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ORIGINAL ARTICLE

Evaluating the Oral Health Knowledge and the Status of Visually Impaired Children using Braille

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ABSTRACT

Introduction: Oral health has great impact on the overall health and well-being of an individual. The Disability Discrimination Act, 1995 states that there is need to ensure removal of all the barriers to dental care for this group of individuals and provide equal access for all. Hence, the present study aimed to create awareness on the importance of the oral health care needs among visually impaired children.

Objectives: To assess the oral health knowledge, attitude and awareness using Braille-scripted questionnaire and to evaluate and correlate the influence on oral hygiene practices following oral health education using Braille-formatted material.

Materials and methods: A total of 100 visually impaired children were selected randomly from two residential blind institutes. Twenty open-ended Braille-formatted questions were scripted in regional language (Kannada) and were distributed to all the children. At baseline, simplified oral hygiene index (OHI-S) was recorded. Children were provided with oral hygiene instructions verbally and in Braille-formatted material individually. At the end of 2 months, the OHI-S index was rerecorded. Data collected were statistically analyzed.

Results: Basic oral health knowledge was fair as evidenced by many children. The study revealed that 67% of children were aware of the importance of health of mouth and teeth over the health of body. In the present study, 78% of children cited that mother was the one who takes care of teeth. These dental visits were mostly reported either as attending the dentist whenever they had dental problems (38%) or as never having visited dentist 36%. The OHI-S scores before and after intervention showed highly statistically significant results (p = 0.001).

Conclusion: Visually impaired children showed acceptable improvement following Braille-scripted oral hygiene instructions with the key factor being the repetition and reinforcement of those instructions.

Keywords: Attitude, Awareness, Health, Knowledge, Oral, Visually impaired children.

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INTRODUCTION

(Braille: Triumph over Darkness)

Oral health has a profound impact on child's health and quality of life. Children with disabilities and special needs are at greater risk of health problems, require extra help, and rely on others to achieve and maintain good health.[1]

With 7.8 million blind people in India, the country accounts for 20% of the 39 million blind populations across the globe.[2] It is estimated that the prevalence of childhood blindness in India is 0.8/1000 children in <16-year age group, implying a total of 300,000 blind children in our country.[2] The control of blindness in children is considered a high priority of the World Health Organization's VISION 2020, The Right to Sight program.[3] Visual impairment is essentially an umbrella term used to describe the loss of sight that can be a consequence of a number of different medical conditions. People who are visually impaired may feel as though they are incapable of undertaking normal tasks and may have a harder time acquiring and processing information, thus compromising oral hygiene significantly.[4] The sense of touch is the first sense to be developed during one's life. It continues to be the primary means of experiencing the world through infancy and as well as in childhood. Braille is a tactile writing system used by people who are visually impaired. It is traditionally written on embossed paper. Most of the studies reveal that brain accelerates the sense of vision by accelerating the sense of touch.[5]

Considering the possible difficulties that visually impaired people may encounter, this study was conducted to assess the oral health knowledge, attitude, and awareness of these children using Braille-based questionnaire and to evaluate the oral hygiene practice following oral hygiene instructions in Braille.

MATERIALS AND METHODS

In the present study, children were randomly selected from two residential schools meant for the blind, these being

the only schools providing Braille education. Necessary permission from the school principal and written informed consent were taken from both the schools. A total sample size of 100 visually impaired children residing in the school meant for the blind were chosen by purposive sampling method based on the availability of Braille-trained children. Both schools were enrolled in the study with the purpose to assess the information regarding knowledge, attitude, and awareness concerning oral health.

Inclusion Criteria

- Children of age group 8 to 14 years with visual impairment/total blindness
- Children who can read Braille

Exclusion Criteria

- Children with any other disability
- Children who could not read Braille

The study was conducted in the course of 8 weeks.[6-10]

First Visit (Interactive Session)

Before the collection of the data, an interactive session was conducted to understand their level of comprehension. Brief history was taken regarding the oral health practices of the children. Separate oral health education and motivational session was conducted for their caregivers.

Second Visit (Questionnaire and First Clinical Examination)

Twenty open-ended questions were standardized in English and then scripted in local language. The Braille-typed Kannada-translated structured questionnaire was prepared with the help of Braille-trained school teacher and were distributed among the children and then translated to English by trained investigator. Oral examination was carried out using plain mouth mirror and explorer. The OHI-S index was recorded to assess the oral health status of the children.[11] Children received one-on-one oral health education and were provided with written material in Braille for self-learning.

Third Visit (Repetition and Reinforcement)

On the 15th and the 30th days, the children were highlighted on the importance of tooth brushing and proper brushing method. Repetition and reinforcement of the oral health instruction were done.

Fourth Visit (Follow-up)

The third visit was held on the 60th day after the onset of the study. The purpose of this visit was to estimate the effectiveness of the oral health education using Braille. The OHI-S index was rerecorded to check the oral health status followed by oral health instructions in Braille.[10,12-14]

Statistical Analysis

The data obtained were analyzed using the Statistical Package for the Social Sciences (statistics for windows, version 21.0). The p-value was considered to be significant when less than 0.05 (confidence interval of 95%). Data collected were analyzed using chi-square test to find association between the oral hygiene and about oral health practices and paired t-test was used to find the difference between OHI-S before and after providing oral health instructions.

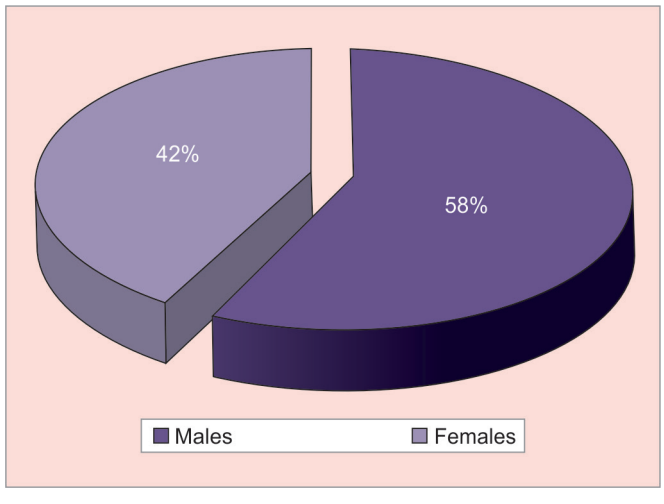
RESULTS

In present study, a total of 100 visually impaired children belonging to the age group of 8 to 14 years were enrolled comprising of 58 males and 42 females (Graph 1).

Table 1 describes the chi-square results with respect to oral hygiene status on the knowledge, attitude, and awareness among visually impaired individuals. Table 2 shows the significant difference of the OHI-S scores before and after providing oral hygiene instructions.

Graph 2 shows the oral hygiene status of study subjects before and after intervention. Graph 3 describes the awareness of individuals regarding the oral health.

In the present study, 67% of the children were aware of the importance of health of mouth and teeth over the health of body; 49% of children said that there were two sets of dentition. Only 8% of them knew that there were 20 milk teeth and 32 permanent teeth; 45% children responded that they cleaned their tongue with their fingers and 33% used toothbrush and remaining 22% did not clean their tongue; 60% of children incorrectly reported that there is no need for regular dental visits.



Graph 1: Percentage distribution of children based on gender

Table 1: Knowledge, attitude, and awareness of visually impaired children about oral health care

Knowledge-based questions	*N (Total-100)*	*%*	*Chi-square value*	*p-value*
1. Do you know how many sets of dentition in life we do have?				
(a) 1	13	13	2.228[a]	0.898
(b) 2	49	49		
(c) 3	16	16		
(d) Do not know	22	22		
2. How many number of milk teeth and permanent teeth do we have?				
(a) 5 and 24	7	7	7.083[a]	0.313
(b) 20 and 32	8	8		
(c) 32 and 32	61	61		
(d) Do not know	24	24		
3. I brush my teeth to:				
(a) Prevent it from tooth decay and gum disease	57	57	2.786[a]	0.835
(b) To achieve cleaner and brighter teeth	26	26		
(c) To avoid bad breath	16	16		
(d) Do not know	1	1		
4. Does the health of mouth and teeth impact the health of your body?				
(a) Yes	67	67	5.388[a]	0.495
(b) No	19	19		
(c) Do not know	14	14		
5. Do you know who takes care of teeth?				
(a) Mother	78	78	3.900[a]	0.690
(b) Dentist	7	7		
(c) Do not know	15	15		
Attitude-based questions				
1. Do you brush your teeth?				
(a) Yes	100	100	0[a]	–
(b) No	0	0		
2. How many times do you brush your teeth?				
(a) Once a day	50	50	1.677[a]	0.795
(b) Twice a day	48	48		
(c) More than 2 times	2	2		
3. When do you brush your teeth?				
(a) In the morning	83	83	5.355[a]	0.253
(b) In the evening	1	1		
(c) Both morning and evening	16	16		
4. What do you clean your teeth with?				
(a) Toothbrush	94	94	3.437[a]	0.488
(b) Finger	4	4		
(c) Neem stick/datum	2	2		
5. Do you use toothpaste to clean your teeth?				
(a) Yes	92	92	8.623[a]	0.196
(b) No	8	8		
6. For how long do you brush your teeth?				
(a) Less than 1 minute	32	32	1.165[a]	0.979
(b) 1 minute	19	19		
(c) 2 minutes	32	32		
(d) Don't know	17	17		
7. Do you clean your tongue?				
(a) Yes, with fingers	45	45	3.203[a]	0.783
(b) Yes, with toothbrush	33	33		
(c) No	22	22		
8. How often do you change your toothbrush?				
(a) Once every month	72	72	7.068[a]	0.719
(b) Once in 3 month	11	11		
(c) Once in 6 month	5	5		
(d) Once in the every year	2	2		
(e) N/A	10	10		

(Cont'd…)

(Cont'd…)

Knowledge-based questions	*N (Total-100)*	*%*	*Chi-square value*	*p-value*
Awareness-based questions				
1. Have you ever felt presence of bad breath?				
(a) Yes	31	31	1.159[a]	0.885
(b) No	69	69		
2. Have you ever visited a dentist?				
(a) Yes	64	64	2.498[a]	0.645
(b) No	36	36		
3. How often do you think dentist should be visited?				
(a) Regularly every 6–12 months	10	10	1.410[a]	0.965
(b) Occasionally	44	44		
(c) Whenever I have dental pain	38	38		
(d) Do not know	8	8		
4. Last time I visited a dentist was				
(a) 6 months ago	4	4	16.566[a]	0.035
(b) Last 1–2 years	35	35		
(c) Last 2–5 years	25	25		
(d) Never visited	36	36		
5. Dentists should be visited regularly?				
(a) Yes	40	40	0.742[a]	0.690
(b) No	60	60		
6. Supari (arecanut) chewing is a bad habit?				
(a) Yes	72	72	0.581[a]	0.748
(b) No	03	3		
7. Efficient cleaning of teeth can be done without using toothpaste?				
(a) Yes	77	77	0.972[a]	0.615
(b) No	23	23		

[a]Cells have expected count less than 5

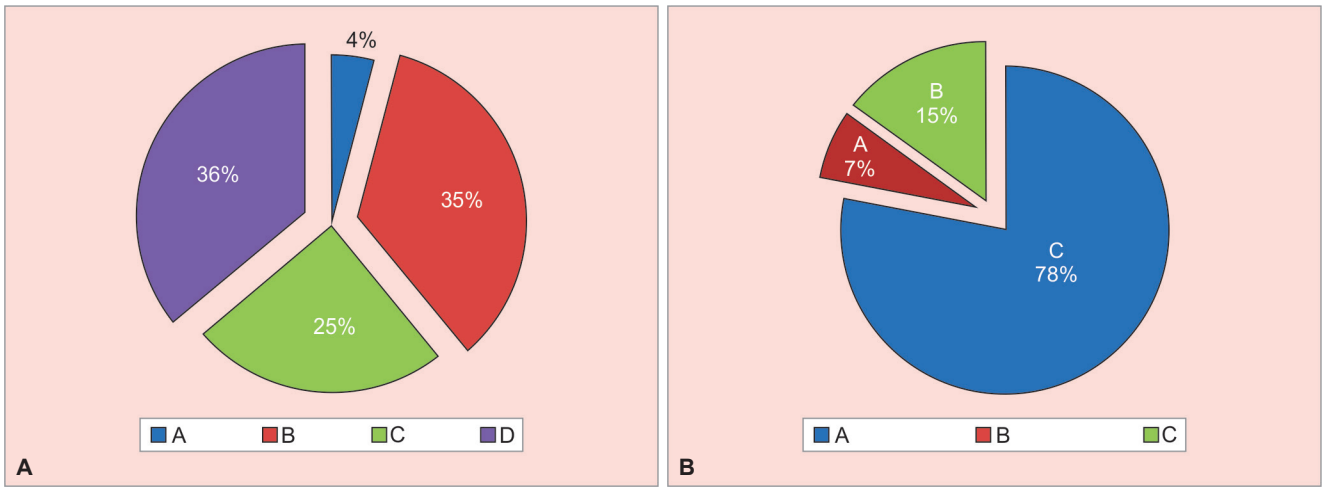
Table 2: The OHI-S scores before and after intervention

		Paired samples statistics				
		Mean	*n*	*Standard deviation*	*Standard error mean*	*p-value*
Pair	OHI-S1	2.4721	100	1.31613	0.13161	0.001
	OHI-S2	2.1887	100	1.24712	0.12471	

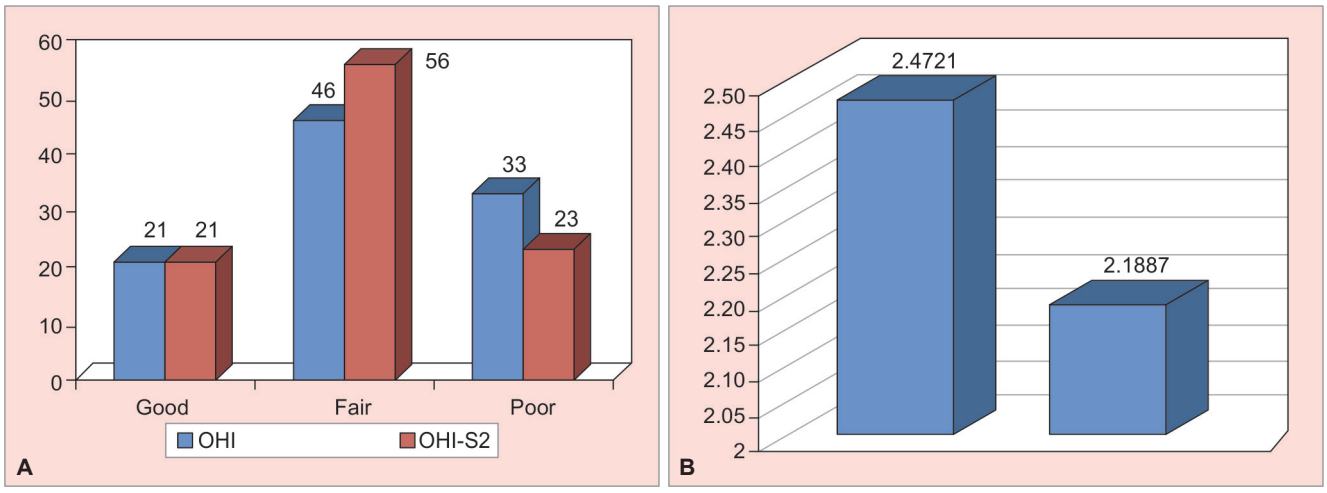
There is significant difference between OHI-S scores

DISCUSSION

Ottawa charter defined health promotion as the process of enabling individuals and communities to increase control over the determinants of health and thereby improve their health.[7] Supporting this statement, the present study was done with the purpose to assess the oral health knowledge and also to educate and promote oral health in visually impaired children. Bhambal et al[15] reported that dental treatment is the greatest unattended health of the disabled people, especially in blind who have oral health problems similar to or more than those seen in the general population. In studies done by Ahmad et al[16] and Vashisth and Devi,[17] 93 and 72% of visually impaired children respectively never visited dentist. In contrast to former studies,



Graphs 2A and B: Awareness of oral health among the visually impaired children



Graphs 3A and B: Oral hygiene status of visually impaired individual classified according to OHI-S before and after intervention

our study revealed that 36% children never visited dentist. The reason for this difference could be that children in our study were exposed to various dental camps and were known to dentist even though they might have not perceived any treatment. Possibility that most of the people would only seek dental treatment if they were in great pain, otherwise they would think that their oral condition was good because they lack capacity to detect signs of abnormalities within the oral cavity in a visual manner.

Chang and Shih,[18] in their study, found that students with visual impairments were less knowledgeable about their oral care. In contrast, in our study, majority of the children had fair oral health knowledge. However, there were some concerns over misconceptions; 77% children stated that efficient cleaning of teeth can be done without using toothpaste and 78% of children cited that mother was the one who takes care of teeth.

Inappropriate technique and brushing contribute to periodontal problems and other oral health diseases. In a study done by Singh et al,[19] only 54% of visually impaired children used toothbrush and toothpaste, but the present study reported with 94% of children using toothbrush and toothpaste; 4% used fingers and 2% used datun. In another study by Solanki et al,[20] 74% of visually impaired children used toothbrush and toothpowder, out of which 90.2% children cleaned their teeth once daily. Our study observed that oral health behavior was acceptable for frequency of brushing. However, the frequency of brushing once a day (83%) was higher than as recommended at least twice a day (17%). Almost all the children brushed their teeth every day. This may be due to the fact that they stayed in residential school and were motivated by each other. A considerable amount of improvement was observed in the frequency and type of brushing after educating the children through verbal and Braille-formatted instructions.

In blind individuals, the presence of oral malodor indicates periodontal problem. The present study reported that 31% had experienced bad breath. Similar findings have been reported by Mohd-Dom et al[21] where 30.8% children presented with malodor.

A study done by Ganapathi et al[22] showed least reduction in plaque scores in the group provided with Braille pamphlets which was in contrast to our study which illustrated a statistically significant (p-value = 0.001) oral hygiene scores post instructions (Table 2 and Graph 2).

In studies conducted by Nandini[23] and Ahmad et al,[16] 8 and 44% of children respectively reported with poor oral hygiene at baseline, while our study revealed 33% of the children with poor oral hygiene (Graph 2). The OHI-S score showed significant improvement in plaque scores which changed from poor to fair and fair to good (Graph 2).

A salient factor in our study is the Braille-formatted questionnaire and instructions. According to O'Donnell and Crosswaite,[24] the visually impaired child's ability to translate verbal instruction is very accurate. Since in our study, we have incorporated both verbal and Braille-formatted instructions, approaching the children individually might have helped us in promoting oral health measures. Thus, we can conclude that our method of imparting oral health education by means of verbal and Braille-formatted instructions successfully helped the children, resulting in enhancement of oral health knowledge and attitude with the reduction in plaque scores.

CONCLUSION

The present study showed that awareness about the oral health among the visually impaired was fair. Although some misconceptions concerning oral health still prevail, the level of knowledge identified among visually

impaired children in our study was encouraging. But the need for oral health education among these children aiming at improving oral health knowledge and continuous implementation of oral health promotion programs still exists.

CLINICAL SIGNIFICANCE

Based on the present study, although children have positive attitude toward oral health, knowledge and practice among children are still below the satisfactory level.

- Establishment of oral health programs that address the oral health promotion and prevention of diseases should be initiated.
- Special considerations must be taken to teach visually impaired about their oral hygiene maintenance.

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