Original Article

Effect of oral health education by audio aids, Braille & tactile models on the oral health status of visually impaired children of Bhopal city

Anjali Gautam^a, Ajay Bhambal^b, Swapnil Moghe^{c,*}^a Dept. of Public Health Dentistry Peoples College of Dental Science & Research Centre, Bhopal, M.P., India^b Dept of Public Health Dentistry, People's College of Dental Science & Research Centre, Bhopal, M.P., India^c Dept. of Oral & Maxillofacial Surgery, Peoples College of Dental Science & Research Centre, Bhopal, M.P., India

ARTICLE INFO

Article history:

Received 14 June 2016

Accepted 1 March 2017

Available online 18 March 2017

Keywords:

Visually impaired

Audio

Braille

ATP

ABSTRACT

Background: Braille is important language for reading & writing for the visually impaired. It helps them understand & visualize the world via touch. Audio aids are being used to impart health education to the visually impaired. Audio aids are useful in being time saving & can be played repeatedly to achieve desired results. Tactile models help them perceive things which they can't visualize & hence are important learning tool.

Aim: To evaluate the effect of Oral Health education by Audio aids, Braille & tactile models on the Oral health status of visually impaired children of Bhopal city.

Material & Methods: Sixty visually impaired children aged 5–18 yrs were selected & randomly divided into three groups (20 children each). Group A: Audio aids + Braille, Group B: Audio aids + tactile models, Group C: Audio aids + Braille + Tactile models. Instructions were given for maintaining good oral hygiene & brushing techniques were explained to all children. After three months time the oral hygiene status was recorded and compared using patient hygiene performance index.

Results: The present study showed a decrease in the mean plaque scores (that is increase in mean difference of PHP score) at all time intervals in individual group as compared to the baseline that was statistically significant.

Conclusion: The study depicts that the combination of audio, Braille & tactile models is an effective way to provide oral health education & improve Oral health status of visually impaired children.

© 2018 Craniofacial Research Foundation. Published by Elsevier B.V. All rights reserved.

1. Introduction

Visual impairment is a rising challenge in developing countries. They face limitations in understanding as they have to rely on their tactile sensations.¹ They have deprived oral hygiene & are dependent on health care workers for most of the routine work. India is expected to have more than 15 million visually impaired personnel.

Braille is important language for reading in visually impaired. It helps them understand & feel the world via touch. Audio aids are being used to impart health education to the visually impaired. Audio aids are useful in being time saving & can be repeatedly played to achieve desired results. Tactile models help them perceive things which they can't visualize & hence are important learning tool.

2. Material & Methods

Sixty visually impaired children aged 5–18 yrs were selected & randomly divided into three groups (20 children each). Group A: Audio aids + Braille, Group B: Audio aids + tactile models, Group C: Audio aids + Braille + Tactile models. Instructions were given for maintaining good oral hygiene & brushing technique was explained to all children. After three months time, the oral hygiene status was recorded and compared using patient hygiene performance index.

The children with a recent dental treatment, history of systemic antibiotics or topical fluoride treatments, Xylitol chewing gums, severe medical conditions were excluded from the study.

Ethical clearance was obtained from the Institutional ethical committee. Permission was taken from a residential institution for visually challenged children in Bhopal city after explaining the benefits of the study. The parents were informed & consent was taken.

The instructions on to how to brush and floss are given through Braille, Tactile models and audio aids. **Modified bass technique**

* Corresponding author.

E-mail address: swap2112@gmail.com (S. Moghe).

Table 1

Comparison of PHP index in different Groups among different time Periods.

		Mean	Std. Deviation	F Value	P value
Patient hygiene performance index (PHP) Baseline	Audio + Braille	0.7500	0.44426	0.296	0.745
	Audio + Tactile	0.6500	0.48936		
	Audio + Braille + Tactile	0.6500	0.48936		
	Total	0.6833	0.46910		
Patient hygiene performance index (PHP) at 1 Month	Audio + Braille	0.5500	0.51042	0.064	0.938
	Audio + Tactile	0.5500	0.51042		
	Audio + Braille + Tactile	0.5000	0.51299		
	Total	0.5333	0.50310		
Patient hygiene performance index (PHP) at 3 Month	Audio + Braille	0.3000	0.47016	1.093	0.342
	Audio + Tactile	0.3500	0.48936		
	Audio + Braille + Tactile	0.1500	0.36635		
	Total	0.2667	0.44595		

was used. The children are given balanced diet meal throughout the study period and snacks in between meals were restricted. The resident school in-charge was instructed to keep the track to make sure that all the children follow the instructions properly.

Sixty visually impaired children with no systemic diseases and those, not using probiotic or oral hygiene supplements were included in this study. Their oral hygiene was assessed using the PHP index.² The scores were recorded at baseline data.

After 1 month, the PHP Index² was taken to check the efficacy of children maintaining their oral hygiene and data were recorded. The children continued the practice for 3 more months and then again the PHP index was checked.

The data thus obtained were subjected to statistical analysis by using ANOVA test. The results were interpreted using Statistical Package for the Social Sciences (SPSS) version 20.0.

3. Results

The analyzed data showed reduction in mean PHP Score from baseline to 3 months. This clearly reflects the importance of oral health education in overall improvement of oral health in visually impaired children. Hence, the focus should be on the development of suitable ATP model for these subjects.

Table 1 depicts comparative PHP index between the three groups at baseline, 1 month, and 3 months. The group A mean PHP Score at baseline was 0.75 compared to 0.65 of group B & 0.65 of group C. At 1 month, the mean PHP scores of group A and B were 0.55 and 0.50 of group C, respectively. At 3 months, the mean PHP scores of group A and B were 0.30 and 0.35 & 0.15 of Group C respectively. Even though with time, the mean PHP index Score reduced, the score comparison among the two groups were statistically not significant.

Table 2 depicts the comparative PHP index within the group at baseline, 1 month and 3 months. In group A, the mean PHP score difference between the baseline and 1 month was 0.20, between the baseline and 3 months, it was 0.45. The PHP score between 1 month and 3 months was 0.25. All the above values were statistically significant. In group B, PHP mean score difference between baseline and 1 month was 0.10, between baseline and 3 months it was 0.30. The PHP score between 1 month and 3 months was 0.20. All the above values were statistically non significant. In group C, the PHP mean difference score between baseline and 1 month was 0.15, between baseline and 3 months it was 0.50. The PHP score between 1 month and 3 months was 0.35. All the above values were statistically significant except for group B.

There is significant variation in duration in Group A & Group C ($p < 0.05$) and according to mean the PHP level reduce from base line to 3 months (Graph 1).

4. Discussion

Visual impairment can have deleterious effect on Oral hygiene. Some persons have compromised oral hygiene than their sighted peers.^{1,3} They have increased tendency for calculus & debris deposition than normal peers. Similar studies have hinted upon use of verbal instructions & tactile aids to maintain Oral Hygiene & improve brushing.^{4–6}

O'Donnell and Crosswaite⁶ found that blind children were very adaptive at converting oral instructions into manual oral hygiene practices. This Justify that adequate given verbal instruction can improve OHS in Visually impaired individuals. Dental plaque is the main Culprit for the development of periodontal diseases and dental caries.⁷

Table 2

Comparison of PHP index in different time Periods among different Groups.

		N	Mean	Std. Deviation	F Value	P value
Audio + Braille	Baseline	20	0.7500	0.44426	4.492	0.015*
	1 Month	20	0.5500	0.51042		
	3 Month	20	0.3000	0.47016		
	Total	60	0.5333	0.50310		
Audio + Tactile	Baseline	20	0.6500	0.48936	1.893	0.160
	1 Month	20	0.5500	0.51042		
	3 Month	20	0.3500	0.48936		
	Total	60	0.5167	0.50394		
Audio + Braille + Tactile	Baseline	20	0.6500	0.48936	6.202	0.004*
	1 Month	20	0.5000	0.51299		
	3 Month	20	0.1500	0.36635		
	Total	60	0.4333	0.49972		

Comparison of PHP in different Groups among different time Periods

Graph 1. Comparison of PHP index in different groups. Graph 1 depicts that mean PHP score reduced from baseline to 3 months.

Education is the important milestone for behavioral changes in children. Oral health education creates healthier atmosphere to enhance Oral health care practices amongst School going children. School is the Optimum media to learn & apply preventive dental health practices.^{8,9}

Different studies have advocated used of various media to correlate association of risk factors for dental caries & Oral hygiene. The instructions given to the children associated with disability should be clear & easy to understand.

Hence in the present study, instructions with use of tactile models, audio aids & Oral hygiene instructions in Braille were utilized to promote motivation in children.

Even though all the three groups showed decreased plaque score, inter-group comparison of PHP index score was statistically not significant (Table 1). In a study by Mendonca,¹⁰ it was found that the visual stimuli absence prevents rapid learning, representing a challenge for surgeons and dentists in motivating these individuals to have appropriate oral hygiene. However, it is debatable that, blind children when well-trained, are able to remember the brushing techniques, thus reinstating good oral condition.

The present study showed decreased mean plaque scores (that is increase in mean difference of PHP score) at all time intervals in individual group as compared to the baseline that was statistically significant (Table 2). This predicts that proper educating the visually impaired children will decrease the plaque score that in turn will improve the oral hygiene (Graph 1).

5. Conclusion

The study depicts that the combination of audio, Braille & tactile models is an effective way to provide oral health education & improve OHS of Visually impaired children.

References

- Anaise JZ. Periodontal disease and oral hygiene in a group of blinded and sighted Israeli teenagers (14–17 yrs of age). *Community Dent Oral Epidemiol.* 1979;7:353–356.
- Podshadley AG, Haley JV. A method for evaluating oral hygiene performance. *Public Health Rep.* 1968;83:259–264.
- Greeley CB, Goldstein PA, Forrester DJ. Oral manifestations in a group of blind students. *ASDC J Dent Child.* 1976;43(January-February (1)):39–41.
- Winstanley ML. A synopsis of the project to evaluate the use of Braille text and tactile aids when teaching dental health to blind children. *Br Dent Surg Assist.* 1983;(March/April):20–23.
- Cohen S, Sarnat H, Shalgi G. The role of instruction and a brushing device on the oral hygiene of blind children. *Clin Prev Dent.* 1991;13:8–12.
- O'Donnell D, et al. Dental health education for the visually impaired child. *J R Soc Health.* 1990;110(2):60–61.4.
- Yalcinkaya SE, Atalay T. Improvement of oral hygiene knowledge in a group of visually impaired students. *Oral Health Prev Dent.* 2006;4:243–253.
- Christensen GJ. Special Oral hygiene and preventive care for special needs. *J Am Dent Assoc.* 2005;136:1141–1143.
- Flanders RA. Effectiveness of dental health educational programs in schools. *J Am Dent Assoc.* 1987;114:239–242.
- Faustino-Silva DD, Ritter F, Nascimento IM, Fontanive PV, Persici S, Rossoni E. Oral health care in preschool children: perceptions and knowledge of parents or legally responsible persons in a health care center of Porto Alegre, RS. *Rev Odonto Cienc.* 2008;23:375–379.