

"SEEING THE UNSEEN" QUALITATIVE ASSESSMENT OF BRAILLE AND AUDIO TACTILE PERFORMANCE TECHNIQUE ALONG WITH ROLE OF PARENTAL INFLUENCE IN VISUALLY IMPAIRED CHILDREN.



Paediatrics

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ABSTRACT

Aim: To assess the effectiveness of Braille and Audio Tactile Performance Technique along with role of parental influence on oral hygiene among visually impaired children of Varkala, Kerala.

Materials and Methods: The present study consists of 30 visually impaired children who were divided into three groups of 10 each. In Group 1, Braille was used, whereas in Group 2, ATP technique and in Group 3, a combination of both the methods was used to teach the method of proper tooth brushing as a part of oral health education. Evaluation of parental influence on the oral hygiene of participants was done using a self-structured questionnaire. Pre and Post Oral Hygiene Index-Simplified (OHI-S) score were calculated and tabulated for statistical analysis.

Results: Comparison of pre-intervention OHI-S score in Group 1, 2 and 3 were found to be statistically insignificant ($p = 0.295$) and postintervention OHI-S was found to be significant ($p = 0.003$). While considering the parental status of children, those with both parents had very good oral hygiene when compared to single parent and orphan among three groups. In case of the parent's role in the supervision of oral hygiene, oral hygiene was found to be good among children who were supervised while brushing in Group-1. Most of the parents who were having a single child had good oral hygiene in comparison to the other groups. Children with good oral hygiene in Group-1 were cared by their parents.

Conclusion: The combination of Braille and ATP technique for effective oral health education yielded as the most effective medium to teach oral hygiene methods for visually impaired children. Single child who were taken care by both parents who were regularly supervised during brushing had good oral hygiene

KEYWORDS

Braille, Audio-tactile performance, Oral Hygiene Index-Simplified.

INTRODUCTION

Blindness is defined by WHO as having a "visual acuity of less than 3/60 meter or corresponding visual field loss in better eye with the best possible correction" meaning that whilst a blind could see 3 m, a non-visually impaired person could see 60 m. It has been estimated that out of 400 million children in India, 680,000 children are blind.¹ Total visual impairment is one disorder that may result in frequent hospitalization, separation from family, and slow social development. Because the capabilities of a child with blindness are difficult to assess, the child may be considered developmentally delayed.²

The visually impaired depend on senses such as sound, speech and touch (tactile perception) to orient themselves to their environment; hence, various techniques have to be custom made to teach these individuals, so that they can perform their daily chores.³

Louis Braille, a French educator, presented a tactile method known as the Braille system. It is a system of bumps and indentations on a surface to represent letters that can be recognized by touch and characters are coded into small rectangular blocks, known as cells, using raised dots, used extensively to give education to visually impaired individuals.⁴

With the vision to improve knowledge, behavior and attitude pertaining to oral health, an innovative technique known as Audio-Tactile Performance (ATP) technique was introduced to teach Fones technique of tooth brushing in visually impaired children. Studies have shown that this customized technique is a very effective tool to educate these children.⁵ As parents are important to children's oral hygiene practices, we examined the parental influence on the oral hygiene of participants using a self-structured questionnaire.

Hence, the present study was planned to assess the effectiveness of Braille and Audio Tactile Performance Technique along with role of parental influence on oral hygiene among visually impaired children of Varkala, Kerala.

MATERIALS AND METHODS

Institutionalized visually impaired children with the informed consent

of their respective guardians in Light to the Blind school, Varkala, Kerala were selected as participants in the study.

STAGE 1

The project was approved from the Institutional Ethical board. The Institution in which the study was to be carried out was a registered Institute for the blind children. Written consent was obtained from this Institute before the study could be performed. 30 participants ranging from age 6 to 10 years were selected using simple random sampling.

On the first day, there was an interactive session with the participants which enabled our team to establish a friendly relation. Oral health status was assessed using OHI-S as formulated by John C. Greene and Jack R. Vermillion in 1964.⁶ A self-structured questionnaire which was tested and validated by the authors was then used to obtain parental influence on oral hygiene. Later, the participants were randomly divided into three groups of 10 each.

Stage II

Oral health education was given using Braille and ATP technique to the ascertained groups.

Group-1

In this group, oral health education was imparted using Braille, as it was the standard method used for giving education to the visually impaired. A Braille slate was prepared with the help of a staff of the blind school. A list of five golden rules were inscribed in the Braille slate which composed of: [1] Brush twice daily with fluoridated toothpaste and a soft-bristled toothbrush (morning and night), [2] Rinse mouth after every meal, [3] Decrease the sugar consumption, [4] Consume more fibrous diet (fruit and vegetables), and [5] Regular dental checkup after every 6 months) to maintain good oral hygiene were written on the Braille slate. The golden rules were written in Malayalam which is the local language. The staff of the school helped to convert it into Braille and also to back translate it in Malayalam. Participants were given these slates to read and were informed to maintain oral health following the above rules. The information given to the participants was reinforced on the 7th day and after one month from the day they were first educated about oral health.

Group-2

Oral health education was given using ATP technique in this group. The participants were first verbally informed about the importance of teeth and were made to feel the teeth on a large sized model on which the Fones method of brushing was taught with assistance. The participants were then asked to feel their own teeth with their tongue and were trained to appreciate the deposits when roughness was felt. The examiner visually inspected and confirmed the ability of the participants to identify deposits on their teeth. This was followed by teaching the participants the Fones method of brushing with assistance and process was continued till they learnt to brush properly.³ Reinforcement of the brushing technique was carried out on the seventh day and after one month from the day the patients were first educated using ATP.

Group-3

Oral health education using the combination of both Braille method and ATP Technique was used in this group. The participants were given Braille slates and were also taught to brush the teeth by ATP technique as it was taught to participants in Group 1 and Group 2, respectively. As mentioned above for the two groups, reinforcement in this group was also carried out on the seventh day and after one month.

Stage- III

At the end of the study, oral health status of the study participants was obtained using OHI-S index.⁶ Furthermore, at the end of the study Group 1 was given oral health education using ATP technique and Group 2 participants were given Braille slates, so that all participants have equal access to both the educational tools. Evaluation of parental influence on the oral hygiene of participants was done using the self-structured questionnaire.

The data was processed and analyzed using SPSS Version 19. Comparison of the study groups, before and after intervention was performed based on suitable statistical methods. The results were compiled and subjected to One way ANOVA, Independent t- test and Chi-square test.

RESULTS

The study was conducted among 30 visually impaired children of age between 6-10 years. Males constituted about 53.3% and female constituted about 46.75%. [Fig-1]

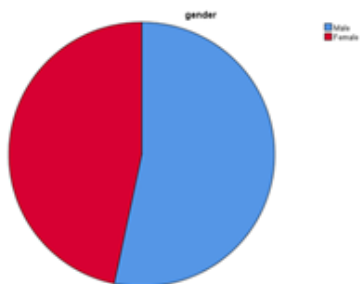


Fig 1: Distribution of gender among participants

At the baseline, among the 10 study participants of Group 1, 7 participants had scored fair on OHI-S index, whereas only 3 participants had low OHI-S score to be in the good category. After intervention using the Braille technique, there was an improvement in the OHI-S index, in which seven individuals scored good and three scored fair on the OHI-S index ($p=0.003$).

In Group 2, it was observed that eight participants were in the fair category and two participants scored good. After receiving health education using ATP technique, 7 were categorized as good and only 3 candidate scored fair on the OHI-S index ($p=0.003$).

In Group 3, using both Braille and ATP technique, statistically significant result was obtained when before and after intervention scores were compared. The final OHI-S scores were the least in this group. Four students had scored excellent, five were in the good category, and only one student scored fair ($p=0.003$). Comparison of before and after intervention OHI-S score was done in all the three groups. ($p=0.295$, $P=0.003$) respectively. [Table-1]

Table 1: Comparison of pre-, mid- and post-intervention oral hygiene status in 3 groups

	Group	N	Mean square	p value
1st visit	Group 1	10	0.294	0.295
	Group 2	10	0.501	
	Group 3	10	0.366	
2nd visit	Group 1	10	0.217	0.213
	Group 2	10	0.459	
	Group 3	10	0.366	
3rd visit	Group 1	10	0.134	0.003
	Group 2	10	0.080	
	Group 3	10	0.345	

One way ANOVA; p value < 0.05 is considered statistically significant. Comparison of pre intervention OHI-S score in Group 1, 2 and 3 were found to be statistically insignificant ($p=0.295$) and post intervention OHI-S was found to be significant ($p=0.003$). [Table-2]

Table 2: Comparison of pre-, mid-, post-intervention oral hygiene status between 3 groups

	Group	N	Mean	P value
1st visit	B1	10	0.216	0.462
	B1 + ATP 1	10	0.100	0.658
	ATP1	10	0.116	0.607
2nd visit	B2	10	0.224	0.388
	B2 + ATP2	10	0.341	0.073
	ATP2	10	0.117	0.536
3rd visit	B3	10	0.083	0.615
	B3 + ATP3	10	0.368	0.042
	ATP3	10	0.285	0.088

Independent t-test; p value < 0.05 is considered statistically significant. While considering the parental status of children, those with both parents had very good oral hygiene when compared to the single parent and orphan, among the three groups. [Fig-2] In the case of parents role in supervision of oral hygiene, good oral hygiene was prevalent more among children who were supervised while brushing in Group-1. [Fig-3] Most of parents who were having a single child had good oral hygiene in three groups. Children with good oral hygiene in Group-1 were cared by their parents.

Fig- 2

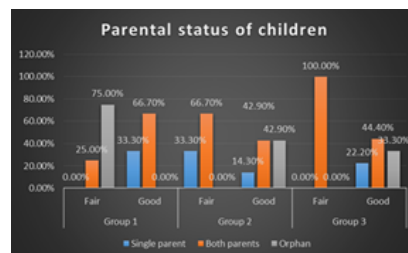
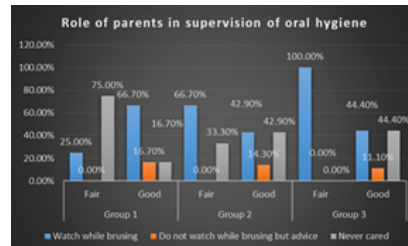


Fig- 3

**DISCUSSION**

Oral health is an integral part of general health and wellbeing. The goal of achieving an infection free oral cavity is a challenge especially in children with special health care needs. Visually impaired children are more adept in converting instructions to manual practice. When trained, they can have equal if not better levels of oral health than their sighted peers.⁷ A study completed by Chang and Shih found that students with visual impairments were less knowledgeable about their oral care.⁸

Visually challenged population depends on audio and tactile sensation to orient themselves to their surroundings. Hebbal M. et al. introduced

the ATP technique, which successfully proved that customized techniques with proper training and periodic reinforcement can have positive impact on oral health of these special children.³ In the present study, it was observed that the visually challenged students easily learned the Fone's brushing method using the ATP technique. This observation was also seen in a study by Joybell C. et al. who compared the Fones and Modified Bass methods using ATP technique in visually impaired children.⁵

In Group 1, after the intervention using the Braille technique four more students reached the good score category who were initially classified as fair. The result obtained was found to be similar to a study performed by Kumar et al., who studied the effectiveness of Braille and fluoridated dentifrices on visually impaired children. They also observed significant decrease in OHI-S scores in fluoridated group when oral health education was given using Braille as a medium.⁹

The OHI-S scores reduced significantly, therefore, placing seven children in the good category as compared to only two children before the intervention. Whereas, in Group 3, where oral health education was given using both Braille and ATP technique, excellent results were obtained when before and after intervention scores were compared. This could be attributed to the combination of Braille and proper customized brushing technique (ATP) which helped the children to learn better.

When post intervention scores were compared the results were statistically significant. These findings are in accordance with the study performed by Yalcinkaya and Atalay in which oral hygiene techniques were reinforced three times in 2 months interval.¹⁰

On comparison of the number of participants in group 1 and 3 who improved their oral hygiene after the intervention; it was statistically evident that the combination of Braille and ATP technique proved extremely well. This confirms the fact that when proper instructions regarding oral hygiene maintenance are given, oral health status of this special population gradually improved. This is in correlation with the studies conducted by O'Donnell and Crosswaite and Schnuth.¹¹

CONCLUSIONS

Although Braille and ATP technique for oral health education are effective tools when used individually, the combination of these techniques proves to be more effective. Single child who were taken care of by both parents and regularly supervised while brushing have good oral hygiene. More research in the direction of customization of educational and oral hygiene aids for visually impaired is the need of the hour. It is also important to educate the parents, teachers, and caregivers regarding the challenges faced by visually impaired individuals and make them aware of the importance of oral health care and its impact on the general health. There is also a social responsibility of dentists and community as whole to work in unison to improve the life of individuals with special health-care needs.

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Nil

Conflict Of Interest:

There are no conflicts of interest

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