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## Culturally Sensitive Oral Health Educational Materials for Older African Americans

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*Abstract:* Oral diseases disproportionately affect older Americans from minority populations. Approaches to reducing such disparities include increasing community-based interventions that target vulnerable older adults. To help in developing and implementing such programs, the U.S. Department of Health and Human Services suggests using the *MAP-IT* technique, from a strategic planning guide to address public health issues in the community. This approach served as the method of investigation for the *Take Charge of Your Oral Health* educational program, a health promotion initiative targeting older African Americans. This paper describes the development and evaluation of the program. A total of 111 African American elders from 7 senior sites in Philadelphia participated in the program. A 6-item pre-test and post-test indicated a significant improvement in mean test scores from baseline ( $p < .001$ ). The program demonstrated merit in improving oral health knowledge among community-residing, inner city, older African Americans.

*Key words:* Older adults, ethnicity, race, health promotion, oral health education, health literacy, health disparities.

Advances in modern dentistry have resulted in a substantial decline in total tooth loss and dental caries in the United States; these advances, however, mask differences in oral health among racial and ethnic subpopulations.<sup>1-5</sup> The 1988–1991 National Health and Nutrition Examination Survey (NHANES III) of adults aged 18 to 75 years reported that, while Whites did not differ from African Americans in the proportion who retained some natural teeth, they were likely to retain more teeth than African Americans.<sup>4</sup> The 1988–1994 and 1999–2002 NHANES reported racial/ethnic differences in tooth loss, as well, with non-Hispanic Black adults retaining fewer teeth than non-Hispanic White and Mexican American adults.<sup>6</sup> African Americans aged 60 years and older experienced more tooth loss than did Whites aged 60 years and older.<sup>4,6</sup> Minority populations also differ from the majority with respect to dental caries, with non-Hispanic Whites having a lower prevalence of untreated decay than non-Hispanic

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Black and Mexican Americans.<sup>6</sup> African Americans have a higher rate of coronal and root surface caries than both Whites and Mexican Americans.<sup>1,3,6</sup> Periodontal disease risk profiles for older people indicate that African Americans have an elevated risk for periodontitis compared with other racial/ethnic groups.<sup>7</sup> National studies indicate an increased use of dental services by people aged 65 years and older over the past 20 years; non-Whites in this age group, however, are less likely than Whites to have visited a dentist during the year.<sup>8</sup> In summary, racial and ethnic minority older adults have considerable unmet dental care needs and have been characterized as being problem-oriented, episodic dental care utilizers.<sup>5,8-12</sup>

It has been reported that many older people do not understand oral diseases and perceive tooth loss to be a natural part of the aging process.<sup>13,14</sup> Slaughter and others reported that urban African American elders had misconceptions in dental knowledge and perceived that there was little the dentist could do to prevent periodontal disease and subsequent tooth loss.<sup>15</sup> Although perceptions and attitudes regarding oral health differ across elderly birth cohorts,<sup>16-19</sup> previous studies report that low-income African American elders have more negative attitudes than do White elders towards dental care and dental health.<sup>20,21</sup> Kiyak and others report that among low-income racial/ethnic elder groups, African Americans had less understanding of good oral health and attributed less importance to oral health than White or Asian elderly people did.<sup>22</sup> In a prospective cohort study, Gilbert and others proposed that African Americans' underutilization of dental services may result from a perceived lack of benefit, based in part on cultural norms.<sup>14</sup> Beliefs about oral health and perceptions of dental providers strongly influence one's decisions both to perform personal hygiene practices and also to seek out dental care.<sup>13</sup>

National health promotion initiatives presented in *Healthy People 2010*,<sup>23</sup> *Oral Health in America: a report of the Surgeon General*,<sup>24</sup> and the National Call to Action<sup>25</sup> provide guided strategies to help reduce health disparities. One of these strategies is providing community-based programs to promote oral health among vulnerable populations. The current project was designed to implement this recommendation. A plethora of oral health educational materials exist that provide good information targeted towards multi-ethnic and older adult populations.<sup>26-28</sup> Few of these materials, however, are targeted specifically towards African American elders. Fewer still have incorporated educational guidelines that follow an evidence-based approach.

This paper describes the development and evaluation of the *Take Charge of Your Oral Health* educational program, which followed the five-phase U.S. Department of Health and Human Services MAP-IT guidelines.<sup>29</sup> The central question was whether a community-based oral health educational program for older African Americans that utilized culturally sensitive content and presentation style would result in improved knowledge about oral self-care practices and effects of oral health on overall health.

**Conceptual framework.** The MAP-IT technique served to guide the development of the program.<sup>29</sup> The Office of Disease Prevention and Health Promotion and the U.S. Department of Health and Human Services developed *Healthy People in Healthy Communities*, a strategic planning guide that explains how to use *Healthy People 2010*<sup>29</sup> objectives to address public health issues considered important in one's community. One piece of this guide is known as the MAP-IT technique, and it guided the development

of the program described here.<sup>29</sup> Figure 1 illustrates the proposed MAP-IT approach. Five steps in the process are defined: *Mobilize* the development of a coalition of individuals and organizations that care about the health of the community; *Assess* the areas of greatest need in the community, as well as the resources and other strengths that can be tapped to address those areas; *Plan* an approach, starting with a vision of the goals, then add strategies and action steps to help achieve that vision; *Implement* the plan using concrete action steps that can be monitored and make a difference; and, finally, *Track* progress over time. It is suggested that by using this approach, one can devise a step-by-step, structured plan that is tailored to the needs of the community. The MAP-IT steps as operationalized for this project are described here together with the results of each step.

**Processes.** *Step I: Mobilize (community partnerships).* The Philadelphia Corporation for Aging (PCA), the area agency on aging, was approached to help form a coalition focused on oral health promotion. The challenge of acquiring and sustaining PCA's support was minimized because of prior relationships with the principal investigator and the Division of Community Oral Health at the University of Pennsylvania School of Dental Medicine (SDM). The MAP-IT technique recommends that sufficient data be available to show the importance of targeted issues. We discussed with the Director of PCA and the Health Promotion staff general information about oral health disparities among older African Americans and possible ways to address the gaps. Selected senior centers were subsequently brought on board by PCA to participate in the project.

*Step II: Assess (preliminary studies and content development).* We conducted 2 preliminary studies in 6 West Philadelphia senior centers: structured focus group interviews with 25 participants to ascertain the perceptions of older African Americans regarding oral health,<sup>15</sup> and a quantitative study with 146 participants that compared actual or objective clinical dental care need with elder's perceived needs.<sup>12</sup>

The probing questions included in the focus group interviews were prepared using the Health Belief Model (HBM)<sup>30,31</sup> and Social Cognitive Theory<sup>32</sup> as the conceptual

M	Mobilize key individuals and organizations that care about the health of the community into a coalition.
A	Assess community needs, strengths, and resources to address the targeted health issue.
P	Plan your approach and create an action plan with concrete steps to achieve the vision of the coalition.
I	Implement your plan using concrete action steps that can be monitored and will make a difference.
T	Track your progress over time.

Figure 1. MAP-IT technique: conceptual framework utilized for program development. Source: U.S. Department of Health and Human Services. Healthy people in healthy communities. Washington, DC: U.S. Government Printing Office, 2001 Feb.

framework. The HBM<sup>30-32</sup> proposes that behavior is determined in part by the following beliefs: susceptibility (perceived chance of getting disease, in this case gum disease and dental decay), severity (perceived seriousness of the disease), benefits of the action (in this case, brushing, flossing, and preventive dental visits), barriers to performing the action, and self-efficacy (confidence in one's ability to carry out some action). Questions also assessed beliefs regarding the value of teeth and expectation to retain natural teeth with increasing age. Gaps in dental knowledge were identified based on the common themes expressed by the interview respondents. The primary aim of both the focus group study and the quantitative study was to evaluate perceptions that may influence the oral self-care behaviors of brushing, flossing, and the use of preventive dental services among community-residing older African Americans and to use this information to develop a culturally sensitive health promotion program.

The demographic characteristics of participants from both studies are shown in Table 1. The participating senior centers located in West Philadelphia were targeted because the University of Pennsylvania is located in this area and promoting the health and well-being of this community is a priority mission for the University at large.

**Table 1.**

**DEMOGRAPHIC CHARACTERISTICS  
FOR TWO PRELIMINARY STUDIES**

Characteristic	Focus group study (n=25)		Clinical study (n=146)	
	n	%	n	%
Race				
African American	25	100	146	100
Gender				
Male	2	8	31	21
Female	23	92	115	79
Dental visit behavior				
Within 6 months	4	16	13	9
One year ago	5	20	33	23
Two years ago	2	8	19	13
Three or more years ago	14	56	65	44
Don't know	NA	NA	16	11
Age (years)				
60-69	NA	NA	28	19
70-79	NA	NA	59	40
80-89	NA	NA	51	35
90-99	NA	NA	8	6
Mean Age: 77				

NA = data not available

The clinical examinations identified common oral conditions, such as cavities (38%), soft tissue lesions (53%), abnormal gingiva (38%), and retained roots (39%) that were not perceived or recognized as being a problem by the elders themselves. As seen in Table 2, when controlling for the assessed oral conditions, elders who reported pain were four times more likely to perceive a dental problem than elders reporting no pain. The perceived need for dental care was mostly associated with symptoms of oral pain. Respondents generally had misconceptions regarding the causes of dental decay and gum disease; they believed that gum disease and tooth loss were inevitable with aging and that there was little the dentist could do to prevent gum disease. From a health promotion perspective, the results of both studies suggest that information for inclusion in educational communications directed to the target population should emphasize non-painful oral signs and symptoms, increase knowledge about the preventive benefits of the thorough cleaning of teeth, and increase awareness of the links between oral health and general health. Additionally, the information should be framed within the context of promoting elders' sense of self-care or increasing self-efficacy for making informed health care decisions.

Based on the aforementioned evidence from our preliminary studies, the following health promotion themes were used as the platform to develop the content for the program:

- Bacteria from dental plaque gets under your gums and between your teeth, and if this plaque is not removed, it can cause dental cavities and gum disease.
- Brushing keeps your teeth clean, but you cannot thoroughly remove plaque just by brushing. Flossing cleans plaque under your gums and from between your teeth.
- Good oral hygiene helps to keep your body healthy, too. Oral infections may affect conditions such as diabetes and heart disease.
- Your dentist and hygienist can clean deeply enough to remove the plaque from all parts of your teeth and under your gums. Your dentist and dental hygienist

**Table 2.**

**LOGISTIC REGRESSION RELATING THE OUTCOME PERCEIVED DENTAL PROBLEM TO CLINICALLY ASSESSED DENTAL CARE NEED (n=142)**

Predictor Variable	OR	(CI)	X <sup>2</sup>	p-value
Clinical Condition				
Pain	4.32	(1.01–18.45)	3.91	.05
Cavities	1.88	(.79–4.47)	2.06	.15
Soft tissue lesions	.60	(.17–2.10)	.63	.43
Abnormal gingiva	1.48	(.56–3.88)	.63	.43
Retained roots	1.21	(.42–3.44)	.12	.73

also can show you how to keep your teeth clean, and together you can keep your teeth healthy.

*Step III: Plan (Development Stratagem and Action Plan).* The Oral Health Coalition visualized a broad-based educational campaign to promote awareness of dental health using the *Take Charge of Your Oral Health* program. This included targeting senior sites located in more economically deprived areas of the city, in particular, those that had little or no prior exposure to dental health outreach programs. The Philadelphia Corporation for Aging agreed to use its resources to support the campaign, to identify the senior sites for the program, and to make initial contact with the identified site directors to inform them about the campaign and to request scheduling to conduct the program. A prototype program, *Take Charge of Your Health Speaker Kit*, a health presentation for seniors developed by Michelle Lombardo, D.O., President of OrganWiseguys<sup>®</sup>,<sup>33</sup> was selected to modify for the current project. This kit includes presentations for diabetes, heart disease, and nutrition, as well as handouts that promote interaction with the audience. A key program feature is the use of overhead projector slides with colorful graphics and a presentation script to enable non-health-trained people (senior center coordinators, senior high-rise directors) to review the intended promotion messages and to facilitate the program easily. This feature was a central reason for choosing this delivery mode. The format may improve the availability of oral health educational materials to diverse elder groups that may not presently have access to consistent outreach programs in their communities.

The planning phase in the *MAP-IT* technique recommends creating an action plan with concrete steps that will help achieve the vision of the coalition. Our action plan began with establishing a collaboration with OrganWiseguys<sup>®</sup><sup>33</sup> to modify and develop materials on oral health utilizing the *Take Charge of Your Health* kit as the model. Specific instructions were submitted to the graphic artist that outlined how the overhead presentation materials should be drafted to represent the intended content for our program.

A literature search was conducted using the PubMedPlus database to investigate approaches to structuring educational materials to our target population using the key words *African American education, cultural sensitivity, oral health education, and risk communication*. We found no reports on developing oral health educational programs. Strategies were noted, however, that were successful in developing culturally sensitive communication materials for breast/ovarian genetic counseling to African Americans.<sup>34</sup> These strategies included using non-technical images to explain concepts<sup>34</sup> and both female and male images so that the information seems more personal, which, it is suggested will make it more understandable.<sup>34-36</sup> Other reported strategies to focus participants on intended messages involve the use of color and brief text that is not noticeably formal or academic.<sup>37</sup>

These suggestions were used to personalize messages to older African Americans in the *Take Charge of Your Oral Health* educational program in several ways. Robust and well-dressed older African American men and women, standing in graphically as peer educators, were portrayed conveying concepts throughout the program. For example, to discuss the association of plaque with periodontal disease, in Figure 2 we used simple

images to depict bacteria and tooth loss that incorporated words and phrases commonly expressed in our West Philadelphia focus group study among older African Americans. The focus group participants most frequently said *pyorrhea*, *teeth become loose*, and *gum disease is a terrible thing* when discussing the reasons for having teeth extracted. The program used these words when explaining the causes of periodontal disease and its deleterious effects on maintaining good oral health and good overall health. To further personalize the information, Figure 3 shows a woman holding her dentures saying, “I took care of my teeth, I kept them clean, but I still lost my teeth.” These illustrations

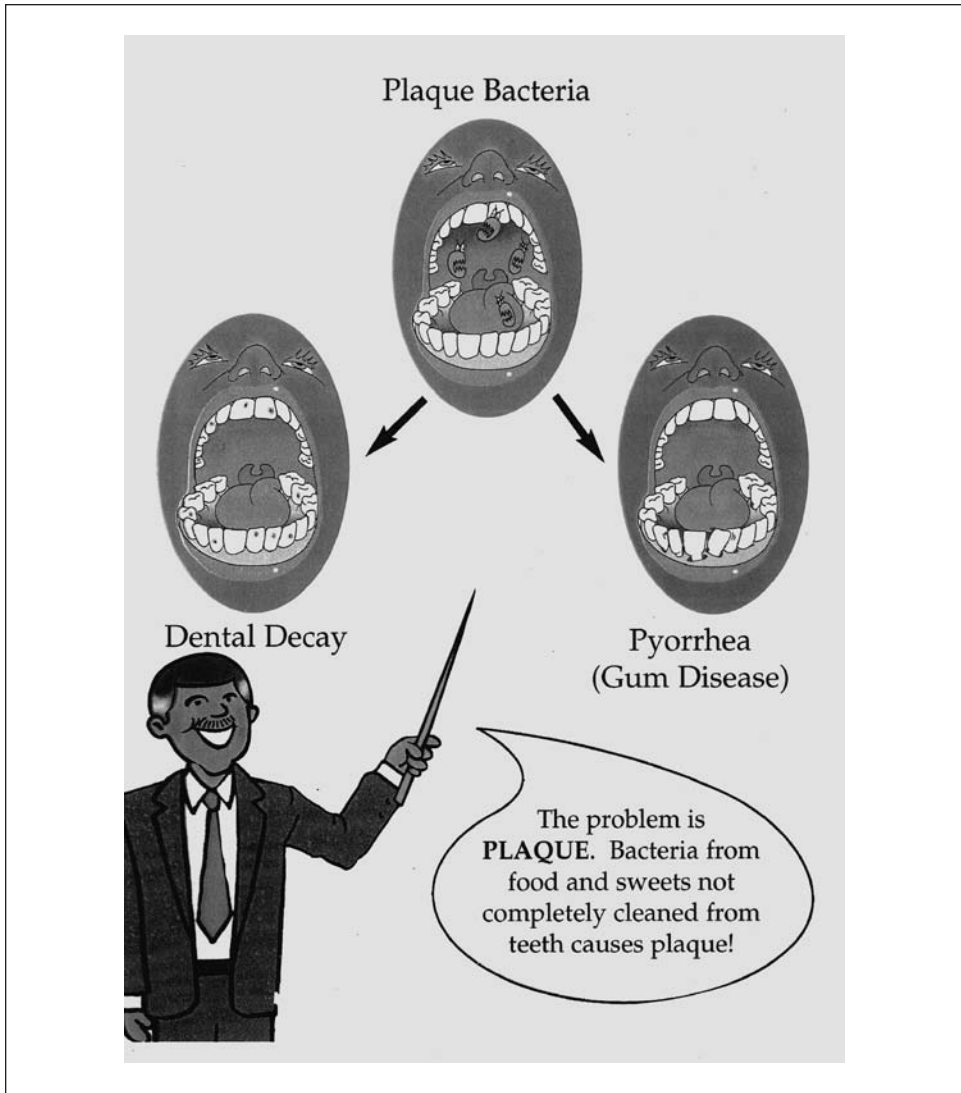


Figure 2. Explains the relationship of plaque bacteria and oral diseases. Color graphics may be requested from the first author.





Figure 3. Addresses the misconception that only brushing teeth is enough to thoroughly clean teeth.

provide an introductory context for explaining the benefits of flossing for thorough plaque removal and to address misconceptions that solely brushing one's teeth keeps them clean. To personalize the discussion of the benefits of preventive dental care visits versus using services primarily when experiencing oral pain, we used Figure 4, which shows the image of a woman holding her face saying, "Just pull it," with the dentist in the background saying, "It does not have to be this way." These images were designed to raise awareness of non-painful oral signs and symptoms that require professional care, particularly the early warning signs of oral cancer. The message that oral health and body health are linked is depicted in the *Take Charge of Your Oral Health* logo, utilizing a tooth and a body holding hands (Figure 5).

One goal of the program was to encourage elders to transfer knowledge to members



Figure 4. The message conveys that visiting the dentist does not have to be limited to tooth extraction services.

of their family networks. Figure 6 shows three generations of a proud African American family proclaiming knowledge of preventive dental practices. It has been argued that decisions to seek health care are greatly influenced by advice and information that are passed among family and friends concerning the effectiveness of treatments.<sup>37</sup> Faith is important to African Americans and the incorporation of spiritual strategies in education and counseling may foster acceptance and perceived relevance of presented material.<sup>38-40</sup> Previously reported studies among older African Americans have included spirituality to promote cardiovascular health,<sup>38</sup> blood pressure screening,<sup>39</sup> and breast cancer screening.<sup>40</sup> For our program, a summary of the health promotion messages was adapted to the well known spiritual song, "Go Tell It on the Mountain" [excerpt: *Go tell it on the mountain, over the hills and in the street, go tell in on the mountain*



Figure 5. This graphic is modeled to stress the importance of the links between oral health and general health.

*that we don't have to lose our teeth. I am so much wiser, for now I know the way, brushing and flossing together take plaque bacteria away].* Participants sing the song at the conclusion of the presentation. It is intended that this interactive activity will reinforce major messages discussed in the program.

*Step IV: Implement (pilot testing).* A single session of the *Take Charge of Your Oral Health* educational program was implemented at 7 senior center sites located in the inner city of Philadelphia. The delivery format for the program was overheads. Table 3 shows the descriptive characteristics of the participating sites which were located in South Philadelphia ( $n=1$ ), West Philadelphia ( $n=2$ ), and North Philadelphia ( $n=4$ ). These sections of Philadelphia predominately encompass African American neighborhoods. The West Philadelphia and South Philadelphia sections of the city tend to have more resources than North Philadelphia. Following the Oral Health Coalition's action plan of targeting senior sites in more economically deprived areas, the majority were located in North Philadelphia. All sessions were conducted by the same African American dental professional (A.S.) and each lasted approximately 45 minutes. All were audio-taped and reviewed to ensure consistency across sessions. Attendance across sites ranged from 8 to 34 people; a total of 157 older adults participated in the program. All were African American and the most (78%) were female. Age was not recorded.

*Step V. Track (evaluation and analysis).* The *MAP-IT* guideline recommends data collection and analysis to determine the progress of the action plan.<sup>29</sup> There were three

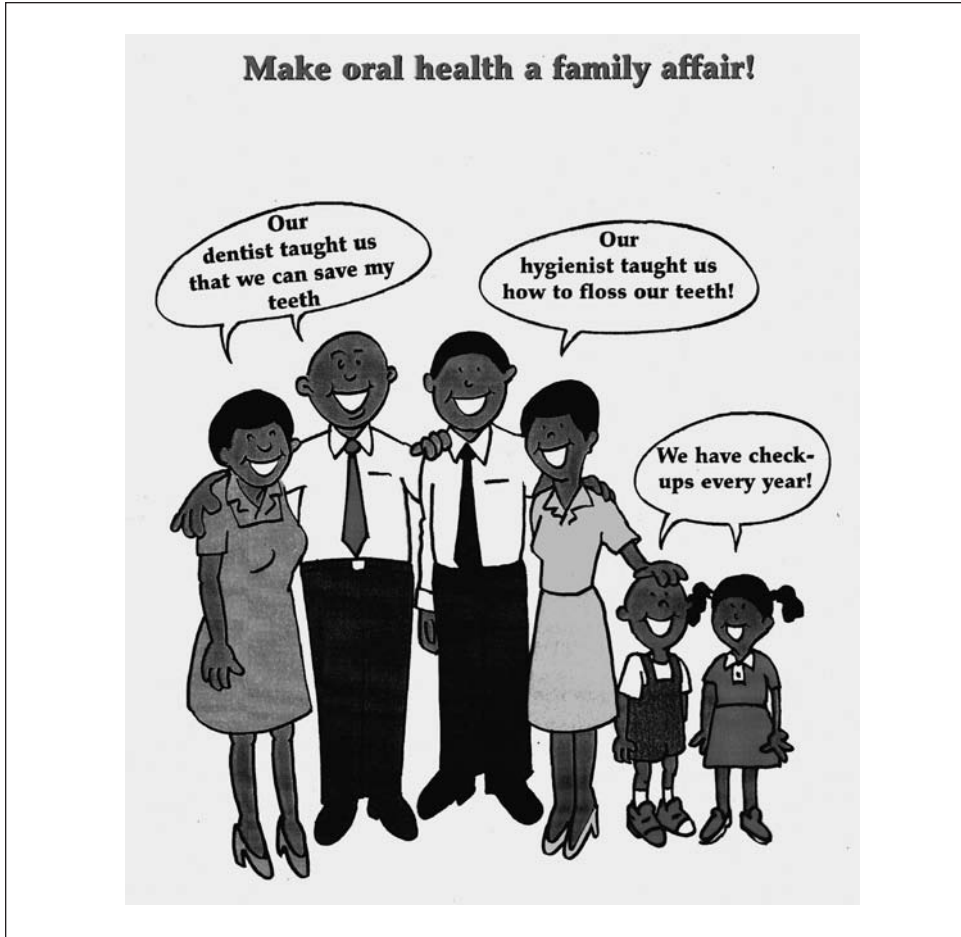


Figure 6. Oral health can be promoted within the family unit. This intergenerational transfer of knowledge can help younger generations to retain their teeth with increasing age.

components to the evaluation. (1) The program was independently evaluated by the Philadelphia Corporation for Aging (PCA) as part of its quality management program. A member of PCA's Health Promotion staff observed random sessions for this purpose and rated it as excellent. (2) The agency required that the Senior Coordinators at each senior center site evaluate the program utilizing PCA's standard service verification form. This entails identifying the type of program and the number of participants, and summarizing the responses from participants as being either *favorable* or *unfavorable*. In these evaluations, all the program sessions were rated as favorable. Overall, the summary comments indicated that the program itself was very informative, the overhead materials visually appealing, and the song fun and entertaining. (3) Finally, the evaluation also included a six-item pre-post test designed by the investigators to focus on the major themes discussed in the educational program. Participants were

**Table 3.****DESCRIPTIVE CHARACTERISTICS FOR  
PILOT TEST PARTICIPANTS (n = 157)**

Senior site	Location	Male (n)	Female (n)
A	Northcentral Philadelphia	11	10
B	Northcentral Philadelphia	10	22
C	Northcentral Philadelphia	3	31
D	Northcentral Philadelphia	4	25
E	West Philadelphia	1	12
F	West Philadelphia	5	15
G	South Philadelphia	1	7
	Total	35	122
	Total (%)	22	78

issued a form with the pre-printed responses of *True*, *False*, or *Don't Know*. Prior to the program, the facilitator read each item aloud and participants were asked to respond. At the conclusion, a new form was issued, with items in reverse order, and the same process used. (See Table 4.)

Data were entered and verified and the analyses were conducted using SAS version 9.1.<sup>41</sup> Total scores could range from zero to six; the difference in pre-test and post-test scores was calculated by subtracting the pre-test score from the post-test score for each participant. The UNIVARIATE procedure was used in order to determine if the changes in pre- and post-test scores were approximately normally distributed and if there was a statistically significant difference between them. The General Linear Model (GLM) procedure was used to determine if there was a statistically significant difference between the areas of the city in which the senior centers were located.

While 157 elders participated in the program, only 111 (71%) participants completed both the pre-test and the post-test. A total of 12 participants (8%) completed only the pre-test; 26 participants (17%) completed only the post-test; and 8 participants (5%) had incomplete responses on both the pre-test and post-test. These 46 were dropped from further analysis. Overall, the mean and median post-test scores each increased by 1 point ( $p < .001$ ;  $t = 5.93$ ). Prior to the intervention, the mean score was 4.72 ( $SD = 1.14$ ) and the median score was 5 out of 6 correct. After the intervention, the mean score was 5.42 ( $SD = .96$ ) and the median score was 6 out of 6 correct. Sixty-five percent of the participants got 6 out of 6 correct on the post-test, compared with 27% on the pre-test. Figure 7 shows the range of changes from baseline. Fifty-five participants (50%) improved their test scores by 1 or 2 points, and an additional 7 (6%) improved their scores by 3 or 4 points. Thirty-eight participants (34%) showed no change in their test scores, and 11 participants (10%) had a negative change in their test scores (-1 to -4). There was no significant difference in change of test scores across senior center sites

**Table 4.****CORRECT RESPONSES TO INDIVIDUAL ITEMS (n=111)<sup>a</sup>**

Item	Pre-test		Post-test		% Im- provement	t-value	p-value
	n	%	n	%			
Dental decay is caused by plaque	73	(65.77)	101	(90.99)	25	4.76	.001
Your dentist and hygienist can help keep you from losing your teeth	96	(86.49)	101	(90.99)	5	1.27	.10
Brushing your teeth is enough to keep your teeth healthy and clean	75	(67.57)	88	(79.28)	12	2.58	.01
If you have dentures, you still need to go to the dentist for a check-up at least once a year	104	(93.69)	103	(92.79)	-1	-.26	NA
Pyorrhea or gum disease is caused by plaque	74	(66.67)	102	(91.89)	25	5.23	.001
Plaque in your mouth can mess with your body health	102	(91.89)	107	(96.40)	5	1.47	.10

<sup>a</sup>Sample size not equal to same number of program recipients (n=157). Only those that completed both the pre-test and the post-test were included in this analysis.

NA = Not Applicable. There was a negative improvement in the pre/post test score; therefore, p-value cannot be calculated.

( $p=.06$ ;  $f=2.85$ ). Table 4 shows the individual item evaluation. Overall, improvement was achieved in the majority of items at post-test.

## Discussion

The purpose of this project was to develop and test an educational program to communicate oral health information that was relevant for and culturally sensitive to older African Americans. Our findings indicate the *MAP-IT* approach is an effective guide to educate community members about oral health. Following the recommended process, the content for the program was based on our assessment of the oral health needs in the community and was helpful in mobilizing community support and resources and in formulating an action plan to implement the program in the community successfully.

Concerning biology, one area of the program described plaque as a cause of gum

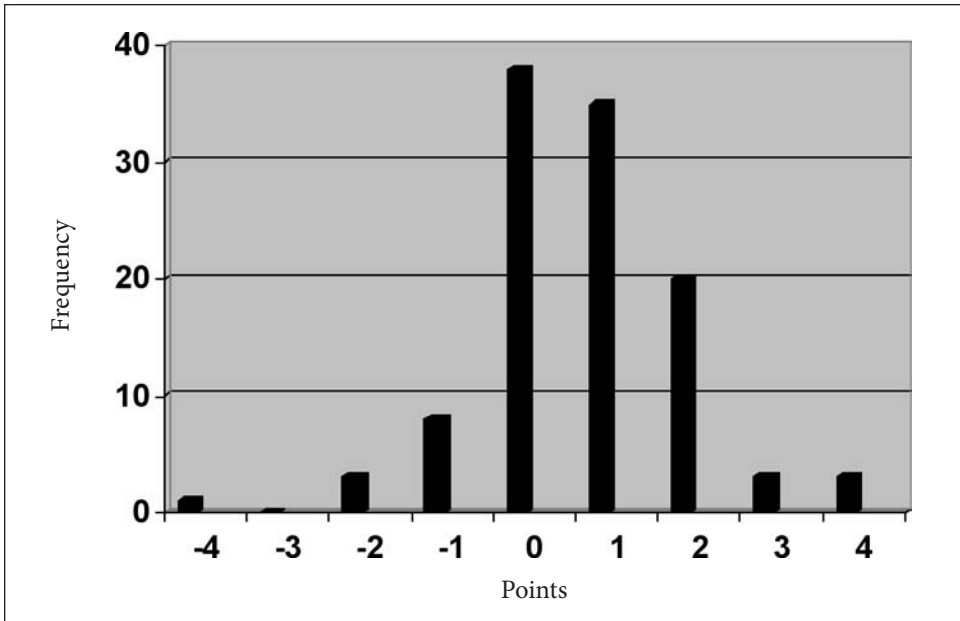


Figure 7. Distribution of change in pre and post test scores.

disease and subsequent tooth mobility and tooth loss. Additionally, the program related plaque bacteria to general health and was focused on associating oral health with systemic diseases. Concerning self-care, content included the benefits of regular flossing to clean plaque in between teeth, non-painful oral signs that require professional care, and the benefits of going to the dentist when not experiencing oral pain.

Overall, over one-half of the participants (56%) demonstrated improved test scores at post-test. Our expectation was confirmed that an important part of the program would be addressing ageist perceptions that tooth loss is a natural part of aging. The items showing the greatest improvement in dental knowledge were that gum disease is caused by plaque (67% correct on pre-test and 92% on post-test) and that dental decay is caused by plaque (66% correct on pre-test and 91% on post-test). Based in part on these two salient findings, we conclude that the program demonstrates educational merit. Increasing awareness that there are realistic measures one can undertake to prevent tooth loss, coupled with increasing expectations to retain natural teeth, may prove to be motivators that influence more regular dental service utilization among the study population.<sup>42</sup> National studies report older African Americans tend to use dental services more frequently when experiencing dental pain than for preventive dental care.<sup>43</sup> Our findings showed the majority of participants (86%) at baseline believed that the dentist and hygienist could help prevent tooth loss. This suggests that participants comprehend that this can be accomplished and consider preventive dental care important. Yet, many participants at baseline lacked definite knowledge concerning the role of plaque bacteria causing dental caries and gum disease; these items showed the most

positive changes in dental knowledge. These findings suggest that elders must be more active on their own behalf asking questions when visiting their dental providers, or that dental providers must present information in ways that facilitate comprehension. In either case, our findings suggest that tailored oral health educational interventions can influence changes in dental knowledge among the study population.

Concerning self-care, our expectation was confirmed that an important part of the program would be emphasizing the benefits of flossing to clean teeth thoroughly. Although most participants (68%) responded correctly on the pre-test that brushing teeth only was insufficient to clean teeth, there is clearly a need for improvement in this area concerning the benefits of flossing. Over three-fourths (79%) of participants responded correctly on this item on the post-test. One reason for the pre-test score being high may be that participants were aware of flossing, but that they lacked confidence or self-efficacy to practice the behavior. The program included a section demonstrating how to use floss as well as other oral hygiene products, such as stimudents, floss holders, and proxa brushes that can be easier than floss to manipulate. During the program, many participants claimed no prior awareness of these alternate aids to cleaning between teeth. Therefore, this particular finding may point not only to improved knowledge of flossing among participants, but also to improved self-efficacy among those participants who were aware of flossing but found it difficult to perform. Previous studies among African Americans report that a lack of knowledge of flossing and perceived low self-efficacy are key barriers to performing this behavior consistently.<sup>44,45</sup>

The evaluation also provided insight into how the program may be enhanced. Nearly all participants (92%) responded correctly at baseline that plaque bacteria can affect their bodily health. This item is not sensitive enough to ascertain whether participants associate oral infections with diabetes or heart disease. We suspect that their responses stem more from associating having an infection in their system with having an abscessed tooth, as reported in our preliminary study.<sup>15</sup> Information regarding the association of plaque bacteria with specific systemic diseases is presented towards the end of the program. Perhaps including this material early in the program, when discussing plaque bacteria and dental diseases, would have a greater impact on elders' associating oral health with general health.

Nearly all of the participants (94%) responded correctly at baseline that people with dentures still required annual dental check-ups. It is possible that respondents said what they perceived as the socially responsible answer given their misconceptions regarding the causes of tooth loss. This item was too general to emphasize the importance of annual oral cancer screenings (its original intent). This information is emphasized most when discussing non-painful oral conditions that require professional dental care. The benefits of preventive dental care visits must be underscored throughout the entire program. Perhaps this change will reinforce the message that self-care together with regular professional care are required to maintain good dental health. As discussed, the authors recognize the possible ceiling effect at baseline for the aforementioned items. Thus, revisions of these items to gain better specificity are in progress in order to assess knowledge outcomes more precisely in future trials.

There were some limitations to this project. The data are not sufficiently rich to allow for a regression analysis. The content was based on focus group information from older



adults residing in West Philadelphia, raising the possibility that the information included in the program may not be applicable or relevant to people who reside outside this community. This does not appear to be the case, however, in that there was no difference in test scores among participants from the West Philadelphia, North Philadelphia, or South Philadelphia sites (all of whom had the same racial/ethnic background). All of the participating senior sites were located in the inner city of Philadelphia. Therefore, it is more accurate to say that our findings may not be representative of older African Americans that reside outside Philadelphia or in its more affluent neighborhoods. Members of the participating senior centers are representative of the heterogeneity of older African Americans who reside within the city limits. Given lack of sufficient demographic information (age or most recent dental visit) it is not possible to ascertain whether those who failed to complete both the pre-test and post-test (and thus were removed from the analyses) differed from the remainder ( $n=46$ ). Most of the non-completers did not take the pre-test because they were late coming to the presentation. It could be that the non-completers represent those with more knowledge about dental health or represent those that are regular dental care attenders. Given that the changes in scores were approximately normally distributed, with 35% of participants having no change in their test scores, this lack of data is not likely to severely bias the validity of results.

**Conclusion.** The *Take Charge of Your Oral Health* program was demonstrated to be effective in improving oral health knowledge in older African Americans, but requires further evaluation to determine its effectiveness in changing behavior. The intent of the program was to tailor materials for African American older adults. Potential utility for use with other populations should be tested. The ultimate goal is to increase the availability of relevant and culturally sensitive oral health promotion communication materials that improve dental knowledge and promote preventive care behaviors among all older adult sub-groups. The *Take Charge of Your Oral Health* program has been recently converted to a video format to facilitate future implementation and evaluation of the program among other older adults.

## Acknowledgments

This project was supported by the Brookdale Foundation and the Aetna Foundation. We appreciate the staff and visitors at the senior sites for their participation. Thanks to Michael Rambo and Jesse Chittams for statistical support.

## Notes

1. Brown LJ, Winn DM, White BA. Dental caries, restoration and tooth conditions in U.S. adults, 1988–1991. Selected findings from the Third National Health and Nutrition Examination Survey. *J Am Dent Assoc.* 1996 Sep;127(9):1315–25.
2. Brown LJ, Brunelle JA, Kingman A. Periodontal status in the United States, 1988–1991: prevalence, extent, and demographic variation. *J Dent Res.* 1996 Feb;75 Spec No: 672–83.
3. Winn DM, Brunelle JA, Selwitz RH, et al. Coronal and root caries in the dentition of adults in the United States, 1988–1991. *J Dent Res.* 1996 Feb;75 Spec No:642–51.

4. Marcus SE, Drury TF, Brown LJ, et al. Tooth retention and tooth loss in the permanent dentition of adults: United States, 1988–1991. *J Dent Res*. 1996 Feb;75 Spec No:684–95.
5. Manski RJ, Magder LS. Demographic and socioeconomic predictors of dental care utilization. *J Am Dent Assoc*. 1998 Feb;129(2):195–200.
6. Beltran-Aguilar ED, Barker LK, Canto MT, et al. Surveillance for dental caries, dental sealants, tooth retention, edentulism, and enamel fluorosis—United States, 1988–1994 and 1999–2002. *MMWR Surveill Summ*. 2005 Aug 26;54(3):1–43.
7. Persson RE, Persson GR. The elderly at risk for periodontitis and systemic diseases. *Dent Clin North Am*. 2005 Apr;49(2):279–92.
8. Manski RJ, Moeller JF, Maas WR. Dental services. An analysis of utilization over 20 years. *J Am Dent Assoc*. 2001 May;132(5):655–64.
9. Mueller CD, Schur CL, Paramore C. Access to dental care in the United States. *J Am Dent Assoc*. 1998 Apr;129(4):429–37.
10. Vargas CM, Manski RJ. Dental expenditures and source of payment by race/ethnicity and other sociodemographic characteristics. *J Public Health Dent*. 1999 Winter; 59(1):33–8.
11. Warren JJ, Cowen HJ, Watkins CM, et al. Dental caries prevalence and dental care utilization among the very old. *J Am Dent Assoc*. 2000 Nov;131(11):1571–9.
12. Slaughter A, Taylor L. Perceptions of dental care need among African-American elders: implications for health promotion. *Spec Care Dentist*. 2005 May–Jun;25(3):158–63.
13. Kiyak HA, Persson RE, Perrson RG. Influences on the perceptions of and responses to periodontal disease among older adults. *Periodontol* 2000. 1998 Feb;16:34–43.
14. Gilbert GH, Duncan RP, Crandall LA, et al. Older Floridians' attitudes toward and use of dental care. *J Aging Health*. 1994 Feb;6(1):89–110.
15. Slaughter A, Smith VJ, Taylor L. Progressing toward a more culturally competent approach to dental care for African American elders. *Spec Care Dentist*. 2004 Nov–Dec; 24(6):301–7.
16. Ettinger RL. The unique oral health needs of an aging population. *Dent Clin North Am*. 1997 Oct;41(4):633–49.
17. Ettinger RL. Cohort differences among aging populations: a challenge for the dental profession. *Spec Care Dentist*. 1993 Jan–Feb;13(1):19–26.
18. Ettinger RL, Mulligan R. The future of dental care for the elderly population. *J Calif Dent Assoc*. 1999 Sep;27(9):687–92.
19. Strauss RP. Culture, dental professionals and oral health values in multicultural societies: measuring cultural factors in geriatric oral health research and education. *Gerodontology*. 1996 Dec;13(2):82–9.
20. Gilbert GH, Duncan RP, Heft MW, et al. Dental health attitudes among dentate black and white adults. *Med Care*. 1997 Mar;35(3):255–71.
21. Gilbert GH, Duncan RP, Crandall LA, et al. Attitudinal and behavioral characteristics of older Floridians with tooth loss. *Community Dent Oral Epidemiol*. 1993 Dec; 21(6):384–9.
22. Kiyak HA. Measuring psychosocial variables that predict older persons' oral health behaviour. *Gerodontology*. 1996 Dec;13(2):69–75.
23. U.S. Department of Health and Human Services (HHS). *Healthy People 2010* (Conference Edition, in two volumes). Washington, DC: U.S. Government Printing Office, 2000.
24. U.S. Department of Health and Human Services. *Oral health in America: a report of*

- the Surgeon General. Rockville, MD: HHS, National Institute of Dental and Craniofacial Research (NIDCR), National Institutes of Health (NIH), 2000.
25. U.S. Department of Health and Human Services. National call to action to promote oral health. (DHHS Pub. no. [NIH] 03-5303.) Rockville, MD: HHS, Public Health Service, NIH, NIDCR, 2003.
  26. U.S. Department of Health and Human Services, NIH, National Cancer Institute (NCI). Oral cancer. (NIH publication 03-5032.) Bethesda, MD: NIDCR, National Oral Health Information Clearinghouse, 2003.
  27. National Institute Dental and Craniofacial Research, National Institute of Diabetes and Digestive and Kidney Disease. Prevent diabetes problems: keep your teeth and gums healthy. (NIH Pub. no. 03-4280.) Bethesda, MD: HHS, National Diabetes Information Clearinghouse, NIDCR, NIH, 2003
  28. National Institute of Dental and Craniofacial Research. Diabetes: dental tips. (NIH Pub. no. OP-09.) Bethesda, MD: HHS, NIH, 2003.
  29. U.S. Department of Health and Human Services, Office of Public Health and Science, Office of Disease Prevention and Health Promotion. Healthy people in healthy communities: a community planning guide using Healthy People 2010. Washington, DC: U.S. Government Printing Office, 2001.
  30. Rosenstock IM. Why people use health services. *Milbank Mem Fund Q.* 1966 Jul;44(3): Suppl:94-127.
  31. Rosenstock IM. Historical origins of the health belief model. *Health Educ Monogr.* 1974;2(4):328-35.
  32. Bandura A. *Social foundations of thought and action: a social cognitive theory.* Englewood Cliffs, NJ: Prentice Hall, 1986.
  33. OrganWise Guys, Incorporated. *The OrganWise Guys.* Duluth, GA: OrganWise Guys Incorporated, Analytical Solutions, Inc., 2007. Available at [www.organwiseguys.com](http://www.organwiseguys.com).
  34. Baty JB, Kinney AY, Ellis SM. Developing culturally sensitive cancer genetics communication aids for African Americans. *Am J Med Genet A.* 2003 Apr 15;118(2): 146-55.
  35. Price JH, Everett SA. Developing cancer pamphlets for economically disadvantaged African Americans. *Patient Educ Couns.* 1996 Jul;28(2):159-67.
  36. List MA, Lacey L, Hopkins E, et al. The involvement of low literate elderly women in the development and distribution of cancer screening materials. *Fam Community Health.* 1994;17:42-55.
  37. Rajaram SS, Rashidi A. Minority women and breast cancer screening: the role of cultural explanatory models. *Prev Med.* 1998 Sep-Oct;27(5 Pt 1):757-64.
  38. Yanek LR, Becker DM, Moy TF, et al. Project Joy: faith based cardiovascular health promotion for African American women. *Public Health Rep.* 2001;116 Suppl 1:68-81.
  39. Kinney AY, Emery G, Dudley WN, et al. Screening behaviors among African American women at high risk for breast cancer: do beliefs about god matter? *Oncol Nurs Forum.* 2002 Jun;29(5):835-43.
  40. Tanner J, Cockerham WC, Spaeth JL. Predicting physician utilization. *Med Care.* 1983 Mar;21(3):360-9.
  41. SAS Institute Inc. *SAS, Version 9.1.* Cary, NC: SAS Institute Inc., 2000.
  42. Persson RE, Persson GR, Powell LV, et al. Periodontal effects of a biobehavioral prevention program. *J Clin Periodontol.* 1998 Apr;25(4):322-9.

43. Atchison KA, Gift HC. Perceived oral health in a diverse sample. *Adv Dent Res.* 1997 May;11(2):272-80.
44. Stewart JE, Wolfe GR, Maeder L, et al. Changes in dental knowledge and self-efficacy scores following interventions to change oral hygiene behavior. *Patient Educ Couns.* 1996 Apr;27(3):269-77.
45. Kiyak HA, Kamoh A, Persson RE, et al. Ethnicity and oral health in community-dwelling older adults. *Gen Dent.* 2002 Nov-Dec;50(6):513-8.