

The Health Status and Health Care Utilization of Deaf and Hard-of-Hearing Persons

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Objective: To evaluate whether health habits, self-reported health status, and communication with physicians play a role in the known altered health care utilization patterns of deaf and hard-of-hearing persons.

Design: A cross-sectional survey. Respondents were given the choice of completing either a self-administered written survey or an American Sign Language interview-administered survey.

Population: Eighty-seven deaf and hard-of-hearing members of various organizations serving this population in southeastern Michigan and 88 hearing patients from a family practice clinic in the same area.

Results: Deaf and hard-of-hearing persons visit physicians more frequently ($P=.01$), have a lower incidence of ever smoking tobacco ($P<.0006$) and of alcohol use ($P=.04$), have more difficulties communicating with physicians ($P<.001$), have trouble understanding physicians ($P<.001$), and feel less comfortable with physicians ($P<.001$). Lower current tobacco use among deaf and hard-of-hearing persons was only seen in persons who were not educated be-

yond high school. Increased frequency of physician visits for deaf and hard-of-hearing persons was especially noticeable in the group of persons 60 years of age and older. Our finding that use of interpreters is associated with increased utilization and decreased understanding suggests deaf and hard-of-hearing patients presenting with interpreters warrant more focused attention from physicians. Reasons for seeing physicians did not explain the difference in frequency of physician visits between the two groups.

Conclusions: Deaf and hard-of-hearing persons report a lower subjective health status and higher physician utilization, as well as substantial communication difficulties with physicians. They also report better health-related behaviors, namely less use of tobacco and alcohol. The use of interpreters did not decrease physician utilization or improve the understanding of physicians by these persons. Overall, our results underscore the fact that deaf and hard-of-hearing persons constitute a minority population that experiences considerable difficulties in the patient-physician relationship.

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HEARING IMPAIRMENT is the second most prevalent chronic condition in the United States.¹ Deaf and hard-of-hearing persons constitute approximately 9% of the population (of whom one in 10 have a profound hearing loss)¹ and are increasing in prevalence owing to the aging of the population.² Between 1980 and 2050, "the number of people with hearing and speech problems will increase at a faster rate than the total US population" (Fact Sheet, The University of Michigan Communication Disorders Center, Ann Arbor).

In 1987, persons with hearing and

communication disorders cost society \$30 billion for care and treatment, re-education, and lost wages.³ Furthermore, the 1977 National Health Interview Survey (NHIS) reveals that deaf and hard-of-hearing persons use medical services more than hearing people. They see physicians twice as often, have more bed days due to illness or injury, have more days of disability, and assess themselves as less healthy.⁴

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PATIENTS AND METHODS

SAMPLE

All respondents in the study resided in southeastern Michigan. To ensure a broad sampling of more profoundly deaf and hard-of-hearing persons, we drew from a number of sources for respondents. These included persons listed in the Washtenaw County Telephone Device for the Deaf directory, attendees at an Ann Arbor Club for the Deaf meeting, persons visiting the Community Services for the Hearing Impaired Center in Pontiac, persons attending a picnic sponsored by the Detroit Club for the Deaf, attendees at a Washtenaw Self-Help for the Hard of Hearing meeting, attendees at a Lutheran church for the deaf in Royal Oak, attendees at a Saginaw Club for the Deaf meeting, attendees of the Dearborn Civic Center for the Deaf, attendees of a St John's civic meeting in Warren, and attendees of a biweekly meeting sponsored by the Detroit Hearing and Speech Clinic. These groups tend to be composed of deaf and hard-of-hearing persons with severe hearing losses that occurred before 60 years of age. All individuals 18 years of age and older present were invited in person to participate in the study; 50% agreed to do so.

Respondents in the control group were recruited from patients attending the University of Michigan Family Practice clinic in Chelsea. This clinic was chosen because patients there have relatively low incomes, a known characteristic of deaf and hard-of-hearing persons.⁹ On days of recruitment, all patients 18 years of age and older who arrived for appointments were asked in person to complete the survey in the waiting room prior to seeing their physician. Compliance was over 90%.

It took an average of 15 minutes to complete the written survey and 30 minutes to complete the ASL survey. Demographic data were not available from individuals who declined to participate in the study.

SURVEY DESIGN

Survey questions were selected from previously validated studies such as the RAND Corporation survey and the NHIS. The questions encompassed six areas of inquiry: degree and causes of hearing loss; frequency and form of conversation

used with deaf, hard-of-hearing, and hearing people; frequency, type, and location of health care utilization; practice of health-related habits, including smoking, drinking, and use of recreational drugs; partner support; and basic demographic information. Attitude scales were designed to investigate reaction toward and level of understanding when communicating with physicians.

Since the average prelingually deaf person reads at a fourth-grade level^{15,16} and employs ASL, not English, as his or her primary language, the survey required further modification to ensure that deaf and hard-of-hearing persons would understand it. First, all related questions were grouped together, making the survey easier to follow. Second, to assess the reliability of the written questionnaire for ASL administration, six deaf and hard-of-hearing persons with a severe hearing loss pretested the survey. Three individuals completed the written questionnaire followed by the ASL translation, and the other three persons completed the ASL format first followed by the written questionnaire. With the exception of three questions identified as ambiguous to those whose primary language was ASL, responses were concordant. The three ambiguous questions were modified and minor adjustments in the survey layout made based on the subjects' suggestions.

The survey administered to the hearing control group was identical to that given the deaf and hard-of-hearing group except for an additional question placed at the beginning asking whether the respondent had a hearing loss. If the subject indicated having none, he or she was asked to skip the first section containing questions specifically relating to hearing loss. Those indicating a hearing problem, on the other hand, completed the first section.

STATISTICAL TESTS

After initial descriptive analysis, differences between the hearing and deaf and hard-of-hearing groups with respect to demographics, attitudes, and health behaviors were tested using χ^2 tests for differences in proportions and *t* tests for differences in means. For health behaviors, health status, and health care utilization, multiple logistic regression and stratified analysis were used to control for potential confounding and effect modification associated with age, education, gender, and income.

Preliminary results from the 1990 survey are similar (oral communication, Peter Ries, May 1992).

Various explanations for these findings have been postulated, such as communication barriers with physicians, especially for deaf and hard-of-hearing persons with a severe hearing loss.^{5,6} This is in part due to their use of American Sign Language (ASL), a language with a unique syntax and grammar.⁷ A study of deaf patients in New Orleans, La, documented that they had significant difficulties communicating with physicians. Many deaf persons did not understand basic medical terminology, including words such as *allergic*.⁸ The lower educational and

economic status of these persons^{9,10} may also play a role; persons of lower socioeconomic status see physicians more frequently.¹¹

Like other minority populations, deaf and hard-of-hearing persons have a poorer health status than the general population, ostensibly because of cultural and communication differences.^{12,13} In fact, deaf persons appear to be the non-English-speaking patients at greatest risk for poor physician-patient communication.¹² Whether this causes their poorer health status and altered health care utilization pattern, however, is unclear. The complexity of the situation is manifested by the fact that, despite the

Table 1. Sample Demographics

	Deaf and Hearing-Impaired Persons	Hearing Persons	P*
No. of subjects	87	81	...
Average age, y	49	39	.001
White, %	95	96	NS
Percentage female	57	71	NS
Mean income <\$20 000, %	46	26	.005
Mean education, y	12	13	.015
Married or in live-in relationship, %	67	79	NS
Receive Social Security, %	41	15	.001
Receive welfare income, %	17	1	.003

*NS indicates not significant.

above facts, prevocationally deaf persons may live longer than the general population.¹⁴

We hypothesize that communication barriers and a decreased smoking prevalence play a significant role in the altered health care utilization patterns and increased longevity, respectively, of deaf and hard-of-hearing persons. This article reports the findings of a survey we conducted in a population of deaf and hard-of-hearing persons and, for comparison, in a sample of the hearing population.

RESULTS

DEMOGRAPHICS

Of the 175 individuals completing the survey, 87 were deaf and hard-of-hearing persons and 88 were hearing persons. Seven patients in the control group had a hearing loss and were excluded from further analysis. Demographic results are shown in **Table 1**. The deaf and hard-of-hearing group was older, less educated, had less income, and received more governmental financial aid than the hearing group.

Fifteen deaf and hard-of-hearing persons (17%) completed the survey in ASL. Fifty (57%) of 87 deaf and hard-of-hearing individuals were profoundly deaf and 52 (60%) of 87 had been so since before 3 years of age. The **Figure** shows the determinants of their hearing loss. Medical illness accounted for the highest percentage; only 1.14% (1/87) of the respondents had a hearing deficit due to aging.

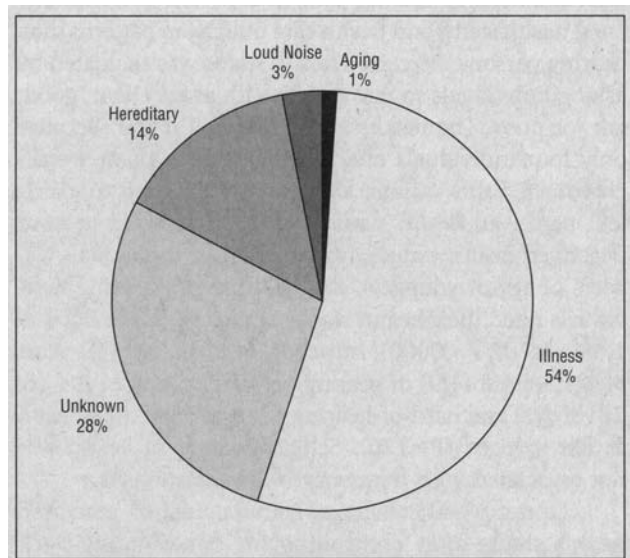
Of those deaf and hard-of-hearing persons who were married or had a significant personal relationship, 61% (34/56) had partners with a profound hearing loss and 14% (8/56) had partners with a mild or moderate loss. None of the control group's partners had a profound hearing loss and of those who answered this question only 9% (5/56) had a mild or moderate loss.

Deaf and hard-of-hearing persons reported substantial communication difficulties with physicians. The various methods of communication used in different situations are shown in **Table 2**. Only 78% (68/87) of deaf and hard-of-hearing subjects regularly communicated with hearing persons, whereas no hearing person did so with deaf and hard-of-hearing persons. Furthermore, 59% (51/87) of deaf and hard-of-hearing persons understood their physicians "sometimes" or "not at all" whereas no hearing person reported such difficulty (**Table 3**).

Independent *t* tests revealed that deaf and hard-of-hearing respondents had significant attitudinal differences regarding their physician interaction compared with their hearing counterparts (**Table 4**). There was no difference in level of trust in physicians. Age, income, and education did not modify these relationships. Attitudes toward physicians within the deaf and hard-of-hearing group were significantly more favorable for respondents who visited physicians three or more times per year compared with those who went fewer times ($P < .05$).

Significant differences existed between deaf and hard-of-hearing persons who completed the survey in ASL and those who took the self-administered survey (**Table 5**). There was no significant difference, however, between persons using ASL and other deaf and hard-of-hearing persons in frequency of their physician visits.

Use of interpreters (oral or sign) during physician visits was associated with differences in health care variables. Persons who used them were almost three times as likely to see physicians six or more times yearly ($P = .0001$) and understood physicians less often ($P = .04$). Although use of interpreters was more common in those who pre-



Causes of hearing loss in 87 deaf and hard-of-hearing persons completing the survey. Percentages have been rounded to the nearest whole number.

Table 2. Methods of Communication of Respondents*

	Deaf and Hard-of-Hearing Persons, %	Hearing Persons, %
Regularly communicate with		
Hearing persons	78	100
Deaf and hard-of-hearing persons	94	0†
How communicate with significant other		
Talk	38	100
Sign	78	0
How communicate with hearing persons		
Talk	62	100
Write	65	0
Use interpreter	35	0
How communicate with deaf and hard-of-hearing persons		
Talk	45	0
Write	18	0
Sign	83	0
How communicate with physicians		
Talk	51	100
Write	51	0
Use interpreter	18	0

*The percentages may add up to over 100% because multiple mentions were allowed.

†None of the hearing persons communicated with deaf and hard-of-hearing persons regularly.

for ASL (43% [6/14] for ASL speakers vs 24% [16/67] for English speakers), the relationship was not statistically significant.

HEALTH STATUS AND HEALTH CARE UTILIZATION

Deaf and hard-of-hearing persons reported different self-rated health status and health care utilization patterns than hearing persons. Perceived health status was evaluated by asking individuals to rate their health as excellent, good, fair, or poor. The results are shown in Table 3. Because only four individuals rated their health as poor, we dichotomized this variable into those with good to excellent perceived health status and those with fair to poor perceived health status. Among younger individuals (60 years of age or younger), deaf and hard-of-hearing individuals rated their health status worse (18.5% [12/65] vs 1.4% [1/70]; $P=.0008$); however, in those over 60 years of age, 44.4% (4/9) of hearing persons vs only 21.4% (6/28) of deaf and hard-of-hearing persons rated their health as fair to poor ($P=.176$). Self-assessment of health was not associated with frequency of physician visits.

To test whether hearing status predicted perceived health status after controlling for confounding variables, we used multiple logistic regression. Hearing status, age (older than 60 or no older than 60 years of

age), and an interaction term for age and hearing status were all significant at the .01 level (Table 6). In those 60 years of age or younger, perceived fair or poor health status was 13 times more common in deaf and hard-of-hearing persons than in hearing persons (adjusted odds ratio [OR]=13.4; 95% confidence interval [CI], 1.67 to 107.4). In those over 60 years of age, perceived fair or poor health status was less than one third as common in deaf and hard-of-hearing persons (adjusted OR=0.29; 95% CI, 0.13 to 0.68).

Deaf and hard-of-hearing individuals reported more physician visits than hearing persons (Table 3). To perform a multivariable analysis, we dichotomized frequency of physician visits as none to two vs three or more per year. Only age and hearing status were significant predictors of frequency of physician visits in logistic regression. Deaf and hard-of-hearing persons were more than twice as likely to have three or more physician visits as hearing persons (adjusted OR=2.2; 95% CI, 1.12 to 4.19). Age magnified the difference in frequency of physician visits between groups, particularly pronounced for persons over 60 years of age ($P<.05$).

Table 3. Health-Related Data*

	Deaf and Hard-of-Hearing Persons, %	Hearing Persons, %	P†	
Understands physician without interpreter				
Very well	41	100	.001	
Sometimes	39	0		
Not at all	20	0		
Self-reported health status				
Excellent	33	33	NS	
Good	47	61		
Fair	16	5		
Poor	3	1		
Physician visit frequency, No./y				
0-2	44	67	.001	
3-5	38	25		
≥6	18	9		
Physician visit frequency by age, No./y				
<60				
0-2	53	70	<.05	
≥3	47	30		
≥60				
0-2	22	50		
≥3	78	50		
Health habits				
Current or past smoker	31	57	.0006	
Smoked in past year	18	28	NS	
Drinks alcohol	48	64	.04	
Uses drugs	8	18	NS	

*Percentages have been rounded.

†NS indicates not significant.

Table 4. Attitudinal Differences Toward Physicians Between Deaf and Hard-of-Hearing and Hearing Persons*

	Deaf and Hard-of-Hearing Persons	Hearing Persons	P
Felt less comfortable with their physician	4.5	3.9	<.001
Had a harder time communicating with physician	4.1	2.6	<.001
Were more likely to feel physicians did not tell them about treatments or medicine they prescribed	4.2	3.9	<.01
Were more likely to dislike going to physicians because of communication difficulties	4.3	3.6	<.001
Felt less treated as a person by physician	4.2	3.9	<.03
Asked physician to repeat themselves less often when their instructions were not understood	4.3	4.0	<.03
Were more worried that physicians prescribed the wrong treatment because of communication problems	4.2	3.2	<.001

*Ratings were calculated on a scale of 1 to 5, where the higher number indicates more agreement with the statement.

Respondents were specifically asked the type of physician they saw at their most recent visit and the reason for seeing that physician. There was no difference in these variables between deaf and hard-of-hearing and hearing persons, and they were not associated with frequency of visits.

HEALTH BEHAVIORS

We examined the relationship of hearing status to historical and current smoking behaviors, recreational drug use, and alcohol use (Table 3). In each case, a lower percentage of deaf and hard-of-hearing persons reported the habit. To examine age, education, gender, and household income as potential confounders, we used stratified analysis and logistic regression.

A markedly higher proportion of hearing than deaf and hard-of-hearing persons had a history of ever smoking cigarettes. Education and gender were strongly related to this, and controlling for these factors magnified the relationship with hearing status. The adjusted OR from logistic regression for ever smoking in hard-of-hearing persons was 0.19 with a 95% CI of 0.09 to 0.40.

Current smoking (smoking within the past year) was considerably less prevalent than a history of ever smoking (Table 3) and appeared due to the impact of education on the current smoking habits of hearing persons. Among hearing persons who completed some college, 10.8% (4/37) smoked during the past year vs 43.9% (18/41) of

those with no more than a high school education ($P=.001$); among deaf and hard-of-hearing persons there was no difference (15.4% [4/26] vs 19.4% [12/62], respectively; $P=.66$) between the groups. In deaf and hard-of-hearing persons with no more than a high school education, the OR for smoking in the past year was 0.31 (95% CI, 0.13 to 0.74). Logistic regression analysis for current smoking did not show hearing status to predict current smoking as it did for ever smoking; however, the sample size may be too small to obtain statistically significant results with needed interaction terms in the model.

Findings in relation to alcohol and recreational drug use were less impressive. Among individuals 60 years of age or younger, fewer deaf and hard-of-hearing than hearing persons drank alcohol (OR=0.48; 95% CI, 0.24 to 0.99). Stratification by age or education revealed no significant differences in recreational drug use. Logistic regression analysis revealed no significant relationship for hearing status with alcohol consumption or use of recreational drugs.

COMMENT

The existence of the deaf community as a separate culture—indeed a minority group in its own right—is not well recognized by most hearing persons. In part this may be due

Table 5. Attitudinal Differences Between Deaf and Hard-of-Hearing Persons Who Prefer American Sign Language (ASL) and Those Who Prefer English*

	ASL	English	P
Felt less comfortable with their physicians	3.4	4.0	.02
Felt that their physicians did not always tell them about the treatment or medication being prescribed	3.3	4.0	.006
Were less likely to ask physicians to repeat themselves when they did not understand the physicians	3.6	4.2	.026
Reported greater agreement with the statement, "I don't like going to doctors because I can't talk with them."	2.9	3.8	.013

*Ratings were calculated on a scale of 1 to 5 where the higher number indicates more agreement with the statement.

Table 6. Logistic Regression for Perceived Poorer Health Status

	Coefficient	SE	P
Hearing impairment	2.5956	1.0619	.0145
No more than high school education	1.1988	0.6761	NS*
Age >60 y	3.7486	1.2235	.0022
Age interacted with hearing status	-3.8209	1.3479	.0046
Constant	-4.9300	1.1287	.0000

*NS indicates not significant.

to the minimal contact between the two groups (confirmed by our finding that no hearing respondent communicated regularly with deaf and hard-of-hearing persons). This relative isolation of deaf and hard-of-hearing persons has resulted in few studies about their health care, an unfortunate occurrence in view of the suggestion they are the non-English-speaking population with the greatest difficulty communicating with physicians.¹² If so, findings about deaf and hard-of-hearing persons may apply to other minority populations as well.

HEALTH STATUS AND HEALTH CARE UTILIZATION

Our results illustrate significant differences between deaf and hard-of-hearing and hearing persons. They confirm the 1977 and 1990 NHISs that twice as many deaf and hard-of-hearing as hearing persons saw their physicians six or more times in the past year.⁴ A variety of explanations for these findings can be offered, but none are satisfactory. In our study population, as documented elsewhere,^{9,10} hearing persons had higher levels of income and education. However, multiple logistic regression did not identify either of these as a cause of increased frequency of visits.

Other studies have found that deaf and hard-of-hearing people have a high prevalence of medical problems.^{9,17} It is possible that our study population likewise had more medical illnesses than the hearing group, thus causing greater frequency of visits and poorer self-health assessment. We did not inquire about this. However, we found no significant difference between the two groups in reasons for their most recent physician visit, suggesting this was not the cause of the differing frequency of visits. Similarly, there was no difference in visits for hearing-related care either.

Differing health attitudes are another potential explanation we did not explore. It is possible that the deaf community has different expectations from the health care system. For example, they may be more prevention-conscious and seek outpatient treatment more frequently, with a resulting lower hospitalization rate. This, however, is unlikely considering the NHIS data that deaf and hard-of-hearing persons have more hospitalization days than hearing persons.⁴

Our findings regarding self-rating of health status are quite interesting. The significant difference between deaf and hard-of-hearing and hearing groups was solely for persons 60 years of age and younger. With larger numbers (only 37 persons were over 60 years of age), this might have been significant for older persons as well. Older deaf and hard-of-hearing individuals were more likely to report better health than hearing persons, whereas in younger individuals the opposite was found. The main difference was a large increase in the report of fair (instead of good or excellent) health status among older hearing persons.

These findings may reflect the known differences between persons with presbycusis and those with hearing loss incurred at a young age.¹⁸ Older individuals may have better coping mechanisms or communication skills for compensating for their disability. Other explanations exist too, such as elderly deaf and hard-of-hearing persons are healthier, or the older controls in our study were not representative of elderly individuals in the community (eg, they visited physicians for reasons different from the younger controls).

COMMUNICATION DIFFICULTIES

The degree to which deaf and hard-of-hearing persons had problems understanding their physicians is striking and consistent with previous reports^{5,6} and confirms the first part of our hypothesis. This difficulty may be due in part to their lack of experience communicating with hearing persons (over 20% of our deaf and hard-of-hearing population rarely or never did so). Writing is often not a viable option. Deaf persons, as a group, read at only a fourth- to sixth-grade level,^{10,15,16} and writing is very time consuming. Lipreading alone is not sufficient either. Numerous words look alike and the best lip-readers understand merely 20% of spoken words¹⁹, only 10% of profoundly deaf people use it alone without other aids,²⁰ and only 4% are proficient in speech reading or speaking.²¹ Finally, ASL has a unique syntax and grammatical structure.⁷ Deaf and hard-of-hearing persons whose primary language is ASL must learn new rules of grammar to communicate in English.

Ways of improving communication between physicians and deaf and hard-of-hearing persons have been suggested.²² Nevertheless, much more physician education is necessary before we are likely to see a significant im-

they are the non-English-speaking population with the greatest difficulty communicating with physicians

provement. At our institution, this problem is not discussed in the medical school curriculum. Physicians may have misconceptions about deafness, sometimes resulting in inadequate communication with²³ and evaluation and/or treatment of deaf and hard-of-hearing patients.^{22,24} In fact, Nash and Nash²⁵ found that deaf and hard-of-hearing persons felt that health professionals communicated poorly with them.

The relatively low use of interpreters by our deaf and hard-of-hearing population (only 18%) is surprising considering that most had a severe hearing loss. This may play a role in the communication barrier, although the issue remains controversial.¹⁵ Not using interpreters is probably due to the unavailability of such persons. The Division of Deafness of the Michigan Department of Labor,

Lansing, reports that 50% of deaf people in that state have trouble getting an interpreter when needed.⁹ This is of concern, considering that deaf and hard-of-hearing respondents who prefer ASL had the most difficulty interacting with physicians. It is to be hoped that the recent passage of the Americans With Disabilities Act, with its mandate for the provision of interpreters for patients who request them, will alleviate this problem.

ONE MIGHT suspect that communication difficulties with physicians would produce frustration and lead to decreased health care utilization by deaf and hard-of-hearing persons. The opposite appears to be the case but the reason is unclear. Perhaps deaf and hard-of-hearing persons keep returning to seek answers to their questions and help for their problems. The finding that those who used interpreters had more visits and poorer health assessment suggests, however, that communication barriers are not the sole factor. It would be interesting to determine if continuity of care improved the ease of communication. More research is needed. For now, we suggest physicians be aware that deaf and hard-of-hearing patients who present with an interpreter may need more focused attention.

The communication difficulties of deaf and hard-of-hearing persons with physicians are amplified by numerous unsolicited comments. Several prefer to see foreign-born physicians because those physicians exert extra effort to ensure they are understood. Deaf and hard-of-hearing persons who rely on writing noted that physicians often wrote illegibly or on too sophisticated a level. Those using interpreters commented that physicians usually interacted with their interpreters rather than the patient. Finally, several instances were noted where physicians performed operations or prescribed medication without informing the deaf or hard-of-hearing patient of the reasons for these. None of the hearing persons made similar comments.

HEALTH BEHAVIORS

The highly statistically significant finding that deaf and hard-of-hearing persons reported less smoking ever and the trend toward less smoking in the past year are interesting in light of a report suggesting that deaf and hard-of-hearing persons live longer.¹⁴ Our crude data supported less alcohol use among deaf and hard-of-hearing persons too, but adjusting for covariates did not confirm the association. Others have reported decreased alcohol use in this population,^{26,27} but we are not aware of studies investigating smoking or drug use of deaf and hard-of-hearing persons. If our findings are confirmed, this would support our second hypothesis.

Reasons as to why fewer adverse health habits are

practiced by deaf and hard-of-hearing persons are unclear, as are reasons for the difference between ever smoking and smoking within the past year. Decreased smoking is not related to using hands to communicate; deaf and hard-of-hearing persons who preferred ASL smoked more. A possible reason may be the reduced exposure of these persons to printed advertisements because of poor reading skills.^{15,16} Stratified analysis revealed an association between education level and smoking in deaf and hard-of-hearing persons. Education level, however, is poorly predictive of reading levels of these persons.^{28,29} It would be interesting to compare reading level with prevalence of smoking. If reduced exposure to cigarette and alcohol advertising is a factor in the decreased practice of these habits by deaf and hard-of-hearing persons, this has significant implications for such advertising in all populations. When interpreting health behavior data in deaf and hard-of-hearing persons, one must recall they are often secretive about their life-styles. The deaf community is comparatively tight knit, and members may be reluctant to admit to these habits for fear that others will find out.

LIMITATIONS

There are several limitations to this study. The deaf and hard-of-hearing respondents are a nonrandom group and may not represent the general population of persons with a hearing loss in Michigan. Nevertheless, the similarity of our results to those from the 1977 and 1990 NHISs suggests our population was relatively typical of the general deaf and hard-of-hearing population. Second, deaf and hard-of-hearing persons had a higher average age, lower educational level, and lower household income than the control group. Increasing age and lower household income are factors associated with greater use of medical services.¹¹ Our analysis suggested that this was not the case, however, because in multivariable analysis only age was associated with frequency of visits. Third, we did not document data indicating frequency of physician visits. It is possible that deaf and hard-of-hearing persons, owing to frustration with the medical system, thought they saw physicians more than they did. Again, however, our findings were consistent with those from the NHIS. Finally, caution is necessary when comparing data received from deaf and hard-of-hearing persons attending community group functions in southeastern Michigan with those from hearing subjects attending a family practice clinic who come from a more limited geographical area.

It is interesting to speculate whether the control group, because they were attending a medical clinic, constitutes a subset of individuals with a greater frequency of physician visits than most hearing persons, especially since many patients attending this clinic have lower incomes than the average American. If so, the true differences between deaf and hard-of-hearing and hearing persons may actually be even greater than those found in our study.

Other limitations need to be noted. The study did not identify the concurrent existence of other illnesses in the selected populations. Also, most deaf and hard-of-hearing subjects were white, had a severe hearing loss, and lost their hearing before 3 years of age. Our results may not apply to persons of other races, people with lesser hearing losses, and those whose hearing was impaired after 3 years of age.

CONCLUSION

This study confirms other reports that deaf and hard-of-hearing persons are a poorly served minority population. They see physicians more frequently, and younger (no more than 60 years of age) deaf and hard-of-hearing persons rate their health as poorer than hearing persons. Use of interpreters was associated with greater frequency of visits. Deaf and hard-of-hearing persons also had significant difficulties communicating with physicians and practiced fewer adverse health habits.

Further studies are needed to determine reasons for these findings. Factors to be investigated include the effect of age of onset of hearing loss, degree of hearing loss, and concurrent medical problems on the health status and health care utilization of deaf and hard-of-hearing persons. Determination of physicians' views of encounters with deaf and hard-of-hearing persons would also be helpful, especially whether they experience similar communication frustrations. Using this information, intervention strategies should be developed. Moreover, these strategies may provide guidelines for improving the efficiency of health care encounters of other minority groups.

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A copy of the survey is available on request.

Reprints not available.

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