



Published in final edited form as:

Spec Care Dentist. 2010 ; 30(5): 193–199. doi:10.1111/j.1754-4505.2010.00150.x.

Recruitment of rural and cognitively impaired older adults for dental research

Bei Wu, PhD^{1,*}, Eric A. Goedereis, PhD², Richard J. Crout, DMD, PhD³, Brenda L. Plassman, PhD⁴, Elizabeth A DiNapoli, BA⁵, Daniel W. McNeil, PhD⁶, Michael Wiener, DMD⁷, Martin L. Boone, PhD⁸, R. Constance Wiener, DMD⁹, Elizabeth Kao, DMD, FAGD¹⁰, and Lina Bai, MBBS, MS¹¹

¹ Associate Professor, The University of North Carolina Greensboro Gerontology Program, Greensboro, NC

² Department of Behavioral and Social Sciences, Webster University

³ Associate Dean for Research and Professor of Periodontics, School of Dentistry, Professor, Department of Biochemistry, West Virginia University

⁴ Associate Research Professor, Department of Psychiatry, Duke University Medical Center

⁵ Doctoral student, University of Alabama

⁶ Professor, Department of Psychology and Clinical Professor, Department of Dental Practice and Rural Health, West Virginia University

⁷ Assistant Professor, School of Dentistry, West Virginia University

⁸ Wedgewood Family Practice & Psychiatry, Morgantown, West Virginia

⁹ Assistant Professor, School of Dentistry, West Virginia University

¹⁰ Professor, School of Dentistry, West Virginia University

¹¹ Research Associate, Gerontology Program, West Virginia University

Abstract

The recruitment of community-dwelling older adults, particularly those with cognitive impairment and those residing in rural areas, has been consistently challenging for researchers, especially in the dental field. This study reports on recruitment experiences from an ongoing study investigating the association between oral health and cognitive status in later life. Multiple recruitment strategies, including educational presentations and traveling to participants' homes, were used to enroll rural elderly participants with various levels of cognitive function. In general, multi-pronged, proactive recruitment strategies were more effective than traditional, passive methods in reaching participants with varying degrees of cognitive impairment.

The outcome of this study suggests that successful recruitment of such populations involves gaining the support of staff at relevant community organizations, informing community members (including older adults and their family members) of the project and the importance of oral health, and making data collection sites accessible for older adults.

Keywords

recruitment; elders; rural; cognitive impairment; underrepresented populations

*Corresponding author: b_wu@uncg.edu.

Introduction

Oral health disparity is a persistent problem in the United States.¹ For example, an evaluation of research data^{2,3} suggests that, compared to urban residents, rural populations have significantly poorer oral health status. Research intended to address health inequalities, including those specific to oral health, requires adequate representation of those most affected by such disparities. Many of the individuals most affected by these disparities, however, are members of traditionally underrepresented groups (e.g., older adults, ethnic minorities, rural-dwelling individuals, and individuals with low socioeconomic status). In order to reduce disparities in oral health within these populations, it is essential that researchers effectively recruit adequate numbers of those most affected by such disparities in order to understand their problems.

West Virginia is the only state entirely within Appalachia, with all 55 counties designated in the region.⁴ Nearly 45% of the state's population is rural, compared to 17% of the United States in general.⁵ Residents of Appalachia have been dubbed a "neglected minority,"⁶ one beset with numerous health problems.⁷ Older adults who live in rural areas constitute a doubly underrepresented population in research. With respect to oral health, older adults in West Virginia have the poorest oral health in the nation. In 2006, West Virginia had the highest rate of complete loss of all natural teeth over age 65 in the U.S.⁸ Clearly, research is needed to understand and address this disparity.

Research participation may decrease health disparities indirectly by providing an improved understanding of factors associated with such disparities and by facilitating the development of specific interventions and programs. The recruitment of older adults, however, has been consistently challenging for researchers.^{9,10} Recruitment difficulties are compounded when the elderly target population also is from underrepresented groups, such as those with cognitive impairment¹¹ and those residing in rural areas, where the incidence of cognitive disorders may be more prevalent when compared to urban areas.¹²

Much of the literature on barriers to the recruitment of older members of underrepresented groups into health research has focused on racial and ethnic minorities. Potential barriers to research participation exist at various levels.¹³⁻¹⁵ With respect to the target population, barriers include those specific to community agencies (e.g., staff burden, time constraints, lack of relationships), "gatekeepers" such as agency administrators and adult children who are caregivers (e.g., based on their lack of knowledge and/or distrust of research, desire to protect clients), and the participants themselves (e.g., uncertainty about research involvement, concerns about privacy, and schedule conflicts).

Such barriers are particularly problematic when the population in question consists of elders who are cognitively impaired. A recent review¹¹ of epidemiological research on dementia concluded that "cognitively impaired individuals are likely to be underrepresented in most community studies." Thus, older adults, particularly those experiencing cognitive impairment or living in rural areas, should be considered members of underrepresented groups within the context of health disparities research.

Much of the published literature has focused on developing strategies to increase the recruitment of ethnic and racial minority populations. These studies,^{16,17} some of which include the recruitment of patients with dementia and their caregivers, highlight a persistent need for effective strategies aimed at the recruitment of elders from underrepresented groups into health research and collectively suggest that a multi-pronged approach to recruitment is most successful in achieving the goal. This multi-pronged approach includes (1) providing

adequate information about the research; (2) developing partnerships and gaining trust within the community; (3) introducing researchers as experts in the field; and (4) providing direct and indirect benefits to the community.

To our knowledge, few published studies have addressed the issue of recruitment among older adults for dental-related research. It is imperative for dental researchers to make the effort to recruit older adults who are at the greatest risk for oral health problems and thus most likely to benefit from future interventions.

The purpose of this report was to provide an overview of our efforts aimed at recruiting older adults, the majority of whom resided in rural areas. We were interested in examining whether the multi-pronged approach to recruitment described above would be a successful model for recruiting rural older adults into dental research in particular.

Methods

Overview of research project

Community-dwelling individuals in West Virginia who were dentate (i.e., having at least four natural teeth) and aged 70 and older were eligible to participate. Our targeted enrollment was 250 individuals spanning a range of cognitive function and socioeconomic levels.

The project included five components of data collection: (1) a clinical oral evaluation, which was undertaken by calibrated researchers using guidelines and procedures from the National Health and Nutrition Examination Survey (NHANES IV) protocols.¹⁸ The oral evaluation included an assessment of the oral mucosa, salivary flow, existing restorations, attrition, plaque, gingival recession, and periodontal attachment levels; (2) an assessment of cognitive functioning, which was administered by a trained psychometrician who used a battery of neuropsychological instruments; (3) a participant interview that included information on sociodemographics, mental health, self-rated oral health, dental hygiene, and dental care utilization; (4) an informant interview¹⁹ with a family member or close friend identified by the participant as someone who could provide information on the participant's clinical and medical histories; and (5) a list of all medications taken within the past two weeks. A sixth and optional component was the collection of blood samples drawn by a registered nurse or a trained phlebotomist. The protocol was approved by the West Virginia University Institutional Review Board.

Results

Challenges of recruiting study participants

Like many of the studies cited above, the scope of our research presented a variety of barriers to participant recruitment. First, the range of logistical issues associated with the in-depth and multifaceted protocol presented several issues that needed resolution prior to data collection. Similarly, with the aim of including a wide representation of respondents from various levels of socioeconomic status (SES), our team needed to travel across the state to collect data, which presented additional scheduling challenges. Second, our sample was to be drawn from the population of older adults aged 70 and above living in West Virginia. Given the target population's members were older adults, in order to better represent the range of oral and cognitive health, as well as the sociodemographic characteristics within the state, it was important to use an assortment of recruitment methods to reach members of these underrepresented groups across the state.

Some participants were recruited from sites within a community with a large university. Consequently, such a context presented the challenge of competing with other researchers for study participants. A related — and perhaps greater — challenge involved reaching individuals who lived in rural areas of the state, as well as individuals who were experiencing cognitive impairment.

Identifying appropriate settings for data collection represented a third challenge. Specifically, it was necessary that we accurately assess the suitability of prospective environments for data collection. With our project, the physical environment was an important concern, as our portable dental chair, dental station, and nurse's station (for the collection of blood samples) had particular space and electrical requirements. Further, given the sensitive nature of many of the protocol items (e.g., the neuropsychological and dental assessments), we were careful to seek out environments conducive to privacy. Most often, we used at least three separate spaces for the data collection.

Strategies used in recruiting study participants

We gradually developed a multi-pronged approach to recruit participants over the course of the project. Our initial recruitment strategies relied on community-level advertising and word-of-mouth referrals in order to inform prospective participants of our study. We posted fliers in various public locations (e.g., grocery stores, malls, churches, and libraries), created university news announcements, and utilized free local newspaper and television advertising. Interested participants were instructed to contact our research office for further information and eligibility screening. In addition, fliers advertising the study, along with sign-up sheets for interested individuals, were mailed to area senior-center directors and staff members for distribution. We also promoted the study in primary care clinics and repeatedly contacted physicians in several memory clinics. Although these physicians were willing to refer patients to the study, due to their own time constraints, it was difficult for them to dedicate additional time to talk with patients about the study. In addition, study participation for many of these prospective participants was likely a low priority, given more pressing needs.

Over the course of the project, our recruitment efforts became more proactive and community-focused. First, our team increased our efforts in developing partnerships with communities in the state. We visited senior centers, assisted living facilities and Alzheimer's Association local chapters and established connections with these local community gatekeepers. More importantly, several members of the research team actively sought opportunities to provide educational information as a part of the service to the participants' communities. One dentist who was also a dental researcher made concerted efforts to contact these organizations and delivered educational presentations about the relation between oral and overall health, as well as health disparities in older adulthood, to potential participants at senior centers, retirement communities, assisted living facilities, and Alzheimer's Association local offices across West Virginia. Other members of the team also delivered educational presentations in various local communities.

Second, we increasingly utilized the services of an oral health research team situated in the central part of the state. We coordinated with various groups and organizations throughout the state to make arrangements for local, on-site data collection sessions convenient for participants. This strategy was particularly important when recruiting participants from more rural-dwelling populations of older adults and those who reported lower SES, given that many of these individuals lived several hours away from our central site or had mobility limitations that would make travel difficult. By providing data collection in close geographic proximity to potential participants, we were able to utilize central facilities (e.g., senior centers) in those areas.

Third, given the study's focus on oral health, it was important to provide participants with a summary of our findings. Therefore, in addition to the financial compensation participants received, participants in our study were given a brief written summary report of their dental assessment. However, we emphasized that this assessment was done for research purposes and encouraged participants to follow up with their respective dentists regarding any problems noted on the summary. We also informed participants that the cognitive assessment was only for research purposes and thus should not be taken as a clinical diagnosis of cognitive status. If, during the course of our data processing, we identified participants who exhibited significant undiagnosed cognitive impairment or dementia, our team followed up with the participants and, as authorized, with participants' primary care physicians.

Fourth, in the later stage of data collection, we expanded our sampling pool to include individuals from assisted living facilities in addition to those residing in their own homes. By using this approach, we expected to recruit more individuals with cognitive impairment.

Recruitment outcomes

Study participants were recruited from 14 counties across the state. Data collection was conducted at 18 sites, including 12 senior or community activity centers, three dental or health clinics, two assisted living facilities, and one retirement housing community. Study participants were heterogeneous with respect to geographic location and sociodemographic characteristics (Table 1). Some of these respondents resided in the counties with the highest, lowest or median income levels in West Virginia.²⁰ Additionally, based on our preliminary data analysis, 23% of the participants in the study were cognitively impaired.

Reaching targeted enrollment

The overall response to this research project has been positive, both in terms of achieving our recruitment goals in a targeted time frame and in terms of participant satisfaction with the procedures. As illustrated in Table 2, informative presentations by a dentist and research staff were a successful strategy for recruiting study participants. More importantly, support from senior center directors and assisted living facility administrators was critical in recruiting study participants. They not only introduced the project to elders and asked them to sign up for participation, but also provided many of the sites for data collection. Overall, our efforts benefited from shifting to a proactive, community-focused, multi-pronged approach to recruitment.

Participant satisfaction outcomes

Our telephone screening process provided staff members a chance to explain the details of the study, as well as our purpose for conducting it. The majority of the participants were contacted by a research assistant after they responded to one of our interest fliers or sign-up sheets posted at area senior centers. Upon contacting prospective participants, a research assistant explained the project in further detail, asked for verbal consent, screened for eligibility, and scheduled appointments for data collection, a process lasting approximately 10 minutes. Eligible participants who responded via the sign-up sheets, where data collection locations and dates were already in place, were generally contacted, screened, consented, and scheduled quickly, most often within two weeks. Identical screening procedures applied to participants who responded via the interest fliers and word-of-mouth referrals, although scheduling was arranged at a later time.

This initial interaction also allowed participants to ask any questions or voice any concerns they may have about their participation. In addition, phone calls were made the day before the scheduled dates to remind participants of their upcoming appointments. Although the

study involved several components, response burden was not a particular concern for participants (including individuals with cognitive impairment).

Based on participant exit interviews at the time of the first wave of data collection, participants viewed the project positively with 93% reporting they would likely participate again if contacted in the future for longitudinal follow-up. The majority of the participants (74%) rated the length of data collection was “just about the right amount,” and only 2% of respondents described the procedure as too long. The ratings were very similar for those individuals with cognitive impairment. Ninety-two percent reported they would likely participate again, and 76% rated the length of data collection acceptable.

Discussion

Scholars have suggested various strategies aimed at recruiting older members of underrepresented groups into health research in general.^{16,17} However, our experience highlights the utility of many of these multi-pronged and proactive approaches in the recruitment of older individuals into dental research in particular. We can infer several important conclusions from our experience.

We must emphasize the importance of gaining the support of “gatekeepers,” who in our case consisted mainly of staff at senior organizations. Most of the staff members were very involved within their respective facilities and trusted by elders and thus were a major asset in assisting with recruitment. The value of building relationships with these individuals cannot be overstated.

It is worth noting that informing participants and their family members about the study and the importance of oral health could facilitate the recruitment of study participants. There is increasing scientific evidence suggesting that oral health is linked to various systemic diseases and conditions.^{21–23} Although no standardized questions were asked about this link between systemic diseases and oral health, few of the individuals with whom we interacted during our recruitment activities were aware of this relationship. Due to this lack of awareness, the importance of oral health could be easily overlooked. Consequently, prospective participants’ enthusiasm toward participation could be reduced. In our experience, having someone with strong credentials (e.g., a well respected dentist with a strong tie to the community) who was an engaging and dynamic speaker deliver educational presentations in various prospective recruitment locations greatly facilitated recruitment. Following the discussion (i.e., question-and-answer period), many elders in the audience who considered themselves eligible signed up for the study. In addition to facilitating participation, these educational activities, as a part of recruitment efforts, also provided a valuable service to the community. By piquing older adults’ interests through community presentations delivered by dental experts in the field, prospective participants were better able to see how their participation in a research project could have practical and translational implications. This activity also served to communicate the importance of the research to the population of interest.¹⁰

Our ability and flexibility to make data collection easily accessible to participants certainly resulted in positive outcomes. Portability of the research tools (e.g., portable dental chair) and the geographically centrally located research team in the state itself permitted flexibility and greater access, which ultimately allowed us to include potentially underserved participants in the sample.

Later during the course of the data collection, we expanded our recruitment to retirement communities and assisted living facilities, where a higher percentage of cognitively impaired elders may reside. In addition, we approached staff at respite programs with the intention of

recruiting potential participants with dementia or cognitive impairment through communication with their caregivers. We were aware that the characteristics of these participants could be somewhat different between those who resided in their own homes and those who lived in assisted living facilities, as shown in Table 1. Future analyses conducted by our research team will account for this issue by statistically controlling for the variable of place of residence.

Special steps must be taken when obtaining informed consent for vulnerable populations, including older adults with cognitive impairment, to participate in research. The study staff members seeking the consent must be trained to assess whether the potential subject demonstrates an understanding of the difference between treatment and research, understands the risks and benefits of study participation, understands the alternatives to study participation, and is able to make a decision. Our study was considered to have minimal risk and participants may have had some familiarity with the procedures as many were similar to those done as part of a routine medical or dental examination. Individuals with mild cognitive impairment or mild dementia are often capable of providing informed consent for studies such as the present one. If the potential study participant was considered to be incompetent to provide informed consent, then his/her legally authorized representative was asked to provide informed consent. The order of authority of those who can provide consent may differ state by state; investigators need to familiarize themselves with the requirements in their state. These procedures are routinely used in studies of cognitively impaired adults. However, Institutional Review Boards (IRB) at different institutions may have varying levels of experience with these standard procedures; therefore investigators may need to provide additional details to the IRB to help them become familiar with the use of these procedures.

We are aware that in our current study sample, 95% of participants reported being Caucasian or White, and only 5% reported racial or ethnic minority status (see Table 1). These figures are consistent with the ethnic/racial distribution of the state of West Virginia which consisted of 96.5% of elders aged 65 and above classified as White based on the 2000 Census.²⁴ In this study, we emphasize that the term “underrepresented groups” refers to a broad description of very heterogeneous populations. In this sense, we have accomplished our targeted goal of recruitment.

Conclusions

Our experience echoes recommendations made by other researchers using a multifaceted strategy of recruitment of members of underrepresented populations and extends this literature to include oral health research. Our experience suggests that key to successful recruitment of participants in research projects was gaining the support of staff at relevant community organizations; informing and educating community members, including older adults and their family members, of the project and the importance of oral health; and making data collection sites accessible for older adults.

Acknowledgments

The authors dedicate this article to the memory of their colleague, Jane M. Chalmers, BDS, MS, PhD, DABSCD, who provided invaluable guidance in the design and implementation of the oral health protocol for this study, but who died prior to completion of the project. We acknowledge her contribution to this manuscript and her ongoing influence on our research on oral health in later life. This project is funded by the National Institutes of Health/ National Institute for Dental and Craniofacial Research (5R21DE016970), the West Virginia University Health Sciences Center, and the West Virginia University School of Dentistry. Thanks are extended to Bill Moughamer, Linda Brown, and Stella Chapman, who provided invaluable assistance in data collection.

References

1. U.S. Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health; 2000.
2. Heaton LJ, Smith TA, Raybould TP. Factors influencing use of dental services in rural and urban communities: Considerations for practitioners in underserved areas. *J Dent Educ.* 2004; 68:1081–9. [PubMed: 15466058]
3. Vargas CM, Dye BA, Hayes K. Oral health care utilization by US rural residents, National Health Interview Survey 1999. *J Public Health Dent.* 2003; 63:150–7. [PubMed: 12962468]
4. Appalachian Regional Commission. Counties in Appalachia. 2008 [Accessed March 10, 2009]. <http://www.arc.gov/index.do?nodeId=27>
5. United States Department of Agriculture, Economic Research Service. State fact sheets. West Virginia: 2008 [Accessed August 6, 2009]. <http://www.ers.usda.gov/StateFacts/us.htm>
6. Tripp-Reimer T, Friedl MC. Appalachians: a neglected minority. *Nurs Clin North Am.* 1977; 12:41–54. [PubMed: 585012]
7. University of Pittsburgh Center for Rural Health Practice. Bridging the health divide: the rural public health research agenda. Bradford (PA): University of Pittsburgh Center for Rural Health Practice; 2004.
8. U.S. Department of Health and Human Services. Healthy People 2010: Understanding and Improving Health. 2. Washington, DC: U.S. Government Printing Office; November 2006 [Accessed January 12, 2009]. <http://www.healthypeople.gov/Document/HTML/Volume2/21Oral.htm>
9. Mody L, Miller DK, McGloin JM, et al. Recruitment and retention of older adults in aging research. *J Am Geriatr Soc.* 2008; 56:2340–8. [PubMed: 19093934]
10. Witham MD, McMurdo ME. How to get older people included in clinical studies. *Drugs Aging.* 2007; 24:187–96. [PubMed: 17362048]
11. Riedel-Heller SG, Busse A, Angermeyer MC. Are cognitively impaired individuals adequately represented in community surveys? Recruitment challenges and strategies to facilitate participation in community surveys of older adults. A review. *Eur J Epidemiol.* 2000;827–35. [PubMed: 11297225]
12. Callahan CM, Hall KS, Hui SL, Musick BS, Unversagt FW, Henrie HC. Relationship of age, education, and occupation with dementia among a community-based sample of African Americans. *Arch Neurol.* 1996; 53:134–40. [PubMed: 8639062]
13. Levkoff SE, Levy BR, Weitzman PF. The matching model of recruitment. *J Ment Health Aging.* 2000; 6:29–38.
14. Levkoff S, Sanchez H. Lessons learned about minority recruitment and retention from the Centers on Minority Aging and Health Promotion. *Gerontologist.* 2003; 43:18–26. [PubMed: 12604742]
15. Paskett ED, Reeves KW, McLaughlin JM, et al. Recruitment of minority and underserved populations in the United States: The centers for population health and health disparities experience. *Contemp Clin Trials.* 2008; 29:847–61. [PubMed: 18721901]
16. Curry L, Jackson J. The science of including older ethnic and racial group participants in health-related research. *Gerontologist.* 2003; 43:15–7. [PubMed: 12604741]
17. Gauthier MA, Clarke WP. Gaining and sustaining minority participation in longitudinal research projects. *Alzheimer Dis Assoc Disord.* 1999; 13:S29–33. [PubMed: 10369515]
18. National Center for Health Statistics. National Health and Nutrition Examination Survey, Dental Examiners Procedures Manual. 2001 [Accessed August 15, 2005]. <http://www.cdc.gov/nchs/data/nhanes/ohe.pdf>
19. Langa KM, Plassman BL, Wallace RB, et al. The Aging, Demographics, and Memory Study: Study design and methods. *Neuroepidemiology.* 2005; 25:181–91. [PubMed: 16103729]
20. U.S. Census Bureau. Small County Income and Poverty Estimates. [Accessed March 20, 2009]. <http://www.census.gov/did/www/saipe/>
21. Meurman JH, Hämäläinen P. Oral health and morbidity – implications of oral infections on the elderly. *Gerodontology.* 2006; 23:3–16. [PubMed: 16433636]

22. You Z, Cushman M, Jenny NS, Howard G. Tooth loss, systemic inflammation, and prevalent stroke among participants in the Reasons for Geographic and Racial Differences in Stroke (REGARDS) study. *Atherosclerosis*. 2009; 203:615–9. [PubMed: 18801482]
23. Joshipura KJ, Hung HC, Rimm EB, Willett WC, Ascherio A. Periodontal disease, tooth loss, and incidence of ischemic stroke. *Stroke*. 2003; 34:47–52. [PubMed: 12511749]
24. Wu, B. Aging in West Virginia: Findings from the 2000 Census. Center on Aging, West Virginia University; 2003.

Table 1

Participant characteristics (N=269).

Variable Name	Total Sample (N=269)	Home (N=243)	Assisted Living (N=26)
	Mean (Range)	Mean (Range)	Mean (Range)
Age	78.5 (69–94)	77.8 (69–94)	84.5 (70–94)
	Percentage	Percentage	Percentage
Female	65.4%	66.3%	57.7%
White	95.4%	95.0%	100.0%
<i>Marital Status</i>			
Never Married	1.5%	1.7%	–
Married	41.6%	42.4%	34.6%
Divorced/Separated	9.7%	10.7%	–
Widowed	46.8%	44.7%	65.4%
Other	0.4%	0.4%	–
<i>Highest Level of Education</i>			
Elementary School or Less	2.6%	2.9%	–
Some High School	13.0%	14.4%	–
High School	30.9%	30.5%	34.6%
Some College	22.3%	22.2%	23.1%
College	20.1%	18.5%	34.6%
Graduate Degree Or Above	11.2%	11.5%	7.7%
<i>Household Income</i>			
Under \$10,000	8.1%	7.9%	11.1%
\$10,000–\$19,999	30.5%	32.0%	11.1%
\$20,000–\$29,999	18.3%	17.5%	27.8%
\$30,000–\$39,999	12.6%	11.8%	22.2%
\$40,000–\$49,999	7.3%	7.0%	11.1%
\$50,000 or Above	23.2%	23.7%	16.7%
Have Medicare Coverage	98.1%	97.9%	100.0%
Have Medicaid Coverage	8.8%	9.2%	4.4%
Have Dental Insurance	13.3%	12.9%	18.2%

Table 2

Summary of participants by recruitment source.

Recruitment source	Number of Participants	% of Total Participants
Presentations by a dentist at senior centers and assisted living facilities	80	29.7%
Senior center/assisted living facility sign-up ¹	71	26.4%
Presentations by research staff at senior centers and assisted living facilities	32	11.9%
Referral by friend, spouse, or past participant	17	6.3%
Health fairs	10	3.7%
Fliers posted at various locations ²	11	4.1%
Referral by dentist and dental hygienist	8	3.0%
Church letters	7	2.6%
Newspaper ad/Newsletter	7	2.6%
Referral by staff at health clinic	5	1.9%
Witnessed data collection and signed up	4	1.5%
Referral by neuropsychologist	1	< 1%
Unknown source of recruitment	16	5.9%
Total (to date)	269	100

Note:

¹ Recruited by senior center directors and administrators from assisted living facilities.

² Fliers posted on car windshield in parking lots from locations such as supermarket and libraries, assisted living facilities, senior centers, and health clinic waiting rooms.