Promoting Oral Health as Part of an Interprofessional Community-Based Women's Health Event

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Abstract: Heart disease is the number one killer of women, and studies have shown connections between cardiovascular and oral health. However, interprofessional community-based participatory initiatives promoting women's oral health have received little research attention. This study evaluated the effectiveness of personalized oral health education (POHE) during a free one-day interprofessional women's health promotion event. The objectives were to 1) assess the participants' knowledge about the connection between oral health and heart disease; 2) disseminate information about oral-systemic linkages; 3) encourage comprehensive dental examinations; and 4) evaluate POHE outcomes. West Virginia University School of Dentistry faculty and students delivered POHE to the participants. These POHE instructors were calibrated with a standardized script regarding periodontal disease, health impact of tobacco, xerostomia-inducing medications, and oral hygiene instruction. Immediately prior to and following each POHE session, all the participants (N=165; 100 percent response rate) completed a number-coded questionnaire. The findings showed that the participants' knowledge of oral-systemic health linkages had increased following the POHE. The respondents received oral health kits and were offered discount vouchers toward the cost of a comprehensive oral examination at the dental school. This replicable model may prove useful to other dental schools in promoting women's oral health.

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Keywords: women's health, dental education, oral health, heart disease, health communication, community health education, interprofessional education, public health

Submitted for publication 12/12/13; accepted 1/17/14

Alarming facts about women's health highlight the need for intervention and education. Since 1984, the number of deaths related to cardiovascular disease (CVD) in women has exceeded those in men.[1,2] Additionally, the American Heart Association (AHA) reports that even though CVD is the leading cause of death among women, only 13 percent of women perceive CVD as a health threat.[3] Evidence such as this points to the need for increased attention to women's health as was identified in a 1999 report on women's health in dental curricula.[4]

In light of the emerging focus on interprofessional education (IPE), dental schools have a tremendous opportunity to collaborate with other health professions in promoting women's health. In 2011, an Interprofessional Education Collaborative Expert Panel, which included representation from the American Dental Education Association (ADEA), unveiled a competency approach to IPE. Each of the four IPE competency domains is unified by community and population-based and patient-centered considerations.[5] In addition, the World Health Organization (WHO) advocates developing policies on oral health promotion and oral disease prevention, including development and implementation of community-based projects for oral health promotion and prevention of

oral diseases and advocacy for a common risk factor approach to simultaneously prevent oral and other chronic diseases.[6]

Former U.S. Surgeon General Dr. C. Everett Koop emphasized the importance of oral health to overall health by stating, "You're not healthy without good oral health."[7] In 2000, U.S. Surgeon General Dr. David Satcher in a landmark report on the nation's oral health described dental and oral diseases as a "silent epidemic," which has serious ramifications for systemic health.[8] That report underscored oral health connections with essential functions such as eating and speaking and also highlighted potential interconnections between chronic oral infections and health problems such as diabetes, heart disease, stroke, and low birthweight and premature babies.

Drawing from the growing body of evidence bridging the significance of a healthy mouth to systemic health and general well-being, the West Virginia University (WVU) School of Dentistry joined the WVU National Centers of Excellence in Women's Health (CoEWH), the WVU Heart Institute, and the AHA in providing an interprofessional women's health event in the local community. Similar to the vision and priorities of the U.S. Department of Health and Human Services Office on Women's Health, the primary focus of the WVU CoEWH is to enhance the well-being of all women through education and promotion of positive health behaviors. In February 2012, the CoEWH led this interprofessional initiative in conjunction with the annual AHA Go Red for Women health promotion campaign.[9,10] The School of Dentistry contributed to the free full-day program by offering a health education intervention to raise awareness about oral-systemic connections with the aim to influence women's optimal health.

The oral health component of this interprofessional women's health event aimed to increase the public's awareness about oral health as well as its relevance to systemic health and overall well-being. The objectives of the component were to 1) assess participants' knowledge about the connection between dental disease and heart disease; 2) disseminate information about oral-systemic linkages; 3) encourage comprehensive dental examinations; and 4) evaluate the impact of an oral health promotion program for women. A modified Transtheoretical Model of Change approach was utilized in an effort to transition from a customary "silo" approach to oral health education.[11] This type of behavioral change model is an action-oriented intervention for the target population to ensure that individual needs are addressed for those who have not made a conscious decision to change and to allow health care workers to help at-risk or possible at-risk individuals along the behavioral change continuum.

The program attracted primarily women from the local community to participate in a series of free health screening and promotion activities provided by faculty and students from the WVU Schools of Dentistry, Medicine, Nursing, and Pharmacy. Registered participants were encouraged to visit all health stations, which included blood pressure and Body Mass Index (BMI) assessment, glucose and cholesterol testing, EKG administration and evaluation, carotid artery scan, nutrition counseling, personalized oral health education, and medication consultation. Event staff provided participants with a map outlining their sequential rotation through each health promotion station. Although individual visits to each station were not timed, activities were designed to take the participant approximately twenty minutes to complete. This article summarizes the personalized oral health education (POHE) component of the community-based women's health promotion event and reports pre-/post-POHE intervention survey findings.

Methods

Prior to implementation, the study was granted exempt status by the WVU Institutional Review Board. The study utilized pre- and post-intervention survey instruments designed to evaluate participants' change in knowledge of current oral health issues, the oral-systemic health connection, and the health impact of tobacco. Survey instruments were color- and number-coded to allow for matching individuals' pre- and post-intervention responses and to ensure validity and respondent confidentiality.

The pre-intervention survey included eight demographic items (e.g., age, frequency of dental care), six of which were self-assessed oral health questions (e.g., dental visits, tobacco use, xerostomia, personal and family history of periodontal problems). In addition, seven items assessed the participant's level of agreement (1=strongly disagree to 5=strongly agree) with statements regarding periodontal disease, heart, stroke, and cognitive connections; harmful effects of tobacco use on healing; heart medications and xerostomia; periodontal bacteria gaining entrance into the bloodstream; and whether bleeding upon brushing was normal. These responses were collected to provide a baseline.

The post-intervention survey was administered immediately following the POHE sessions. Questions on the post-intervention survey included the same seven Likert-style items that were on the pre-intervention survey: these included questions about periodontal disease, heart, stroke, and cognitive connections; harmful effects of tobacco use on healing; heart medications and xerostomia; periodontal bacteria gaining entrance into the bloodstream; and whether bleeding upon brushing was normal.

The POHE intervention included advanced preparation of School of Dentistry students and faculty providers with calibration on use of a standardized script to provide a consistent intervention about common oral health educational topics. Additionally, providers were instructed to personalize the script based on the individual participants' needs or questions, oral health awareness, and knowledge of oral health link to systemic conditions.

The POHE sessions were presented in three adjacent clinical operatories with an adjoining corridor that provided adequate seating and a table for participant registration. This area was equipped with oral health posters for participants to peruse while waiting to participate in the session. Each operatory was equipped with a standardized script, personalized protective equipment, oral health posters, dentoform, floss, and a large toothbrush to demonstrate oral hygiene instructions. These individual operatories provided a confidential area for respondents to receive POHE and complete the pre- and post-POHE surveys.

Participants who completed both surveys and the POHE session were given a discount voucher toward the cost of a comprehensive oral examination at the dental school along with an oral health kit containing toothbrush, toothpaste, floss, and oral health informational brochures to promote positive personal oral health behaviors. These items were distributed to participants immediately after they completed the POHE and the post-intervention survey. A participant log was maintained to document distribution of vouchers to assist with subsequent scheduling of comprehensive dental screenings at the School of Dentistry. To eliminate unauthorized duplication or transfer of vouchers, the uniquely embossed card included the recipient's name, POHE provider signature, patient scheduling telephone number, expiration date by which the screening appointments must be scheduled, and statement of non-transferable use by another person.

The assumption was that, by attending the health fair, all participants were interested in their individual health, sought information on strategies to improve or maintain their health status, and were self-motivated to complete the POHE (i.e., self-selection bias). Therefore, the results based on information gathered from this specific cohort comprised mainly of females cannot be generalized. The inability to assess comprehension or long-term retention of information presented in POHE was another limitation of this study. Statistical analysis utilized the Wilcoxon signed-rank test with the significance level being set at $p<0.05$.

Results

Of the 165 individuals who signed up for the study, all (100 percent) completed the pre-intervention survey, POHE intervention, and post-intervention survey. The majority (63 percent) were between the ages of fifty and sixty-nine with a mean age of fifty-five. Regarding oral health self-assessment (Table 1), the majority (88 percent) reported that they routinely visit the dentist; of these, all except six had received dental care within the last year (96 percent). The participants were primarily (93 percent) non-tobacco users. Approximately one-third (32 percent) reported experiencing dry mouth or cracked lips. Forty-seven participants (28 percent) had been previously informed that they have periodontal problems, while thirty-two (19 percent) reported having family members with periodontal disease.

Table 1. Responses to self-assessed oral health items, by percentage of total participants (N=165)

Item	Yes	No	No Response
Routine dental visits	88%	11%	1%
Dental care within past 12 months	96%	4%	–
Tobacco use	7%	93%	–
Dry mouth experience	32%	67%	1%
Personal history of periodontal problems	28%	70%	2%
Family member with periodontal problems	19%	76%	5%

The pre- and post-POHE findings from the seven cognitive questions used to measure the participants' knowledge about oral and systemic health topics are shown in Figure 1. All seven items demonstrated a statistically significant increase in knowledge of oral and systemic health topics. With regard to knowledge of connections between periodontal disease and cardiovascular problems, agreement was expressed by 67 percent pre-POHE and 91 percent post-POHE. The number responding correctly to a statement about connections between gum disease and stroke almost doubled from seventy-five pre-POHE to 144 post-POHE. The majority of participants (78 percent) began the POHE session with a correct understanding that bleeding when brushing is abnormal, with an additional eleven gaining this understanding as indicated in post-POHE findings.

Awareness of the connection between periodontal disease and memory loss increased fivefold after the POHE, while knowledge of the contribution of heart medication to dry mouth increased nearly sevenfold. In reference to the statement that chemicals in tobacco delay healing, prior to the POHE, thirty participants were undecided, while forty-five agreed and eighty-two disagreed. However, the number of post-POHE responses to this survey item shifted upward to ninety-one (55 percent) expressing agreement, while there was a notable reduction in the number who were undecided before (thirty) as opposed to after (seven) the POHE. Before the POHE, 77 percent of the participants accurately responded that bacteria found in periodontal disease can enter the bloodstream and contribute to heart disease; after the POHE, correct responses increased to

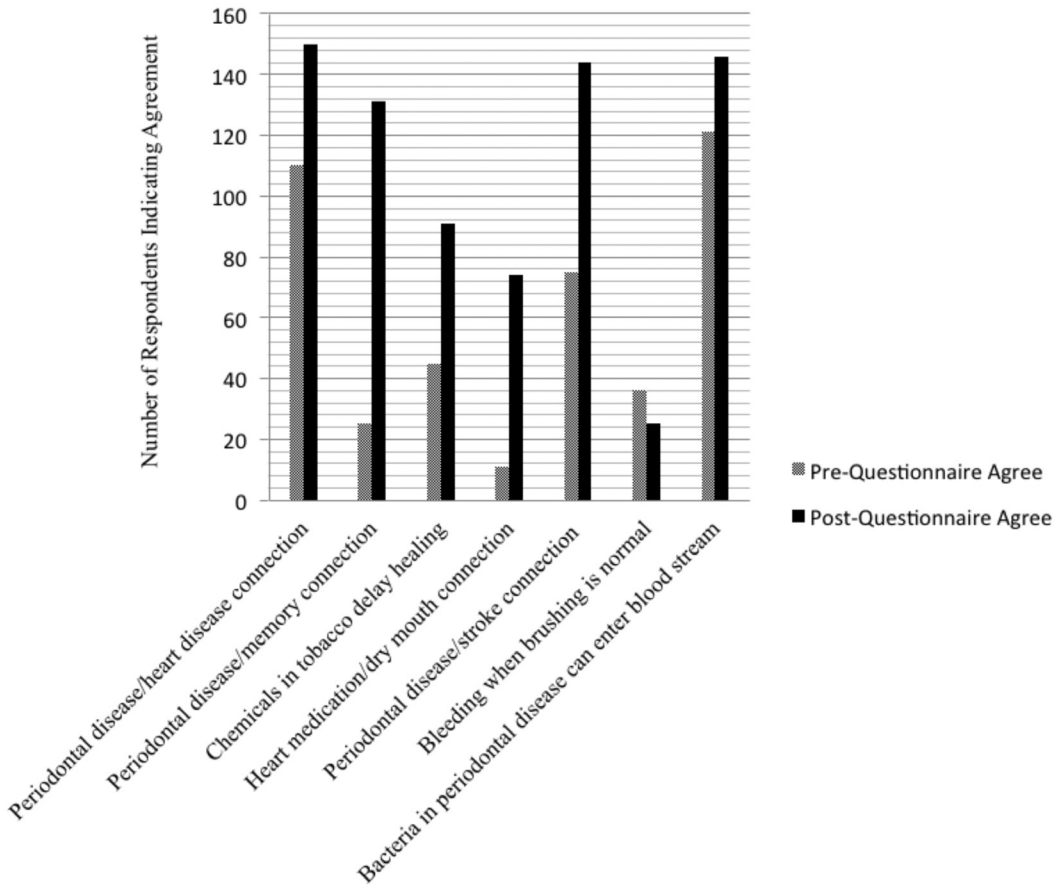

Figure 1. Participants' agreement with questions concerning oral-systemic connections, by number pre- and post-POHE (N=165)

89 percent, with all but one of the originally undecided respondents reporting agreement.

All the POHE participants were offered comprehensive dental examination discount vouchers for use at the School of Dentistry anytime within the next twelve months. Sixty-eight declined a voucher due to recent dental exams or ongoing dental treatment at private dental offices. Of the ninety-seven distributed vouchers, only two individuals subsequently requested and received an examination at the dental clinic.

Discussion

This interprofessional community-based women's health promotion event provided an excellent venue to bring attention to oral health and its relationship to overall health. The results clearly showed an increase in the participants' knowledge of oral health and systemic linkages after completing the oral health education intervention. Prior to receiving the POHE, the majority demonstrated a lack of awareness in the following areas: oral health and heart disease associations, effects of smoking on delayed healing, and the drying effects that heart medications may have on the oral cavity. These findings were eye-opening given that the majority of the participants routinely visit a dentist. This feedback may indicate that oral health professionals caring for this cohort are not sufficiently addressing oral-systemic health issues during patient visits. Past research suggests that West Virginia internists and obstetricians/gynecologists do not examine the oral cavity,[12] and a national study of obstetricians/gynecologists produced similar findings.[13] Therefore, it may be inferred that if non-dental health care professionals are not examining their patients' mouths, they may also omit discussions about oral-systemic connections in the patient care environment.

Findings from our brief POHE intervention suggest that it successfully reinforced the importance of periodontal disease prevention among the participants. In fact, the participants were informed about the American Academy of Periodontology's going on record agreeing with the AHA's claim that studies support an association, independent of shared risk factors, between periodontal disease and cardiovascular disease.[14] Equally importantly, the participants learned about the oral health impact of diuretics and anti-hypertensive medications that are often prescribed to treat systemic conditions such as cardiovascular disease.[15] Many cardiovascular/cardiac medications can cause xerostomia or dry mouth. Xerostomia may cause dysgeusia, cracked lips, difficulties eating, oral discomfort, or improper fitting of dental appliances.[16] Dental decay, periodontal disease, inflamed soft tissue, and candidiasis may also occur when taking cardiovascular medications.[17,18] An additional finding suggests that the participants had very little prior knowledge about connections between gum disease and memory problems. This finding was not surprising because research has only recently been released pointing out a relationship between gum disease and memory problems.[19]

The finding that most participants in this study were not tobacco users was very encouraging since tobacco use is a well-known risk factor for oral cancer, pharyngeal cancer, periodontal disease, cardiovascular disease, dental caries, and other diseases. However, even though prior to the POHE, about one-fourth of the participants understood that chemicals in tobacco delay healing, the finding of slightly more than half having this understanding after the POHE suggests that more attention to this topic was needed. These findings are supported in another study.[20]

In general, the success of this systematically planned and executed brief oral health intervention is demonstrated by the statistically significant increase in knowledge on oral and systemic health connections after participating in the POHE intervention. However, on a cautionary note, findings from this study cannot be generalized. For example, nearly one-fourth of this state's general population smokes tobacco,[21] whereas only 7 percent of our study participants indicated the use of tobacco products. Furthermore, by attending the health fair, the participants demonstrated intrinsic motivation to maintain and improve their overall health, which is consistent with their non-tobacco use.

On debriefing, the POHE project team identified several shortcomings that will be addressed in future presentations of this community-based interprofessional health promotion event. First, the survey instrument did not ask for the participants' ethnicity, gender, socioeconomic status, and educational level achieved; therefore, it is unknown if they were impacted by oral health disparities. The survey questions will be revised to ascertain specific demographic information for the purpose of identifying potential oral health disparities experienced by program respondents.

One surprising part of the study was that even though discount vouchers toward the cost of a comprehensive dental examination at a later date were available to all participants, four out of every ten individuals declined the voucher. Furthermore, very few of the ninety-seven voucher recipients subsequently scheduled an examination at the dental school. This is likely due to the high rate of survey participants who had received dental care within the past year and the fact that coupons were not transferable to family or friends. This item will be addressed in the future by securing each POHE participant's contact information for the purposes of individual follow-up. In addition, the participants' overall satisfaction with this event was not assessed, nor was their motivation to attend future similar outreach programs and overall knowledge gained from other health promotion stations. Incorporating these evaluative measures will strengthen efforts to assess the program in the future.

Among many advantages of this interprofessional collaborative project was the opportunity for dental faculty members and students to work alongside colleagues in other health professions in promoting women's health. Past research has indicated that similar projects have increased oral health knowledge in non-dental health care providers.[22,23] Informal feedback given by faculty and student POHE providers, both women and men, suggests that this annual interprofessional women's health promotion activity should be continued. It is anticipated that this positive experience will stimulate the development of additional inclusive approaches to promote women's health.

Conclusion

This interprofessional, community-based women's health promotion event provided members of the local community an opportunity to obtain health information and assessments offered by various health care providers and students. Utilizing a POHE intervention, dental faculty members and students alerted participants to oral health and oral-systemic associations with focus given to cardiovascular health connections. This strategy proved successful in raising awareness about oral-systemic health linkages. Other dental schools may consider engaging their lay communities in similar interprofessional women's health promotion initiatives.

Acknowledgments

This oral health promotion project was made possible by the efforts of many individuals. We express appreciation to Wendy Ridenour, Debbie Anderson, and Charlotte Tenney for their administrative and technical assistance. Special thanks to faculty colleagues and students who assisted with presentation of the Personalized Oral Health Education sessions: Ms. Ashlee Charnoplosky, Dr. Robert Wanker, Ms. Paige Botbyl, Ms. Chelsea Morton, Ms. Amber Naylor, Ms. Loniann Pell, Ms. Sarah Peplowski, and Mr. Steve Schultz. We also thank Ms. Betty Parsons for leading the development and implementation of this interprofessional community health event to promote women's health. Funding was provided by the West Virginia University School of Dentistry Office of Dental Research.

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