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Hearing Health Perceptions and Literacy Among Primary Healthcare Providers in the United States: A National Cross-Sectional Survey

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Objective: To characterize current awareness, perceptions, and literacy surrounding hearing loss among United States primary healthcare professionals.

Study design: National cross-sectional survey study.

Setting: United States.

Participants: Four hundred six healthcare professionals.

Results: Survey respondents included 205 primary care physicians and 201 nurse practitioners or physician assistants. When compared with 10 other common health conditions, only 1% of respondents ranked hearing loss as a “most important” health condition to manage. Less than half of providers reported recommending hearing testing for their patients at least once per year, whereas evaluation of blood pressure, total cholesterol, body mass index, and blood glucose levels are recommended at least annually by more than 80% of providers. Although 95% of respondents indicated that it is somewhat important or very important for patients to know the standard definition for normal hearing, only 57% of surveyed providers know of a standard definition themselves, and only 28% reported familiarity with the concept of “20/20 hearing.” Conversely, more than 80% of respondents know the “normal” metric for blood pressure, total cholesterol, body mass index, blood glucose, and

vision. Most respondents realize that hearing is important to overall health and hearing loss can impact personal safety, lead to social isolation, and negatively impact quality of life. Fifty-four percent also acknowledged a link between hearing loss and depression, but a majority were not very aware of the relationship of hearing loss to risk of falling and dementia, reduced income and job opportunities, and type 2 diabetes. Importantly, only 40% of providers believe hearing loss is treatable, and only 17% believe it is preventable.

Conclusion: Despite widespread literacy of what constitutes normal blood pressure, total cholesterol, body mass index, blood glucose, and vision metrics, healthcare providers exhibit a poor understanding of normal hearing levels. Few providers prioritize hearing health or regularly recommend for annual hearing evaluation. Most providers believe that options for people with hearing loss are limited, which may have important implications for prioritizing discussion of hearing loss with patients.

Key Words: Cochlear implantation—Deafness—Hearing loss—Sensorineural hearing loss.

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INTRODUCTION

Hearing loss affects nearly a quarter of all Americans 12 years and older (1). It has been cited as the third most common chronic health condition in older adults (2), and the prevalence is expected to continue to increase because of the increasingly aging population (3). Although frequently disregarded as an expected consequence of aging, untreated hearing loss has been linked to depression, social isolation, poor quality of life, reduced educational achievement and employability, heightened fall risk, and premature mortality (4–7). Furthermore, in the updated 2020 Lancet Commission on Dementia, midlife hearing loss remains the single largest modifiable risk factor for later-life cognitive impairment and dementia (8). Importantly, hearing loss is more common in individuals with other comorbidities such as heart disease (9) and diabetes (10).

Despite compelling evidence suggesting that hearing loss is a significant health condition requiring early

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identification and intervention, it remains underdiagnosed and undertreated. Estimates suggest that 21% of individuals who are candidates for hearing aids use them (11); 2.1 to 12.7% of candidates for cochlear implants have one, with a range depending on whether conservative or more inclusive candidacy criteria (e.g., single-sided deafness) are applied (12). Furthermore, it is impossible to estimate how many of those who are using these devices are potentially inadequately treated. Multiple factors have been cited as possible underlying reasons for inadequate treatment of hearing loss, including lack of routine screening protocols for at-risk adults, misconceptions regarding the importance of early and adequate management, lack of recognition of hearing loss as a healthcare priority, stigma, and cost, among others (13).

Healthcare providers are often the front line of intervention for health conditions, including hearing loss. However, approximately 50% of primary care providers believe that nothing can be done to manage hearing loss and often do not inquire about it (14). Unfortunately, even when asked, approximately 30% of adults misclassify their hearing ability (15), suggesting that routine formal screening for hearing loss is required. Patients' poor ability to self-identify as requiring intervention for hearing decline underscores the importance for literacy and proficiency surrounding hearing loss among frontline healthcare providers. For this reason, the current study was undertaken to assess attitudes and behaviors regarding hearing loss among healthcare providers in the United States.

METHODS

An online quantitative survey (Supplementary Appendix, <http://links.lww.com/MAO/B454>) was sent to a convenience sample of 4,300 US healthcare providers from May 5 to May 13, 2019; 951 respondents started the survey, and 406 qualified and completed. The overall survey response rate was 9.4%, and the overall conversion rate was 43%. Continuous features were summarized with medians and interquartile ranges, and categorical features were summarized with frequencies and percentages. Participants were asked to consider patients 50 years and older in their responses. Statistical analyses were conducted using SAS software (SAS Institute, Cary, NC).

RESULTS

Respondent Demographics

Survey respondents included 406 US healthcare professionals; 205 were primary care physicians, and 201 were nurse practitioners (NPs) or physician assistants (PAs). Half of healthcare professionals surveyed were female, and 44% were in private practice. Demographic respondent data are presented in Table 1.

Defining Hearing Loss

Healthcare professionals felt it was "very important" (42%) or "somewhat important" (53%) for patients 50 years or older to know the standard definition for normal hearing and hearing loss. However, only 57% of healthcare professionals surveyed were aware that an established definition

TABLE 1. Demographics for healthcare professional respondents

Demographics ^a	All (n = 406)	Physicians (n = 205)	NPs/PAs (n = 201)
Sex			
Male	50	78	23
Female	50	22	77
Geographic region			
Northeast	21	19	23
Midwest	22	19	25
South	38	38	39
West	18	24	12
Job title			
Physician	50	100	—
NP	25	—	50
PA	25	—	50
Practice type ^b			
Private practice	44	51	36
Physician network practice	7	8	5
Outpatient clinic practice	23	21	25
Community hospital-based practice	12	9	14
Academic/teaching hospital-based practice	16	11	21
Private hospital-based practice	6	4	8
Military/other government practice	1	1	1
Other	2	1	2
Years in practice post-residency for physicians	—	20 (12–27)	—
Years in practice for NPs/PAs	—	—	11 (6–19)
Percent of time spent treating patients	99 (90–100)	99 (90–100)	99 (90–100)
Percent of patients in the following age brackets ^c			
0–17 yr	5 (0–10)	5 (0–10)	5 (0–10)
18–34 yr	15 (10–20)	15 (10–20)	15 (10–20)
35–49 yr	20 (15–25)	20 (15–25)	20 (15–25)
50–64 yr	20 (20–25)	20 (20–25)	20 (20–25)
65–74 yr	20 (15–25)	20 (15–25)	20 (10–25)
75+ yr	10 (9–20)	15 (10–20)	10 (5–20)

^aDemographics summarized with median or percentages.

^bRespondents were asked to check all that apply.

^cRespondents were asked to focus on patients 50 years or older for the questions summarized in the remaining tables.

NP indicates nurse practitioner; PA, physician assistant.

existed. By comparison, healthcare professionals were more frequently aware of established "normal" or "average" ranges for blood glucose (98%), blood pressure (98%), body mass index (95%), cholesterol (93%), and vision (76%) (Table 2). Not surprisingly, hearing came in last among these conditions in terms of healthcare provider familiarity of these normal ranges. In this case, only 28% of providers were familiar with the concept of "20/20 hearing," whereas 82% or more were familiar with other standard health metrics (Table 2).

Prioritization of Hearing Health

When asked to rank the importance of addressing hearing loss within the context of 10 other common health conditions, including Alzheimer's disease, arthritis, asthma, cancer, chronic obstructive pulmonary disease, diabetes, heart disease, high blood pressure, obesity, and vision loss, hearing loss was tied for last by healthcare professionals (Table 3). When considering annual health maintenance,

TABLE 2. Literacy and utilization of “normal” or “average” health metrics among healthcare professionals

Responses ^a	All (n = 406)	Physicians (n = 205)	NPs/PAs (n = 201)
Knowledge of a standard definition for normal or average health metrics ^a			
Blood pressure	98	97	98
Total cholesterol	93	92	95
Body mass index	95	95	95
Blood glucose	98	98	98
Vision	76	77	75
Hearing	57	62	52
Familiarity with normal or average health metrics ^b			
Blood pressure 120/80 mm Hg	94	96	92
Total cholesterol <200 mg/dl	93	95	92
Body mass index 18.5–24.9 kg/m ²	90	92	89
Blood glucose 70–130 mg/dl	89	89	88
Vision 20/20	82	85	78
Hearing 20/20	28	32	23
Frequency of evaluating/testing and discussing results of health conditions with patients ^c			
Blood pressure	93	98	87
Total cholesterol	82	91	72
Body mass index	90	96	83
Blood glucose	87	93	82
Vision	60	68	51
Hearing	46	55	36

^aResponses of “yes” summarized with percentages.

^bResponses of “very familiar” summarized with percentages.

^cResponses of “twice a year or more” combined with “once a year” summarized with percentages.

NP indicates nurse practitioner; PA, physician assistant.

hearing loss is the least commonly discussed or recommend screening, with only 46% of providers reporting they do so (Table 2).

When hearing loss is discussed, 65% of healthcare professionals recommend that patients 50 years or older with hearing loss receive at least annual hearing testing, and 36% recommend at least annual testing among the same-age demographic without diagnosed hearing loss (Table 4). However, in a recent survey (16), when US adult respondents were asked when the last time their hearing was checked, the most frequent response was “longer than

TABLE 3. Most important health condition to manage (hierarchy of health conditions) among healthcare professionals

Responses ^a	All (n = 406)	Physicians (n = 205)	NPs/PAs (n = 201)
Heart disease	29	33	25
Cancer	20	17	24
Diabetes	15	15	15
High blood pressure	15	17	13
Obesity	12	11	12
Arthritis	2	1	3
COPD	2	1	2
Vision loss	2	4	1
Alzheimer's disease/dementia	1	0	1
Asthma	1	0	1
Hearing	1	1	1

^aResponses summarized with percentages.

COPD indicates chronic obstructive pulmonary disease; NP, nurse practitioner; PA, physician assistant.

TABLE 4. Frequency of recommended hearing testing among healthcare professionals

Responses ^a	All (n = 406)	Physicians (n = 205)	NPs/PAs (n = 201)
Patients without hearing loss			
Twice a year or more often	2	1	2
Once a year	34	33	36
Every 2 yr	17	20	15
Every 3–5 yr	11	10	12
Only as needed	34	36	32
Never	1	<1	2
Patients with hearing loss			
Twice a year or more often	18	15	21
Once a year	47	47	48
Every 2 yr	12	16	9
Every 3–5 yr	6	7	4
Only as needed	15	16	14
Never	2	<1	3

^aResponses summarized with percentages.

NP indicates nurse practitioner; PA, physician assistant.

10 years ago” (22%); among subjects with hearing loss, the most frequent response was “in the past 6 months” (36%), and in total, 64% had their hearing checked within the past 12 months. The second most commonly cited reason for not pursuing a hearing test was “my healthcare provider has never mentioned getting my hearing tested” (30%). The most common reasons for a healthcare professional to initiate a conversation about hearing loss are presented in Table 5.

Awareness and Perceptions Surrounding Hearing Loss

Although 54% of healthcare professionals were “very aware” of the link between hearing loss and depression, awareness of other health risk associations ranged from 37% to as low as 10% (Supplementary Table 1, <http://links.lww.com/MAO/B455>). Although most healthcare professionals acknowledge the potential impacts of hearing loss on health, safety, and quality of life, less than half strongly agree that hearing loss is treatable and less than 20% strongly agree that hearing loss is preventable (Table 6).

Prevention and Treatment

When asked about hearing loss prevention related to noise exposure, 71% of healthcare professionals recommended use of hearing protection such as earplugs and earmuffs when around loud noise (Supplementary Table 2, <http://links.lww.com/MAO/B455>); however, 41% indicated they did not know at what sound level these measures should be used.

DISCUSSION

Although pervasive, hearing loss has been traditionally reduced to an unavoidable aspect of senescence, garnering limited attention in medical education and practice. However, growing evidence over the past two decades links hearing loss with myriad important health consequences beyond obvious quality-of-life decrements to include elevated risk of dementia and even mortality (4–8). Despite

TABLE 5. *Reasons to initiate conversation about hearing loss among healthcare professionals*

Responses ^a	All (n = 406)	Physicians (n = 205)	NPs/PAs (n = 201)
Reasons healthcare professional initiates conversation			
Noticed difficulty hearing during a discussion with patient	87	83	91
Caregiver/loved one requested to talk about hearing loss	86	85	88
Patient noted hearing loss on intake form	77	77	78
Patient demonstrated symptoms possibly associated with hearing loss	65	63	68
Routine part of a physical	58	58	58
Association with other health conditions	47	39	55
Other	1	2	1
None of the above	1	1	1
Reasons patient initiates conversation			
They have experienced a notable change in their hearing	83	82	85
A loved one recommended they ask about it	83	86	79
They want to talk about specific solutions	64	66	61
They do not enjoy certain activities anymore	45	44	47
They have concerns about their safety	36	32	39
None of the above	1	1	1
Other	<1	0	1

^aResponses summarized with percentages.

NP indicates nurse practitioner; PA, physician assistant.

ultimately not treating most causes of adult hearing loss, primary care and other frontline providers harbor a significant educational burden as most patients rely heavily on those interactions for information regarding their medical conditions (17,18).

The current work illustrates the disproportionately limited understanding of the consequences of hearing loss compared with other common medical conditions among healthcare providers in the United States. For instance, although more than half of providers recognize the relationship between hearing loss and depression, less than 40% appreciate the association of hearing loss with increased fall risk, reduced income and job opportunities, dementia, and type 2 diabetes mellitus. Thus, despite over 80% of providers discussing blood pressure, total cholesterol, body mass index, and blood glucose with patients at least once per year, only 46% acknowledge doing the same for hearing loss. A minority of providers understand that hearing loss is treatable, and only 17% believe it is preventable. These observations may be influenced by providers feeling limited in their capacity to offer solutions when inquiring about hearing loss. Substantial barriers surrounding hearing healthcare among primary care practices have been described, including limited referral options to an audiologist as well as general attitudes surrounding the effectiveness and usability of hearing aids (19–22).

Notable differences were observed regarding awareness of a standard definition for normal or average hearing compared with similar metrics for other health conditions.

Whereas more than 80% of providers readily recognized normative values for blood pressure, total cholesterol, body mass index, blood glucose, and vision, only 28% of providers understood the metric “20/20” as it relates to hearing. Even without a specific metric, only 57% of providers know there is a normative level. It is therefore interesting to note that 95% of providers believed that it is somewhat important or very important for patients to know the standard definition for normal hearing, even though providers do not feel comfortable that they know that information themselves.

Studies suggest that healthcare providers, and particularly primary care providers, are influential for changing patient behaviors. Often the first point of contact for a patient experiencing changes in their hearing (23), primary care providers play an essential role in educating patients and inspiring action. In a recent study considering the role of primary care providers for encouraging older adults to change their lifestyle behaviors pertaining to diet and physical activity, participants reported that their providers influence their health behaviors by developing strong relationships, addressing concerns and encouraging change, and providing concrete instruction. When providers did not discuss the relevant topics, or mentioned them only briefly, participants frequently perceived that they should continue their current behaviors (24). Similarly, if healthcare providers neglect hearing loss or cannot provide substantive direction about management, patients will unknowingly be at risk for deleterious long-term sequelae.

Bennett et al. (19) recently reviewed data surrounding the implementation of hearing screening programs targeting older adults, showing that small changes—such as routinely asking hearing screening questions and establishing a relationship with local audiology and otolaryngology practices—significantly increase detection rates of hearing loss and subsequent intervention. However, in the absence of a standard screening program for at-risk adults, it is uncommon for patients to routinely receive recommendation for comprehensive hearing evaluation. In the 2014 National Health Interview Survey, of 40.3 million adults with self-reported hearing loss, 12.9 million (32%) had never seen a healthcare professional regarding their hearing loss and

TABLE 6. *Impact of hearing loss on health, safety, and quality of life among healthcare professionals*

Responses ^a	All (n = 406)	Physicians (n = 205)	NPs/PAs (n = 201)
Hearing loss impacts the quality of one's life	84	81	87
Hearing loss can lead to social isolation	78	77	78
Hearing loss can impact one's personal safety	76	72	81
Hearing is important to my overall health	67	60	74
Hearing loss is treatable	40	36	44
Hearing loss is a normal part of aging	20	20	21
Hearing loss is preventable	17	19	14

^aResponses of “strongly agree” summarized with percentages.

NP indicates nurse practitioner; PA, physician assistant.

over 11 million (27%) had never previously undergone formal audiometric testing (25).

Beyond implementation of screening programs into primary care practices, several other key action areas exist to improve hearing healthcare nationally. For instance, the combination of often inadequate reimbursement for hearing health services and the significant associated out-of-pocket cost of many hearing rehabilitation devices, such as hearing aids, introduces an important socioeconomic barrier. Interestingly, delays in patient referral are prevalent even within many general audiology and otolaryngology practices (26). Evidence suggests that many patients with significant hearing disability are inadequately treated, with modern cochlear implant recipients experiencing several years of qualifying hearing loss before undergoing cochlear implantation (27,28). Similarly, many sociodemographic factors seem to influence who receives cochlear implants among those with qualifying hearing loss (29,30). Taken together, multiple actionable areas exist to improve widespread hearing health across the United States.

There are several important limitations of the current work. First, survey data are inherently influenced by respondents' susceptibility to recall bias. For instance, the act itself of taking a survey about hearing loss likely influences responses to questions such as the likelihood of recommending hearing evaluation. The extent to which recall bias influences the primary conclusions of the current work—that is, the uniformly poor understanding of normal hearing compared with other common medical conditions and the limited understanding of long-term sequelae of untreated hearing loss—is presumably less affected as these questions chiefly deal with what respondents currently know rather than past or future behavior. In addition, the findings of a nonrandomized convenience sample cannot be extrapolated beyond the population sampled. Future studies may benefit from eliciting more information regarding the typical populations seen (e.g., geriatric versus family medicine practices) and any screening measures already routinely incorporated.

CONCLUSION

Despite widespread literacy of what constitutes normal blood pressure, total cholesterol, body mass index, blood glucose, and vision metrics, respondents demonstrate limited understanding of normal hearing levels. Few providers report hearing loss as a top 10 health condition to evaluate and manage, and recommendation for annual hearing evaluation is predictably low. Most providers believe that options for people with hearing loss are limited, and this may harbor important implications for prioritizing discussion of hearing loss with patients. Primary care providers are key frontline contacts for patients who may have hearing loss that has not yet been identified or managed. Ensuring frontline provider literacy surrounding normative metrics and reliable standards for referral is essential for improving hearing healthcare nationally.

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