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Research Article

ORAL HEALTH STATUS AMONG VISUALLY IMPAIRED AND NORMAL SCHOOL CHILDREN OF DELHI, INDIA- A CROSS SECTIONAL AND COMPARATIVE STUDY

SavitaSolanki[1.], Sumanth Prasad[2], Roma Yadav[3] RituDahiya[4]

[1,4]PDM Dental College, Bahadurgarh, Haryana
[2]Jaipur Dental College, Rajasthan
[3]NIMS Dental College, Rajasthan

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A B S T R A C T

Objective: To evaluate and compare the Oral hygiene status, plaque accumulation, gingival health, dental caries status and prevalence of traumatic injuries among visually impaired and normal school children. Basic research design: Cross-sectional and comparative study with oral examination. **Participants:** 1272, with an age group of 6-16 year (631 from either school) in Delhi, India. **Results:** The mean OHI score among visually impaired was (2.61 ± 0.60) as compared to normal children (2.23 ± 0.51). Mean Plaque index and GI score was 1.81 and 1.43 respectively for visually impaired whereas 1.40 and 1.08 for normal children respectively. The mean DMFT and dmft Score was 2.10 and 0.92±1.94 for visually impaired and 0.99 and0.19±0.77 respectively. The caries prevalence among the visually impaired children was 57.84% and among the normal children was 25.67%. The prevalence rate of traumatic injuries was quite high among visually impaired (38.21%) as compared to normal children (20.07%) and statistically significant values were also found in all the parameters between the two groups. **Conclusions:** Overall oral hygiene status was poor among blind children when compared with the normal children. Visually Impaire Children experienced more dental caries and traumatic injuries.

INTRODUCTION

Disability is the umbrella term for impairments, activity limitations and participation restrictions, referring to the negative aspects of the interaction between an individual (with a health condition) and that individual's contextual factors (environmental and personal factors)[7].

Child's vision is essential for successful learning in school. When the vision suffers, pupil's routine school work and day to day activities also get affected. Vision problems are common among school students. The reasons are mainly unhygienic living conditions, malnourishment and the alluring media influence like television, computer games and diminishing parental care etc. The students are not mature enough to point out the deficiency at the early stage or the parents have no idea on the gradually developing vision problem. This results in tiredness, distraction, headache and a few other disorders. Children who are affected have difficulty in concentration on studies or on any other curricular, extracurricular or recreational activities[10]. Good oral health is imperative for proper mastication, appearance and speech.

Corresponding author:* **SavitaSolanki
PDM Dental College, Bahadurgarh, Haryana

Individuals with visual impairment have greater limitation in oral hygiene performance due to their potential motor, sensory and intellectual disabilities and thus are prone to poor oral health and managing a patient with impaired vision is a challenge to the dental health care team[8].

According to WHO Global data on visual impairment in 2010, the total population of children across world is 1848.50 million across the world, out of which 1.4 million were found to be blind, 17.5 million were with low vision and 18.9 million were visually impaired. It is estimated that prevalence of childhood blindness in India is 0.8 per thousand children implying a total of 3,00,000 blind children in the country[12].

As the oral health problems of all the visually impaired children in India have not been thoroughly documented with all the clinical parameters, and also there is paucity of data in the literature regarding comparison of oral health status between visually impaired and normal school going students. Therefore, the current study was conducted with an aim to assess and compare the oral hygiene status, periodontal health, dentition status and treatment needs of visually impaired and normal school going children aged 6-16 years in Delhi. Since the oral health of these children requires more observance and care, this study was aimed at understanding the oral health care needs of the visually impaired children of Delhi in a better way.

MATERIALS AND METHOD

The present cross-sectional study was carried out in the registered blind and normal schools of Delhi with an age group of 6-16 year forming a sample of 1272 (631 from either school). Before the onsent of the study, informed consent in the form of Braille was taken from each visually impaired child and school authority. For the normal school children the consent was taken from the child and school authorities. Ethical clearance was also obtained from the college ethical committee. The oral health examination was done for the children in their respective schools by Type 3 Examination. A Single calibrated Examiner recorded all the clinical parameters.

Inclusion and exclusion criteria- All the children present in the blind school with an age group of 6-16 year during the study period were included. The children who were not present on the day of the examination or with any other systemic disease were not taken into the study.

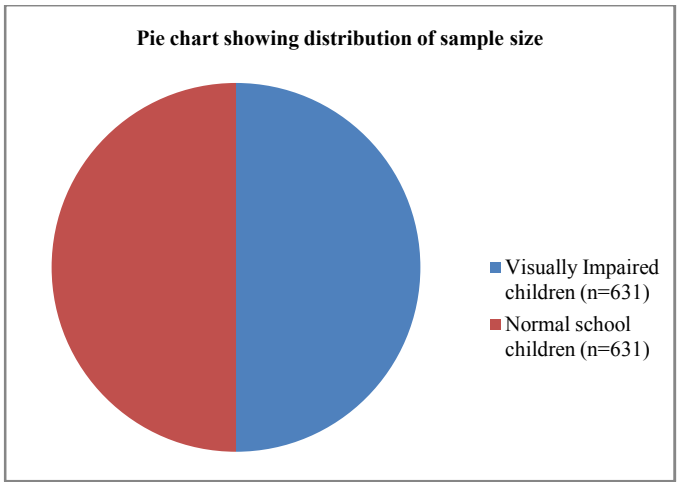
A survey Performa was prepared which consisted of Demographic details and Clinical parameters: Oral Hygiene Index simplified (OHI-S) by John C Greene and Jack R Vermillion (1964) was assessed for oral hygiene status.Plaque Index and Gingival index was assessed for plaque accumulation and for measuring gingival health. DMFT and dmft was assessed for Dental caries status, missing and filled teeth among permanent and primary dentition. The prevalence rate of dental caries was also recorded. In addition, prevalence rate of traumatic injuries was also assessed based on the Ellis and Davey classification.

Statistical analysis

Statistical analysis was performed using SPSS version19 for statistical parameters i.e. mean and standard deviation. Student's t-test and ANOVA was used for calculating the significant difference between the different variables. Significance for all statistical tests was predetermined at a probability value of 0.05 or less.

RESULTS

A total of 1272 subjects out of whom 631 were visually impaired and 631 were normal children (graph 1)participated into the study.



The intra examiner reliability for OHI-S (Oral Hygiene Index Simplified), PI (Plaque Index), GI (Gingival Index),DMFT (Decayed, missing, filled teeth), traumatic injuries was assessed using Kappa Statistics, which were found to be 90%, 88%, 87%,88%,90% respectively.

Regarding the Oral Hygiene status, the mean OHI score among visually impaired was high (2.61 ± 0.60) as compared to normal children (2.23 ± 0.51) and statistically significant differences ($p \leq 0.05$) were also found between the two groups. Both the visually impaired and normal children showed varying degrees of plaque accumulation ranging from mild to moderate. Mean Plaque index score was 1.81 ± 0.56 for visually impaired and 1.40±0.61 for normal children. However, statistically significant difference was appreciated in both groups (table 1) The results showed statistically significant differences in plaque score between the two groups ($P < 0.0001$), as moderate accumulations of plaque were found more frequently among the visually impaired group. Most children in both groups exhibited mild gingivitis; but majority of the visually impaired showed moderate gingivitis thus forming mean GI score 1.43 and 1.08 respectively amongst two groups.

The mean DMFT score for visually impaired and normal school children was 2.10 and 0.99 respectively. The mean DMFT score of visually impaired was more as compared to normal subjects which was found to be significant $p \leq 0.0001$. Similary, overall mean dmft was 0.92±1.94 for visually impaired and0.19±0.77for normal subjects. The mean dmft score was also higher in visually impaired as compared to normal subjects.

The overall prevalence rate of traumatic injuries was quite high among visually impaired (38.21%) as compared to normal children (20.07%).

Table 1 Comparative Evaluation of clinical parameters among Visually Impaired and normal subjects

Group	Oral Hygiene status	PI	GI	DMFT	dmft	Prevalence of Dental Caries	Prevalence of Traumatic injuries
Visually Impaired Children	2.61 ± 0.60	1.81±0.56	1.43±0.89	2.10±2.2	0.92±1.94	57.84%	38.21%
Normal Children	2.23 ± 0.51	1.40±0.61	1.08±0.21	0.99±2.42	0.19±0.77	25.67%	20.07%
p value	≤ 0.05	≤0.0001	≤0.001	≤0.001	≤0.0001	≤0.0001	≤0.001

DISCUSSION

Good health is a fundamental goal for the people and the societies in which they live. Oral health is an important aspect in matter of overall health for all children, specially in case of children with special health care needs. These children are always at disadvantage as they often are unable to adequately use the techniques of controlling plaque and keeping good oral hygiene and thence are more prone to develop dental caries.They have less knowledge about their oral health and thereby experience higher level of dental diseases.Oral health is one aspect which is highly disregarded in case of children with special health care needs[13].So, to plan out a proper oral health programme for these special children is needed to chart out their oral health needs. In the current study, most of the visually impaired children showed comparatively higher oral hygiene index simplified scores when compared with the normal children as shown in table 1. Statistically difference was also seen in the mean OHI-S of the two groups and which was found to be consistent with a study reported byJosephet

al[6]. This could be due to the sensory impairment, which makes maintaining good oral hygiene more difficult for the visually impaired children.

The plaque accumulation scores were higher in visually impaired children and same results were reported by Bimstein[4] et al.In children, Plaque-induced gingivitis is almost a common finding. This high plaque score led to more gingival inflammation, thus more GI scores which was also found to be significantly different between the two groups.The GI score were also similar to the studyreported by Alsadhan[1] et al. with statistically consistent difference in both the groups.

The caries prevalence in this study among the visually impaired children was 57.84% which seems to be much higher when compared with the normal children as shown in table 1 and found to be in agreement with the study done by Avasthi K[2] and Chauhanet al[4]where the caries prevalence was found to be 59.68% and 59%respectively. In the current study, the proportion of visually impaired subjects free from dental caries were 42.1% which is comparatively high when compared with the study by Shyama et al[15]and Naveen Net al[9] where only found 35.5% and 31.9% of subjects were free from dental caries.

The present study revealed that the visually impaired children showed higher DMFT and dmft scores when compared with the normal school children. These results are in accordance with the study by Avasthi et al[2] 2011who conducted the study in the same area but with a comparatively smaller sample size (n=350).This might be due to the fact that the visually impaired children are unable to visualize their oral health which leads to the failure of recognition of dental caries like presence of discoloration or any cavity formation at an initial stage.These children only get to know about some problem in their oral health when they experience discomfort or toothache.When the individual components of the mean DMF values were examined, disparities with marked difference was seen among the visually impaired and normal children. Although, the decayed component constituted the major component of DMFT in both the groups and it shows that the unmet treatment need was large with very few children having been treated especially among the visually impaired children group, a high demand for provision of dental services, and it clearly indicates that this special group of children has received less dental treatment.

The prevalence of tooth fracture was high in visually impaired children and a significant difference was also found when compared to the normal subjects this is in agreement with other studies done by Bhatet al[3]and Poureslami et al[11]who showed that theprevalence of tooth fracture in visually impaired children was higher than the sighted children. This study too indicated that the visually impaired seemed to be at a greater risk of sustaining a fractured anterior tooth than with the normal subjects.Lack of vision exaggerate the chance of fall and hitting an object in these special group of visually impaired children.

Thus, this study revealed that the oral health of the visually impaired children was poor, and a majority of the children were in need of specific dental care.

The study also confirmed a need for preventive treatment for these children. Delivery of timely dental services is of particular importance to children with disabilities because of higher prevalence of dental caries when compared to the normal children of same age group. The oral health situation of these special children must be improved and special consideration must be given to them. There is a clear need to involve the dental profession more actively in dietary counselling. It is an alarming situation needing immediate attention and a prevention based intervention programme for these special group of children is of utmost need to improve their oral health.

Limitation

The limitation of the study was that no venture was being made to assess the level of severity of visual impairment among the children of blind schools.

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