

Perception of Complete Visually Impaired Children to Three Different Oral Health Education Methods: A Preliminary Study

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Aim: To evaluate the perception of visually impaired children to three different methods of oral health education. **Study design:** Sixty total visually impaired children were divided into three groups of 20 children each. Children in group-I received oral health education through a lecture. Children in group II received Demonstration on a Model by Tell and Touch method (DMTT) and children in group III were self trained on oral hygiene skills. All children received written instructions in Braille. Their knowledge and practice of oral hygiene methods were recorded by a questionnaire and their method of brushing and rinsing was assessed during a personal interview. Data obtained was subjected to statistical analysis. **Results:** Children in group II were able to brush and rinse significantly better ($p < 0.05$) as compared to the other groups. Demonstration on a Model by Tell and Touch method was found to be the most preferred method of oral health education. **Conclusion:** Oral health education given through DMTT method was perceived well by the visually impaired children.

Key words: Visually impaired children, oral health education.

INTRODUCTION

Blindness is defined by WHO as having a “visual acuity of less than 3/60 m 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 meters. It has been estimated that out of 400 million children in India 680,000 children are blind.¹

Visual impairment has an adverse impact on psychomotor and emotional development in a child.² Poor oral hygiene, gingivitis, periodontal diseases and high dental caries has been reported among visually impaired children.³⁻⁹ The severity of oral problems in these children has been attributed to lack of awareness about oral hygiene, an inability to access oral care facilities, physical limitations and neglected attitude of parents and health providers.¹⁰

The maintenance of oral hygiene is important for preventing the development of periodontal disease and dental caries.² Loss of vision leads to sensory compensation and visually impaired children depend more on sound, smell, touch and speech usually to orient themselves to a situation.¹¹ These children usually rely on their parents or care takers for carrying out oral hygiene practices.

Health education is an accepted approach in prevention of oral diseases. Visually impaired children have better developed tactile acuity and haptic senses.¹² Studies have demonstrated improvement in oral hygiene following oral health education among visually impaired children.^{6,8,13} Thus the present study was conducted to assess the acceptance of different oral health education methods in a group of visually impaired children.

MATERIALS AND METHOD

A total of sixty (8-18 yr old) children were selected from a residential blind school in Bangalore for the study. Prior informed written consent was obtained from the authorities of the residential school and parents of the children. The study was approved by the institutions ethical review board. Children with visual impairment associated with any systemic condition or any other disability were not included in the study. Participation in the study was voluntary.

A set of structured questions were asked to each child to assess their knowledge on importance of oral hygiene and personal experience with dental care. The responses were recorded by a one to one personal interview. The children were then divided into three groups of 20 children each by the method of purposive sampling.

Group I- Children received oral health education through a twenty minute lecture only

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The content of oral health education included information on importance of oral health and methods of oral hygiene maintenance (tooth brushing and oral rinsing)

Group II – In addition to receiving oral health education through a lecture, Demonstration on Models by using Tell and Touch (DMTT) was carried out. It included

- Dispensing of tooth paste on a tooth brush
- Demonstrating and training of Fones circular motion technique of tooth brushing by the investigator on large tooth models.
- Oral rinsing was also demonstrated by the investigator and the children were asked to place their hands on the cheeks of the investigator.

Group III – Children received oral health education by “Self Training” method.

In this they were educated orally and were taught tooth brushing and oral rinsing on themselves under the supervision of the investigator.

Oral hygiene instructions in Braille were distributed to all children. The oral health education was imparted in one morning session. One investigator provided oral health education to the study participants, while a second investigator recorded the participant’s responses. The investigator recording the responses was unaware of

the method by which the child was educated. Each participant was asked to perform tooth brushing and oral rinsing method they learnt. The investigator scored their ability to perform tooth brushing and oral rinsing as A) yes–able to perform, B) No–unable to perform and C) perform with difficulty.

Children in respective groups were then educated by the other two methods and their perception of the oral health education methods provided was evaluated by an eight item questionnaire. The responses were recorded by a personal one to one interview. The data obtained was subjected to statistical analysis by chi-square test.

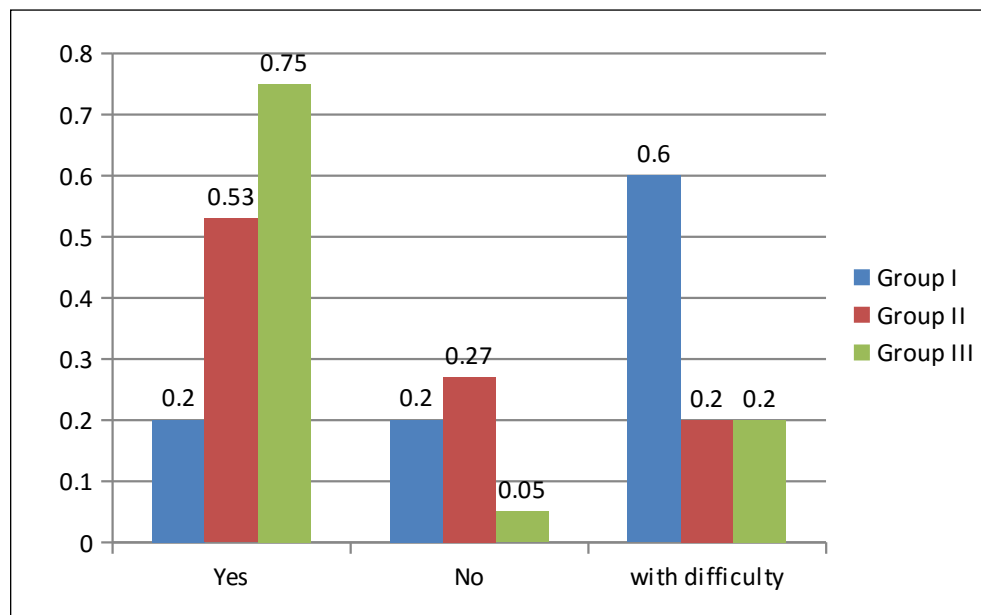
RESULTS

Children’s response to questions on importance of oral hygiene and personal experience with dental care are shown in table-1. Graph 1 shows ability of children to demonstrate tooth brushing and oral rinsing. Graph 2 shows children’s perception of the preferred method of oral health education among the groups. About seventy five percent of children in group II were able to demonstrate the practice of brushing and rinsing taught to them which was significant compared to children in group I, where only 20% were able to follow instructions and 60% could follow it with difficulty. The written oral hygiene instructions in Braille were not preferred by the children.

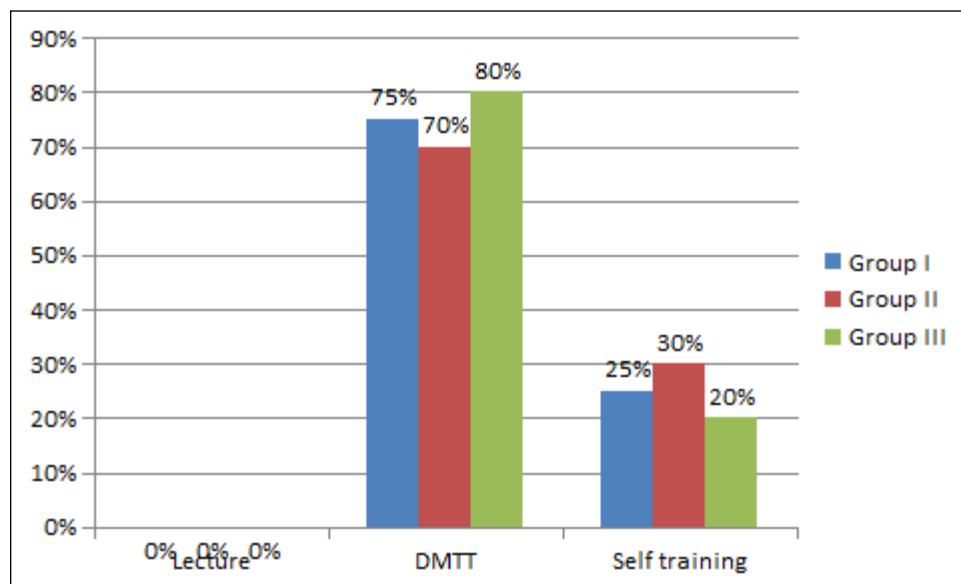
Table-1: Responses to questions by children on importance of oral hygiene and personal experience with dental care

Sl.No	Question asked	Response	Frequency	P value
1.	Why do you think teeth are important?	Chewing	55%	<0.001
		Speech	41%	
		Good looks	4%	
2.	How do you take care of your teeth regularly	Brushing only	69%	0.001
		Brushing and rinsing	31%	
3.	From where did you get information on how to keep your mouth clean?	Parents	80%	0.005
		Teachers	20%	
4.	Have you ever visited a dentist?	Yes	29%	0.005
		No	71%	
5.	How do you brush your teeth?	Horizontal	49%	0.005
		Vertical	24%	
		Round	27%	
6.	Does any food stick between your teeth/ if yes what do you do?	Tooth pick	59%	<0.001
		Rinse my mouth with water	35%	
		Others	6%	
7.	How often do you replace your tooth brush?	3 months	36%	0.002
		6 months	36%	
		1 year	16%	
		Only when lost	11%	
8.	How does a worn out tooth brush feel like?	Hard	18 %	0.004
		Bent bristles	40%	
		Don’t know	38%	
		Others	4%	
9.	Are you able to brush independently?	Yes	89%	0.018
		No	11%	
10.	What is the amount of tooth paste you apply on the tooth brush?	Smear	41%	0.022
		Pea size	18%	
		Full length	23%	
		Half length	18%	

Graph-1: Children's ability to demonstrate the brushing and rinsing method taught to them among the groups.



Graph-2: Children's responses to preferred method of oral health education among the groups.



DISCUSSION

Oral health is an integral part of general health and well being. 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 to converting instructions to manual practice, when trained they can have equal if not better levels of oral health than their sighted peers.²

All of the visually impaired children in the study knew the importance of teeth and most of them considered it to be important for chewing and speech. Only four percent of them perceived it for good looks.

Caretakers more often reinforce brushing instructions in institutionalized visually impaired children. In our study the majority of children learnt the method of brushing from their parents. The children in present study were selected from residential school for

the visually impaired, where they are enrolled at the age of six years. This could be the reason that most of them had learnt the method of tooth brushing from their parents. A similar study found 65% of visually impaired children had gained information on the method of brushing from their mother and 35% from teachers.⁷

All the children brushed their teeth once daily. Other Indian studies have reported the frequency of one time brushing to range from 64.6-89%^{2, 8-10}. The frequency of twice a day brushing was found to be low. Flossing was not practiced by any of them. Over two thirds of children were able to independently dispense tooth paste on a tooth brush and feel the difference in change of bristles over time. This can be attributed to the better developed haptic senses in these children.¹³ A study found enhanced haptic perception to three dimensional objects among visually impaired individuals and was attributed to greater activity in ventral visual cortical areas

compared to sighted participants.¹⁴ Majority of children never rinsed their mouth after snacking.

Children with visual impairment have very low dental attendance. Studies^{3, 15} have found that high percentage of visually impaired children have never been to a dentist. In our study, 71% of children had never been to a dentist. These results clearly indicate dental neglect by the parents and also lack of interest by dentist/dental society towards oral health of these children.

Total visual impairment poses a big challenge for day to day activities of an individual. Very often, oral health care is not given attention by the parent and/or care givers as well as authorities of institutionalized children. Few studies^{5,6} have reflected on the unmet oral needs among visually impaired children.

DMTT method was more accepted and preferred than other methods. This can be attributed to teaching the brushing method on a model, individual attention given to each child and tactile discrimination ability.¹⁶ Tactile discrimination ability is well developed in these children attributing to sensory compensation, but this discrimination ability increases only by practice¹¹. This might be the probable reason why 75% of children preferred demonstration on models over the other two methods of oral health education. Learning through this method provided a better understanding of the technique. Following completion of our study, all the children were trained in oral hygiene practice by demonstration on models by using Tell and Touch method.

CONCLUSION

Demonstration of oral health practices/skills on models by Tell and Touch method was found to be the most preferred method of oral health education.

REFERENCES

1. Dandona R, Dandona L. Childhood blindness in India: A population based perspective. *Br J Ophthalmol*; 87(3): 263–65. 2003.
2. Ching CS, Shih Y. Knowledge of dental health and oral hygiene practice in Taiwanese visually impaired children. *J Vis Impair Blind*; 98:1-27. 2004.
3. Reddy V, Chaurasia K, Bhambal A, Moon N, Reddy E. A comparison of oral hygiene status and dental caries experience among institutionalized visually impaired and hearing impaired children of age between 7 and 17 years in central India. *J Indian Soc Pedod Prev Dent*; 31(3):141-5. 2013.
4. Parkar SM, Patel N, Zinzuwadia H. Dental health status of visually impaired individuals attending special school for blind in Ahmedabad city, India. *Indian J Oral Sci*; 5(2):73-77. 2014.
5. Jain M, Bharadwaj S, Kaira L, Chopra D, Prabu D, Kulkarni S. Oral health status and treatment need among institutionalized hearing-impaired and blind children and young adults in Udaipur, India. A comparative study. *Oral Health Dent Manag*; 12(1):41-9. 2013.
6. Ahmad M, Jindal MK, Khan S, Hashmi SH. Oral health knowledge, practice, oral hygiene status and dental caries prevalence among visually impaired students in residential institute of Aligarh. *J Dent Oral Hyg*; 1(2):022-026. 2009.
7. Reddy K, Sharma A. Prevalence of oral health status in visually impaired children. *J Indian Soc Pedod Prev Dent*; 1(29):25-7. 2011.
8. Kumar K, Fareed N, Shanthi M. The Effectiveness of Oral Health Education Program with and without Involving Self-Maintainable Oral Hygiene Skills among the Visually Impaired Children. *Int J Sci*; 1(3):51-8. 2013.
9. Prashanth ST, Bhatnagar S, Das U, Gopu H. Oral health knowledge, practice, oral hygiene status, and dental caries prevalence among visually impaired children in Bangalore. *J Indian Soc Pedod Prev Dent*; 29(2):102-5. 2011.
10. Nandini S. New insights into improving the oral health of visually impaired children. *J Indian Soc Pedod Prev Dent*; 21:142-3. 2003.
11. Arora S, Kour R. Sensory Training Programme for Visually Impaired Children. *Int J Sci Rep*; 2(3):1-3. 2012.
12. Daniel G, Ingrid M. Tactile acuity is enhanced in blindness. *J Neurosci*; 23(8): 3439-3445. 2003.
13. Shetty V, Hegde AM, Varghese E, Shetty V. A novel music based tooth brushing system for blind children. *J Clin Ped Dent*; 37(3):251-4. 2013.
14. Sathian K. Visual cortical activity during tactile perception in the sighted and the visually deprived. *Dev Psychobiol*; 46(3):279-86. 2005.
15. Tagelsir A, Khogl A and Nurelhuda N. Oral health of visually impaired schoolchildren in Khartoum State, Sudan. *Biomed central*; 13:1-8. 2013.
16. Srivastava N, Vasishat A, Gupta G, Rana V. A comparative evaluation of efficacy of different teaching methods of tooth brushing in children. *J. Dent. Oral Hyg*; 1(3):1-4. 2013.