Oral health status of Deaf and Hard of Hearing people associated with two centers in Kathmandu, Nepal

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ABSTRACT

Oral health is a vital component of overall health. The adult onset hearing impairment is considered to be the third leading cause of disability. In Nepal, out of the total population,1.94% has some kind of disability. This study was formulated to assess the oral health status of deaf and hard of hearing people in two centers in Kathmandu Valley. All the members above 18 years of age in two centers, who were willing to participate were selected after informed written consent. Questionnaire was distributed to the participants for oral health awareness assessment. Sign language interpreter along with the examiner were present to explain the questionnaire in case of doubt. Decayed, Missing, Filled Teeth (DMFT) index and Russell's Periodontal index was assessed for oral examination. The data was recorded in SPSS version 17 and sent for statistical analysis. The mean DMFT score of deaf participants was 1.95 ± 3.53, which was lower than that of the hard of hearing group (3.16 ± 3.82). The mean periodontal index of deaf participants was higher (0.38 ± 0.74) than that of the hard of hearing group (0.19 ± 0.27). Among the participants, 22.2% of the participants had never visited a dentist and among those who had, the primary reason for the visit was pain or trouble with teeth and gums (50.8%). Oral health promotion program should be provided aimed at the deaf and hard of hearing community and also efforts should be made to seal the communication gap.

Keywords: Hard of Hearing, DMFT index, Russel's Periodontal index, oral health awareness

INTRODUCTION

Oral health is a vital component of overall health, which contributes to each individual's well- being and quality of life by positively affecting physical and mental well being, appearance and interpersonal relations.[1] Unfortunately, oral health care is of the greatest underserved needs of the disabled people.[2] The adult onset hearing impairment is considered to be third leading cause of disability.[3] Hearing impairment can be classified as deaf and hard of hearing. A person who cannot hear, speak properly or cannot speak at all and has to use sign language for communication with a hearing capacity of 80 decibels or less is defined as "Deaf". Those who cannot hear properly, speak clearly or can only speak very little, or require a hearing aid and have a hearing capacity between 65 to 80 decibels is defined as " Hearing impaired".[4] In Nepal , out of total population 1.94% (5,13,321) have some kind of disability. About 2,368 people have been found to suffer from hearing impairment in Kathmandu valley.[5] Dental caries has historically been considered the most important part of the global burden of oral diseases. In Nepal, the prevalence estimate for caries was seen to be significantly higher among the sensory disabled than physically disabled children.[6] Inadequate dental care or poor dental public health measurements tend to have negative influence on the health status of an individual.[7]

The hearing impaired people can only communicate through sign language. Their impairment proves to be a severe disadvantage when it comes to communicating with health personnel. Due to the communication gap,medical and dental health is often neglected. As previous studies on the adult population were unavailable, this study was formatted to assess the oral health status of deaf and hard of hearing people in two centers in Kathmandu , Nepal.

MATERIALS AND METHODS

A cross-sectional study was conducted at two centers namely Shruti (organization for hard of hearing) and National Association of Deaf and Hard of Hearing (NADH) of Kathmandu, Nepal. The study duration was 3 months from August 2015 to October 2015. The study participants were enrolled through a non-probability sampling technique with the help of total

enumeration method. Individuals who were above 18 years of age, diagnosed as deaf or hard of hearing and willing to participate in the study were included as the study sample. WHO oral health assessment questionnaires were distributed to the participants. Sign language interpreter along with the study investigators were present to explain the questionnaire in case of doubt. The interpreters were first trained regarding the use of questionnaires by the study investigators. Oral assessment was done by the investigators and values for DMFT index and Russell's Periodontal index were recorded.[8,9]

The data was entered, coded and analyzed using Statistical Package for Social Sciences (SPSS) version 17.0 Chicago SPSS Inc. The responses from the study participants were expressed in frequency, percentages and were displayed through frequency distribution tables. The continuous data like the index scores were summarized with the help of mean and standard deviation. Categorical DMFT scores between the groups were compared with the help of Chi-squared test and calculation of odds ratio. The mean ranks of DMFT and Russel's PI were compared with the help of Mann Whitney-U test after checking for normality. The level of significance was set at 5%.Ethical clearance was taken from the Institutional Review Committee of Kathmandu Medical College Teaching Hospital (KMCTH). Permission from both the centers was taken to conduct the study. Informed written consent was taken from each participant. Confidentiality and anonymity of the study participants was assured and maintained.

RESULTS

Among the eighty one individuals who had participated, sixty three were deaf and eighteen were hard of hearing. Majority of them were males (70.4%), from urban locality (91.4%) and had received education till high school (37.0%). Compared to deaf participants, more proportion (50.0%) of hard of hearing individuals had experienced pain and discomfort at their oral region in the last 12 months. Current state of teeth and gums were found to be in average condition by 53.1% and 51.9% of the participants respectively.

More than half (56.8%) of the participants brushed their teeth once a day and except for one respondent all used tooth brush to clean their teeth. Wooden tooth picks were used by 11.1% of the respondent while only one used dental floss as other aids for cleaning teeth. None of them used plastic toothpicks, charcoal, chewstick to clean their teeth. Although, all the study participants (100%) used toothpaste to clean their teeth, a large portion (34.6%) did not know whether it was fluoridated or not (Table 1).

Table 2 shows that 22.2% of the participants had never visited a dentist. Among those who had visited, the primary reason was due to pain or trouble with teeth and gums (50.8%) followed by treatment or follow up appointment (25.4%), routine checkup (15.9%) and some did not remember (07.9%).

Majority of participants (61.7%) did not report difficulty in biting food while 22.1% of them sometimes did experience difficulty in chewing food in the past 12 months. A large proportion of study participants did not report trouble related to speech (85.3%) and dry mouth

Table 1: Frequency and percentage distribution of variables oral hygiene practices among both the groups.

Variables of Oral Hygiene Practice	Categories	Deaf		Hard of hearing		Total	
		Count	Percent	Count	Percent	Count	Percent
Frequency of brushing teeth	2-3 times /week	04	06.3%	0	0	04	04.9%
	Once / week	01	01.6%	0	0	01	1.2%
	2 -6 times/week	01	01.6%	0	0	01	1.2%
	Once/day	34	54.0%	12	66.7%	46	56.8%
	2 or more/day	22	34.9%	06	33.3%	28	34.6%
	61.0	01	01.6%	0	0	01	1.2%
Use of toothbrush to clean teeth	Yes	62	98.4%	18	100%	80	98.8%
	No	01	01.6%	0	0	01	01.2%
Use of wooden toothpicks to clean teeth	Yes	07	11.1%	02	11.1%	09	11.1%
	No	56	88.9%	16	88.9%	72	88.9%
Use of dental floss to clean teeth	Yes	01	01.6%	0	0	01	01.2%
	No	62	98.4%	18	100%	80	98.8%
Use of toothpaste to clean teeth	Yes	63	100%	18	100%	81	100%
	No	0	0	0	0	0	0
Use of toothpaste with fluoride	Yes	36	57.1%	10	55.6%	46	56.8%
	No	05	07.9%	02	11.1%	07	08.6%
	Don't know	22	34.9%	06	33.3%	28	34.6%

(86.4%) in the past 12 months. Among the studied participants, 9.9% felt embarrassed due to appearance of their teeth, 22.2% had been tensed about problems related to teeth and mouth, 7.3% had avoided smiling because of their teeth, 6.2% had interrupted sleep, a small proportion 2.5% had taken days off work, 4.9% felt less tolerated of people close to them and 3.7% had reduced participation in social activities.

Majority of the participants (27.2%) used to eat or drink sweet things several times a week. Cariogenic food like biscuits, cakes, sweet pies and buns were consumed by 28.4% of participants several times a month. Similarly, highest proportion (37.0%) of participants consumed jam and honey only once a month while 30.9% seldom or never consumed gums containing sugar. More than one third (33.3%) of deaf and hard of hearing participants ate candy several times per month while majority (27.2%) seldom or never consumed lemonade, coca cola and soft drinks. Frequency of consuming tea and coffee with sugar was seen once / day in 59.3% and 32.1% of participants respectively. About one fifths (17.3%) of the study participants were cigarette smokers and 6.2% of them smoked on a daily basis. The proportion of smokeless tobacco use was 6.10% and a larger (32.2%) proportion were consumers of alcohol.

InRussel's periodontal index, about one fourth (24.7%) suffered from gingival inflammation. Beginning (4.8%) and established (9.6%) destructive periodontal disease was seen only among the deaf participants while terminal disease was not seen among either of the groups. (Table 3).

Table 4 shows comparison of DMFT scores revealed that higher proportion (72.2%) of hard of hearing participants had DMFT score > 0 compared of deaf participants (58.7%). However, it was not statistically significant (p=0.412).

Table 2: Frequency and percentage distribution of variables of dental health service utilization among both the groups.

Variables of dental health service utilization	Categories	Deaf		Hard of hearing		Total	
		Count	Percent	Count	Percent	Count	Percent
Last Visit to a dental professionals	< 6 months	09	14.3%	03	16.7%	12	14.8%
	6 - 12 months	12	19.0%	05	27.8%	17	21.0%
	>1 to < 2 years	10	15.9%	02	11.1%	12	14.8%
	> 2 to < 5 years	12	19.0%	0	0	12	14.8%
	> 5 years	07	11.1%	03	16.7%	10	12.3%
	Never	13	20.6%	05	27.8%	18	22.2%
Reason for last visit to dentist (n = 63)	Pain/trouble with teeth, gums mouth	28	54.9%	04	33.3%	32	50.8%
	Treatment/followup	12	23.5%	04	33.3%	16	25.4%
	Routine check up	08	15.7%	02	16.7%	10	15.9%
	Don't know/ remember	03	05.9%	02	16.7%	05	07.9%

Table 3: Frequency and percent distribution of various categories of periodontal disease among both the groups.

Index	Categories	Deaf		Hard of hearing		Total	
		Count	Percent	Count	Percent	Count	Percent
Russel's PI	Clinically Normal Supportive Tissues	41	65.1%	11	61.1%	52	64.2%
	Simple Gingivitis	13	20.6%	07	38.9%	20	24.7%
	Beginning Destructive Periodontal Disease	03	04.8%	0	0	03	03.7%
	Established Destructive Periodontal Disease	06	09.6%	0	0	06	07.4%
	Terminal Disease	0	0	0	0	0	0

Table 4: Comparison of categories of DMFT scores between the two groups.

DMFT score	Deaf		Hard of hearing		Odds ratio	95% Confidence Interval		P value
	count	percent	count	percent		Lower	Upper	
Score of 0	26	41.3%	05	27.8%	1.83	0.580	5.752	0.412
Score > 0	37	58.7%	13	72.2%				

The mean DMFT score of deaf participants was 1.95 ± 3.53 which was lower than hard of hearing group whose average DMFT score was 3.16 ± 3.82. On the other hand, average score of periodontal index of deaf participants was higher (0.38 ± 0.74) than the hard of hearing group (0.19±0.27) (Table 5).

Table 5: Mean and Standard Deviation of DMFT and Periodontal index scores among both the groups.

Groups	DMFT Index (mean± sd)	Periodontal Index (mean± sd)
Deaf	1.95 ± 3.53	0.38 ± 0.74
Hard of hearing	3.16 ± 3.82	0.19 ± 0.27
Total	2.22 ± 3.61	0.34 ± 0.66

Table 6 shows comparison of DMFT and periodontal scores between the two groups. The mean ranks were higher in hard of hearing group for DMFT index and in the deaf group for Russel's PI. However, this difference failed to show statistical significance (p>0.05).

Table 6: Comparison of DMFT and Periodontal Index scores among the two groups.

	Deaf	Hard of hearing	Deaf	Hard of hearing	Mann Whitney U statistic	p value
	Mean Rank		Sum of Ranks			
DMFT Index	38.67	49.17	2436	885	420.00	0.084
Periodontal Index score	41.46	39.39	2612	709	538.00	0.717

DISCUSSION

Oral health is a reflection of one's systemic health. Handicapped people are at greater risk for dental diseases because of greater neglect or poor oral hygiene and access to routine dental care. Males (70.4%) were more than females in our study population which correlates with the global prevalence of hearing impairment (males 56%, females 44%) [10]. Even though hard of hearing individuals were less compared to their counterparts, 50 % of them had experienced pain and discomfort in the oral cavity in the last 12 months.

Regular visit to a dentist is mandatory for maintenance of good oral health but awareness among the general population is not seen as indicated by studies done by Rajkarnikar, where 35.5% of the participants visited for pain and only 15.6% had gone for regular dental check up. Humagainconducted a study, which revealed that only20%were regular dental attendees and by Dali where 70% of the participants went to dentist only when they had pain.[11-13]

Even in our study, nearly half of the participants (50.8%) had visited dentists only due to pain in their tooth and gums and only 15.9% for routine checkup. Communication barrier and hesitation of the deaf and hard of hearing people could have led to slight increase in the percentage than the general population. Dental flossing and tooth brushing are the most commonly performed oral self care behavior.[14] It was reassuring to know that except one individual everyone brushed their teeth with a toothbrush. Twenty two individuals did not know whether their toothpaste was fluoridated or not, suggesting their ignorance about the benefits of fluoride. More than half the participants (56.8%) brushed their teeth once a day while 34.6% of them brushed twice or more. Similar findings were seen in a study by Rajkarnikar, where only 68.8% (once daily) and 29.5% (twice daily).[11] Only one participant used floss which shows the inadequate knowledge about the benefits of flossing regularly among the hearing impaired community.

Compared to the studies conducted in the past by Nowark*et al* with DMFT of 13.25 among 17 years and above, Jain *et al* (4.48 for 18-22 age group) suggesting adult to have greater number of decayed teeth while our study showed DMFT mean (2.22 ± 3.61).[15,16] Similar findings were seen in a study conducted by Acharya which showed DMFT mean (2.48± 0.65) among sensory disabled children in Kathmandu valley.[6] Diet plays a vital role in increasing the caries prevalence and low mean DMFT could be caused due to infrequent consumption of cariogenic diet by the participants. Caries free individuals were more from the deaf community (41.3%) than hard of hearing (27.8%), which emphasizes the need for oral health awareness among them.

Periodontal disease is a result of microbial plaque induced inflammation. Proper oral hygiene maintenance plays a key role in prevention of gingivitis and periodontitis. Studies conducted among individuals in Nepal showed 52.5% suffering from gingival inflammationwhile only 24.7% of our study population was seen to be suffering from gingival inflammation.[11] This could have been possible as majority of our study participants used toothbrush and toothpaste to clean their teeth. Beginning (4.8%) and established (9.6%) destructive periodontal disease was seen only among the deaf participants while none of the hard of hearing individuals had destructive periodontal disease. Tobacco smoking, mostly in the form of cigarette smoking, is recognized as the most importantenvironmental risk factor in periodontitis.[17] A small number (17.3%) of the study participants were cigarette smokers and only 6.2% of them smoked on a daily basis. This could have resulted in low percentage of periodontal problems in our study participants.

Quality oral health care contributes to holistic health which should be right rather than a privilege for each individual. Deaf and hard of hearing people who were enrolled in our study belonged to two centers working towards the upliftment of their communities. So preventive programs should be focused targeting the hearing impaired community in and beyond the centers and strategies should be formulated to remove the communication barrier between them and health personnel.

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