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Comparison of Oral Health Status of Visually Impaired and Non-visually Impaired Children in Chennai

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Abstract

Introduction: Understanding the oral health status of visually impaired children remains an understudied area, particularly within the urban context of Chennai city. This study bridges this gap by systematically comparing the oral health status between visually impaired children and normal children. Utilizing a comprehensive assessment protocol, such as dental examinations, we investigate key indicators such as dental caries prevalence, flurosis, and oral hygiene practices.

Aim: The aim of this study is to compare the oral health status of visually impaired and non visually impaired

children in Chennai.

Study Design: A cross-sectional study, 392 visually impaired children from selected blind schools and 392 non visually impaired children from selected normal schools will form the sample size.

Materials and Method: A Cross-sectional study conducted among children between 14-16 years of age studying in blind schools and normal schools in Chennai city.

Result: Suggest that visually impaired children face greater challenges in maintaining optimal oral health compared to normal children.

Keywords: Visual Impairment, Oral Health, Dental Caries and Oral Hygiene

Introduction

Globally, over 2.2 billion individuals grapple with vision impairment^[1]. This immense burden on global health is particularly acute in India, where approximately 4.95 million individuals suffer from blindness and 70 million struggle with visual impairment, among whom 0.24 million are blind children^[1,2]. The impact of vision impairment extends far beyond the loss of sight itself, with profound implications for individuals' quality of life, educational opportunities, and overall health outcomes^[3].

Blind children face unique challenges that exacerbate the already considerable burdens of vision impairment. Beyond the obvious difficulties in navigating the world without sight, blind children often encounter barriers in accessing education, healthcare, and other essential services^[4]. These challenges can have lasting consequences, impacting their social integration, academic success, and overall well-being. Alarming, studies have shown that visually impaired children experience higher rates of dental caries and oral hygiene problems compared to their sighted peers^[2,3,4]. These disparities in oral health highlight the need for targeted interventions to address the specific needs of visually impaired individuals, particularly children, who are at a heightened risk of poor oral health outcomes^[5].

Emerging research has begun to shed light on the complex interplay between vision impairment and oral health, revealing the extent of the disparities faced by visually impaired individuals in accessing dental care and maintaining oral hygiene^[6,7]. Despite the growing recognition of these challenges, there remains a significant gap in our understanding of how best to address the oral health needs of visually impaired individuals, particularly children. Addressing this gap requires a multifaceted approach that encompasses both research and practice, with a focus on developing innovative strategies to improve oral health outcomes for this vulnerable population^[8].

This study is aimed to assess and compare the oral health status among visually impaired and non-visually impaired children in Chennai. The objective of this study is to contribute empirical evidence to the existing body of research elucidating the oral health challenges faced by blind children in Chennai city.

Aim

The aim of the study is to assess and compare the oral health status among visually impaired and non-visually impaired children in Chennai.

Objectives

To assess and compare the oral health status of visually impaired and non-visually impaired children using WHO Dentition Status 2013 and OHI-S.

Materials and Method

Study Design: Cross-sectional study.

Study Population: Children between 14-16 years of age studying in blind schools and normal schools in Chennai city.

Sampling technique: A stratified clustered random sampling method will be employed to select schools for visually impaired and non-visually impaired children in Chennai.

A list of blind schools and schools for non-visually impaired children in Chennai city will be obtained and will be divided according to geographical locations as north, south, east, and west zones. (List of Blind schools, Chennai - St Louis School for Deaf & Blind- Adyar, National Institute for the Visually Handicapped- Poonamallee, CSI School for Deaf & Blind- Mylapore, Little Flower Convent for Blind & Deaf- T Nagar, Government Higher Secondary School for Blind- Poonamallee).

Then by using random sampling technique the schools from each zone will be selected till the required sample size is obtained.

After getting permission from the principal or headmasters, the study will be explained in detail to the study participants and informed consent will be obtained.

After obtaining consent from the child, the clinical evaluation will be done among visually impaired children and the sample matches gender and age wise with the non-visually impaired children.

Inclusion Criteria

1. Visually impaired and non-visually impaired children of 14-16 years of age.
2. Children who are willing to provide consent for the clinical evaluation
3. Children with visual impairment since birth.
4. Children with complete blindness in both eyes.

Exclusion Criteria

1. Unwilling to provide consent for the clinical evaluation.
2. Individuals with acquired blindness in recent years.

Study Period: 2 months.

Sample Size

784; 392 visually impaired children of 14-16 years of age from the selected blind schools and 392 non-visually impaired children from selected normal schools will form the sample size.

Statistical Analysis

Data from the clinical evaluation will be captured into Microsoft excel and analyzed using SPSS Version 24.

Results

Comparing the oral health status between normal children (Group A) and visually impaired children (Group B) reveals significant differences across various parameters. In terms of fluorosis, while 94.13% of normal children exhibited its absence, the percentage decreased to 89.03% among visually impaired children, indicating a higher prevalence in the latter group. Similarly, oral mucosal lesions were less prevalent among normal children, with 97.1% showing no signs compared to 91.5% in visually impaired children. Notably, oral ulceration and candidiasis were more prevalent in the visually impaired group, with 7.14% and 1.27% of cases, respectively, compared to lower percentages in the normal group.

Regarding fractures and dental trauma, visually impaired children showed a higher incidence of treated dental fractures (7.90%) compared to normal children (1.27%). The prevalence of caries was also substantially higher among visually impaired children, with 54.33% compared to 20.9% in normal children. This trend extended to oral hygiene indices, with visually impaired children demonstrating poorer debris and calculus indices, along with higher percentages of fair and poor oral hygiene indices.

The disparities in oral health status are further emphasized by the varied treatment needs between the two groups. While a larger proportion of visually impaired children required prompt (58.67%) or immediate treatment (8.41%), normal children exhibited a lower need for such interventions, with only 80.2% requiring prompt treatment and 1.02% needing immediate attention.

Overall, these findings suggest that visually impaired children face greater challenges in maintaining optimal oral health compared to normal children, highlighting the importance of tailored oral health interventions and access to dental care for this vulnerable population.

Discussion

Visual impairment significantly affects individuals' ability to maintain good oral health, leading to various challenges and disparities in dental care access and outcomes^[1, 9]. From an early age, visually impaired individuals face difficulties in performing daily oral hygiene activities independently, often relying heavily on caretakers for assistance^[1]. This dependence extends to educational activities, where visually impaired children may experience limitations in understanding and practicing proper oral hygiene techniques^[10, 11]. Consequently, studies have shown a higher prevalence of dental caries and poorer oral hygiene among visually impaired children compared to their sighted peers^[12, 13, 14].

Conventional strategies for oral health education and dental care are often ill-suited to meet the needs of visually impaired individuals. Traditional methods rely heavily on visual cues, such as demonstrations of brushing techniques or the use of disclosing agents to visualize plaque^[15, 16]. For visually impaired individuals, these visual aids are ineffective, leaving them at a disadvantage in maintaining proper oral hygiene^[17]. Moreover, the lack of accessible information and resources further compounds the challenges faced by visually impaired individuals in managing their oral health effectively. As a result, many visually impaired individuals struggle to maintain good oral hygiene, leading to higher rates of dental problems and oral diseases^[18, 19].

Limited access to oral health information and services exacerbates oral health disparities among visually impaired individuals [6, 20]. Factors such as socioeconomic status, parental education levels, and geographic location contribute to disparities in oral health outcomes and care utilization [9]. Moreover, the lack of tailored oral health education programs for visually impaired children and adolescents further hinders preventive efforts [12]. Educational methods that rely heavily on visual perception are often ineffective for this population, highlighting the need for innovative approaches that utilize auditory and tactile modalities [13, 21]. The psychosocial impact of oral diseases on quality of life is particularly pronounced among children, with visual impairment exacerbating these challenges [3]. Beyond physical discomfort, poor oral health can lead to social isolation, diminished self-esteem, and communication barriers, further underscoring the importance of addressing oral health needs in this population [3, 22].

Addressing the oral health needs of visually impaired individuals requires multifaceted approaches that encompass education, access to care, and psychosocial support [4, 23]. Integrating oral health education into existing vision rehabilitation programs and collaborating with educators, healthcare professionals, and policymakers are crucial steps toward improving oral health outcomes in this vulnerable population [24]. Furthermore, innovative interventions such as music-based tooth brushing systems and game-based education show promise in promoting oral hygiene practices among visually impaired children [25].

While existing research provides valuable insights into the oral health status and challenges faced by visually impaired individuals, further investigations are needed to address remaining gaps [4, 26]. Longitudinal studies assessing the effectiveness of tailored oral health interventions, as well as the impact of socioeconomic factors and access to care on oral health outcomes, can inform the development of targeted public health initiatives [27, 28]. Additionally, exploring the psychosocial factors influencing oral health behaviors and attitudes among visually impaired individuals can enhance our understanding of their unique needs and preferences [29, 30].

Conclusion

The findings discussed underscore the importance of addressing oral health disparities among visually impaired individuals through comprehensive, evidence-based interventions tailored to their specific needs and circumstances.

References

1. Kavyashree Gururaj Hebbarlimage, Girish Babu KL. Oral health of visually impaired and sighted children residing in institutions: A comparative cross-sectional study, 2022. Doi: 10.51463/cpd.2022.120
2. Arpan Debnath BK, Srivastava, Punith Shetty, Shruthi Eshwar. New Vision for Improving the Oral Health Education of Visually Impaired Children- A Non Randomized Control Trial, 2017. Doi: 10.7860/JCDR/2017/26515.10170
3. Aditi Singh, Preeti Dhawan, Vivek Gaurav, Pradeep Rastogi, Shilpi Singh. Assessment of oral health-related quality of life in 9–15-year-old children with visual impairment in Uttarakhand, India, 2017. Doi: 10.4103/1735-3327.201132
4. Nasrin Sharififard, Katayoun Sargeran, Katayoun Katayoun. Oral Health Status and Related Factors in Children with Visual Impairment Aged 7-11 Years: A Cross-Sectional Study, 2022. Doi: 10.18502/fid.v19i13.9216
5. James Rufus John, Breena Daniel, Dakshaini Paneerselvam, Ganesh Rajendran. Prevalence of Dental Caries, Oral Hygiene Knowledge, Status, and Practices among Visually Impaired Individuals in Chennai, Tamil Nadu, 2017. Doi: 10.1155/2017/9419648
6. Maureen Macharia, Mary Masiga, Nathan Psiwa, Janella Bermudez, Ana Lucia Seminario, Arthur Musakulu Kemoli. Oral health status and hygiene practices among visually impaired adolescents from a school in Kenya, 2023. Doi: 10.1186/s12903-023-03428-7.
7. Prashanth ST, Sudhanshu Bhatnagar, Usha Mohan Das, Gopu H. Oral health knowledge, practice, oral hygiene status, and dental caries prevalence among visually impaired children in Bangalore, 2011. Doi: 10.4103/0970-4388.84680.
8. Wondwossen Fantaye, Abdela Nur, Getachew Kifle, Fasikawit Engida. Oral health knowledge and oral hygiene practice among visually impaired subject in Addis Ababa, Ethiopia, 2022. Doi: 10.1186/s12903-022-02199
9. Salwa A AlSadhan, Asma M Al-Jobair, Mariam Bafaqeeh, Hanadi Abusharifa, Maram Alagla. Dental and medical health status and oral health knowledge among visually impaired and sighted female schoolchildren in Riyadh: A comparative study, 2017. Doi: 10.1186/s12903-017-0446-6
10. Lu Liu, Ying Zhang, Wei Wu, Mu He, Zhenfu Lu, Kaiqiang Zhang, *et al.* Oral health status among visually impaired schoolchildren in Northeast China, 2019. Doi: 10.1186/s12903-019-0752-2
11. Nasrin Sharififard, Katayoun Sargeran, Mahdia Gholami. Oral Health Status and Related Factors in Children with Visual Impairment Aged 7-11 Years: A Cross-Sectional Study, 2022. Doi: 10.18502/fid.v19i13.9216
12. Brahmanna Chowdary P, Uloopi KS, Vinay C, Veerabhadra Rao V, Chandrasekhar Rayala. Impact of verbal, Braille text, and tactile oral hygiene awareness instructions on oral health status of visually impaired children, 2016. Doi: 10.4103/0970-4388.175510
13. Shetty V, Hegde AM, Varghese E, Shetty V. A novel music based tooth brushing system for blind children, 2013. Doi: 10.17796/jcpd.37.3.28v62k5114659g62
14. Azza Tagelsir, Ahmed Eltigani Khogli, Nazik Mostafa Nurelhuda. Oral health of visually impaired schoolchildren in Khartoum State, Sudan, 2013. Doi: 10.1186/1472-6831-13-33
15. Nasrin Sharififard, Katayoun Sargeran, Mahdia Gholami, Farid Zayeri. A music- and game-based oral health education for visually impaired school children; multilevel analysis of a cluster randomized controlled trial, 2020. Doi: 10.1186/s12903-020-01131-5
16. Vinay Suresan, Diptajit Das, Avinash Jnaneswar, Kunal Jha, Gunjan Kumar, Goutham Bala Subramaniam. Assessment of dental caries, oral hygiene status, traumatic dental injuries and provision of basic oral health care among visually impaired children of Eastern Odisha, 2017. Doi: 10.4103/JISPPD.JISPPD_48_17

17. Mahoney EK, Kumar N, Porter SR. Effect of visual impairment upon oral health care: A review, 2008. Doi: 10.1038/bdj.2008.2
18. Sebnem Ercalik Yalcinkaya, Turhan Atalay. Improvement of oral health knowledge in a group of visually impaired students. 2006; 4(4):243-253.
19. Pushpa Momin, Sophina Mahmood. A quality improvement project to assess the use of visual aids to improve understanding and motivation in periodontal patients, 2020. Doi: 10.1038/s41405-020-0041-9
20. Vinay Kumar Srivastava, Aman Kumar, Pooja Gupta, Vaishali Bhati. Visually impaired population from low socioeconomic strata and their oral health status: An observational study, 2024. Doi: 10.22514/jocpd.2024.015
21. Sa'adiyah Shahabudin, Hashim H, Maizurah Omar. The effectiveness of dental health education tools for visually impaired students in Bukit Mertajam, 2016. Doi: 10.1063/1.4968866
22. Vabitha Shetty, Amitha M Hegde, Srikala Bhandary, Kavitha Rai. Oral health status of the visually impaired children--a south Indian study, 2010. Doi: 10.17796/jcpd.34.3.j4781g2w8891848u
23. Kompal Gautam, Rizwan Ali A, Divya Agrawal, Aparna Choudhary, Arpana Shekhawat, Rashmi L Jain. New vision for improving oral hygiene status of visually impaired students aged from 9 to 17 years, 2020. Doi: 10.4103/jfmprc.jfmprc_854_20
24. Mustafa Alshehri, Najla Alghamdi, Mansour Assery, Abdulrahman Al Saffan, Hoda Abdellatif. Oral health findings, needs and demands of visually impaired children in Saudi Arabia, 2018. Doi: 10.15406/jdhodt.2018.09.00382
25. Jessica Ka Yi Lee, Agatha Wing Tung Yuen, Karen Pui Yan Leung, Joyce Tin Wing Li, Seon Yeong Bae, Yi Yung Chan, *et al.* Oral Health Status and Oral Health-Related Behaviours of Hong Kong Students with Vision Impairment. *Healthcare*. 2024; 12:391. Doi: 10.3390/healthcare12030391
26. Srikala Bhandary, Lekshmi R Suresh, Urvashi A Shetty, Kavitha Rai. Blindness to the Dental Needs of Children with Visual Impairments: Caregiver's Perspectives on Traumatic Dental Injuries, 2020. Doi: 10.5005/jp-journals-10015-1746
27. Helene Chua, Divesh Sardana, Robin Turner, Graeme Ting, Manikandan Ekambaram. Effectiveness of oral health education methods on oral hygiene in children and adolescents with visual impairment: A systematic review, 2021. Doi: 10.1111/ipd.12788
28. Lauren Crowder. Is the oral health of visually impaired children and adolescents different compared to their sighted peers? 2022. Doi: 10.1038/s41432-022-0814-1
29. Taofeek Olalekan Ligali, Omolola Olubunmi Orenuga, Folakemi Adenike Oredugba. Caries impact on quality of life among visually impaired adolescents: A cross-sectional study, 2020. Doi: 10.1111/scd.12447
30. Shapira J, Mann J, Tamari I, Mester R, Knobler H, Yoeli Y, *et al.* Oral health status and dental needs of an autistic population of children and young adults, 1989. Doi: 10.1111/j.1754-4505.1989.tb01022.x