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"A Study to Determine the Effect of Teaching Using Audio Drama on Knowledge Regarding Oral Hygiene Among Visually Impaired Children of Selected Blind School in Pune"

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Abstract: Oral health is an essential component of overall health, yet visually impaired children are at increased risk of poor oral hygiene because conventional health education primarily relies on visual aids. This study assessed baseline oral hygiene knowledge, evaluated the effectiveness of audio drama-based education, and examined its association with selected demographic variables among visually impaired children. A quantitative pre-experimental one-group pretest–posttest design was conducted among 150 children aged 6–14 years from Poona School and Home for Blind, Pune, selected through purposive sampling. Baseline knowledge was assessed using a structured interview schedule, followed by a 15-minute audio drama, with posttest evaluation after seven days. Before the intervention, 44.0% of participants had poor knowledge, 53.3% had average knowledge, and only 2.7% had good knowledge. Post-intervention, all participants achieved good knowledge scores, with the mean score increasing significantly from 10.3 ± 4.6 to 26.8 ± 0.4 (t=44.0, p<0.001). Audio drama was highly effective in improving oral hygiene knowledge and represents an accessible educational strategy for promoting oral health among visually impaired children.

Keywords: *Audio drama; Oral hygiene; Visually impaired children; Health education; Oral health promotion; Knowledge; School health..*

Introduction

Oral health is universally recognized as an essential component of general health and well-being. According to the World Health Organization (WHO), health is defined as a state of complete physical, mental, and social well-being rather than merely the absence of disease. Oral health contributes significantly to this definition because healthy teeth and oral tissues are fundamental for eating, speaking, social interaction, and maintaining an acceptable quality of life. Oral diseases not only cause pain and discomfort but also negatively affect nutritional status, communication, educational performance, self-esteem, and psychosocial development in children.

Despite considerable advances in preventive dentistry, oral diseases remain among the most prevalent chronic conditions affecting children worldwide. Dental caries and periodontal diseases continue to impose a substantial public health burden, particularly in developing countries. The World Health Organization estimates that approximately 60–90% of school-aged children experience dental caries during childhood. In India, surveys conducted by the Indian Dental Association have also demonstrated a high prevalence of dental problems among school children, with a significant proportion suffering from gingival diseases and untreated dental decay. These findings indicate that oral health promotion should remain a priority within school health programmes.

The development of healthy oral hygiene practices begins during early childhood. Daily tooth brushing using appropriate techniques, fluoride toothpaste, healthy dietary habits, and regular dental visits are the cornerstones of preventing oral diseases. Children who establish good oral hygiene practices early in life are more likely to maintain healthy dentition throughout adulthood. Conversely, inadequate oral hygiene during childhood substantially increases the risk of dental caries, gingivitis, periodontal disease, halitosis, and eventual tooth loss. Poor oral health has also been associated

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with school absenteeism, impaired concentration, nutritional deficiencies, and reduced quality of life.

Health education is one of the most effective primary preventive strategies for improving oral health behaviours. Educational interventions increase awareness, strengthen positive attitudes, and encourage healthy practices among children. Several studies have demonstrated that structured oral health education significantly reduces dental plaque accumulation, improves gingival health, and enhances oral hygiene practices among school children. Educational programmes therefore constitute an important component of community-based preventive dentistry.

Children with visual impairment represent a particularly vulnerable population with respect to oral health. Visual impairment limits the acquisition of motor skills through observation and makes it difficult for children to understand proper brushing techniques demonstrated visually. Unlike sighted children, visually impaired children depend primarily on tactile and auditory learning. Consequently, maintaining effective oral hygiene becomes considerably more challenging without appropriate educational adaptations.

The inability to visualize dental plaque or identify areas requiring cleaning often results in ineffective brushing practices. Furthermore, many visually impaired children depend upon caregivers or teachers for reinforcement of oral hygiene behaviours. Several studies have reported higher prevalence of dental caries, poorer oral hygiene status, increased treatment needs, and reduced oral health-related quality of life among visually impaired children compared with their sighted peers. These findings highlight the necessity for innovative educational methods specifically designed for this population.

Traditional oral health education typically relies on posters, charts, videos, demonstrations, and printed educational materials. While these methods are effective for sighted children, they are considerably less useful for children with visual impairment. Therefore, accessible educational approaches that utilise the remaining sensory modalities are essential. Audio-based learning, tactile demonstrations, Braille materials, music-assisted instruction, and storytelling have emerged as promising alternatives for promoting health education among visually impaired individuals.

Among these approaches, audio drama offers several educational advantages. Audio drama combines narration, realistic sound effects, dialogue, music, and storytelling to create vivid mental imagery and sustain learners' attention. Because visually impaired children predominantly rely on auditory perception, audio drama can transform health information into an engaging and memorable learning experience. Educational messages delivered through dramatization may also improve motivation, comprehension, and long-term retention compared with conventional verbal instruction alone.

Previous investigations have demonstrated encouraging outcomes using customized educational interventions for visually impaired children. Music-assisted oral hygiene instruction has been shown to improve plaque scores and gingival health, while audio-tactile performance techniques have successfully enhanced brushing practices and reduced plaque accumulation. Similarly, Braille-supported education combined with motivational strategies has significantly improved oral hygiene awareness and oral health status. These studies collectively suggest that educational programmes specifically adapted to sensory abilities are considerably more effective than conventional teaching methods for children with visual impairment.

Although several educational interventions have been evaluated internationally, evidence regarding the effectiveness of audio drama as an independent educational strategy remains limited, particularly in the Indian context. Most available studies have focused on tactile instruction, Braille education, or music-assisted brushing programmes, whereas audio drama has received comparatively little scientific attention despite its potential accessibility, low cost, ease of dissemination, and scalability.

The present study was therefore undertaken to evaluate whether a structured audio drama programme could effectively improve knowledge regarding oral hygiene among visually impaired children attending a blind school in Pune. The study was guided by the Health Promotion Model proposed by Nola Pender, which emphasizes behaviour-specific cognition, perceived benefits of action, interpersonal influences, and behavioural outcomes as determinants of health-promoting behaviours. Within this framework, audio drama was conceptualized as a health education intervention intended to improve children's knowledge, thereby facilitating healthier oral hygiene practices.

The specific objectives of the study were to assess baseline knowledge regarding oral hygiene among visually impaired children, determine the effectiveness of audio drama-based teaching in improving knowledge, and examine the association between selected demographic variables and knowledge levels. It was hypothesized that children receiving audio drama-based education would demonstrate significantly higher posttest knowledge scores compared with their baseline assessment.

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Problem Statement
A study to determine the effect of teaching using audio drama on knowledge regarding oral hygiene among visually impaired children of selected blind school in Pune.

Objectives of The Study
- To assess the knowledge of oral hygiene among visually impaired children.
- To evaluate the effect of audio drama teaching on knowledge regarding oral hygiene.
- To find the association of knowledge on oral hygiene with selected demographic variables.

Variables
Independent Variable: Audio drama on oral hygiene
Dependent Variable: Knowledge on oral hygiene

Hypothesis
H0: Statistically, there will be no significant difference between the pre-test and post-test knowledge scores of children regarding oral hygiene after the audio drama.

Materials and Methods
Study Design
A quantitative research approach with an evaluative orientation was adopted to determine the effectiveness of an audio drama-based educational intervention on oral hygiene knowledge among visually impaired children. A **pre-experimental one-group pretest–posttest design** was employed. Baseline knowledge was assessed before the intervention, followed by administration of the audio drama and reassessment of knowledge after seven days. This design enabled comparison of participants' knowledge before and after the educational programme.

Study Setting
The study was conducted at **Poona School and Home for Blind**, Koregaon Park, Pune, Maharashtra, India. The institution was selected because of its accessibility, availability of eligible participants, administrative feasibility, and willingness to participate in the study.
A pilot study was conducted separately at Patashibai Manav Trust Blind School, Pune, to evaluate the feasibility of the methodology and data collection procedures before commencement of the main study.

Study Population
The target population comprised visually impaired children studying in blind schools in Pune. The accessible population included children aged **6–14 years** enrolled at Poona School and Home for Blind during the study period.

Sample Size and Sampling Technique
A total of **150 visually impaired children** participated in the study. Participants were selected using a **non-probability purposive sampling technique**, ensuring inclusion of children who satisfied the eligibility criteria and consented to participate.

Inclusion Criteria
- Visually impaired children aged 6–14 years.
- Children willing to participate in the study.

Exclusion Criteria
- Children with visual impairment associated with additional disabilities.

Study Instrument
Data were collected using a researcher-developed structured interview schedule and an audio drama specifically designed to educate visually impaired children regarding oral hygiene. The interview format was chosen because all participants were unable to complete written questionnaires independently.
The instrument consisted of two sections.

Section I: Demographic Characteristics
This section collected information regarding:
- Age
- Gender
- Educational level
- Previous knowledge of oral hygiene
- Source of previous knowledge
- Previous dental treatment
- Tooth-brushing materials used

Section II: Knowledge Assessment
Knowledge regarding oral hygiene was assessed using **18 structured interview questions** with a maximum attainable score of **27**.
Knowledge levels were categorized as:
- **Poor:** 0–9
- **Average:** 10–18
- **Good:** 19–27

The questionnaire was developed in English and translated into Marathi for ease of administration.

Development and Validation of the Intervention
The educational intervention consisted of a **15-minute audio drama** focusing on essential oral hygiene practices, including:
- Importance of oral hygiene

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- Tooth-brushing frequency
- Appropriate brushing technique
- Prevention of dental caries
- Importance of regular oral care

The educational content was developed after reviewing published literature and consulting experts in paediatric nursing, paediatric dentistry, child health nursing, medical-surgical nursing, and teachers from blind schools.

Content validity was established by **20 experts**, of whom **14 returned their evaluations**. Based on their recommendations, modifications were made to demographic items, questionnaire options, and the audio drama script. The brushing technique described in the intervention was revised to the **Fones method** before finalization.

Reliability of the Instrument

Reliability of the structured interview questionnaire was assessed using the **test–retest method** on fifteen visually impaired children. The Pearson correlation coefficient obtained was **r = 0.97**, indicating excellent reliability and consistency of the instrument.

Pilot Study

A pilot study involving **15 visually impaired children** was conducted from **6 July to 16 July 2015**.

Participants completed the pretest questionnaire, received the audio drama intervention, and completed the posttest after seven days.

Statistical analysis demonstrated a highly significant improvement in knowledge (**p < 0.001**), confirming the feasibility and practicality of the study procedures.

Data Collection Procedure

Data collection for the main study was undertaken between **17 July and 15 August 2015**.

Following institutional permission and informed consent, participants were divided into three groups of fifty children.

The procedure consisted of:

1. Administration of the structured interview schedule (pretest).
2. Delivery of the 15-minute audio drama.
3. Seven-day interval.
4. Administration of the posttest using the same questionnaire.

Confidentiality was maintained throughout the study.

Statistical Analysis

Data were analysed using descriptive and inferential statistics.

Descriptive statistics included:

- Frequency
- Percentage
- Mean
- Standard deviation

Inferential statistics included:

- Paired *t*-test to compare pretest and posttest knowledge scores.
- Fisher's exact test to examine associations between demographic variables and knowledge.

A significance level of **p < 0.05** was considered statistically significant.

Results

Demographic Characteristics

A total of **150 visually impaired children** participated.

The largest proportion (**38.7%**) belonged to the **6–8-year** age group, followed by **24.0%** aged 12.1–14 years, **20.0%** aged 8.1–10 years, and **17.3%** aged 10.1–12 years.

All participants were male.

Regarding educational status, **42.0%** were studying in classes I–III, **23.3%** in classes IV–VI, and **34.7%** in classes VII–IX.

More than half (**58.0%**) reported previous knowledge regarding oral hygiene. Family members constituted the most common information source (30.7%), followed by teachers (19.3%), media (5.3%), and peers (2.7%).

None of the participants had previously undergone dental treatment, and all reported using a toothbrush with toothpaste for daily oral hygiene.

Baseline Knowledge Regarding Oral Hygiene

Before the intervention, oral hygiene knowledge was generally inadequate.

Among the participants:

- **44.0%** demonstrated poor knowledge,
- **53.3%** demonstrated average knowledge,
- Only **2.7%** demonstrated good knowledge.

These findings indicate considerable deficiencies in oral hygiene awareness before implementation of the educational programme.

Effectiveness of Audio Drama

Following the educational intervention, marked improvement was observed in knowledge scores.

Whereas only four participants demonstrated good knowledge before the intervention, **all 150 children (100%) achieved good knowledge scores during the posttest**.

Neither poor nor average knowledge categories remained after the intervention, suggesting complete improvement in knowledge classification across the study population.

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The mean pretest knowledge score was **10.3 ± 4.6**, increasing to **26.8 ± 0.4** following the intervention.

Paired *t*-test analysis demonstrated a highly significant improvement in knowledge (t = 44.0; df = 149; **p < 0.001**), confirming that the observed improvement was unlikely to have occurred by chance.

Table 1. Comparison of Pretest and Posttest Knowledge Scores (N = 150)

Variable	Pretest	Posttest
Mean score	10.3	26.8
Standard deviation	4.6	0.4
t value	44.0	
Degrees of freedom	149	
p value	<0.001	

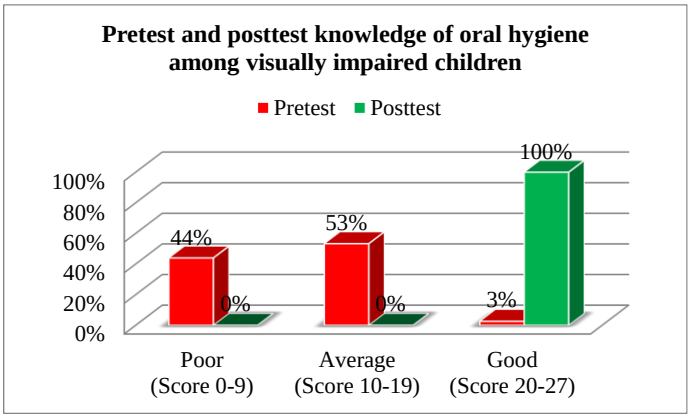

Fig 1: Bar diagram shows the distribution of overall pretest and posttest knowledge score in percentage obtained by the visually impaired children

Table 2. Distribution of Knowledge Categories

Knowledge Level	Pretest n (%)	Posttest n (%)
Poor	66 (44.0)	0 (0.0)
Average	80 (53.3)	0 (0.0)
Good	4 (2.7)	150 (100.0)

Association Between Knowledge and Demographic Variables

Fisher's exact test demonstrated statistically significant associations between baseline knowledge and selected demographic characteristics.

Knowledge scores were significantly associated with:

- Age
- Educational level
- Previous knowledge regarding oral hygiene

All three variables demonstrated statistically significant relationships (**p < 0.001**), indicating that older children, children with higher educational attainment, and those possessing prior oral health knowledge exhibited better baseline knowledge before the intervention.

Discussion

The present study evaluated the effectiveness of an audio drama-based educational intervention in improving knowledge regarding oral hygiene among visually impaired children attending a blind school in Pune. The findings demonstrated a statistically significant improvement in knowledge following the intervention, supporting the usefulness of audio-based health education for children with visual impairment.

Baseline Knowledge Regarding Oral Hygiene

The pretest assessment revealed that the majority of participants possessed only average (53.3%) or poor (44.0%) knowledge regarding oral hygiene, while very few (2.7%) demonstrated good knowledge. These findings indicate that oral health awareness among visually impaired children remains inadequate despite more than half of the participants reporting previous exposure to oral hygiene information.

Several factors may explain these findings. Conventional oral health education programmes predominantly use visual demonstrations, posters, videos, and illustrations that are not fully accessible to children with visual impairment. Consequently, these children may not acquire sufficient knowledge regarding proper brushing techniques, prevention of dental diseases, and maintenance of oral hygiene. Furthermore, dependence on caregivers for daily oral care and limited access to adapted educational resources may contribute to inadequate oral health literacy.

These observations are consistent with previous studies reporting poorer oral hygiene status and higher prevalence of dental caries among visually impaired children compared with sighted peers. Earlier investigations cited in the thesis similarly demonstrated substantial treatment needs and inadequate oral health awareness among children with visual impairment, emphasizing the importance of tailored educational interventions.

Effectiveness of Audio Drama-Based Education

The principal finding of the study was the remarkable improvement in knowledge following the educational intervention. After exposure to the 15-minute audio drama, every participant achieved a good knowledge score. The mean knowledge score increased from **10.3**

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± 4.6 during the pretest to **26.8 ± 0.4** during the posttest, and the difference was highly statistically significant ($t = 44.0$, $p < 0.001$).

The effectiveness of the intervention can be explained by its alignment with the preferred learning modality of visually impaired children. Audio drama combines narration, dialogue, music, and realistic sound effects, making educational messages engaging and easier to understand and remember. Unlike conventional lecture methods, dramatization encourages active listening and improves attention and retention.

From a theoretical perspective, these findings support the Health Promotion Model, which proposes that increasing knowledge and perceived benefits of healthy behaviours promotes positive behavioural intentions. By delivering oral hygiene information through an accessible auditory medium, the intervention likely enhanced participants' understanding and motivation, leading to improved knowledge outcomes.

The large improvement observed also suggests that accessible educational materials can reduce disparities in health education experienced by children with disabilities.

Association Between Knowledge and Demographic Variables

The present study identified statistically significant associations between baseline knowledge and age, educational level, and previous knowledge regarding oral hygiene. Older children and those with higher educational attainment demonstrated better baseline knowledge than younger participants. Similarly, children who had previously received oral health information scored significantly higher during the pretest.

These findings are expected because cognitive development, educational exposure, and repeated health education opportunities generally increase with age and schooling. Previous exposure through family members and teachers may also reinforce healthy concepts before formal interventions.

No meaningful associations were observed for variables such as gender, dental treatment history, or brushing materials because the study population was relatively homogeneous: all participants were male, none had undergone previous dental treatment, and all used a toothbrush with toothpaste.

Comparison with Previous Studies

The findings of the present study are broadly consistent with earlier research demonstrating that adapted educational interventions significantly improve oral health knowledge and practices among visually impaired individuals.

Studies evaluating audio-tactile instruction, Braille-supported education, music-assisted learning, and other sensory-adapted teaching methods have consistently reported improvements in oral hygiene behaviour and reductions in plaque accumulation. Likewise, investigations conducted among visually impaired children in India have highlighted inadequate baseline knowledge and emphasized the need for specially designed oral health education programmes.

The magnitude of improvement observed in this study may reflect the suitability of audio drama as a culturally acceptable, inexpensive, and easily reproducible educational tool. Unlike resource-intensive interventions requiring specialized personnel or equipment, audio recordings can be disseminated widely through schools, community health centres, and mobile devices.

Although the study demonstrated excellent educational outcomes, the interpretation of these findings should consider the pre-experimental design. Without a comparison group, improvements cannot be attributed exclusively to the intervention with absolute certainty. Nevertheless, the substantial increase in knowledge scores strongly supports the educational value of the audio drama programme.

Strengths of the Study

The study has several notable strengths.

- It addressed an underserved population with unique educational needs.
- The intervention was specifically designed for visually impaired children.
- A relatively large sample of 150 participants enhanced the precision of estimates.
- The structured questionnaire demonstrated excellent reliability (r = 0.97).
- The educational intervention is inexpensive, scalable, and suitable for implementation in resource-limited settings.

Limitations

Several limitations should be acknowledged.

- The study employed a **one-group pretest–posttest design** without a control group, limiting causal inference.
- Participants were recruited using purposive sampling from a single blind school, reducing generalizability.
- Outcomes were limited to knowledge assessment; actual oral hygiene practices and clinical oral health status were not evaluated.
- Long-term retention of knowledge following the intervention was not assessed.
- All participants were male, limiting applicability of the findings to female students.

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Future studies using randomized controlled designs with longer follow-up periods and behavioural outcomes are recommended.

Implications for Nursing Practice and Public Health

The findings have important implications for nursing education, school health services, and community oral health promotion.

Nurses working in schools can incorporate audio-based educational materials into routine health education programmes for children with visual impairment. Community health nurses may collaborate with teachers, caregivers, and dental professionals to develop accessible oral health promotion initiatives tailored to the needs of children with disabilities.

School health programmes should consider adopting audio educational modules as part of comprehensive oral health promotion strategies. Periodic reinforcement through audio recordings may improve knowledge retention and encourage healthy oral hygiene practices over time.

The study also highlights the importance of interdisciplinary collaboration among nursing professionals, dentists, special educators, and parents to ensure equitable access to preventive oral health education.

Conclusion

The present study demonstrated that visually impaired children had inadequate baseline knowledge regarding oral hygiene. Following administration of a structured audio drama-based educational programme, knowledge improved significantly, with all participants achieving good posttest knowledge scores. The substantial increase in mean knowledge score and the highly significant paired *t*-test findings indicate that audio drama is an effective educational strategy for improving oral hygiene knowledge among visually impaired children.

Age, educational level, and previous exposure to oral health information were significantly associated with baseline knowledge, suggesting that repeated educational opportunities throughout childhood are beneficial.

Overall, audio drama represents an accessible, cost-effective, and scalable educational approach that can be incorporated into school health programmes to improve oral health literacy among children with visual impairment.

Recommendations

Based on the findings, the following recommendations are proposed:

1. Conduct randomized controlled trials comparing audio drama with other educational methods.
2. Evaluate long-term retention of oral health knowledge and behavioural changes.
3. Assess the impact of audio drama on clinical oral health outcomes such as plaque scores and dental caries.
4. Replicate the study across multiple schools and different geographical regions.
5. Develop multilingual audio educational resources for children with visual impairment.
6. Integrate audio-based oral health education into national school health programmes for children with disabilities.

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Conflict of Interest

The author declares no conflict of interest.

Ethical Approval

Institutional permission and approval from the school authorities were obtained prior to data collection. Participation was voluntary, informed consent was secured from parents or guardians through the institution, and confidentiality of participant information was maintained throughout the study.

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