Factors Influencing California Dental Hygienists' Involvement in School-Based Oral Health Programs

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Abstract

Purpose: To assess the influence of community oral health experiences during entry-level dental hygiene education on participation in community oral health events after graduation and the facilitators and barriers experienced by dental hygienists in participating in these programs.

Methods: A 27-item survey, consisting of items related to community oral health experiences during and after entry-level education, was distributed by the California Dental Hygienists' Association to all dental hygienists whose email addresses were in their database. Frequencies of participants' responses to each survey item were calculated. Chi-square analysis was performed to identify significant relationships among variables.

Results: Response rate was 8%, with 513 out of the 6,248 contacted having responded. Additionally, 95% of the respondents had participated, as entry-level students, in community oral health experiences such as school-based oral health educational programs. Respondents agreed that participation in these programs was valuable to their professional development and encouraged them to participate after graduation; both these variables were related ($p<0.01$) to their participation in community experiences as a licensed dental hygienist. Most (75%) respondents reported participation in community events after graduation. The most commonly reported facilitators, encouraging participation, were an interest in helping people (89%) and professional development (59%). Barriers included conflict with work (61%), family time commitment (52%), and no knowledge of existing programs (24%).

Conclusion: Dental hygienists' involvement in school-based oral health programs is enhanced by their community experiences as a dental hygiene student. Barriers and facilitators need to be addressed to increase the number of programs and participants so that more children can benefit.

Keywords: access to oral care, community oral health experiences, dental hygiene student experiences, school-based oral health programs, volunteerism

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Introduction

School-based oral health programs address the problem of access to care for children.[1-7] Dental decay is the most common preventable disease seen in children.[1] According to the 2004-2005 California Smiles Survey, 53% of children entering kindergarten had experienced dental decay, and of those, 28% had untreated dental decay.[7] Hispanic children were found to be twice as likely to have untreated dental decay than white children.[1] Dental problems interfere with the academic and social development of children.[1,8-10] In California 874,000 school days were lost due to dental problems, costing schools nearly $30 million annually.[8] Children who suffer from painful dental problems are 12 times more likely to miss school,[1] and 4 times more likely to have a lower-grade-point average than those who do not.[10] One solution to these issues would be oral health programs in schools so that all school children could benefit.

School-based oral health programs have been shown to reduce oral disease.[2-6] In a school-based oral health program, such as described by Niederman et al, oral disease was reduced by 52%.[6] In these programs education and preventive care can be delivered to children in underserved populations, who are otherwise unable to receive care. These programs are closing the gap in ethnic and racial oral health disparities, by eliminating critical barriers to care.[1,2,4]

Dental hygienists' involvement in school-based oral health programs began in 1913 when dental hygienists functioned as community health professionals in schools. They believed that "it was equally important they provide outreach services to those who could not afford private dental care,"[11] and consequently reduced tooth decay by 75%.[12] Greater involvement of dental hygienists would allow further expansion of these programs. Dental hygienists have the skills and knowledge to initiate and participate in school-based oral health educational programs.

Dental hygiene entry-level programs prepare dental hygienists to provide oral health education, usually offering educational opportunities in public health settings.

Currently, there is a low percentage of dental hygienists involved in community oral health programs: 9% of respondents to an ADHA survey reported that they worked in a non-clinical role, such as school-based oral health programs.[13] However, it is unknown why more dental hygienists do not participate in these programs. The purpose of this study was to assess the influence of community oral health experiences during entry-level dental hygiene education on participation in community oral health events after graduation, and to assess the facilitators and barriers that are experienced by dental hygienists in participating in these community programs.

Methods and Materials

The study population consisted of dental hygienists whose email addresses were in the California Dental Hygienists' Association (CDHA) database. The 27-item survey instrument was composed of the following items: 13 items on community experiences as a dental hygiene student; 2 items on community experiences as a licensed dental hygiene; 3 items on facilitators and barriers to participation; 1 item on attitudes toward 6 community oral health statements; and, 8 items on demographic information.

A convenience sample of 7 dental hygiene educators and 11 licensed dental hygienists pilot-tested the survey for feasibility and clarity. The survey was modified based on their feedback. CDHA electronically distributed the information about the survey to those in their database with a link to the informed consent and the survey. The researchers had no access to the personal identifiers of the respondents, as well as the target population. CDHA had no knowledge of who had responded to the survey and their responses. This anonymous process resulted in CDHA needing to re-distribute the survey 3 times to the same population. On the second and third distributions, a disclaimer was added to the message for the recipients to disregard if previously completed.

Qualtrics,[14] a survey research software program, was used to create and host the survey instrument, as well as tabulate the data and calculate frequencies of responses for each survey item. Chi-square analyses were performed on predictive variables to assess relationships with participation in community experiences as a licensed dental hygienist. Relationships were considered statistically significant when p values were <0.05. Comments from open-ended items were grouped into themes.

Table I: Demographic Characteristics of Respondents

	Percent	n
Qualifications in addition to entry-level degree:* (n=256)		
Baccalaureate in Dental Hygiene	40	107
Baccalaureate in another discipline	38	101
Masters in Dental Hygiene	8	23
Masters in Public Health	3	8
Masters in another discipline	11	28
Doctorate	2	5
RDHAP	14	37
Other	8	21
Year of graduation from dental hygiene program:		
1960 to 1979	17	66
1980 to 1999	35	138
2000 to 2010	23	92
2011 to 2014	25	97
Number of children living at home:		
0	62	264
1 to 2	33	140
>3	5	21
Number of days employed as a dental hygienist:		
0 to 1	15	64
2 to 3	31	129
4 to 5	51	214
>6	3	11
Ethnicity		
White, Non-Hispanic	72	304
Hispanic	13	55
Asian	10	41
Other (African-American, Pacific Islander, Bi-Racial)	3	20

*Respondents selected all that applied

Results

Of the 6,248 in the CDHA database, 513 dental hygienists responded to the survey for a response rate of 8%. Respondents were mainly female (97%), graduates from an associate entry-level dental hygiene program (66%), and a member of the American Dental Hygienists' Association (ADHA) (86%). Table I reports that the majority of respondents were white non-Hispanic, had a degree in addition to that of their entry-level program, graduated from an entry-level dental hygiene program between 1980 to 1999, had no children living at home and were employed 4 to 5 days a week. Participation in community oral health events as a licensed dental hygienist

Table II: Respondent's Participation in Community Experiences as a Dental Hygiene Student and the Value of the Experience to Professional Development and the Level of Encouragement to Participate in Such Programs after Graduation (percent, n)

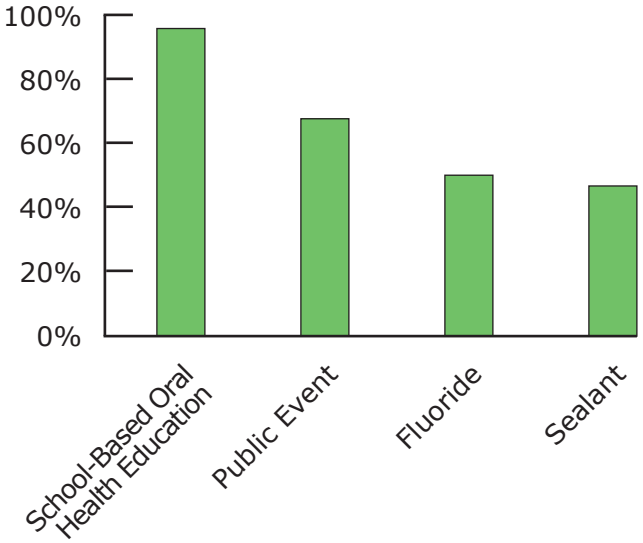
Participation as a Dental Hygiene Student in community programs	Volunteer	Required	Both Volunteer and Required
School-Based (n=447)	8 (37)	44 (196)	48 (214)
Public Health (n=306)	25 (76)	30 (92)	45 (138)
Fluoride (n=232)	8 (19)	46 (107)	46 (106)
Sealant(n=226)	9 (21)	52 (117)	39 (88)

Community Experiences Valuable to Professional Development	Strongly Disagreed	Disagreed	Neutral	Agreed	Strongly Agreed
School-Based (n=440)	6(30)	2 (7)	6 (27)	35(153)	51(223)
Public Health (n=307)	3 (8)	1 (4)	6 (19)	37(113)	53 (163)
Fluoride (n=230)	3 (6)	1 (3)	7 (16)	37(84)	53 (121)
Sealant (n=224)	4 (9)	2 (4)	6 (14)	32(72)	56 (125)
Community experiences encouraged participation after graduation	**Strongly Disagreed**	**Disagreed**	**Neutral**	**Agreed**	**Strongly Agreed**
School-Based (n=439)	7 (31)	8(37)	26 (114)	27(117)	32 (140)
Public Health (n=305)	3 (8)	6(17)	18(54)	33(102)	41 (124)
Fluoride (n=282)	3 (7)	7(15)	21(49)	30(68)	39 (89)
Sealant (n=220)	5 (10)	7(16)	25(54)	25(55)	38 (85)

was not statistically significant to either the number of children living at home (p=0.55) or the number of days employed (p=0.25).

A total of 95% of respondents reported participating in community experiences to promote oral health as an entry-level dental hygiene student. Figure 1 illustrates the percentages of respondents who participated in each of the 4 different community oral health programs: school-based oral health educational program, public health event, sealant program and fluoride program. The number of respondents who had participated in each of the 4 programs varied, from 226 to 447, with school-based oral health educational programs having the highest percentage of participants (Figure 1). Participation in the school-based oral health educational program was fairly equally divided between those who only had participated in the required school program and those who had additionally volunteered (Table II). Public health events had the highest percentage of respondents who had volunteered. Fewer respondents participated in the sealant programs, but the percentage of participation required by the dental hygiene program was higher than the other programs.

Figure 1: Percentage of Respondents Who Participated In Each of the Community Oral Health Programs as a Dental Hygiene Student



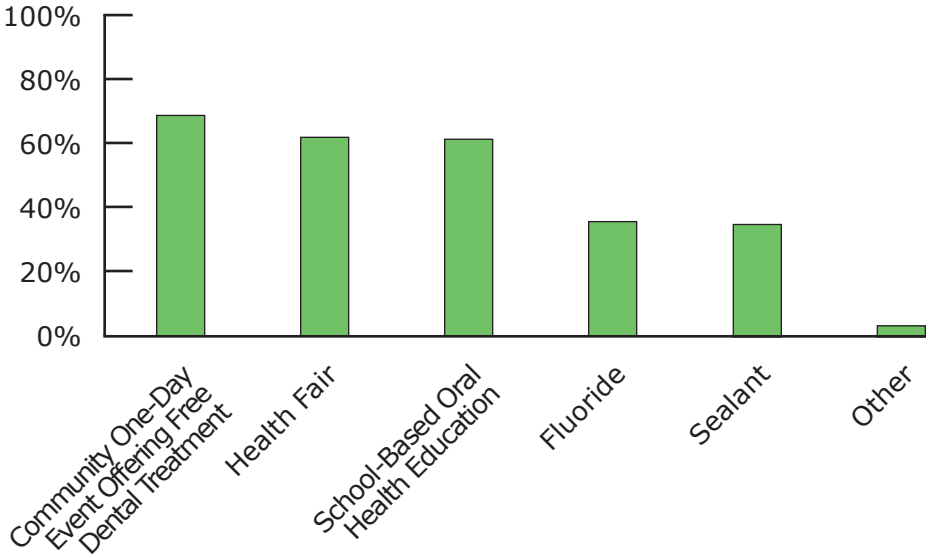
Over half of the respondents who had participated in each of the programs strongly agreed that their experiences in community oral health programs as a student were valuable to their professional development (Table II). Participating in school-based oral health educational programs as a student offered encouragement to participate after graduation for over half the respondents. Three-quarters of respondents agreed that public health events had this encouraging effect.

Table III: Respondent's Attitudes Toward Community Oral Health Statements, as a Licensed Dental Hygienist (percent, n)

	Strongly Disagreed	Disagree	Neutral	Agree	Strongly Agreed
All children should have a dental exam before entering kindergarten	2 (8)	1 (2)	1 (6)	15 (65)	81 (355)
All communities should have fluoride in their drinking water	2 (8)	1 (3)	3 (13)	16 (70)	78 (342)
All children should have access to affordable dental care	2 (8)	2 (9)	8 (33)	28 (122)	60 (263)
All elementary schools should have the responsibility to provide oral health educational programs	4 (18)	3 (12)	13 (55)	23 (101)	57 (250)
All elementary schools should commit to providing oral health educational programs	3 (11)	4 (18)	10 (47)	27 (117)	56 (243)
All elementary schools should incorporate tele-dentistry	3 (13)	4 (16)	27 (116)	22 (96)	44 (191)

Responses to the community oral health statements showed general agreement (Table III). The most positive response, with 81% responding strongly agree, was to the statement that all children should have a dental exam before entering kindergarten. Most respondents also agreed that all children should have access to affordable dental care and that schools should be committed to providing school-based oral health educational programs. The most neutral response was to the statement that all schools should incorporate tele-dentistry.

Figure 2: Percentage of Respondents Who Volunteered in Community Oral Health Programs as a Licensed Dental Hygienist

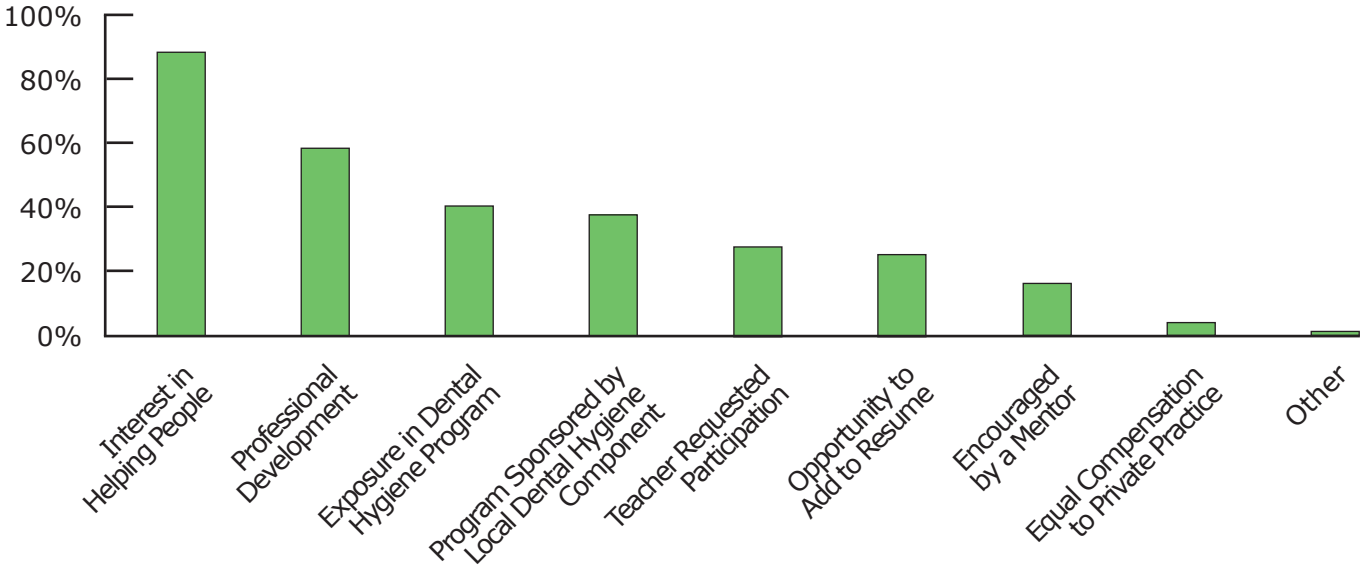


Respondents selected all that applied

A total of 75% of licensed dental hygienists reported participating in community events to promote oral health. Respondents indicated participation in community 1-day events (69%), health fairs (62%), school-based educational programs (61%), fluoride programs (36%), sealant programs (35%) and other (2%) (Figure 2). Responses received to "other" included international missionary trips and homeless shelter programs.

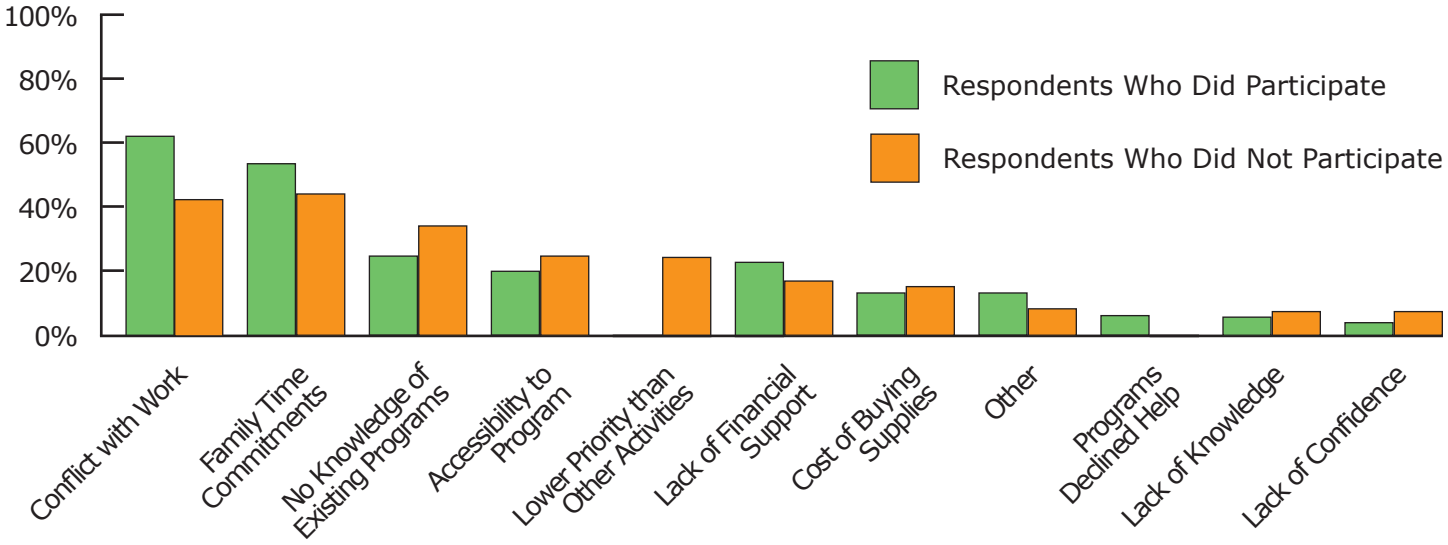
The percentages of specific factors that encouraged their participation in community oral health programs are illustrated in Figure 3. The commonly selected facilitator factors were an "interest in helping people," "professional development," "exposure in dental hygiene program" and "program sponsored by local dental hygiene component." Respondents of-

Figure 3: Percentages Selecting Specific Factors That Encouraged their Participation in Community Oral Health Programs, as a Licensed Dental Hygienist



Respondents selected all that applied

Figure 4: Percentages of Respondents Selecting the Factors that Discouraged/Limited Their Participation in Community Oral Health Programs



Respondents selected all that applied

Table IV: Relationship of Participation in Community Experiences as a Licensed Dental Hygienist to the Following Survey Items

My participation in the school-based oral health educational program encouraged me to participate in school programs after graduation	0.00*
My participation in the school-based oral health educational program was valuable to my professional development	0.01*
All elementary schools should commit to providing oral health educational programs	0.01*
ADHA Membership	0.02*
As a dental hygiene student, did you participate in community experiences that promoted oral health	0.06

*Significant relationships indicated by $p \leq 0.05$

fered the following comments related to encouragement: "good feeling you get when helping others," "opportunity to introduce our values to the public" and "I believe professionals have a duty to give back to their community."

Survey participants also identified barriers, factors that discouraged them to participate, or to participate more frequently in community oral health programs (Figure 4). The most commonly selected barriers for both groups were "conflict with work," "family time commitments" and "no knowledge of existing programs." "Lack of financial support," "lack of knowledge" and "lack of confidence" were not shown to be substantial barriers. The greatest difference between the 2 groups was "conflict with work," in which over 60% of those who did participate selected this as a barrier that discouraged them from participating more frequently. Respondents also provided the following comments related to discouragement: "finding a babysitter," "I have been rarely asked to help; I don't have the time to organize, but am willing to help when asked" and "poor organization."

The chi-square analyses showed that participation in community oral health programs as a licensed dental hygienist was significantly ($p<0.05$) related to these survey items: professional development and encouragement of participation in school-based oral health educational experiences as a student, ADHA membership and elementary schools' commitment to providing oral health educational programs (Table IV). The relationship between licensed dental hygienists' community experiences and entry-level dental hygiene students' community experiences approached significance ($p=0.06$).

Discussion

Community Experiences as an Entry-Level Dental Hygiene Student

In this study, 95% of the respondents had participated as entry-level dental hygiene students in community oral health experiences, such as school-based oral health programs. The majority agreed that their participation in all 4 programs - school-based oral health education, public health, fluoride and sealant, was valuable to their professional development, and that their involvement while a student encouraged them to participate after graduation. Agreement that involvement was valuable for professional development and that it encouraged participation after graduation was significantly related to participation in community experiences after graduation

More than half of respondents participated as a student in community oral health programs, both voluntarily, i.e., in addition to what was required, and as a program requirement. More students volunteered outside of school time at public health events than at the other 3 programs, which may be due to public health events being more accessible and easier to coordinate. According to Volvovsky's study, the students who volunteered on their own time exhibited increased interest in working with others to enhance the community, and increase their respect for diverse cultures.[15]

Most respondents strongly agreed that their participation in school-based oral health programs as a dental hygiene student was valuable to their professional development. The findings of the current study are consistent with other studies, such as Simmer-Beck et al who reported that student experiences in school-based oral health programs during the dental hygiene program provided the opportunity for students to share their knowledge and skills while providing care in the community.[16] One important component of professional development is the ability to place societal needs before personal needs.[17] Blue reported that participation in the community allowed dental hygiene students to experience this altruistic professional trait, and develop a sense of their role as a health care provider relative to the community.[17] In that study the respondents agreed that participation in these programs as dental hygiene students was valuable to establishing their identity as a dental hygiene professional.[17]

The majority of respondents agreed that their participation in school-based oral health programs as a student encouraged them to participate after graduation. Furthermore, this encouragement from participating in school-based oral educational programs was significantly related to licensed dental hygienists' participation in community experiences after graduation. This relationship may have arisen from the experience of developing and presenting their lesson plans in the school environment, which led to an increase in the respondents' comfort in educating children concerning their oral health. Similar studies showed that students' participation in community experiences increased their comfort and their willingness to volunteer in the future.[18]

Community Experiences and Attitudes of Licensed Dental Hygienists

Participation in community experiences as a licensed dental hygienist was marginally related to their participation as a student. Higher numbers of respondents volunteered in health fairs, one-day community events, and school-based oral health educational programs after graduation than in sealant and fluoride programs. This lower participation in sealant and fluoride programs may have been due to less participation as dental hygiene students. This confirms a study, that evaluated dental hygiene students' behaviors relating to community oral health throughout the 2-year curriculum, where students were found to be more comfortable in the last semester.[16] The ADHA Access to Care

position paper supports these findings by recommending that dental hygiene programs develop externships in underserved communities.[19] These experiences would provide more time for dental hygiene students to provide care to the underserved and would encourage them to participate in solving dentistry's access to care problem after graduation.

By agreeing with the 6 community oral health statements presented to participants of this study, respondents indicated their support of these concepts. This is consistent with a study by Marsh, who found that volunteers had a more positive attitude concerning community service.[20] In the current study, 75% of respondents did volunteer in at least 1 community oral health program after graduation and nearly all strongly agreed with the concepts and potential strategies for improving access to care for children. Interestingly, the most prevalent attitude was that children entering kindergarten should have a dental exam. This suggests that the respondents recognized that a need exists for children to see a dentist before starting school. In California, parents are required to complete an oral health form before their children enter kindergarten.[21] Unfortunately, while this encourages parents to find a dental home, they can be excused from this requirement for many reasons. This is a lost opportunity for the underserved children to be seen by an oral health professional, who may detect dental disease. According to the 2004-2005 California Smile Survey, 17% of children entering kindergarten who had not seen a dentist in the past year were more at risk than those children with an established dental home, and of those at risk, 42% had untreated decay.[7]

A total of 83% of respondents agreed that schools should be committed to providing oral health educational programs. Studies indicate that children with toothaches are more likely to have poor grades and that they miss more school days.[9,10] To supplement a school's commitment to provide these programs, models have been designed to share the commitment. The Health Promoting Schools model by the World Health Organization,[22] and the First National Oral Health model by the Center for Disease and Prevention,[23] are designed to collaborate with the school, dental professionals and community. A success story in Missouri used a similar model called the Preventive Service Program to engage volunteers and dental professionals to provide preventive services to low-income school districts.[5]

Facilitators and Barriers to Participation in Community Experiences

The primary factor encouraging dental hygienists to participate in community oral health programs was an "interest in helping people." Based on the comments received, the respondents feel good when they help others. In another study on dental hygiene students, Baca et al found that the "desire to help others" was an important motivating influence for choosing dental hygiene as a profession for 100% of the dental hygiene student respondents.[24] In a study on underrepresented racial and ethnic group dental hygiene students, helping others was cited by 89% of the respondents as being the aspect of dental hygiene, which had interested them the most.[25]

Another factor encouraging participation in community programs was "professional development." Blue interpreted the term "professional development" as placing the needs of society above your own by giving back knowledge and skills to promote the well-being of the community.[17] The combination of dental hygienists' great interest in helping people and the value they place in giving back to their communities partly explains the high percentage of dental hygienists who participate in community oral health programs.

One factor that most respondents agreed that discouraged dental hygienists from participating, or participating more frequently, in community oral health events was "conflict with work." This barrier was more pronounced in respondents who did rather than did not participate. However, statistical results showed no relationship between number of days employed and participation in community oral health events. Dental hygienists employed more than 4 days a week did not volunteer less than those employed less days.

"Family time commitment" was another factor reported by participants that discouraged dental hygienists from volunteering. In this survey over half the respondents had no children living at home. The number of children living at the respondents' home and their participation in programs was not statistically related. This did not confirm the thought that dental hygienists with children might have been more involved in teaching oral health in their children's classrooms.

On the other hand, the lack of children did not contradict the respondents' view that family time commitment was a barrier. Respondents may have perceived family time commitments to include extended family other than children, such as spouse and parents. The Simmer-Beck et al study found that in a 3-year longitudinal study, dental hygiene students' priorities concerning personal time commitments diminished after volunteering in their community for a semester.[16] This suggests that a priority of family time commitments may be able to be balanced by a passion for serving in the community.

The third ranked factor discouraging dental hygienists from participating was "no knowledge of existing programs." Due to the large percentage of ADHA members in this study, it is surprising that many had no knowledge of existing community oral health programs. Often, local dental hygiene components organize community oral health events. Furthermore, in

our study ADHA membership was significantly related to participation as a licensed dental hygienist. Perhaps these ADHA members are not actively involved in their specific component. While some components may not be sponsoring oral health programs, 38% of our respondents selected "program sponsored by local dental hygiene components" as a facilitative factor that had encouraged participation. This result may be related to the smaller percentage of those who did, rather than did not participate, who selected no knowledge of existing programs.

One suggestion for increasing involvement in school-based oral health programs is for dental hygienists to assume leadership roles. Respondents indicated that the lack of organization discouraged them from participating in these programs, but expressed their willingness to participate when others would assume a leadership role to organize the event. To organize these programs, leaders, funding and resources are needed. ADHA component members could work together to organize the details and enlist others to help on the day of the event. Volunteers could be recruited from the component's website or component meetings, emphasizing the role that the dental hygienists can play in improving oral health for others who are less fortunate.

As more children are enrolled in federal programs and living in dental shortage areas, school-based oral health programs can be an effective strategy to providing oral health care in a convenient environment.[2,26] Studies have reported that oral health programs that incorporate oral health education, fluoride and sealant programs are the most effective approach to preventing caries.[3] The Affordable Care Act supports and funds school-based oral health programs.[27]

Funding to support these programs could be obtained through grants from the ADHA Institute for Oral Health, Affordable Care Act, as well as community organizations. For example, the 2014-2015 Wrigley Company Foundation Community Service Grant funded a nonprofit organization of dental professionals, called the Oral Health Awareness Society, who initiated a school-based oral health program. This program provided oral health education, dental screenings and fluoride varnish applications to 425 children entering kindergarten at preschools in California.[28]

Resources for school-based oral health programs can be found on various websites. A valuable community partner is The California School-Based Health Alliance, which provides oral health resources to parents, and provides preventive oral health tools to dental hygienists to use in initiating school-based programs. Another resource is The World Health Organization Series on school health, which supplies information specific to school oral health programs.[22]

One limitation of this study may be response bias, due to the low response rate of 8%. Those respondents that completed the survey may have done so due to greater interest in the topic, which prevents generalizing these findings to all dental hygienists in California. Social desirability bias may have influenced respondents' responses, causing the respondents to answer more positively regarding community experiences. Attempts to remember their experiences as a student may have caused recall bias for those less recently graduated. Because CDHA had no means to track respondents, the survey was distributed to the same population three times, to both respondents and non-respondents. There is a slight possibility that a respondent may have completed the survey 3 times. Although this is highly unlikely, especially with the added disclosure, it is noted as a limitation. Also, the lack of specific definitions for the 4 community oral health programs: school-based oral health education, public health event, fluoride and sealant may have created some confusion among participants.

To avoid some of these limitations and to reduce threats to internal and external validity, it is recommended that further research studies focus on increasing the response rate. One suggestion would be to change the mode of distributing the survey to the target population from the internet to postal mail. Mailed surveys generally have a higher response rate than web-based ones.[29] The response rate of web-based surveys may be lower because the e-mail message, inviting them to participate in the survey, may not have reached the potential respondents. The message may have been filtered by the computer's spam blocking tools and deleted as spam. As email addresses are frequently changed, the email addresses in the CDHA database may not have been current or the ones routinely checked by the potential respondent. On the other hand, mailing addresses, obtained from the state licensing committee, would be more reliable as an accurate billing address is required for license renewal. For these reasons and others, a mailed survey may elicit a higher response rate and should be considered in future studies.

Conclusion

Dental hygienists involvement in school-based oral health programs could be influenced by student experiences in entry-level dental hygiene programs. Respondents that participated in school-based programs as a student reported their experiences were valuable to their professional development and encouraged them to participate after graduation. These reported benefits, as well as the respondents' interest in helping others and positive attitudes toward improving access to care for children, would have seemed to predict a greater number of respondents participating in school-based oral health programs. However, perceived barriers, such as conflict with work, family time commitments and no knowledge

of existing programs, seemed to have discouraged participation, or more frequent participation in community programs.

Dental hygiene needs to assume greater responsibility for overcoming these barriers. Leadership is needed at the dental hygiene component level to solicit funding, organize programs and recruit volunteers to help. These activities could be organized to minimize the impact of barriers and maximize the dental hygienists' altruistic traits of helping others and placing societal needs before their own. Increasing the involvement of dental hygienists in school-based oral health programs is an innovative and feasible approach to reducing oral disease in school children. The reported barriers and facilitators need to be addressed to increase the number of programs and participants so that more children can benefit from the skills and knowledge of dental hygienists.

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References

1. U.S. Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research [Internet]. 2000 [cited 2014 August 26]. Available from: nidcr.nig.gov

2. Kwan SY, Petersen PE, Pine CM, et. al. Health-promoting schools: An opportunity for oral health promotion. Bull World Health Organ. 2005;83(9):677-85.

3. McCombs GB, Gadbury-Amyot CC, Wilder RS, et. al. Dental hygienists' contributions to improving the nation's oral health through school-based initiatives from 1970 through 1999: A historical review. J Dent Hyg. 2007;81(2):52.

4. Simmer-Beck M, Gadbury-Amyot CC, Ferris H, et al. Extending oral health care services to underserved children through a school-based collaboration: Part 1: A descriptive overview. J Dent Hyg. 2011;85(3):181-92.

5. Hoffman AM, Branson BG, Keselyak NT, et al. Preventive services program: A model engaging volunteers to expand community-based oral health services for children. J Dent Hyg. 2014;88(2):69-77.

6. Niederman R, Gould E, Soncini J, et al. A model for extending the reach of the traditional dental practice: The ForsythKids program. J Am Dent Assoc. 2008;139(8):1040-50.

7. Dental Health Foundation. The California Smile Survey an Oral Health Assessment of California's Kindergarten and 3rd Grade Children. Dental Health Foundation [Internet]. 2006 [cited 2015 June 3]. Available from: www.centerfororalhealth.org/images/lib_PDF/dhf_2006_report.pdf

8. Alston PA, Knapp J, Luomanen JC. Who will tend the dental safety net? J Calif Dent Assoc. 2014;42(2):112-8.

9. Braun B, Horowitz AM, Kleinman DV, et al. Oral health literacy: At the intersection of K-12 education and public health. J Calif Dent Assoc. 2012;40(4):323-30.

10. Seirawan H, Faust S, Mulligan R. The impact of oral health on the academic performance of disadvantaged children. Am J Public Health. 2012;102(9):1729-34.

11. Naughton DK. Expanding oral care opportunities: Direct access care provided by dental hygienists in the united states. J Evid Based Dent Pract. 2014;14 Suppl:171-182

12. Mosby's. Dental Hygiene: Concepts, cases, and Competencies. St. Louis, Missouri, Elsevier Science, 2002; p.10

13. Isman BA, Farrell CM. Are dental hygienists prepared to work in the changing public health environment? J Evid Based Dent Pract. 2014;14 Suppl:183-90.

14. Qualtrics software, Version 60526, of Qualtrics Research Suite. Copyright © 2015. Provo, UT, USA. http://www.qualtrics.com

15. Volvovsky M, Vodopyanov D, Inglehart MR. Dental students and faculty members' attitudes towards care for underserved patients and community service: Do community-based dental education and voluntary service-learning matter? J Dent Educ. 2014;78(8):1127-38.

16. Simmer-Beck M, Gadbury-Amyot C, Williams KB, et al. Measuring the short-term effects of incorporating academic service learning throughout a dental hygiene curriculum. Int J Dent Hyg. 2013;11(4):260-6.

17. Blue CM. Cultivating professional responsibility in a dental hygiene curriculum. J Dent Educ. 2013;77(8):1042-51.

18. Kuthy RA, Heller KE, Riniker KJ, et al. Students' opinions about treating vulnerable populations immediately after completing community-based clinical experiences. J Dent Educ. 2007;71(5):646-54.

19. American Dental Hygienists' Association. Access to Care Position Paper, 2001. American Dental Hygienists' Association [Internet]. 2001 [cited 2015 June 3] Available from: www.adha.org/resources-docs/7112_Access_Care_Position_Paper.pdf

20. Marsh LA. Dental hygienist attitudes toward providing care for the underserved population. J Dent Hyg. 2012;86(4):315-22.

21. California Dental Association. Kindergarten Oral Health Requirement. California Dental Association[Internet]. 2006 [cited 2015 June 21] Available from: www.cda.org/public-resources/kindergarten-oral-health-requirement

22. World Health Organization. Oral health promotion through schools. World Health Organization [Internet]. 2003 [cited 2015 June 3]. Available from:www.who.int/oral_health/publications/doc11/en/

23. California School Boards Association. Integrating Oral Health into the School Health Programs and Policies [Internet]. 2010 [cited 2015 June 3]. Available from:www.csba.org

24. Baca ZR and Rowe DJ. Motivational factors influencing different racial and ethnic groups to enter dental hygiene educational programs. unpublished data

25. Sandino AH, Rowe DJ. Students from underrepresented racial and ethnic groups entering the dental hygiene profession. J Dent Educ. 2014;78(3):465-72.

26. Tsai C, Wides C, Mertz E. Dental workforce capacity and California's expanding pediatric medicaid population. J Calif Dent Assoc. 2014;42(11):757-766.

27. California School-Based Oral Health Alliance. School-Based Health Centers and Health Care Reform [Internet]. 2013 [cited 2015 June 7]. Available from:www.schoolhealthcenters.org/wp-content/uploads/2013/12/SBHCs-and-Health-Care-Reform-2014.pdf

28. Snyder J. The 2015 Wrigley Company foundation grants. Access. 2015; 29(9-10):24-27

29. Manfreda KL, Bosnjak M, BerzelakJ, et al. Web surveys versus other survey modes: A meta-analysis comparing response rates. Int J Market Res. 2008;50(1):79-104