

The Comparison of Anxiety Tactile Using the RMS Tactile Scan in Visually Impaired Children After Performing Oral Prophylaxis by Explaining to Them the Procedure by Verbal Tactile Method

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ABSTRACT

Background: Dental anxiety assessment for blind children is important. Appropriate knowledge of the patient's anxiety will help to review management options specific to every child.

Aim: The aim of this study was to evaluate the anxiety level using the Raghavendra, Madhuri, Sujata (RMS) tactile scale (RMS-TS) of visually impaired children after explaining the oral prophylaxis procedure verbally and by the verbal-tactile method followed by performing the oral prophylaxis procedure.

Materials and methods: A total of 30 children aged between 6 and 13 years were included in this study from a residential school for visually impaired children. These children were divided into two equal groups. One group was explained oral prophylaxis by verbal method and another was explained in a verbal-tactile method, preintervention and postintervention anxiety of the children was checked on the RMS-TS.

Results: A comparison of mean values between the two groups was done using a *t*-test. Comparison of mean values in each group for before and after values were done using paired *t*-test and was found that anxiety had reduced in the verbal-tactile group more significantly than that of the verbal group.

Conclusion: The study shows that the combination of verbal and tactile models for explaining the dental procedure is an effective way to reduce anxiety in blind children.

Keywords: Raghavendra Madhuri Sujata tactile scale, Verbal tactile, Visually impaired children.

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INTRODUCTION

"The best and most beautiful things in the world cannot be seen or even touched. They must be felt with the heart"—Hellen Keller.

When sight is damaged in childhood, it can negatively impact physical, neurological, cognitive, and emotional development. Vision may be the most crucial sense for understanding the world around us.¹

Blindness is defined as the "absence or loss of visual ability or perception of visual stimulus" (Andrews and Shirley 2005, World Health Organization 2004).²

According to the 2016 Rights of Persons with Disabilities Act.

The following are characteristics of visual impairment:

- "Blindness" is defined as the presence of any one of the following circumstances, even with the best correction. One of the following conditions must exist: (1) absolute blindness; (2) visual acuity less than 3/60 or less than 10/200 (Snellen) in the better eye with the best correction; or (3) a field of vision restriction extending to fewer than 10°.
- The term "low vision" refers to a condition in which a person has any of the conditions listed below, namely.
- Visual acuity not exceeding 6/18 up to 3/60 or up to 10/200 (Snellen) in the better eye with the best possible correction; or
- A restricted field of vision extends from <40° up to 10°.

The eye is a crucial sensory organ that contributes significantly to the entire amount of information a person can gather through

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his senses. According to estimates, the use of the eyes accounts for about 85% of all information or more than three-fourths of all learning. The youngsters who are blind must learn by using their other senses, such as hearing, taste, smell, sensation, or touch.

The range and quality of cognition are decreased by sensory defects in vision since the senses are the entrance to knowledge.

Vision is also the sense that is employed the most frequently. A lot of knowledge is developed as a result of visual encounters. As a result, the vision's consequences are severe. According to Berthold Lowenfeld, having vision problems "imposes three basic limits" on the person, that is, a limitation in the breadth and variety of experiences, a restriction in one's mobility, a restriction in one's ability to influence one's surroundings and one's relationship to it. A person who is blind can only learn about an object's spatial characteristics by touching it and observing it. Kinesthetic experiences are crucial in this kind of information. Direct contact is required to carry out any touch observations, must with the objects to be observed.³

Raghavendra, Madhuri, Sujata tactile scale (RMS-TS) is a new scale to determine anxiety in blind children. It was named RMS by the names of Raghavendra, Madhuri, Sujata (the inventor of the scale).⁴ It is an innovative scale keeping in mind the needs of visually impaired children was designed and named the RMS-TS (patented-Ref: No. 201741038533/CHE/2017) which is a modified version of the RMS Pictorial scale (PS) using tactile sense. The RMS-TS consists of a row of five expressions carved faces with commonly seen expressions ranging from not anxious to extremely anxious (1-not anxious, 2-slightly anxious, 3-fairly anxious, 4-very anxious, 5-extremely anxious).⁵

Dental anxiety is the patient's reaction to a particular dental issue.

According to the American psychiatric association 2013, "anxiety disorders include disorders that share features of excessive fear and anxiety and related behavioral disturbances. Fear is the emotional response to a real or perceived imminent threat, whereas anxiety is the anticipation of future threat."⁶

In the field of pain management and patient care, modern science has made enormous strides. Despite improvements in child management, dental treatment anxiety and the dread of pain that goes along with it are still very common in society.⁵ Hence, this study aimed to evaluate the anxiety level using the RMS-TS of the visually impaired children after explaining the oral prophylaxis procedure verbally and by verbal-tactile method followed by performing the oral prophylaxis procedure.

MATERIALS AND METHODS

A total of 30 visually impaired children in the age range of 6–13 years were selected from Ghodawat residential blind school, Miraj.

Permission was taken from the institute, after providing detailed information to the head of the institute, children, and caretakers.

Inclusion criteria

Thirty visually impaired children with no previous dental experience.

Exclusion criteria

- Children with any medical history or with any dental history.
- Ethical clearance was obtained from the Institutional Ethical Committee of Bharati Vidyapeeth Deemed to be University, Sangli, Maharashtra.
- The 30 children were then randomly divided into two groups.
- Group I (15 children): Verbal explanation.
- Group II (15 children): Verbal + tactile. The anxiety of children was measured on the RMS-TS (Fig. 1).

Group I

The children in group I was explained verbally about the oral prophylaxis procedure (Fig. 2) followed by which, the anxiety level of each child in group I was checked on the RMS-TS and recorded (Fig. 3). Further, oral prophylaxis was performed and again the anxiety level was checked and recorded.

Group II

The children in group II were explained about the oral prophylaxis procedure verbally and they were made to feel the same on the typodont jaw set by holding the scaler in their hand and their hand held by the operator (Fig. 4), also they were made to feel the scaler on their nails.

The anxiety level of each child in group II was checked on the RMS-TS and recorded. Later oral prophylaxis was performed for children in group II, and again the anxiety level of each child in group II was checked on the RMS-TS and recorded.

RESULTS

- The data were subjected to statistical analysis using Statistical Package for Social Sciences (version 21.0, IBM).
- A comparison of mean values of variables between the two groups was done using a *t*-test.
- A comparison of mean values in each group for before and after values were done using paired *t*-test.
- The $p < 0.05$ was considered to be statistically significant, keeping a error at 5% and β error at 20%, thus giving power to the study as 80%.



Fig 1: RMS-TS

Intergroup Comparison

When the mean score of anxiety before the oral prophylaxis procedure of children between groups I and II was compared, it was noted that for the verbal group (group I) the score was 4.00, and for the verbal + tactile group (group II) it was 3.80, whereas



Fig 2: Verbally explained oral prophylaxis



Fig 3: RMS-TS recorded



Fig 4: Verbal-tactile explanation

the mean score after the oral prophylaxis procedure for the verbal group (group I) dropped down to 3.3 and for verbal + tactile (group II) drastically dropped down to 1.40 (Fig. 5).

DISCUSSION

Pediatric dentistry is recognized as the area of competence, research, and development in the field of behavior modification related to the provision of pediatric dental care in dental settings. Behavior in contrast to other areas, pediatric dentistry places a strong emphasis on guidance. It might be difficult for pediatric dentists to treat medically fragile children, especially those who are visually impaired. Furthermore, the anxiety levels of adolescents with visual impairment are significantly higher than those of sighted ones.⁵ Pediatric dentists should be knowledgeable about how dental dread develops.

A three-pathway hypothesis of how fear develops was described by Rachman and includes direct conditioning, modeling, and information. According to further study, these three routes are interactively connected (King et al.).

Dental fear was highly correlated with both the direct pathway and the modeling pathway (Goumans et al.). Dental phobia might make a child's therapy more challenging.⁷ Though being aware of anxiety levels in visually impaired children will help the pediatric dentist to follow the proper behavior guidance techniques.⁵ Hence, the study focused on determining the anxiety in visually impaired children which will further help in managing the children easily.

The routes used to transmit touch and visual information to the brain are physically distinct. The primary visual cortex (V1) and primary somatosensory cortex are two distinct basic regions at the level of the cerebral cortex that independently process information for sight and touch. Higher-order cortical areas do additional processing and even combine visual and somatosensory input, although this processing is still reliant on the fundamental cortical areas. Blindness is the outcome of V1 loss, although tactile sensory impairment is not. Similar to how losing the primary somatosensory cortex impairs vision but causes a loss of touch discrimination. As a result, these two paths are separate at the beginning of cortical processing (Pons).⁸

The blind kids were given oral hygiene instructions *via* the braille, audio methods, or tactile methods, and also studies where anxiety was checked using these aids. Hebbal et al. stated in a study that when taught using specialized techniques like the audio-tactile

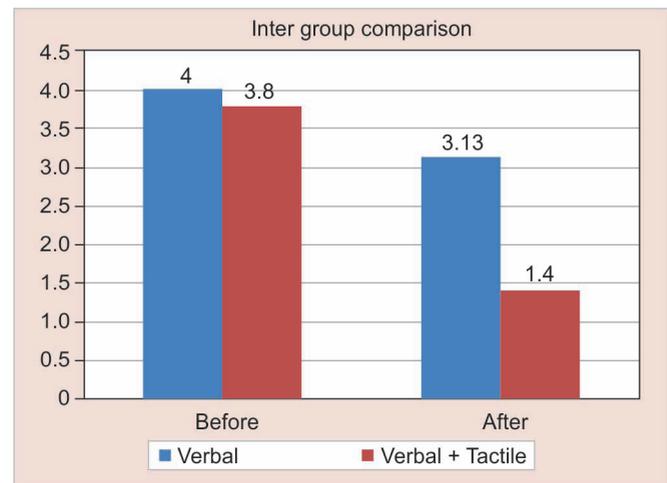


Fig. 5: Intergroup comparison

performance approach, visually challenged youngsters could maintain a respectable level of dental hygiene.⁹

Setiawati et al., conducted a study using Braille Leaflet Dental Health Education (BLDHE) and Audio Dental Health Education (ADHE) techniques, to contrast methods of dental health education for visually impaired youngsters and concluded that dental anxiety can be reduced in visually impaired youngsters by using BLDHE and ADHE as non-face-to-face dental health education techniques.¹⁰

Mahantesha et al., from the study to compare the level of oral hygiene among children with visual impairments who are institutionalized and between the ages of 6 and 20 and who are provided Braille and audio instructions., came up with the conclusion that, for the visually impaired youngsters, ongoing encouragement and reinforcement in the form of Braille and audio teaching is helpful in promoting appropriate dental hygiene levels in visually impaired children.¹¹

Gautam et al. in a study aiming to assess the improvement in oral hygiene by audio aids and Braille and tactile models in visually impaired children depicts that the combination of audio aids, Braille, and tactile models is an effective way to provide oral health education and improve the oral health status of visually impaired children.¹²

Shetty et al. aimed to validate and assess the efficacy of RMS-TS for visually impaired child and compare it with a modified dental anxiety scale and Braille scale by asking about the feelings during different dental situations using a set of five questions and concluded that RMS-TS can be reliable anxiety assessment scale for measuring child's dental anxiety in visually impaired children.⁵

A study done by Mohan et al. Proved that, if taught with special customized methods like a multisensory approach like the "audio tactile performance technique" along with the creative use of other senses, blind children could maintain an acceptable level of oral hygiene.¹³

Krishnakumar et al. compared the effectiveness of audio and audio-tactile methods in improving the oral hygiene status of visually impaired school children and concluded that visually impaired children could maintain an acceptable level of oral hygiene when taught using special customized methods.¹

No studies were encountered where treatment like oral prophylaxis for visually impaired children was carried out and anxiety was recorded, so the focus was on performing oral prophylaxis and recording the anxiety using the newer approach of using the RMS-TS. The results of the present study showed a decrease in the anxiety level of the children who were explained the procedure by the verbal tactile method compared to the children who were explained only by the verbal method.

CONCLUSION

The goal of the dentist should be to provide patients with disabilities, with the best dental experience. We should create unique, tailored health education strategies that are tailored to the needs of the subjects if we want to combat dental phobia and negative attitudes. The same possibilities for oral health and hygiene should be available to people with impairments as to those in good health.

The research shows that the combination of verbal and tactile models for explaining the dental procedure is an effective way to reduce anxiety in visually impaired children, as this study has been carried out in a lesser number of population and this being the positive result of the study, there is further scope of performing such studies on a larger scale for different treatments like restorations, extractions, pulpectomies, and randomized control trials for visually impaired children using this new aid of tactile sense that is the RMS-TS as it comprises of different expressions giving the clinician the idea of the level of anxiety in the child and provide the child with the best possible treatment by making the child calmer, fearless and less anxious manner.

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REFERENCES

1. Krishnakumar R, Silla SS, Durai SK, et al. Comparative evaluation of audio and audio - tactile methods to improve oral hygiene status of visually impaired school children. *ChrisMed JHR* 2016;3(1):55. DOI: 10.4103/2348-3334.172403
2. Bolat N, Doğangün B, Yavuz M, et al. Depression and anxiety levels and self-concept characteristics of adolescents with congenital complete visual impairment. *Turk Psikiyatri Derg* 2011;22(2):77-82.
3. Pandey RK. Comparative study of adjustment of visually impaired students. *Univ J Educ Res* 2018;6(11):2562-2571. DOI: 10.13189/ujer.2018.061121
4. Shetty RM, Khandelwal M, Rath S. RMS pictorial scale (RMS-PS): an innovative scale for the assessment of child's dental anxiety. *J Indian Soc Pedod Prev Dent* 2015;33(1):48-52. DOI: 10.4103/0970-4388.149006
5. Shetty RM, Gaddekar TR. RMS tactile scale: an innovative tactile anxiety scale for visually impaired children. *J Indian Soc Pedod Prev Dent* 2018;36(1):76-81. DOI: 10.4103/JISPPD.JISPPD_351_16
6. Augestad LB. Mental health among children and young adults with visual impairments: a systematic review. *J Vis Impair Blind* 2017;111(5):411-425. DOI: 10.1177/0145482X1711100503
7. Goumans C, Veerkamp JS, Aartman IH. Dental anxiety and behavioural problems: what is their influence on the treatment plan? *Eur J Paediatr Dent* 2004;5(1):15-18.
8. Sadato N. How the blind "see" Braille: lessons from functional magnetic resonance imaging. *Neuroscientist* 2005;11(6):577-582. DOI: 10.1177/1073858405277314
9. Hebbal M, Ankola AV. Development of a new technique (ATP) for training visually impaired children in oral hygiene maintenance. *Eur Arch Paediatr Dent* 2012;13(5):244-247. DOI: 10.1007/BF03262878
10. Setiawati AD, Suharsini M, Budiardjo SB, et al. Assessment of dental anxiety using Braille leaflet and audio dental health education methods in visually impaired children. *J Int Dent Medical Res* 2017;10(Special issue):441-444.
11. Mahantesha T, Nara A, Kumari PR, et al. 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 Prev Community Dent* 2015;5(Suppl 2):S129-S132. DOI: 10.4103/2231-0762.172953
12. Gautam A, Bhambal A, Moghe S. Effect of oral health education by audio aids, Braille & tactile models on the oral health status of visually impaired children of Bhopal city. *J Oral Biol Craniofac Res* 2018;8(3):168-170. DOI: 10.1016/j.jobcr.2017.03.002
13. Mohan R, Raju R, Gubbihal R, et al. Comprehensive dental care for the visually impaired: a review. *Int J Oral Health Med Res* 2016;3(4):97-101.