy assessments were the only significant indicators of the number of communication techniques used routinely. Specifically, dental hygienists from the Southern region of the Marshfield Clinic service area had the greatest use of communication techniques, with those in the Central and Northern regions using 1.8 ($p=0.044$) and 1.3 ($p=0.1$), respectively, fewer techniques on average. In addition, dental hygienists who reported using oral health literacy assessments also used an average of 1.6 ($p=0.033$) more communication techniques relative to dental hygienists who did not report using oral health literacy assessments. Other indicators had relatively weak associations with communication techniques.

Focus Group Findings

The most frequently used codes and sub-codes were those emerging from the discussions as compared to the initial set of codes mapped to the survey communication domains. Additional codes that arose from the focus group conversations were "motivational interviewing strategies" and "oral health literacy" with associated sub-codes. Motivational interviewing is defined as a "form of collaborative conversation for strengthening a person's own motivation and commitment to change."²¹ Dental hygienists in all focus groups indicated routinely assessing patient receptiveness to engaging in a collaborative conversation about oral health behavioral change. These results were coded as "motivational interviewing strategies." A representative quote was, "...as you're talking to them you can find out the things that will motivate them." Participants in all focus groups discussed their reasons for providing oral health instruction to patients regardless of the patient's assessed receptiveness to behavior change. These exchanges were coded as "sense of duty" (i.e., dental hygienist delivers a message she feels is expected of her and part of her job) and "mismatched priorities" (i.e., patient and dental hygienist prioritize oral health differently). A participant quote representative of "sense of duty" was, "I've got to tell you (the patient) this. It's my job." Representative quotes of "mismatched priorities" were:

- "You still talk to them and do it over and over again, and they still come back and say 'I don't brush.' And if you ask why, they say, 'I just don't care.'"
- "And that's what a lot of people say, 'I don't want to be lectured. I don't need that lecture.'"
- "It's not a big deal to them but it's a big deal to us."

The oral health literacy code used the standard oral

Table I: Descriptive Characteristics of Study Participants

Characteristics	n=38
Region	
North	14 (37%)
Central	10 (26%)
South	14 (37%)
Age (y)	38.5±8.7
Race	
White	35 (92%)
Non-White	3 (8%)
Hygienist experience (y)	13.6 ±8.0
Familiarity with oral health literacy	
Familiar	18 (47%)
Not familiar	20 (53%)
Use oral health literacy assessment	
Yes	16 (42%)
No	18 (47%)
Unavailable	4 (11%)
Previous communications course	
Yes	8 (21%)
No	29 (76%)
Unavailable	1 (3%)

Values are reported as mean ± standard deviation or frequency count (percent sample).

health literacy definition: "the capacity to obtain, process and understand basic oral health information and services needed to make appropriate health decisions."¹ None of the dental hygienists participating in a focus group expressed familiarity with the term "oral health literacy." A representative answer was, "It just seems self explanatory. I think of it as just making sure that your patients are understanding...but I've never heard...the term 'health literate' or 'oral health literacy.'" Extensive discussions occurred in all focus groups describing the multiple factors affecting patient oral health literacy. These included barriers such as time constraints for either the patient or the dental hygienist, explanations of why patients can't change, or how dental hygienists succeeded at moving patients toward behavioral change.

When asked if the dental hygienists used a health literacy instrument to measure the health literacy of their patients, a representative quote was, "I don't remember what I put (in the survey), but it was like other than questioning them, that's the only thing as far as a tool. It's just using your words."

Of the 5 initial codes representative of the survey communication domains, patient-friendly materials was coded most frequently as dental hygienists stated they routinely used radiographs or other vi-

Table II: Dental Hygienists' Communication Technique Use and Perceived Effectiveness

Domain (Communication technique) n=38	Count (Percentage)					
	Never	Rarely	Occasionally	Most of the Time	Always	Perceived Effectiveness
Interpersonal Communication*						
Present 2 to 3 concepts at a time**	0	1 (3)	2 (5)	26 (68)	8 (21)	20 (54)
Ask patients whether they would like a family member or friend involved in the discussion	5 (13)	13 (34)	17 (45)	3 (8)	0	15 (39)
Draw pictures or use printed illustrations	6 (16)	17 (45)	14 (37)	1 (3)	0	12 (32)
Speak slowly	0	0	7 (18)	26 (68)	5 (13)	26 (68)
Use simple language	0	0	0	15 (39)	23 (61)	32 (84)
Teach-Back Method*						
Ask patients to repeat information or instructions back to you	0	5 (13)	20 (53)	10 (26)	3 (8)	19 (50)
Ask patients to tell you what they will do at home to follow instructions	1 (3)	6 (16)	16 (42)	9 (24)	6 (16)	9 (24)
Patient-Friendly Materials and Aids*						
Use a video or digital video disc	0	27 (71)	4 (11)	5 (13)	2 (5)	5 (13)
Hand out printed materials	0	3 (5)	25 (66)	9 (24)	1 (3)	14 (37)
Use models or radiographs to explain	0	0	9 (24)	23 (61)	6 (16)	34 (90)
Assistance*						
Underline key points on print materials	6 (16)	16 (42)	12 (32)	4 (11)	0	10 (26)
Follow up with patients by telephone to check understanding and adherence	12 (32)	13 (34)	12 (32)	1 (3)	0	11 (26)
Read instructions out loud	1 (3)	13 (34)	6 (16)	13 (34)	5 (13)	16 (42)
Ask office staff to follow up with patients for post care instructions	17 (45)	16 (42)	3 (8)	1 (3)	1 (3)	4 (11)
Write or print out instructions	0	11 (30)	23 (61)	1 (3)	2 (5)	15 (40)
Patient-Friendly Practice*						
Ask patients how they learn best	8 (21)	21 (55)	9 (24)	0	0	10 (26)
Refer patients to the Internet or other sources for information	4 (11)	15 (39)	15 (39)	4 (11)	0	3 (8)
Use a translator or interpreter**	1 (3)	7 (19)	1 (3)	6 (16)	22 (60)	33 (87)

*Basic communication techniques

**n=37

sual materials as a routine communication strategy. The other 4 survey domains including assistance, interpersonal communication, patient-friendly practice and teach back were minimally coded in several, but not in all focus groups.

The last question in the focus group script allowed dental hygienists to comment on additional tools or strategies that they found helpful, as well as those that they would like to implement in their practice. This discussion was robust in all focus groups. One tool mentioned in the majority of focus groups as useful was the integrated electronic medical and dental record (IEMDR). Dental hygienists stated that the IEMDR provided information that supported a holistic approach to oral health education. Patients with chronic disease co-morbidities, such as diabetes and periodontal disease, appeared most receptive to this approach.

DISCUSSION

This study found statistically significant differences in the number of communication strategies used by dental hygienists with low oral health literacy patients in 3 North Central Wisconsin geographic regions. Dental hygienists practicing in the Central region were least likely while those in the South region were most likely to use a variety of communication strategies. No difference was found in dental hygienists reporting familiarity with oral health literacy, but a statistically significant difference in those reporting use of an oral health literacy assessment tool was found. Because focus group results indicated that many dental hygienists did not understand the definitions of either oral health literacy or oral health literacy assessment tools, the researchers are not confident that the survey results accurately measured oral health literacy knowledge.

Compared to other studies using the same survey, dental hygienists in this study used fewer communication strategies compared to Maryland dental hygienists⁸ and dentists across the nation.^{9,10} The average number of strategies utilized in this study was 6.3 compared to 6.95 for Maryland dental hygienists,⁸ 7.9 for Maryland dentists⁹ and 7.1 in a national study of dentists.¹⁰ The most frequently used technique by dentists and dental hygienists in the current study was "simple language," with 91% or more of providers reporting routine use of this technique.^{14,16} Another consistent result was routine use of models or radiographs with 73 to 77% using this technique, and "reading instructions aloud," which ranged from 46 to 49% across all studies. The least used technique was "asking patients how they learned best," with 0% in this study, and 4.9% in the national study of dentists.¹⁰

The lower use of communication strategies in this Wisconsin sample may reflect the fact that dental hy-

Table III: Univariate Linear Regression Models Depicting the Association between Each Indicator Variable and the Number of Communication Techniques Used Among Survey Respondents

Indicator variables	Number of communication techniques used	Model R ²
Region (n=36)		
North	-1.29±0.76, p=0.100	0.13
Central	-1.77±0.85, p=0.044	
South	ref.	
Age (n=34)	-0.06±0.04, p=0.111	0.08
Dental hygienist experience (n=35)	-0.06±0.04, p=0.199	0.05
Familiarity with oral health literacy (n=36)		
Familiar	0.39±0.70, p=0.580	0.01
Not familiar	ref.	
Use oral health literacy assessment (n=32)		
Yes	1.56±0.70, p=0.033	0.14
No	ref.	
Previous communications course (n=35)		
Yes	0.48±0.84, p=0.576	0.01
No	ref.	

Values are reported as point estimate ±standard error, p-value, R². Positive values indicate more communication techniques used relative to the reference category (or a 1-unit increase for continuous indicators) and negative values indicate less communication techniques used relative to the reference category. Bolded values denote point estimate was significant at p<0.05.

gienists in this study were less likely to have taken a communication course after graduation (21%) compared to Maryland dental hygienists (66%) and dentists (60%), as well as dentists nationally (27%).⁸⁻¹⁰

Despite fewer than half of survey respondents indicating that they were familiar with the concept of oral health literacy, more detailed focus group discussions suggested that those unfamiliar with the explicit oral health literacy terminology were at least aware of the underlying challenge of low oral health literacy in their patients. Survey results indicated that the majority of hygienists did not assess the oral health literacy level of their patients. Yet focus group results showed that many dental hygienists used an informal approach of asking open-ended questions, as proposed by Schiavo.¹⁴ This approach reflects familiarity with some elements used in motivational interviewing, a communication and counseling approach shown to be effective in helping patients change various health behaviors including oral health.²²⁻²⁴ Further, the availability and use of an IEMDR that allows hygienists to use this information for targeted education for patients with chronic medical-dental co-morbidities was available to all dental

hygienists in this study. Focus group discussions consistently reflected the value and use of the IEMDR by dental hygienists. As both motivational interviewing and use of electronic medical-dental records in patient education become more widely used in clinical practice, exploring and including these elements for communication in future surveys may provide a more holistic view of contemporary dental and dental hygiene practice. In addition, further coordination and training to record educational and communication strategies used and how they are associated with oral health outcomes is also needed.^{25,26} To address our primary aim, we found a lower number of routinely used communication strategies by dental hygienists by geographic region in the North Central Wisconsin service area. These results support the need to design and implement an intervention on effective communication with low oral health literacy patients. In addition, basic information on oral health literacy and oral health literacy assessment should be incorporated into the intervention.

Based on our qualitative focus group findings, survey questions referring to oral health literacy and whether patient oral health literacy is assessed likely require clarification to assure that respondents fully comprehend these terms. A more comprehensive assessment of construct validity for the survey tool would assure that oral health literacy-specific questions will be worded to improve universal understanding. Adding motivational interviewing to the survey as an additional communication strategy would be useful, as motivational interviewing has been shown to be effective with low oral health literacy patients.²⁷ Goal-setting is an important aspect of motivational interviewing and assessing whether dental hygienists record patient intentions for behavior change and whether stated goals are met would also be helpful in future studies.^{21,22} In addition, a relatively new communication medium is using the IEMDR to educate patients about the link between oral and general health, which may be useful in dental practices where it is available. Addressing our secondary aim, the utility of the survey instrument would be improved by making these modifications followed by psychometric testing of the instrument in a representative sample of dental hygienists before further use.^{25,26}

Limitations

This study was primarily limited by the small sample size and cross-sectional survey design, which limited the sensitivity to statistically detect some associations and precluded cause-and-effect conclusions. The robust survey response rate was representative

of the target population, but cannot be generalized due to the homogeneity of the study setting. Comparative findings from this study suggest there may be substantial regional variation in dental hygienists' use of communication techniques. The self-reported survey tool used in this study has not been validated, thus recall and self-presentation biases are also a threat to validity. Future research should examine more objective markers of the use of oral health literacy communication techniques by dental hygienists (e.g., recording direct interactions with patients) in order to gauge their association with self-reported use of such communication techniques.

CONCLUSION

Dental hygienists in this study routinely used about one-third of the recommended communication techniques for oral health literacy patients. This result was less than the techniques reported in prior studies of Maryland dental hygienists and dentists nationally. Focus group results indicated that not all survey items were clear and the survey could be updated by adding recent communication techniques related to motivational interviewing and use of an integrated electronic medical-dental record. More research is needed to study the psychometric properties of the survey instrument, to assess the effectiveness of dental hygienist communication techniques on a larger scale, and to determine how communication techniques affect patient behavioral change, and in turn, oral health outcomes.

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