ORIGINAL ARTICLE

Oral Health Status Among Hearing and Speech Impaired Children of Karachi, Pakistan

Marium Azfar[1] **BDS, MPH**
Imran Khan[2] **BDS, MSc**
Sameer Quershi[3] **BDS, MSc**
Nighat Zia[4] **BDS, MSc**
Khadijah Abid[5] **BSC, MSc**

OBJECTIVE: To evaluate dental status of children with hearing and speech impairment of Karachi Pakistan.
METHODOLOGY: This cross sectional study was conducted in Karachi, Pakistan for a period of 6 month among 106 children with hearing and speech impairment aged 5-15 years of either gender attending Deaf Reach School. After taking informed consent the subjects were examined for oral health status. Dental caries was assessed by using DMFT index and Oral hygiene status was assessed by using oral hygiene index simplified (OHIS). The data were analyzed using SPSS version 23.
RESULTS: The overall caries prevalence in the study population was 51% with an overall mean DMFT score of 2.08 (±2.97). Out of 106 hearing and speech impaired children, majority had good hygiene status (48.1%), 46.2% had fair hygiene status and only 5.7% had poor hygiene status with overall mean OHI-S score of 1.45±1.01.
CONCLUSION: A high prevalence of dental caries was observed among hearing and speech impaired children.
KEYWORDS: Dental caries, DMFT, Oral health, Oral hygiene status, deaf, hearing and speech impaired children.
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INTRODUCTION

Dental care is noted to be the most common issue & unmet need among disabled children. Disabled children are at greater risk of poorer oral health due to other major disease such as frequent oral infections, moderate to severe malocclusion, periodontal disease & craniofacial birth defects.[1] The oral needs among them may be compromised to due limited access to facilities of oral health care, neglect from parents or care takers, socio-economic status or communication barriers.[2] Therefore, the disabled children appear to have more worsen oral health as compared to general population.[3] Judicial says in London, "Fit for the future" suggested that Oral wellbeing of disabled children ought to be raised to the level of that provided for normal children.[4]

Deafness is the common disability in childhood. Almost two to three children per 1000 have some level of permanent congenital hearing loss.[5] According to WHO estimate there are 360 million people globally with hearing impaired, among them 9% of these are children under the age of 15. The prevalence of hearing loss disability among children is very high in Asia Pacific, South Asia, and Sub-Saharan Africa. The leading cause hearing impaired among children is chronic otitis media.[6] In Pakistan, it is estimated about 1.6 per 1000 persons have bilateral hearing loss and 70% increase is due consanguineous families.[7] A survey conducted at the rural area of Pakistan showed total hearing impaired as 7.9%.[8]

Children with hearing & speech impairment have greatest barrier of communication. They cannot understand or cooperate with dental healthcare providers easily. Literature has reported an increased level of dental caries in these

1. Associate Professor, Department of Preventive & community dentistry, Sindh Institute of oral health sciences, Jinnah Sindh Medical University.
2. Assistant Professor, Department of Preventive & community dentistry, Sindh Institute of oral health sciences, Jinnah Sindh Medical University.
3. Assistant Professor, Department of Prosthodontics, Fatima Jinnah Dental college.
4. Assistant Professor, Department of Preventive & community dentistry, Sindh Institute of oral health sciences, Jinnah Sindh Medical University.
5. Senior Bio-Statistitcian, Department of Research Evalution Unit, College of Physicians & Surgeons Pakistan.

Corresponding author: "Khadijah Abid" < khadijahabid@gmail.com >

sensory impaired children.[9,10] Hence, there is no current data available on the oral status of deaf and dumb children of Sindh, Pakistan. Therefore, the present study was designed to provide primary data for development and planning of regional or national oral health programs for these children.

METHODOLOGY

It was a cross-sectional study conducted at the Deaf Reach School Karachi, Pakistan and duration of study was 6 months. The sample size of 106 participants was obtained by using open epi online sample size calculator. The statistics considered for sample size estimation was dental caries as 30.74%[11], margin of error as 8.8% and 95% confidence level. The non-probability purposive sampling technique was employed. All children of 5-15 years of either gender having speech & hearing impairment were included in the study. Children exhibiting other forms of sensory disorders or those affected by mental and physical disabilities along with speech and hearing loss were excluded from the study.

Before check-ups the Pakistan Sign Language (PSL) training workshop was conducted for the two examiners.[12] The aim of this workshop was to familiarize the examiners with deaf culture and basic sign language that is used to communicate with deaf children.

Informed consent was taken from school admin and parents of the children to participate in the study. All the parents were informed regarding the study protocol during their monthly visit to the school and consent was obtained. The clinical examination was carried according to World Health Organization (WHO) techniques[13] in the OPD of Integrated Occupational Health Services (IOHS) by the two examiner with experience of 3 years. Examiners were calibrated and validated by doing examination on 20 subjects. The inter examiner reliability was checked using Kappa statistics and it was found to be 83%. The children were then examined for oral status by making them sit on the upright chair in adequate light using autoclaved instruments; plain mouth mirror and WHO probe. Caps, gloves, masks and gauze were used in accordance with infection control guidelines. Dental caries was evaluated by using DMFT (decayed, missing, and filled teeth) index.[14] The DMFT score=0 was labelled as "caries-free" & DMFT score>0 as "caries present". Oral hygiene was evaluated by using the simplified oral hygiene index (OHI-S) introduced by Green and Vermillion.[15] OIH-S score was labelled for oral cleanliness as "good" for score between 0.1-1.2, "fair" between 1.3-3.0 and "poor" between 3.1-6.0.[16] Each examination took about 10-15minutes.

The demographic information such age, gender, weight & height of the children was recorded. BMI of each children was calculated by using the formula BMI =weight/height^{t2} (kg/m^2). Other related information regarding previous dental visits, frequency of tooth brushing, material used for brushing & food preferences was obtained under the supervision of school interpreters.

The data was entered into database, using Epi Info Version 3.6.1 by the researcher. To reduce data entry errors, check codes were incorporated into the database and the data was cleaned to ensure consistency of responses. For questions that were unanswered or blank responses during data entry were treated as missing variables.

Data analysis was carried out using the SPSS Version 23. Normality of the data was checked by using Kolmogrov-Smirnov test. Frequencies and percentages were calculated for all the qualitative variables. Mean & SD were calculated for all the quantitative variables. Chi-square was applied where appropriate. The confidence level was considered as 95% and P-value<0.05 was taken as statistically significant.

RESULTS

The study sample was consisted of 106 children with mean age as 12.88±2.59 years. Out of 106, 64 were males and 42 were females. The mean BMI of the children was reported as 20.10±4.09 kg/m2. Majority of the children had never visited the dentist (57.5%). About 59.4% of them brushed once daily, 28.3% of them brushed twice a day, 7.5% of them brushed after every meal and only 4.7% of them brushed less than one time. Majority of the subjects (91.5%) were using toothpaste to clean their teeth, tooth power was used by 5.7% & no material was used by 2.8% of the children. Regarding eating habits, majority of children (91.5%) were consumer of confectionaries, flavored sweetened milk was consumed by 73.6% & 83% of the children were habitual consumers of sweetened juices. (Table 1)

The overall caries prevalence in the study population was 68.9% with an overall mean DMFT score of 7.58±2.62. According to dentition status, sixteen children had dental caries in primary teeth, whereas 57 children had dental caries in permanent teeth. None of the children had missing primary teeth due to caries or other reasons, filled teeth with or with no decay. Two children had permanent teeth missing due to caries, none had missing teeth due to other reasons, two had permanent filled with no decay, and one child had permanent filled with decay. Out of 106 hearing and speech impaired children, majority had good hygiene status (48.1%), 46.2% had fair hygiene status and only 5.7% had poor hygiene status with overall mean OHI-S score of 1.45±1.01. (Table 2)

Table 1: Baseline characteristics of whole cohort:

VARIABLES	STATISTICS
Age in years	12.88±2.59
Gender	
Male (%)	64(60.4%)
Female (%)	42(39.6%)
BMI (kg/m2)	20.10±4.09
Dental Visits	
Haven't visit (%)	61(57.5%)
Visited at least once (%)	45(42.4%)
Brushing Frequency	
Once a day (%)	63(59.4%)
Twice a day (%)	30(28.3%)
After every meal (%)	8(7.5%)
Less than once a day (%)	5(4.7%)
Material Used for Brushing	
Toothpaste	97(91.5%)
Tooth powder	6(5.7%)
No material	3(2.8%)
Eating & drinking habits	
Sweet milk consumption	78(73.6%)
Consumption of juices	88(83%)
Consumption of confectionaries	97(91.5%)

Table 2: Dental caries and oral health status

Dental Health Status	
DMFT index	7.58±8.62
Dental caries	
Caries Free (%)	33(31.1%)
Caries Present (%)	73(68.9%)
Debris index	0.92±0.56
Calculus index	0.54±0.62
OHI-S index	1.45±1.01
Oral Hygiene Status	
Good Oral Hygiene	51(48.1%)
Fair Oral Hygiene	49(46.2%)
Poor Oral Hygiene	6(5.7%)

Table 3: Age and gender wise distribution of dental caries and oral hygiene status

	Dental Caries		P-value	Oral Hygiene Status			P-value
Age Groups	**Present**	**Absent**		**Good**	**Fair**	**Poor**	
5-10 years	15(75%)	5(25%)		12(60%)	7(35%)	1(5%)	
11-15 years	58(67.4%)	28(32.6%)	0.511	39(45.3%)	42(48.8%)	5(5.8%)	0.493
Gender							
Male	43(67.2%)	21(32.8%)		30(46.9%)	31 (48%)	3(4.7%)	
Female	30(71.4%)	12(28.6%)	0.645	21(50%)	18(42.9%)	3(7.1%)	0.782

The age and gender wise distribution of dental caries and oral hygiene status has been shown in Table 3. The stratification of dental caries was done with respect to brushing frequency, eating habits, dental visits and obesity by using chi-square test, hence the relationship was found as statistically insignificant (p>0.05). (Table 4)

Table 4: Association of dental caries with other variables

Variables	Dental Caries		P-value
	Yes	No	
Brushing Frequency			
Once a day	43(58.9%)	20(60.6%)	
Twice	18(24.7%)	12(36.4%)	
After every meal	7(9.6%)	1(3.0%)	
Less than once a day	5(6.8%)	0(0.0%)	0.198
Eating Habits			
Sweet Milk	54(74.0%)	24(72.7%)	0.893
Juices	61(83.6%)	27(81.8%)	0.825
Confectionaries	65(89.0%)	32(97.0%)	0.175
Dental Visits			
Haven't visit (%)	37(50.6%)	24(72.7%)	
Visited at least once	36(49.3%)	9(27.2%)	0.095
Obese(BMI=>27.5 kg/m^2)			
Yes	70(95.9%)	30(90.9%)	
No	3(4.1%)	3(9.1%)	0.304

DISCUSSION

Our study shows that majority of the hearing and speech impaired children had never visited to a dentist for any treatment or check-up. The similar proportions was presented in previous literature of the disabled children.[3,17,18] The reason for not visiting the dentist could be due less priority of parents/caretakers regarding importance of dental health, lack of communication and low socio-economic status.[19,20]

In the present study, only 4.7% of the children didn't use to brush their teeth whereas majority of the children brushed their teeth once daily (59.4%) followed by 28.3% of the children brushed their teeth twice a day and 7.5% of the children use to rinsed their mouth after every meal. In the present study we also observed that majority of the children used toothpaste & tooth brush as cleaning materials. The similar findings was observed in the study by Prashanth ST et al. at Banglore among disabled children, which showed 62.35% of the children use to brushed their teeth only once in the morning & 37.65% of the children responded that they use to brushed twice a day & 98.82% of the children clean their teeth with toothbrush.[21]

In the present study most of the children prefered confectionaries 91.5%, about 83% consumed juices and 73.6% consumed sweetened milk. In the study conducted by Folakemi OA found that most of the pupils (60%) prefered biscuits, sweets and softdrinks.[22] Children eating habits could be potentially influenced by parent's social and envirnomental behaviours such as the use of food as rewards and the withholding of food as punishment.[23] The study stated that less consumption and lower intake of sweets is very important

especially for down synodrome patients since they are unable to maintain proper oral hygiene.[22]

In the present study, mean DMFT was very high and reported as 7.58±2.62 and dental caries was prevalent among 68.9% of children. With increase in age range prevalence of dental caries was also increased and male was prominently affected by caries. Similar findings was observed in the study by Suma G et al. which showed higher prevalence of dental caries among the 11-15 years old children and majority of the males were affected by the caries.[3]

In the present study, most of the children had good hygiene status (48.1%). The dissimilar findings was observed in previous literature where frequency of poor oral hygiene was observed as high among disable children.[24,25] In the present study, we observed that with increase in age of the children the good hygiene practice has also increased. However, the frequency of good oral hygiene was high among males as compared to females.

In the present study we have also assessed the relationship of dental caries with brushing frequency, eating habits, dental visits and obesity. We found that dental caries predominantly affecting the children who brushed their teeth once a day, children who consumed confectionaries/juices/sweet milk, children who had never visited dentist and children who were obese. Hence these variables can be considered as potential risk factors for poor dental health among children with hearing and speech impairment.

CONCLUSION

A high prevalence of dental caries was observed among hearing and speech impaired children There is a high need for an epidemiological survey followed by the comprehensive dental care programs for children with hearing speech impairment, as well as efforts should be taken to encourage and promote parents of these children to improve their oral health.

CONFLICT OF INTEREST

None to declare

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