



ORIGINAL RESEARCH PAPER

Audiology

ATTITUDE OF GENERAL PUBLIC TOWARDS USAGE OF HEARING AIDS: A SURVEY-BASED STUDY

KEY WORDS: Societal attitude; stigma; hearing aids

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ABSTRACT In the modern world merely 1 in 4 people with hearing loss buys a hearing aid, and an even minor figure make use of them. The study was carried out to know and compare the social depiction of hearing aids and also to know the social attitude of general public on individuals who use hearing aids. The study was carried among 425 participants within the age range of 18-55 years belonging to different gender and geographical location. The survey showed a negative attitude towards usage of hearing aids and also on individuals who use hearing aids. The overall attitude towards usage of hearing aids and the societal acceptance of individuals who use hearing aids needs to change towards the positive side

1. Introduction:

Hearing impairment is among the one of the most regular conditions among adults (Collins, J. G., 1988; *Vital and health statistics, 1963; National vital statistics reports, 1998*). Hearing loss is a worldwide health care problem due to lack of access to essential amenities for persons with hearing impairment. This is because of hurdles such as poor knowledge among community, lack of proficiency and too little resources (Swanepoel et.al, 2010). According to information by the World Health Organization, a huge number of persons with hearing loss are recognized late and are short of access to diagnostic and intervention services (Mathers, C, 2004). Olusanya et al. (2006) reported that hearing loss acts as a serious burden in low and middle-income countries. This could be attributed to the prophylactic, diagnostic and intervention services being either unavailable or unaffordable.

Hearing assistive devices such as hearing aids are the rehabilitation approach most frequently prescribed for those with permanent damage to the hearing ability, and use of hearing aids is a renowned way to lessen the difficulties faced due to hearing loss (Stark & Hickson, 2004). Nevertheless, in the modern world merely 1 in 3 or 1 in 4 individuals with reduced hearing sensitivity buys a hearing instrument, and an even minor figure make use of them (Davis et.al, 2007; Bainbridge & Ramachandran, 2014). In the under developed and the developing countries, this number possibly will be as little as 1 in 10 or 1 in 20 persons with hearing impairment. The existing manufacturing of a listening device is likely to accommodate not more than ten percent of large-scale requirement (World Health Organization, 2015). Likewise, diverse elements like apparent impairment in sense of hearing, value and price, and shame have been related to lesser percentage of people who are prepared to purchase and use a hearing aid (McCormack & Fortnum, 2013; Ng & Loke, 2015).

In current years, researches on mindset towards hearing impairment and hearing aids has occupied the attention of clinical audiologists and investigators, while debates are mostly carried out from the viewpoint of persons with hearing disorder (Knudsen et.al, 2010). Attitudes regarding hearing aids are mostly concurrent to outcome measures such as help-seeking, hearing aid uptake, hearing aid use, and contentment from hearing aid use. Even though there is no collectively acknowledged meaning, the word "attitude" can possibly be explained as an established mode of opinion or emotion on somebody or something. Available research on

attitude proposes that it consists of 4 key components: 1) evaluative; 2) intuitive; 3) intellectual; and 4) behavioural (Olson & Zanna, 1993). On the other hand, it's essential to notice that it's demanding to determine attitudes because outcome measuring methods fails to measure all of the aspects listed previous (i.e., behavioural or intuitive). A study concluded that persons who went to a hearing clinic regarding their hearing complications, however did not purchase hearing instrument have less favourable attitudes regarding hearing aids than those who purchased hearing aids (Brink et.al, 1996)

Some studies have studied people's personal mindsets and views about impairment in hearing and hearing aids. A study collected opinions from female peers' relations with and without hearing aids. Those who gave judgments had under no circumstances used hearing aids; nevertheless, they judged peers wearing aids negatively on aspects of self-confidence, intellect, and sociability (Doggett et.al, 1998). University going scholars who saw illustrations of young kids using hearing aids graded them disapprovingly on aspects of aptitude and look (G. W Blood et.al, 1977). McCormack & Fortnum (2013) considered the mindset of women with normal hearing about hearing impairment and hearing aids. They disclosed negative impressions related with loss of hearing and hearing aids, and this information was linked with age (i.e., young women exhibited a larger stigma). The study also established fewer stigmas with respect to hearing aids as compared with hearing impairment, suggestive of an affirmative effect of hearing aid rehabilitation. Though the above studies emphasize significant features of attitudes toward hearing aids, they fall short to contemplate wider societal, economical and environmental aspects.

Societal attitude plays a vital part in the choice making of individuals in common. Individuals with hearing loss are likely to be prejudiced in concluding whether to take help and to go ahead for intervention to solve their complications based on opinions of different individuals in the public, including friends/acquaintances, colleagues, social group and health care professionals (Manchaiah et.al, 2011; Manchaiah & Stephens, 2012). A study acknowledged that decisions of adults with acquired hearing impairment about purchasing and wearing a hearing aid depends on, other people's encounters and experiences, recommendations, and support (Laplante et.al, 2010). Therefore, exploring the general public's opinions and attitude towards hearing aids becomes the need of the hour.

The World Health Organization's International Classification of Functioning, Disability and Health (ICF) model has enumerated societal factors below the section "Environmental Factors". The ICF core sets for hearing loss project has emphasized that different factors connected to society (eg, e460 societal attitudes and e465 social norms, practices, and ideologies) are vital in relative to hearing loss, on the basis of information taken from a number of places around the world (ICF Research Branch, 2013; Granberg et.al, 2014). This highlights the significance of getting to know the societal attitudes towards hearing aids.

Furthermore, it has been proposed that there are inadequate researches in the area of hearing health care especially where there is difference in the socio-economic status (Zhao et.al, 2015). Also, in India, although there are many studies which discuss about awareness and attitude towards hearing loss, not much research is carried out on attitude towards the hearing aid rehabilitation. For this reason, the present study aims at understanding and comparing the social depiction of hearing aids amongst different gender, age group and geographical location. It also gives us an idea about how is the representation of hearing aids in places where they are not often exposed to these methods of rehabilitation with that of individuals who are aware of hearing aids. In addition the present study is a small step towards creating awareness towards hearing aids and its use.

2. Methods and Materials

2.1. Questionnaire

The questionnaire was formed by taking into considerations the aspects mentioned in the literature and from already standardised questionnaires such as Manual of the Hearing Attitudes in Rehabilitation Questionnaire (HARQ) given by Hallam & Brooks, (1996). It is vital that the questionnaire is practically suitable across different languages to be able to use in different states of India. The questionnaire was thus translated into Kannada and Konkani to be used in Karnataka and Goa. The procedure involved well-accepted methods of forward and back-translation given by Beaton et.al, 2000 which includes: 1) forward translation; 2) expert back translation; 3) review and resolution of any discrepancies and 4) pretesting with five participants from each area. The final questionnaire consisted of 19 questions which assessed the attitude towards hearing aids. There were 3 domains; General awareness about hearing aids (5 items), Personal attitude towards hearing aids (7 items) and Attitude towards individuals who use hearing aids (7 items). The questions were close ended and were to be answered 'Yes' or 'No' by the participants. In addition demographic details such as age, gender, geographical location of the participants were also collected.

2.2. Participants:

The study was carried among 425 participants within the age range of 18-55 years. They were further divided into two groups based on age; Young adults (18-35 years) and Middle aged adults (36-55 years). Out of 425 participants, 251 were young adults and the remaining 174 were middle aged adults. Individuals belonged to various regions urban and rural regions in and around Karnataka and Goa respectively. Out of 425 participants 214 individuals were from urban regions of the above mentioned states and remaining 211 were from rural parts of the particular states. In the present study 197 participants out of 425 were males and 228 individuals were females. All participants who were a part of the survey had at least completed primary education and were able to read and write without any difficulty. Individuals who had any history of hearing loss and had used hearing aids were not considered for the study. All participants were informed about the purpose of the study and were provided with the questionnaire after obtaining formal consent.

2.3. Procedure:

The researcher approached the participants who were his or

her friends, neighbours in both various locations and requested them to participate in the survey. The questionnaire was also sent through email as a Google form and returning of the form was considered as consent. The responses from both direct survey and Google form survey were recorded and tabulated.

2.4. Analysis:

The responses of all the individuals for each of the 19 questions were coded for the intention of statistical analysis as follows; Yes = 1 and No = 2. Descriptive statistics was carried out to find out frequency and percentage of responses. Non parametric statistical analysis was carried out as the data was categorical. Chi-square test of significance was done to determine the statistical significance between different groups such as age, gender and geographical location. Cronbach's alpha coefficient was determined to know the internal reliability of the questionnaire. All statistical analysis was carried out in SPSS 20, Copyright IBM Corporation and its licensors, 1989, 2011.

3. Results:

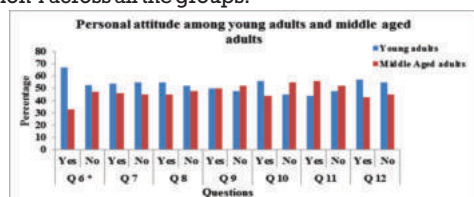
The survey was carried out on 425 individuals within the age range of 18-55 years. The mean age of young adults was 26.82 years (SD=3.88) and the mean age for middle aged adults was 47.55 years (SD= 5.87).

Table 1 – Summary of responses to General awareness about hearing aids

Categories	Percentage of responses									
	Q1		Q2		Q3		Q4		Q5	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Young adults (N=271)	64%	48%	54%	55%	52%	50%	56%	57%	49%	52%
Middle Aged adults (N=174)	36%	52%	46%	45%	48%	50%	44%	43%	51%	48%
Males (N=197)	52%	50%	63%	16%	53%	76%	54%	55%	55%	46%
Females (N=228)	48%	50%	37%	8%	47%	24%	46%	45%	45%	54%
Urban (N=214)	56%	57%	64%	35%	50%	20%	49%	52%	78%	40%
Rural (N=211)	44%	43%	46%	65%	50%	80%	51%	48%	22%	60%

3.1. General awareness about hearing aids

Questions from 1 to 5 in the questionnaire assessed the general awareness of hearing aids among public. A summary of responses in percentage is shown in the above table 1. As observed in table 1 it is seen that inspite of having reduced exposure to hearing aids (Question 3) all individuals across different groups of age, gender and geographical location exhibited good awareness about hearing aids (Questions 1, 2, 4 and 5). However, Chi square test of significance indicated significant difference for only question 1 across age groups (X2 (1) = 4.88, p < 0.05). Significant difference was seen for question 2, 3 and 5 across gender (X2 (1) = 5.57, p < 0.05; X2 (1) = 13.34, p < 0.05; X2 (1) = 15.88, p < 0.05) and geographical location (X2 (1) = 4.22, p < 0.05; X2 (1) = 22.01, p < 0.05; X2 (1) = 10.41, p < 0.05). No significant difference was seen for question 4 across all the groups.



*Indicating statistically significant difference

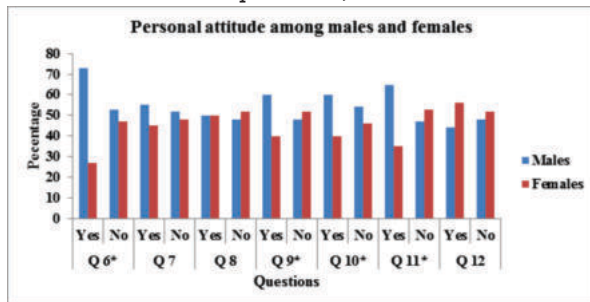
Figure 1 – Percentage of responses to personal attitude towards usage of hearing aids among young adults and middle aged adults.

3.2. Personal attitude towards usage of hearing aids

This particular domain assessed the individual's attitude and opinion about hearing aids and its usage. Question 6 to question 12 describes the personal attitude towards hearing aid usage.

Statistically significant difference was seen between young adults and middle aged adults for question 6 ($X^2(1) = 24.45, p < 0.05$). In the above figure it is seen that, for question 6 higher percentage of 'Yes' responses was obtained from young adults (67%) when compared with middle aged adults (33%). No significant difference was observed for other questions among young adults and middle aged adults.

Analysis of responses among males and females revealed that there was significant difference for questions 6, 9, 10 and 11 respectively ($X^2(1) = 15.8, p < 0.05; X^2(1) = 7.87, p < 0.05; X^2(1) = 12.76, p < 0.01; X^2(1) = 12.83, p < 0.05$). No significant difference was seen for questions 7, 8 and 12.



***Indicating statistically significant difference**
Figure 2 – Percentage of responses to personal attitude towards usage of hearing aids among Males and Females.

Question wise result analysis was carried out to avoid ambiguity and to make understanding easier. The responses in percentage are illustrated in Figure 2. In questions 6, 9, 10 and 11 higher number of 'Yes' responses were obtained from females (73%, 60%, 60% and 65%) than when compared to males. No significant difference was observed for 'No' responses in all these questions. No statistically significant difference was seen for questions 7, 8 and 12.

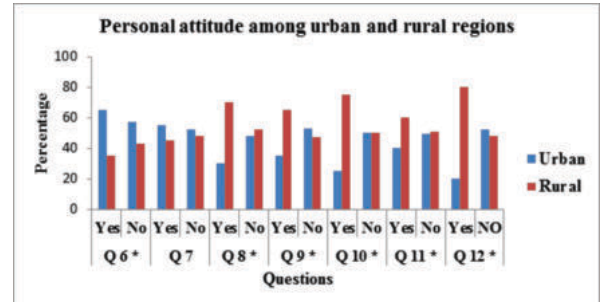
To determine how personal attitude towards usage of hearing aid varies among different geographical location, a comparison was made among rural and urban population. Significant difference was observed in rural and urban populations for all the questions except for question number 7.

Table 2 – Pearson Chi-Square value and P value of Chi-Square test of significance

Question Number	Pearson Chi-Square value	Exact Significance value (2-sided)
Question 6*	10.41	0.01
Question 7	0.175	0.680
Question 8*	9.19	0.03
Question 9*	21.44	0.00
Question 10*	7.62	0.04
Question 11*	22.01	0.00
Question 12*	15.48	0.00

***Indicating statistically significant difference**
 Figure 3 explains the percentage of 'Yes' and 'No' responses for question 6 to 12 among rural and urban population. By the figure it is understood that for question number 6 percentage of 'Yes' responses is high in urban (75%) when compared with rural (25%) populations. On the other hand for questions 8, 9, 10, 11 and 12 number of 'Yes' responses is higher in individuals residing in rural regions when compared with individuals in urban regions. For question 7 there was no significant difference observed in 'Yes' and 'No' responses

among the two regions. The Pearson Chi-Square value and exact significance values of each question is mentioned in Table 2

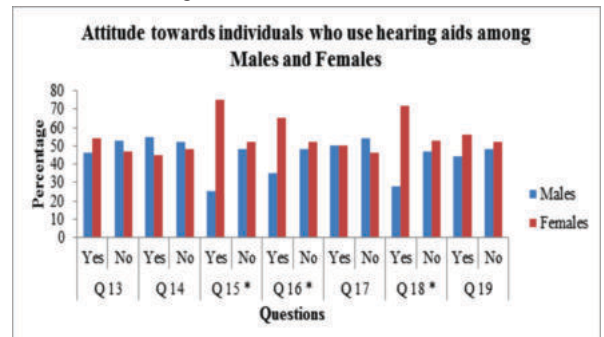


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Figure 3 – Percentage of responses to personal attitude towards usage of hearing aids among Urban and Rural regions.

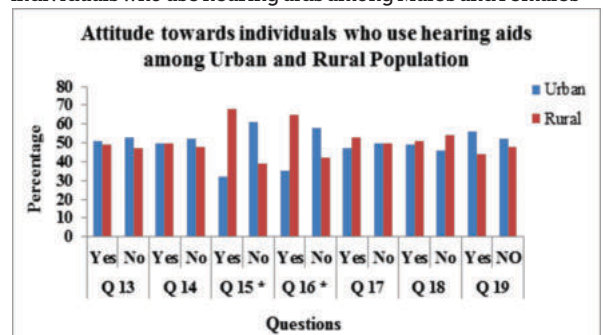
3.3. Attitude towards individuals who use hearing aids

Questions from 13 to 19 assessed the attitude of general public towards other individuals who use hearing aids. The comparison was made between all the groups which are mentioned in the above domains.

The statistical analysis between young adults and middle-aged adults across question 13 to 19 showed no significant difference. However, significant difference was noted among responses of males and females for questions 15, 16 and 18 ($X^2(1) = 32.32, p < 0.05; X^2(1) = 10.64, p < 0.05; X^2(1) = 7.89, p < 0.01$). Among 425 overall responses, number of individuals who responded yes for questions 15, 16 and 18 are 158, 142 and 412 respectively. The percentage of 'Yes' responses of females for questions 15, 16 and 18 (75%, 65% and 72%) were higher than the responses of males (25%, 35% and 28%) respectively. No significant difference was noted for questions 13, 14, 17 and 19. The percentage of yes and no responses among males and females are illustrated in Figure 4.



***Indicating statistically significant difference**
Figure 4 – Percentage of responses to Attitude towards individuals who use hearing aids among Males and Females



***Indicating statistically significant difference**
Figure 4 – Percentage of responses to Attitude towards individuals who use hearing aids among Urban and Rural population

Among comparing urban and rural population, statistically significant difference in responses of rural and urban population was observed for the questions 15 and 16. The percentages of responses for all the questions are illustrated in figure 5. Percentages of 'Yes' responses for questions 15 and 16 is higher for rural (68% and 65%) compared to urban population (32% and 35%) respectively. Whereas, the percentage of 'No' responses for questions 15 and 16 was higher in Urban population (61% and 58%) when compared to Rural population (39% and 42%). No significant difference was observed for questions 13, 14, 17, 18 and 19.

3.4. Internal consistency

Cronbach's alpha coefficient (α) was estimated to know the internal reliability of the questionnaire. An excellent internal reliability of (α) = 0.96 nearer to 1 was suggestive of good reliability (Albuam, & Oppenheim, 1993).

Discussion

Recent study by Meister et al (2008) explored the intention to use hearing aids using the Theory of Planned Behaviour. This study suggested that "attitude toward hearing aids" and "subjective norms" play an important role in help-seeking and hearing aid uptake. Another study on prospective hearing aid users has suggested that less-positive expectations and a more problem-oriented approach may be some of the main reasons for non-uptake and non-use of hearing aids. Such expectations and attitudes toward hearing aids even before any first-hand experience with hearing aid use are generally formulated by various societal factors (eg, others' attitudes, media, etc). Hence, understanding how hearing aids are seen by the society may have important clinical implications.

The current study aimed at knowing the opinion and attitude of hearing aids in Northern Karnataka region of India. The study intended to know how attitude towards usage of hearing aid varies with gender, geographical variation and between different age groups. A close ended questionnaire with 3 domains assessing different aspects of hearing aid usage was administered among 425 individuals across different age groups, geographical location and gender.

The first domain assessing the general awareness about hearing aids among public revealed the following results. Answers for the question 1 'Do you know why a hearing aid is used?' significantly differed among age groups. Younger adults had more awareness of why a hearing aid was used when compared to middle aged adults. Exposure to younger adults and the use of better technology might have made them more aware about availability and usage of a hearing aid. Questions 2, 3 and 5 had a significant difference among gender and geographical location. Males and individuals in urban area were more aware of hearing aid styles when compared to females and individuals in rural area.

The second domain assessed the personal attitude and views towards use of hearing aids. Young adults were more concerned about the size of the hearing aids when compared to middle aged adults. There was significant 'Yes' answers for the Question 'Does size of hearing aid matter?' from younger adults when compared with middle aged adults. Females were more apprehensive in usage of hearing aids and had negative attitude when asked about use of hearing aids when compared to males. For questions 6, 9, 10 and 11 (Does size of hearing aid matter? Do you think hearing aid is not comfortable to use? Do you think managing hearing aid is difficult? Do you get embarrassed to wear a hearing aid?) significant number of females answered as 'Yes' when compared to males. Results of the study by Erler and Garstecki (2002) showed that hearing aid use was associated negatively with age by 65% of women in Group younger women which is in agreement with the current study. It is also interesting to note that individuals who live in rural area had

higher percentage of negative associations with usage of hearing aids when compared to individuals in urban area.

Appearance and design were one of the main factors which were considered important when using a hearing aid. This mainly linked to ease or difficulty in using and others' attitudes. Factors related to appearance (i.e., stigma of wearing hearing aid, do not like the appearance, cosmetic concerns) were some of the common reasons for negative attitude towards usage of hearing aids according to multiple studies (Tomita et.al, 2001; Kochkin, S, 2000; Gianopoulos, 2002). A recent study investigating the factors associated with hearing aids in older adults found a more-positive attitude towards hearing aids to be one of the important factors (Hickson et.al, 2014). There were also a few negative responses related to functioning of a hearing aid such as 'The hearing will make every sound feel louder and will not help in hearing better, it is difficult to maintain a hearing aid, hearing aids are not comfortable to use' etc. Stigma was reported as a primary reason for not wearing hearing aids in a significant proportion of studies. The size and visibility of hearing aids were the main features associated with the reluctance to use them and with the stigma associated with them (Cienkowski & Pimentel, 2001; Johnson et.al, 1982, 2005; Kochkin, 1983, 1994 and 2007; Iler et.al, 1982).

The third domain in the questionnaire aimed to find out the societal attitude towards individuals who use hearing aids. When compared among gender, females were found to be more judgemental about individuals who use hearing aids and believed that hearing aids will isolate individuals from the society and individuals who wear hearing aids will be under psychosocial pressure. Individuals in rural area responded negatively when asked about how they feel about people who wear hearing aids and were less open to accept those individuals in the society when compare to individuals in urban area. The attitude of people with hearing loss can be influenced by societal factors, and hence it is important to ensure that the society in general has a positive attitude toward hearing aids.

The finding of this study is in agreement with the findings of a study (Saunders et.al, 2016) where they reported that attitudes and beliefs were associated with future hearing health behaviours. Cobelli et.al (2014) also found that a person's attitude toward amplification or hearing aids significantly impacted his/her decision toward adopting amplification. Both of those studies closely tie in to the findings of this study: attitudes toward hearing aids will impact hearing aid adoption.

Conclusion

Perceptions that hearing loss and hearing aid use are stigmatizing are thought to contribute to denial of hearing impairment and, for many adults, rejection of hearing aid use. This study provides evidence of the variability of stigma associated with hearing loss and hearing aid use among age group, gender and geographical location with age-normal hearing. Perceptions of impairments are shaped by factors such as one's stage of life and belief system younger individuals, for whom hearing loss and hearing aid use are less familiar, are likely to have life styles that require communicative competence for effective employment and parenting. For individuals in their middle years who also face professional and personal demands on effective communication, hearing loss might or might not be anticipated and accepted. Although individuals in this age group recognize the benefits of amplification, they also admit to concerns about hearing loss and hearing aid use as a sign of aging. Although hearing aid use is closely associated with aging, use of a hearing aid is perceived as an enhancement to successful function and personal interaction. The overall awareness about hearing aids, attitude towards usage of hearing aids and the societal acceptance of individuals who

use hearing aids needs to change towards the positive side and hence promoting the use of hearing aids. We as researchers should work on creating awareness regarding hearing aids and its usage, acceptance of hearing aids in the society and counselling regarding benefits of wearing a hearing aid when suffering with hearing loss.

**Appendix 1
Questionnaire**

Name:
Age/Sex:
Literacy level:
Geographical are: Rural/ Urban

General awareness about hearing aid

1. Do you know why a hearing aid is used? –YES or NO
2. Have you seen anyone wearing a hearing aid? –YES or NO
3. Does anyone in your family wear a hearing aid? –YES or NO
4. Do you think hearing aid is helpful in making hearing easier? –YES or NO
5. Did you know that hearing aids are available in different styles? –YES or NO

Personal attitude towards hearing aid use

6. Does size of hearing aid matter? –YES or NO
7. Will you prefer wearing a hearing aid in spite of the compromised cosmetic appearance? –YES or NO
8. Do you think hearing aid will make every sound louder and will not help in hearing better? –YES or NO
9. Do you think hearing aid is not comfortable to use? –YES or NO
10. Do you think managing hearing aid is difficult? –YES or NO
11. Do you get embarrassed to wear a hearing aid? – YES or NO
12. Do you think using of hearing aid would make you feel old? –YES or NO

Attitude towards individuals who wear hearing aids

13. Will you accept people wearing hearing aids to social gatherings? –YES or NO
14. Do you think people react differently when someone wears hearing aid? –YES or NO
15. Do you think individuals who wear hearing aids will be under psychosocial pressure? –YES or NO
16. Do you think hearing aid would make the user isolated from other people? –YES or NO
17. Do you feel instead of a hearing aid parents or client should follow untraditional methods of treatment? –YES or NO
18. Do you suggest your hearing-impaired friend [If any] to go for hearing aid? –YES or NO
19. Will you accept a person who wears hearing aid as your friend? –YES or NO

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