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### Title

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### Permalink

<https://escholarship.org/uc/item/7dv707pz>

### Journal

Geriatric Nursing, 38(6)

### ISSN

0197-4572

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### Publication Date

2017-11-01

### DOI

10.1016/j.gerinurse.2017.03.015

Peer reviewed



# HHS Public Access

Author manuscript

*Geriatr Nurs.* Author manuscript; available in PMC 2018 November 01.

Published in final edited form as:

*Geriatr Nurs.* 2017 ; 38(6): 527–530. doi:10.1016/j.gerinurse.2017.03.015.

## Hearing Loss Education for Older Adults in Primary Care Clinics: Benefits of a Concise Educational Brochure

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### Abstract

Hearing loss, common in older adults, is associated with negative health outcomes but screening rates in primary care clinics are low and individuals screened or referred often do not follow-through. To address these problems, we worked with 2 primary care clinics to design a simple screening and education protocol for integration into a standard office visit. To assess the effectiveness on the education brochure that was developed, we assessed its impact on individuals age 60 or older who screened positive for possible hearing loss. Ninety-four of 125 screened positive. Seventy-one agreed to participate and were given a brochure along with a brief review of the materials it contained. Of 67 completing follow-up, 23 (34%) sought further testing and 47 (70%) had used the information to enhance communication. A simple educational brochure accompanied by a brief review of its contents may enhance effective use of hearing healthcare services. (147)

### Introduction

Hearing loss serious enough to make understanding speech more difficult is common in older adults, affecting nearly two-thirds of those age 70 and older.<sup>1,2</sup> It is also associated with a variety of negative physical and mental health outcomes, including physical disability, falls, social isolation, diminished cognitive function, spousal depression, and possible increased health service utilization secondary to unmet health care needs.<sup>3–9</sup>

At the same time, many older persons remain unaware of their hearing loss or minimize its extent, partly because it comes on slowly or is attributed to aging and something they can do nothing about. When individuals do seek hearing assessments, they often either do not obtain hearing aids or return them because they do not assess the benefit as worth the cost or consider them stigmatizing.<sup>10</sup> Social support or lack thereof also plays a role.<sup>11</sup> Lack of

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coverage for hearing aids by Medicare<sup>12</sup> and many other health insurance plans further serves as a disincentive for their purchase.

An additional underappreciated deterrent is the low rate of hearing screening in primary care settings, even of older adults who are at high risk of hearing loss and in spite of its high prevalence.<sup>13</sup> This low rate of screening was recently reinforced in a review of the potential benefits of hearing screening accomplished for the United States Preventive Services Task Force (PSTF).<sup>14</sup> Between 40–86% of primary care practitioners admitted not screening routinely with barriers noted to include lack of time, perception that there are more pressing clinical issues, and lack of reimbursement. Lack of screening reinforces the perception that hearing loss is not an important health related condition, a perception that is supported by data documenting that referral has a positive impact on an individual seeking care.<sup>15</sup> Unfortunately, an additional problem exists. Even if individuals are screened and referred, they often have misperceptions or unrealistic perceptions about hearing aids that can influence hearing help seeking as well as subsequent hearing aid use.<sup>16–18</sup> They also lack awareness of alternative approaches to hearing aids that can facilitate communication in the context of a hearing loss.

To address both the lack of screening and the deficits in knowledge of hearing loss and available options, we worked with primary care practitioners to develop a short, cost-effective screening procedure for assessing hearing loss coupled with a brief education intervention to provide information that would encourage those found to have potential hearing loss to take steps to address it. The focus of the current paper is on whether the educational component was effective in producing a change in behavior for those who tested positive for possible hearing loss and to elicit whether additional changes in the brochure were needed before the full protocol was tested using a longitudinal research design.

## Material and Methods

### Design

To address the lack of understanding of the services that are available to persons with hearing loss and what hearing loss actually is or does in relationship to communication, we developed a brief trifold brochure that addressed questions often raised including information about hearing loss, how it affects one's communication, why it is important to address hearing loss early in the process, what hearing aids can and cannot do, and alternatives to the use of hearing aids. These alternatives included telephone enhancements, amplification using simple devices like pocket talkers, facing someone directly when talking, strategies for noisy restaurants or other meeting places, home amplification devices, and personal sound systems often available in theaters and auditoriums.

To assess the effectiveness of the educational protocol, we worked with two primary care clinics located in suburban environments in California that offered a wide range of services. Individuals age 60 and older coming into these collaborating clinics for checkups or routine procedures and who had not worn hearing aids for at least a year were asked by clinic personnel if they would consider taking part in a hearing study. Those who agreed were seen by the study's research nurse before being seen by their providers. The research nurse

explained the study and screened those who remained interested in participating for possible hearing loss. When the screening indicated possible hearing loss the individuals' providers were notified and they were told the research nurse would see them again after their exam to enroll those still interested in the study. If they agreed to see the research nurse after they saw the practitioner, the research nurse obtained a signed informed consent, accomplished the baseline interview, and carried out the brief education session on hearing loss and its treatment based on the brochure. The brochure was then given to the participant to take home. Participants were contacted by the research nurse after 3 months to see what the participants had done, if anything, and to obtain feedback on the brochure. If the participant had problems hearing on the phone, the research nurse went to the participant's home to conduct the follow-up interview.

### Participants

A total of 125 individuals expressed an interest in hearing about the study and agreed to be tested when seen by the research nurse. Ninety-four tested positive for possible hearing loss. Of those testing positive, 71 subsequently agreed to enroll in the study and were consented. At the 3 month follow-up, we were unable to reach one participant and 3 no longer wished to participate, leaving 67 with complete data.

### Data collection

The baseline questionnaire was administered after participants had seen their practitioners and had been consented. The questionnaire included a set of questions on knowledge about age related hearing loss and asked participants to assess their hearing using the Inner Ear scale, an instrument designed to assess the problems an individual has experienced related to his or her hearing loss over the prior 2 weeks.<sup>19</sup> The Inner Ear was found to be reliable (Cronbach's alpha = .85), have good test-test reliability (intraclass correlation coefficient=0.76), and sensitive to change.

Participants were also asked what their provider had said and done about their possible hearing loss. The participants were then given the brochure and a brief education intervention that focused on the main points included in the brochure.

At the three-month follow-up, participants were asked to describe to what extent they had followed through on practitioner recommendations, what if any changes they had made in their daily lives to address their hearing loss, how useful the brochure was to them, and any recommendations they had for improving the materials they received. Upon completion of follow-up, participants received a \$30 gift card. This study was approved by the Committee for Human Research at the University of California, San Francisco.

### Data analysis

Analyses were performed using SPSS version 22.0. We analyzed age differences for referrals and making changes with logistic regression models adjusting for gender.

## Results

### Sociodemographic data

The mean age of the 67 participants was 72.8 years with a range from 60 to 93. 63% were females and 37% were males. Minorities (Black, Asian, and Hispanic) constituted 15%. The group was fairly well educated with 79% having at least some college. For health insurance, 88% had Medicare coverage and, in addition to their primary health insurance, 92% had supplemental health insurance.

### Physician referrals

Frequency of physician referrals for further testing and subsequent patient follow-ups is shown in Table 1. There was a nearly even split in physicians offering to refer participants with 34 providing a referral and 33 not doing so. For the non-referrals the results of the hearing test were not even discussed by the physician in 31 of the 33 cases. For the other two, the participants reported that the physician did not feel their hearing loss was serious enough for a referral. For the 34 cases where referrals were offered, 25 individuals accepted the referral, 4 told the physician they preferred to go on their own, and the remaining 5 declined.

### Subsequent patient actions

A more complex picture emerges in the second part of Table 1 when subsequent patient actions are presented. While 28 of the 33 individuals who had not been offered a referral took no further actions, 5 did seek a hearing evaluation on their own, including the 2 where the physician had told them their hearing loss was not serious enough for a referral. For the 34 offered referrals, 18 followed through, although one was part of the group of 5 who had initially refused to be referred.

### Alternative changes

Results were stronger for adopting one or more of the 6 alternatives to hearing aids for improving hearing that were included in the brochure: As Table 2 indicates, during the three months prior to follow-up, 70% of the 67 participants made at least one change in their daily lives to improve their communication; 24% made more than one change. The most common were changing seating locations in restaurants or other places (34%), trying personal amplifiers or assistive devices for telephones, TVs, or theaters (22%), and changing how one faces or interacts with others when talking (13%).

### Gender and age referral differences

Although we found no gender differences in rates of referrals or making changes, we did find two interesting age differences. These results are presented in Tables 3 and 4. Physicians were more likely to refer individuals in their 70's for further testing compared with those younger or older. In contrast, younger individuals predominated when it came to making changes on their own to improve their hearing.

The relationships presented in Tables 3 and 4 were obtained using logistic regression models. For the first, being offered a referral was entered as the dependent variable and

having an age of 70 to 79 versus younger or older was entered as the independent variable. Gender was included in the model as an adjustment variable. The odds ratio for age 70 to 79 compared with younger or older was 3.81 with a 5% confidence interval of 1.36 to 10.63 indicating a statistically significant relationship. For making at least one change, chronological age was entered as the independent variable along with gender as an adjustment variable. The resulting odds ratio for age was 0.88 with a 95% confidence interval from 0.81 to 0.95, again indicating a statistically significant relationship.

### **Participant Feedback on the Brochure**

Almost all participants responded positively to the brochure and found it useful. At the same time, over half made suggestions for consideration. The most frequent were to include more detail on alternatives to hearing aids, list sources like websites for finding additional information, include local referral sites and places for obtaining lower cost aids, and discuss causes and preventive actions. In considering these suggestions, the challenge is being comprehensive while being concise and selecting the most valuable and influential data to include.

### **Discussion**

Primary care clinics face a significant number of time demands, including the need for practitioners to see a large number of individuals in a short time. The current study involved developing a protocol that would be both efficacious yet extremely efficient in terms of time demands. Although we used a nurse researcher for the testing and education, our goal was to develop a simple assessment and educational protocol that could be used by medical assistants as part of their routine intake protocol. The results of the impact of the brochure with a brief review on subsequent follow-up are encouraging but additional research is necessary to further confirm the findings.

Half of those who screened positive for possible hearing loss were referred for further testing, and 70% used our brochure to make changes in their daily lives to improve their hearing or enhance their communication. At the same time, even though physicians at the two clinics knew the study was taking place and were given the results of the screening, there was a near even split for whether they discussed the results with the participants. In some cases, other health problems may have taken too much time or were deemed of higher priority, as suggested by the findings of the PSTF<sup>14</sup>, but these findings support the need to educate practitioners so they understand the health implications of hearing loss and how facilitating its treatment can enhance the effectiveness of the care they provide.

In spite of the lack of referral, a small number of individuals (5 of 33) sought out further testing on their own because of what they had learned from the education and brochure even though their physician had not discussed their hearing loss. In the 34 cases where referrals were offered, 53% had already followed through after three months. The relatively short follow-up time, however, did not allow us to assess what these participants did over a longer period of time.

The age differences we noted in Tables 3 and 4 show a different pattern for being referred compared with making changes. Physicians were more likely to refer individuals in their 70's than for those younger or older. It is possible that reluctance to refer those in their 60's stems from a view that individuals in this age group will be more resistant to considering hearing aids. As noted in the introduction, there is a perceived stigma to wearing aids and denial of hearing loss is a problem. These biases are present in health care practitioners as well. Additionally, practitioners may believe younger individuals have less hearing loss than older individuals, and some data suggest that physicians are more likely to refer persons with more moderate hearing loss vs. mild and discourage the use of hearing aids for persons with mild hearing loss.<sup>15</sup> However, persons in their 60s are often active in the work setting where the ability to hear is often essential to their performance. Thus, lack of referral in this age group could be detrimental to finding solutions to issues that would allow them to continue to work successfully. We do not have a good rationale why those in their 80's were less likely to be offered referrals but this could relate to a belief that hearing loss is a natural occurrence in older adults and thus not in need of treatment, or that hearing assistance would be of less benefit. Whether practitioners believe that hearing loss in an older population is less detrimental to a person's well-being than in a younger population needs to be studied.

The decreasing proportions of those making changes from our brochure to improve their hearing by age, also noted in Table 4, is straight forward. This is troubling because the changes are relatively easy to make, can be done quickly, and cost nothing or very little. Those who do make them generally find them effective. And while the changes made may seem minor, we believe that these initial steps mean the individual is acknowledging their hearing loss and is willing to do something to enhance their communication and will, when effective, promote further actions over time.

We were not able to assess whether the older individuals who were less likely to make changes felt they had already adjusted to their hearing loss, whether they either did not encounter situations where they would use the strategies suggested, or whether they had withdrawn from such activities because of their hearing loss. This also warrants further study, especially given that social engagement has been found to be important for healthy aging.

## Conclusion

In spite of the current study's limitations, our data suggest that a very brief hearing educational brochure accompanied by a brief review can stimulate the subsequent use of positive communication strategies as well as the use of hearing health care services. Given the prevalence of hearing loss and its impact on multiple areas of health and well-being, such changes are important and may lead to even greater use of services when individuals see the positive impact they can have on their lives. Additional research is needed to promote hearing assessment in primary care settings and to delineate the most effective strategies to assure that practitioners are aware of the significant impact of hearing loss on an individual's health.

## Acknowledgments

Research Nurse Tina Rothschild did the audiologic testing and conducted the interviews.

Funding: This work was supported by the National Institute for Deafness and Other Communication Disorders. Grant number: R21DC011510.

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**TABLE 1**

Physician actions and patient follow-up after screening (N = 67)

Physician Actions	Totals	Patient Actions	
		Sought Specialist	Did Not Seek Specialist
No referral for further testing offered	33	5	28
Hearing loss not discussed	31	3	28
Hearing loss discussed but no referral	2	2	0
Referral for further testing offered	34	18	16
Patient declined referral	5	1	4
Patient preferred to go on own	4	3	1
Patient accepted referral	25	14	11

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**TABLE 2**

Number of changes made from study brochure to improve hearing (N = 67)

	<b>Number</b>	<b>Percentage</b>
Made 0 changes	20	29.9%
Made 1 change	31	46.3%
Made 2 changes	12	17.9%
Made 3 changes	4	6.0%

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**TABLE 3**

Age differences for referrals (N = 67)

	Age Groups			
	All Ages	60 to 69	70 to 79	80 and older
Referred for further testing	50.7%	37.5%	69.0%	35.7%

OR (Odds Ratio) for age 70 to 79 compared with other two age groups adjusted for gender = 3.81, 95% CI (Confidence Interval) = 1.36 – 10.63.

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**TABLE 4**

Age differences for making changes from study brochure (N = 67)

	Age Groups			
	All Ages	60 to 69	70 to 79	80 and older
Made at least one change	70.1%	91.7%	62.1%	50.0%

OR for age adjusted for gender = 0.88, 95% CI = 0.81 – 0.95.

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