

A Comparative evaluation of effectiveness of an oral health education program among three groups of children in Bagalkot

¹Dr. Sushmitha Dandamudi ,Post-Graduate 3rd year , Department of Pediatric and Preventive Dentistry, P.M.N.M Dental College and Hospital, Bagalkot, Karnataka-587103, India

²Dr. Shivaprakash P. K, Professor and Head, Department of Pediatric and Preventive Dentistry, P.M.N.M Dental College and Hospital, Bagalkot, Karnataka-587103, India

³Dr. Mahantesha T, Professor, Department of Pediatric and Preventive Dentistry, P.M.N.M Dental College and Hospital, Bagalkot, Karnataka-587103, India

Corresponding Author: Dr. Sushmitha Dandamudi, Post-Graduate 3rd year , Department of Pediatric and Preventive Dentistry, P.M.N.M Dental College and Hospital, Bagalkot, Karnataka-587103, India

Citation of this Article: Dr. Sushmitha Dandamudi, Dr. Shivaprakash P. K, Dr. Mahantesha T., “A Comparative evaluation of effectiveness of an oral health education program among three groups of children in Bagalkot”, IJDSIR- October - 2020, Vol. – 3, Issue - 5, P. No. 360 – 368.

Copyright: © 2020, Dr. Sushmitha Dandamudi, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Oral health is a vital component of overall health and oral health education aims to promote oral health principally by providing information to improve awareness, positive attitudes and good oral health behavior. Schools are the best setup for such educational and motivational program.

Aims & objectives: The main objective of this study is to evaluate the effectiveness of oral health education program among three different groups of children of the age group 10-12 yrs in Bagalkot.

Methodology: Among a sample size of 90 children divided into three groups 30 in each, Group-A consisting of visually impaired children from a blind school ,Group-

B consisting of healthy children from a residential school & Group-C consisting of healthy children visiting the department routinely were selected and a self-designed questionnaire in English, kannada and Braille languages was administrated to assess their oral health awareness. A specially designed oral health educational programme consisting of audio aid, Braille booklet & individualized training was implemented to educate & motivate visually impaired children for maintaining their oral health and a similar programme for the visually able residential school children and children visiting the department routinely was implemented without Braille aid. Oral hygiene status using PHP index of Podshadley and Haley was evaluated at the baseline and reevaluated after 3 week. Oral Health

Educational Programme was implemented and reinforced after oral examination & prophylaxis. Data was statistically analyzed .Results: The oral health awareness among all the study groups was less, routine patients having more awareness compared to the other two study groups. The PHP scores of visually impaired children was relatively higher indicating the lack of supervision & impairment.

Conclusion: Visually impaired children irrespective of the degree of blindness could maintain an acceptable level of oral hygiene when taught and supervised. However, continuous motivation and reinforcement at regular intervals are required for the maintenance of oral health status irrespective of the impairment.

Keywords: oral health education programme, children, visually impaired.

Introduction

“There is no better way to thank god for your sight than by giving a helping hand to someone in the dark.” - Hellen Keller

Oral health promotion is a prerequisite for maintenance of good oral health which is a vital component of general health contributing to an individual’s well-being and quality of life. Schools are the best setup for such educational and motivational programmes. ^[1]The key oral health promotion tool used in dentistry is oral hygiene instructions through the use of visual aids.

The development of a child may be severely compromised by loss of one or more of the sensory modalities because, it is through these senses that one learn about the external world. The visually impaired depend more on sound, speech, and touch to orient them to a situation. The oral hygiene status of people with visual impairment can be at a disadvantage since they are less able to detect early symptoms of tooth decay that are typically recognized through vision and hence there is a need to promote oral

health awareness and need for supervision must be emphasized.

Lack of understanding of the importance of oral hygiene in visually impaired children results in the progression of oral diseases and poor health. Visually impaired children tend to have significant dental plaque and have a high risk for dental diseases because of their diet, eating patterns, medications, physical limitations lack of cleaning ability, and attitude of parents and health care providers. These children face difficulties during tooth brushing including placing toothpaste on the brush and often practice traumatic brushing strokes that may damage their periodontium. ^[1] Therefore, the acquisition and maintenance of oral hygiene skills remains an important and challenging task for them. Students who are visually impaired need to learn oral hygiene skills as do all children, dental instruction programs targeting these groups must be developed.

This study was undertaken to comparatively evaluate the effectiveness of an oral health education program that was specialized to train the visually impaired to that of the routine one for the healthy children.

Aims of the Study

To evaluate the oral health awareness & oral hygiene among blind school children, residential school children and regular children of the age group 10-12 yrs in Bagalkot and to evaluate the effectiveness of oral health education program

Methodology

Ethical clearance was obtained prior to the start of the study from the ethical committee of P.M.N.M Dental College and Hospital, Bagalkot, Karnataka. Official permission to conduct the study was obtained from the school authorities and informed consent from their parents/guardians/caretakers before the start of the study was also obtained.

A sample size of 90 children of the age group of 10 -12 years with no history of any previous dental treatment were selected. They were divided into three groups of 30 in each, Group-A consisting of blind school children, Group-B consisting of residential school children & Group-C consisting of children visiting the department routinely. Children irrespective of the degree of visual impairment and who were free from any other form of mental handicapping conditions were included in the study, whereas medically compromised children, children using any chemical mode of plaque control, and children under medications that could affect the state of the gingival tissues were excluded from the study.

A self designed questionnaire in Braille, English and Kannada was administered to assess their oral health awareness. Their oral hygiene was assessed using PHP index of Podshadley and Haley ^[2] at baseline before oral health education. A specially designed oral health educational programme consisting of audio aid, Braille booklet & individualized training was implemented to educate & motivate visually impaired children for maintaining their oral health and a similar programme for the visually able residential school children and children visiting the department routinely was implemented without Braille aid. The children of all the three study groups were instructed to use circular motion of brushing twice daily and to gargle with water after every meal. They were also given soft manual toothbrushes and toothpastes. ^[3] Oral Health Educational Programme was implemented and reinforced after oral examination & prophylaxis.

After 3 weeks, the PHP Index was taken to check the efficacy of children maintaining their oral hygiene and data were recorded.

Questionnaire

A twelve item self designed questionnaire was prepared to collect information regarding the knowledge and awareness of the children about oral hygiene maintenance. The questionnaire was formulated in English, Kannada and Braille languages as a part of the specialized oral health education program. A single interviewer distributed the questionnaire to the participants and collected once before the intervention and later again after 3 weeks after the intervention along with oral hygiene assessment.

Statistical Analysis

Statistical Package for Social Sciences [SPSS] for Windows, Version 22.0. released in 2013. Armonk, NY: IBM Corp. was used to perform statistical analyses. One-way ANOVA test followed by Turkey's Post hoc Analysis- 1 was used to compare the mean sum total score of oral health awareness & PHP scores between 3 groups before intervention and after 3 weeks of intervention. Student Paired t Test- used to compare the mean sum total score of oral health awareness & PHP scores before and after 3 weeks of intervention each study group. Chi Square Test - was used to compare the responses of the study subjects for question on obtaining information on oral health and reporting of any dental problem b/w 3 groups. Level of significance [P-Value] was set at $P < 0.05$.

Results

All 90 children of the age group of 10-12 years with almost equal sex predilection were selected by nonprobability sampling method (convenience) with 30 in each study group. Table 1 depicts the comparison of mean sum scores of oral health awareness between Pre and Post intervention time periods in each study group using Student Paired t test. The mean score of oral health awareness before the intervention was 4 in group-A when compared to 4.27 and 5.5 of group B and C respectively.

After 21 days post intervention the mean scores of oral health awareness were 8.9, 8.5 and 8.9 for groups A, B and C respectively. This showed a statistically significant increase in oral hygiene awareness among all the three study groups after the intervention yielding the oral health educational program motivating.

Table 2 depicts comparison of mean PHP scores between Pre and Post intervention time periods in each study group using Student Paired t test. The mean score of oral health

awareness before the intervention was 3.53 in group-A when compared to 2.07 and 2.57 of group B and C respectively. After 21 days post intervention the mean scores of oral health awareness were 1.7, 1.13 and 0.67 for groups A, B and C respectively. This showed a statistically significant decrease in PHP scores among all the three study groups after the intervention yielding it successful.

Table-1: Comparison of mean sum scores of oral health awareness b/w Pre and Post intervention time periods in each study group using Student Paired t test

Groups	Time	N	Mean	SD	Mean Diff	p-value
Group-A	Pre test	30	4.00	0.64	-4.83	<0.001*
	Post test	30	8.83	0.46		
Group-B	Pre test	30	4.27	0.69	-4.30	<0.001*
	Post test	30	8.57	0.63		
Group-C	Pre test	30	5.50	0.94	-3.40	<0.001*
	Post test	30	8.90	0.66		

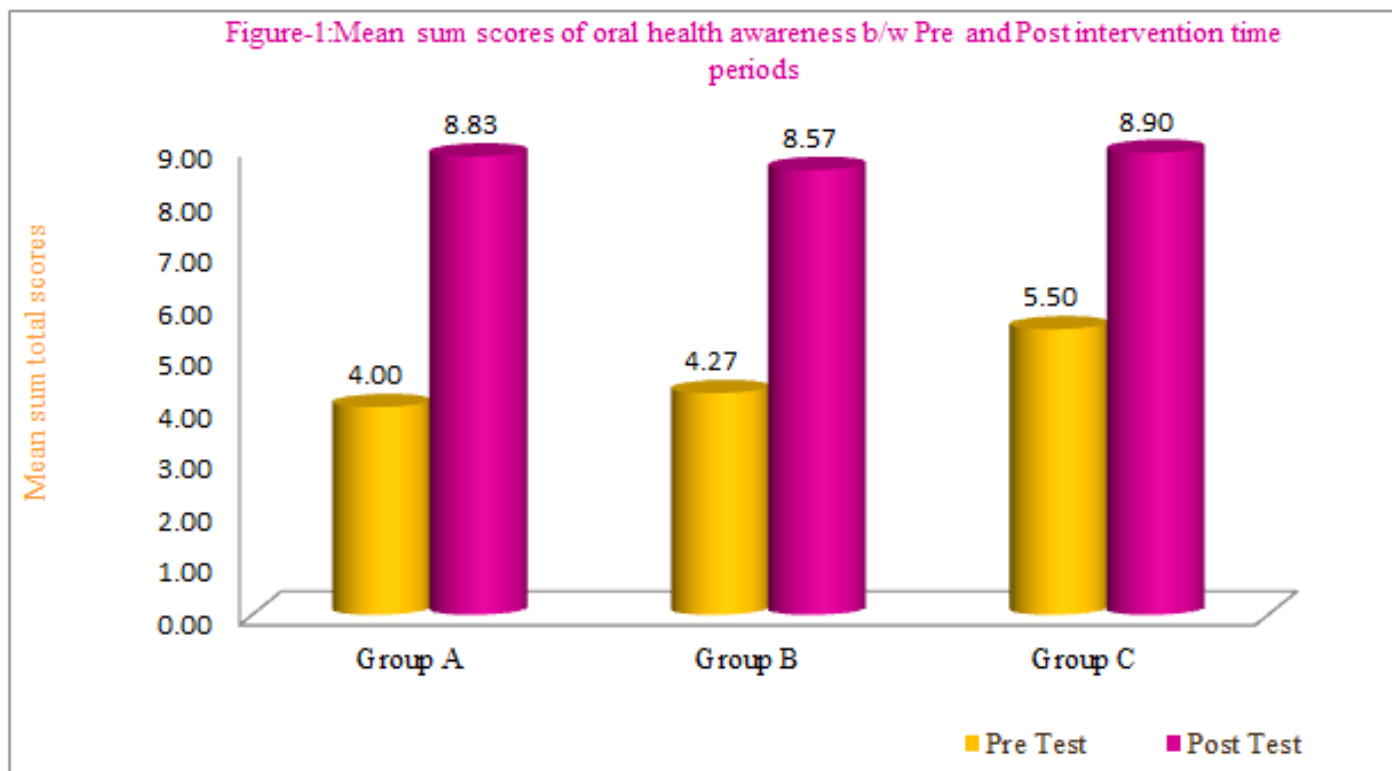
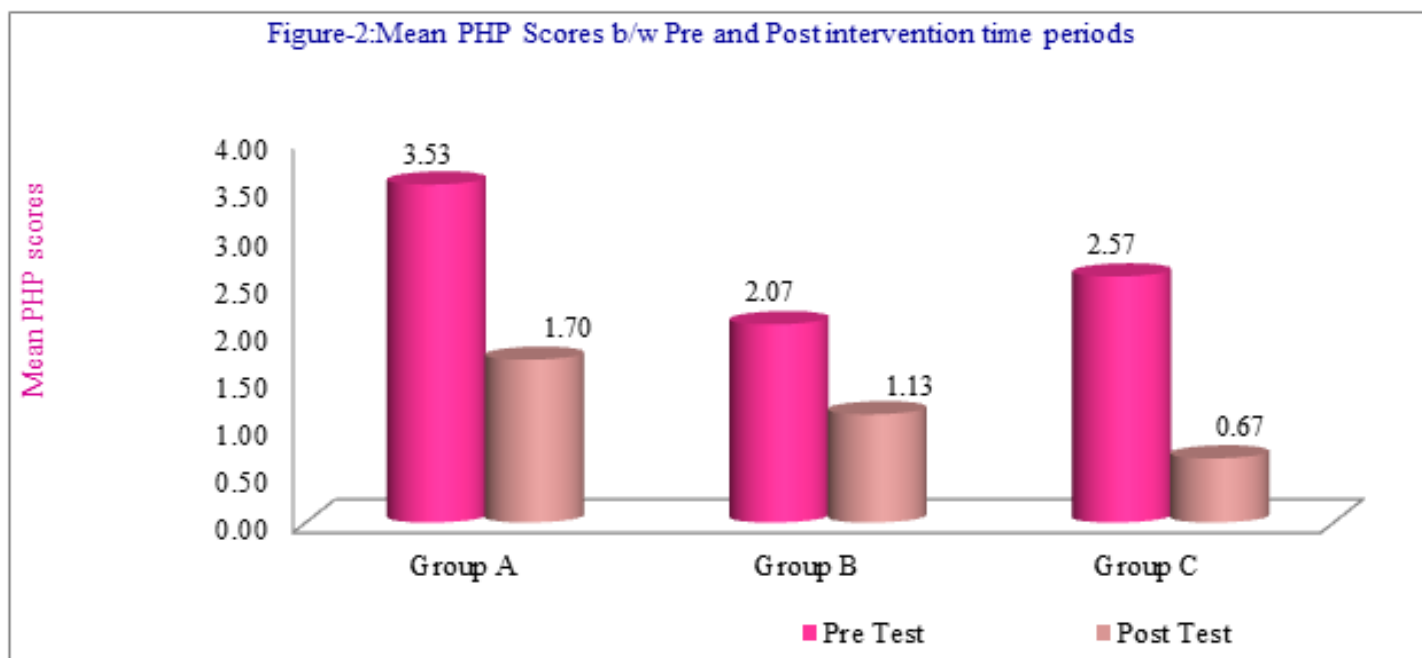


Table-2: Comparison of mean PHP scores b/w Pre and Post intervention time periods in each study group using Student Paired t test

Groups	Time	N	Mean	SD	Mean Diff	p-value
Group-A	Pre test	30	3.53	1.07	1.83	<0.001*
	Post test	30	1.70	0.88		
Group-B	Pre test	30	2.07	0.98	0.94	<0.001*
	Post test	30	1.13	0.94		
Group-C	Pre test	30	2.57	0.82	1.90	<0.001*
	Post test	30	0.67	0.76		



Discussion

“Children are like buds in a garden and should be carefully and lovingly nurtured, as they are the future of the nation and the citizens of tomorrow. Only through right education can a better order of society be built up.”- Jawaharlal Nehru

Oral health is a vital component of overall health and oral health education aims to promote oral health principally

by providing information to improve awareness, positive attitudes and good oral health behavior. Schools are thought to be the most suitable environment to provide health information to children to achieve the goals of health education programs, as children are relatively accessible and are already in a learning environment. However, some subgroups of children with disabilities are constantly neglected in receiving oral health education.

Despite the urgent need for patients with visual impairment to learn these skills, little research has been conducted on teaching oral hygiene skills to them.^[4] However, literature on giving oral health education, teaching oral hygiene skills and assessing their effectiveness to visually impaired children along with control groups (healthy counterparts without any disability) is very scanty. Based on these ground realities, this study was undertaken with the purpose to evaluate the effectiveness of oral health education using verbal instructions and Braille text as an educative tool on oral health status of visually impaired children along with two types of control groups comprising of institutionalized and non institutionalized healthy children without impairment.

The higher level of oral disease among the disabled may be because teaching students to manage their disability is of major concern among the educators and oral hygiene is of least priority. It has been observed that the lack of dental knowledge and infrequent dental visits affect the oral health of a population.^[5] In children, oral health care is interrelated with various factors, ranging from individual factors to caregiver support or other environmental factors.^[6] In visually impaired children, education regarding maintenance of oral hygiene is more important to reduce the additional burden of oral diseases. They cannot learn the methods of oral health maintenance by visual limitation as their sighted counterparts.^[7] Improving knowledge and teaching oral hygiene practices to these children require special approaches such as the introduction of oral health education booklets typed in Braille and a continuous reinforcement in the form of oral health talks.

Instructions need to be clear and simple to understand in targeting children's personal needs and also adapts to their educational level and cognitive ability with continuous reinforcement.^[8] Various ideas have been proposed in the

literature on delivering oral health education to the visually impaired. Schnuth used audio tapes, models of teeth, typhodonts of primary and permanent dentitions, and a nutritional game in place of visual aids during instruction for the visually impaired children.^[9] In the present study, oral health education was imparted using Braille booklets, audio clip, and individual tooth brushing training to each child in a single group as compared to most of the previous literature in which either only one method of oral health education was used or different methods were compared in separate groups. In the present study oral instructions in the form of a Braille booklet along with audio tactile method of demonstration of oral hygiene instructions was followed. Similar results were found in studies done by Agarwal et al and Bhor et al where aids like audio and Braille booklets were used to increase the skills of children.^[10,11]

The study showed that the children visiting the department routinely with previous history of dental treatment had more oral health awareness followed by residential school children followed by institutionalized visually impaired children who had least awareness before the oral health education program. Studies done by Khurana et al and Chang and Shih found that children with visual impairment were less knowledgeable about their oral care. Most of the children used tooth brush and tooth paste to clean their teeth at base line. However the frequency was only once daily. It is a common custom in India to clean teeth daily in the morning, hence most of the children brushed once daily. After health education the frequency increased to twice daily among most of the subjects which was in accordance to a study done by M. Hebbal and A.V. Ankola.^[12]

The PHP scores of visually impaired children were much higher when compared to the other two study groups reflecting the lack of supervision and impairment. It has

been reported that the absence of visual stimuli prevents rapid learning, representing a challenge for dentists in motivating these individuals to have appropriate oral hygiene. But there was a statistically significant decrease in PHP score yielding to reduced biofilm formation after the oral health education and intervention which suggests that the visually impaired children could learn satisfactory brushing techniques when well trained, thus maintaining healthy oral conditions. This could be due to the fact that these children were staying in a residential school and lead a disciplined life style and were very receptive to learning new things. In a study conducted by Mendonça,^[12] it was stated that the absence of visual stimuli prevents rapid learning, representing a challenge for surgeons and dentists in motivating these individuals to have appropriate oral hygiene. However, it is arguable that, when well trained, blind children are able to learn the brushing techniques, thus maintaining good oral condition. Various studies^[12-14] have been conducted to explore different education tools to make visually impaired children understand about the importance of oral health and eventually have recorded improved results in their oral health knowledge, practices, and status also.

APPENDIX-1

Name:

Age:

Gender:

School:

1) How many teeth are there in your mouth?

- a) 10 b) 20 c) 24 d) 32 e) I don't know

2) What is the best way of cleaning teeth?

- a) Tooth brush and paste b) tooth powder and finger c) Dry twigs

3) How do you clean your teeth?

- a) Tooth brush and paste b) tooth powder and finger c) Dry twigs

4) How much tooth paste should be used at a time for brushing?

- a) Cover the bristles b) pea size c) smear layer on the bristles d) don't know

Hence, this study has shown that the customized, individualized teaching methods for visually impaired children are extremely beneficial.

Limitations

The study was carried out among limited number of students in a single school as it was the only school for blind students in the area. Further research is required on a varied and larger sample representative of the entire population and a longer follow-up is required to assess the impact of the program on oral health behaviors.

Conclusion

This study has led us to conclude that although the blind students cannot see, they still practice good oral hygiene. The fact that they are all living in an institution may play a major role in the enforcement of their oral hygiene practices. As a dental healthcare professional, it is our responsibility to provide comprehensive dental care to the visually impaired individual as these individuals can be managed well with adequate training and alterations in dentist's routine preventive and treatment protocols

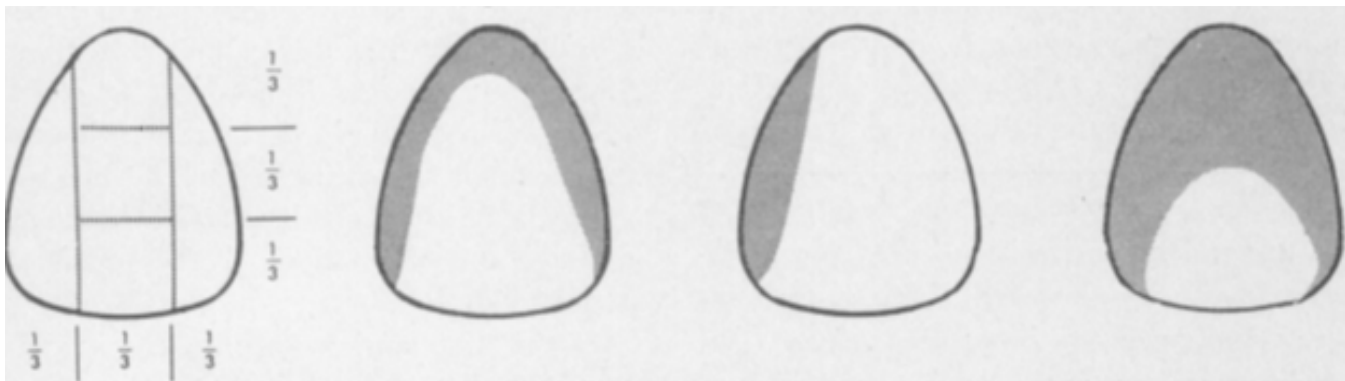
- 5) How often should you change your toothbrush?
 a) once in a month b) once in three months c) once in a year d) not frequently
- 6) How frequently do you brush?
 a) Once a day b) twice a day c) no brushing required d) don't know
- 7) How do you brush your teeth?
 a) Horizontal scrub b) Vertical
- 8) Do you use mouthwash?
 a) Yes b) No c) occasionally
- 9) Do you brush on your own or under guidance of another person?
 a) Own b) Guidance
- 10) Where do you get information regarding oral health?
 a) Teachers b) Friends c) family d) media
- 11) How often do you visit the dentist?
 a) Once in a month b) once in 6 months c) when problem arises
- 12) Do you have any of the following problems?
 a) Tooth decay b) discolored teeth c) bleeding gums d) No

APPENDIX-2

Patient Hygiene Performance (PHP) method

Dr.Podshadley & Dr.Haley

16-BUCCAL	11-LABIAL	26-BUCCAL
36 -LINGUAL	31-LABIAL	46 -LINGUAL



$$\text{PHP Score} = \frac{\text{Sum of debris score}}{\text{No: of debris scores}}$$

Acknowledgment: I would like to acknowledge the authorities of the Sajeevi Blind School Bagalkot and

Balakiyara balamandira residential school Bagalkot, for their support and encouragement throughout my study.

References

1. Khurana C, Tandon S, Chand S, Chinmaya BR. Effectiveness of oral health education program using Braille text in a group of visually impaired children-

- before and after comparison trial. *J Edu Health Promot* 2019; 8:50.
- Podshadley AG, Haley JV. A method for evaluating oral hygiene performance. *Public Health Rep* 1968; 83:259-64
 - Mahantesha T, Nara A, Kumari PR, Halemani PK, Buddiga V, Sarpangala M. A comparative evaluation of oral hygiene using Braille and audio instructions among institutionalized visually impaired children aged between 6 years and 20 years: A 3-month follow-up study. *J Int Soc Prevent Communit Dent* 2015; 5:S129-32.
 - Krishnakumar R, Silla SS, Durai SK, Govindarajan M, Ahamed SS, Mathivanan L. Comparative evaluation of audio and audio – Tactile methods to improve oral hygiene status of visually impaired school children. *CHRISMED J Health Res* 2016; 3:55-9
 - Nandini NS. New insights into improving the oral health of visually impaired children. *J Indian Soc Pedod Prev Dent*. 2003; 21:142-3
 - Chang CS, Shih Y. Knowledge of dental health and oral hygiene practices of Taiwanese visually impaired and sighted students. *J Vis Impair Blind* 2004; 98:5.
 - Jain A, Gupta J, Aggarwal V, Goyal C. To evaluate the comparative status of oral health practices, oral hygiene and periodontal status amongst visually impaired and sighted students. *Spec Care Dentist*. 2013; 33:78-84.
 - Azrina AN, Norzuliza G, Saub R. Oral hygiene practices among visually impaired adolescents. *Ann Dent Univ Malaya*. 2007; 14:1-6.
 - Aggarwal et al: Self-Reported Oral Hygiene Habits amongst Visually Impaired Students. *J Nepal Soc Perio Oral Implantol*. 2019; 3(5):6-8
 - Bansal M. Effect of auditory aid in improving oral hygiene among visually impaired children in Chandigarh city, India – A Longitudinal study. *Oral Health Dent Manage* 2014; 13:894-6
 - Mahoney EK, Kumar N, Porter SR. Effect of visual impairment upon oral health care: a review. *Br Dent J*. 2008; 204:63–67
 - Suresan V, Das D, Jnaneswar A, Jha K, Kumar G, Subramaniam GB. Assessment of dental caries, oral hygiene status, traumatic dental injuries and provision of basic oral health care among visually impaired children of Eastern Odisha. *J Indian Soc Pedo Prev Dent*. 2017; 35:284–290.
 - Shetty V, Hegde AM, Bhandary S, Rai K. Oral health status of the visually impaired children south Indian study. *J Clin Pediatr Dent* 2010; 34:281-5.
 - Ahmad MS, 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*. 2009; 1:22-6