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RESEARCH ARTICLE
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# A PROSPECTIVE INVESTIGATION INTO THE IMPACT OF FULL-MOUTH DENTAL REHABILITATION UNDER GENERAL ANAESTHESIA ON THE ORAL HEALTH-RELATED QUALITY OF LIFE OF CHILDREN AND ADOLESCENTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITIES.

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**Abstract**

**Background:** Children with intellectual and developmental disabilities (IDD) often experience poor oral health, frequently necessitating comprehensive oral health rehabilitation (OHR) under general anaesthesia (GA).

**Aim:** This prospective study evaluated the impact of OHR under GA on the oral health-related quality of life (OHRQoL) of children with severe behavioural challenges and medical complexities, as perceived by their parents/caregivers using the Child Oral Health Impact Profile-14 (COHIP-14) and Family Impact Scale-12 (FIS-12).

**Methods:** Children with severe behavioural disabilities and medical compromises requiring OHR under GA were recruited. Necessary dental treatments, including restorations and extractions (with informed consent), were performed. Parents/caregivers completed the COHIP-14 and FIS-12 questionnaires pre-operatively and post-operatively. Paired t-tests were used to compare pre- and post-operative scores.

**Results:** Significant improvements ($p \leq 0.001$) were observed in all domains of both the COHIP-14 and FIS-12 following OHR under GA.

**Conclusion:** Oral health rehabilitation under general anaesthesia significantly improved the oral health and functional well-being of children with severe behavioural disabilities and medical complexities. Furthermore, it positively impacted their families by reducing limitations in activities and emotional distress, and alleviating financial burdens associated with oral health issues.

## Introduction:

Oral health is an integral component of overall health and well-being, significantly influencing an individual's ability to eat, speak, socialize, and experience comfort. However, for children with intellectual and developmental disabilities (IDD), achieving and maintaining optimal oral health presents a unique set of challenges. This vulnerable population often experiences a higher prevalence and severity of oral diseases, including dental caries, periodontal disease, and malocclusion, compared to their neurotypical peers (Tesini, 2003; Dougherty, 2011). These disparities are multifactorial, stemming from difficulties in maintaining adequate oral hygiene practices,

communication barriers hindering the reporting of oral symptoms, dietary preferences often high in cariogenic foods, and limited access to routine dental care (Casamassimo et al., 2009; Glassman & Miller, 2016).

The consequences of poor oral health in children with IDD extend beyond the oral cavity. Pain, discomfort, and functional limitations due to untreated dental disease can significantly impact their quality of life, affecting their ability to eat nutritious food, communicate effectively, and participate fully in daily activities (Sheiham, 2006). Furthermore, these oral health issues can have a profound impact on their families and caregivers, leading to increased stress, financial burdens associated with emergency dental visits and complex treatments, and limitations in their own time and activities (Sinha et al., 2000; Locker, 2003). The challenges in providing comprehensive dental care to children with IDD are often compounded by behavioural issues, communication difficulties, and sensory sensitivities, making conventional dental treatment in a clinic setting challenging or even impossible (Nelson & Sheller, 2004). These children may exhibit anxiety, fear, and uncooperative behaviours, hindering effective examination and treatment delivery. Consequently, many children with IDD requiring extensive dental interventions often necessitate alternative management strategies, with oral health rehabilitation (OHR) under general anaesthesia (GA) emerging as a crucial and effective approach (Amin et al., 2014). General anaesthesia provides a controlled and safe environment to perform comprehensive dental procedures in a single visit, eliminating patient anxiety and ensuring the delivery of high-quality care without compromising the child's well-being (O'Sullivan et al., 2014). Under GA, dentists can address multiple oral health issues, including the restoration of carious teeth, extraction of non-restorable teeth, management of periodontal disease, and sometimes the placement of preventive measures, in a predictable and efficient manner. This approach not only resolves existing oral health problems but also aims to prevent future disease progression, ultimately contributing to improved oral health outcomes for this vulnerable population. While OHR under GA is recognized as an effective means of addressing the immediate oral health needs of children with IDD, it is crucial to evaluate its broader impact on their overall well-being, particularly their oral health-related quality of life (OHRQoL). OHRQoL is a multidimensional construct that encompasses the impact of oral health conditions on various aspects of an individual's life, including physical function, psychological well-being, social interaction, and pain and discomfort (Slade, 1997). Assessing changes in OHRQoL following OHR under GA provides valuable insights into the true benefits of this intervention beyond just clinical outcomes. Several studies have investigated the impact of dental treatment under GA on the OHRQoL of children, including those with disabilities (Broder et al., 2007; Jokovic et al., 2004). These studies have generally reported improvements in various domains of OHRQoL following treatment. However, research specifically focusing on the long-term effects of comprehensive OHR under GA on the OHRQoL of children with intellectual and developmental disabilities, particularly those with severe behavioural challenges and medical complexities, remains relatively limited. Understanding the sustained impact of this intervention on their daily lives and the well-being of their families is essential for informing clinical practice, healthcare policy, and resource allocation. Furthermore, the impact of a child's oral health on their family's well-being is a significant consideration. The Family Impact Scale (FIS) is a valuable tool for assessing the broader consequences of a child's oral health problems on their family, encompassing aspects such as parental emotions, daily activities, financial implications, and overall family functioning (Locker et al., 2005). Evaluating changes in family impact scores following OHR under GA can provide a more holistic understanding of the benefits of this intervention, highlighting its potential to alleviate the burdens experienced by caregivers. Therefore, the present prospective study aims to address this gap in the literature by evaluating the changes observed in the Child Oral Health Impact Profile (COHIP-14) and Family Impact Scale (FIS-12) scores of children with severe behavioural disabilities and medically compromised conditions following comprehensive oral health rehabilitation under general anaesthesia. By prospectively assessing these outcomes, this research seeks to provide valuable evidence regarding the effectiveness of OHR under GA in not only improving the oral and functional health of these children but also in enhancing their oral health-

related quality of life and reducing the negative impact on their families. The findings of this study will contribute to a better understanding of the benefits of this essential treatment modality for a highly vulnerable population and inform future strategies for improving their oral health and overall well-being.

**Materials and Methods**

A prospective observational clinical trial was conducted during the period from September 2023 to December 2023 in the Department of Dentistry of an GIMSH, Durgapur after receiving ethical clearance from the Institutional Ethics Committee. All Participants were selected from the OPD of the Department of Dentistry as per the following inclusion and exclusion criteria. Inclusion criteria for selecting the participants are children in the age group of 4 to 12 years with severe behavioural disabilities and medically compromised conditions of any form for whom routine dental treatment in an out-patient setting was not possible. The OHR under general anaesthesia indicated for other reasons such as very young children, parents wishing to complete dental treatment in a single session, and a history of negative behaviour during dental treatment were excluded in the present trial. A convenience sampling method was followed in drawing the sample size, and all children satisfying the inclusion criteria were consecutively recruited during their first oral health screening. One specialist pediatric dentist performed the initial screening, periodontal health (inflammation/ sinus tract openings), and hard tissue findings (dmft/ DMFT). A definitive treatment plan was formulated, and the parents and caregivers were clearly explained about the procedures and prognosis, and informed consent was duly signed. Complete blood profile and viral tests were done to detect any abnormality and accordingly; a pre-anaesthetic clearance (PAC) was taken for all included participants. After getting the PAC, patients were scheduled as per the department protocol for treatment under GA. All necessary treatments specific to each participant were completed in a single session by an experienced paediatric dentist.

The COHIP-14 includes ten items assessing oral health well-being and four items on functional well-being, which were suitable for parents/caregivers to answer on behalf of the patients who were not able to answer on their own. Responses from the COHIP-14 and FIS-12 were taken before taking up the participants for OHR under GA. The COHIP-14 questionnaire includes ‘how frequently the patient had experienced oral impacts, such as oral pain, during the past 3 months’. The responses were scored as ‘almost all the time’ (score 0), ‘fairly often’ (score 1), ‘sometimes’ (score 2), ‘almost never’ (score 3), and ‘never’ (score 4) such that a higher score represents a better OHRQoL.[13] The Family Impact Scale (FIS-12) assesses the degree of impact of the patient’s oral condition on the parents or family members with the following four subscales: parent/ family activity (five items), parental emotions (four items), family conflict (four items), and financial burden (one item). The frequency of the related events in the past 3 months will be asked with the following response options: ‘never’ (score 0), ‘once or twice’ (score 1), ‘sometimes’ (score 2), ‘often’ (score 3), and ‘every day or almost every day’ (score 4); a higher score reflects more negative effects on the children’s family.[13] Responses for the COHIP-14 and FIS-12 were taken from the parents/ caregivers after 3 months of OHR under GA. Post-operative responses from parents/caregivers were evaluated by another observer who was unaware of the intervention given to the patient.

**Statistical Analysis:**

Descriptive statistics were used to present the age and demographic details of the included participants. The Student t-test was used to assess the difference of the scores before and after operative dental treatment under GA for COHIP-14 and FIS-12 scales. All statistical tests were done using the SPSS software version 21, and a P value of less than 0.05 was considered statistically significant.

**Results**

A total of 17 patients (12 males and 5 females) were recruited, and the mean age was 5.64 ± 2.59. 65% of patients (11/17) reside in their houses, and 35% (6/17) of them reside in any institute/hostels. Parents are the primary guardians in 70% of patients (12/17) and others in 30% of patients (5/17). 41% of patients had dmft scores of 6–10; 47% of patients had dmft scores of 11–15, and 12% of patients had dmft scores of 16–20. All the included patients have some form of periodontal health issues such as inflamed gingiva, bleeding on probing, and gingival abscess in 80% of patients (14/17). The responses for the COHIP-14 questionnaire on oral health well-being showed a significant improvement (P = < 0.001) after OHR under GA. All the components of the Family Impact Scale (FIS-12) (parent/family activity, parental emotions, family conflict, and financial burden) had shown significant improvement (P =

**Discussion:**

This prospective study provides compelling evidence for the significant positive impact of oral health rehabilitation (OHR) performed under general anaesthesia (GA) on the oral health-related quality of life (OHRQoL) of children with intellectual and developmental disabilities (IDD). The statistically significant improvements observed across all domains of both the Child Oral Health Impact Profile-14 (COHIP-14) and the Family Impact Scale-12 (FIS-12) following comprehensive dental treatment under GA underscore the profound benefits of this intervention for this vulnerable population and their families. The compromised oral health often prevalent in children with IDD, as highlighted in the background, can have far-reaching consequences beyond just dental discomfort. Difficulties in maintaining oral hygiene due to behavioural challenges, sensory sensitivities, and limited cooperation often lead to a higher prevalence and severity of dental caries, periodontal disease, and other oral health issues. These conditions can significantly impact a child's ability to eat, speak, socialize, and even sleep, thereby diminishing their overall quality of life. Furthermore, managing the complex oral health needs of these children often places a substantial burden on their families, affecting their emotional well-being, daily routines, and financial resources. The findings of this study directly address this critical issue by demonstrating that OHR under GA offers a viable and effective solution to comprehensively address the extensive dental needs of children with severe behavioural disabilities and medical complexities. The ability to perform necessary restorative procedures and extractions in a single, controlled setting eliminates the anxieties and challenges associated with conventional dental treatment in this population. This not only ensures the delivery of optimal dental care but also minimizes the potential for traumatic experiences that could further exacerbate behavioural issues and dental anxiety. The significant improvements observed in the COHIP-14 scores across all domains – including oral symptoms, functional limitations, emotional well-being, social well-being, and school environment – highlight the multifaceted benefits of OHR under GA for the children themselves. The reduction in oral pain and discomfort, coupled with the restoration of functional dentition, likely contributes to improved eating habits, clearer speech, and increased comfort in social interactions. The positive changes in emotional and social well-being suggest that addressing underlying oral health problems can alleviate feelings of embarrassment, frustration, and isolation often associated with poor oral health. Furthermore, the improvements in the school environment domain indicate that better oral health can positively influence a child's ability to participate in school activities and interact with peers. The positive impact of OHR under GA extends beyond the individual child to their families, as evidenced by the significant improvements in the FIS-12 scores. The reduction in parental/caregiver-reported impacts on activity limitations and emotional well-being underscores the considerable burden that poor oral health in children with IDD can place on their families. Managing dental pain, dealing with feeding difficulties, and navigating challenging dental appointments can be emotionally draining and significantly disrupt family routines. The successful completion of comprehensive dental treatment under GA alleviates these stressors, leading to improved emotional well-being and a greater ability for families to engage in everyday activities without the constant worry and disruption associated with their child's oral health problems.

Furthermore, the study's finding of reduced financial concerns within the family post-OHR under GA is particularly noteworthy. The cost of managing untreated dental disease in children with IDD can be substantial, involving multiple appointments, potential emergency care, and the need for specialized dental professionals. By addressing all necessary dental treatment in a single GA session, this approach can potentially be more cost-effective in the long run, reducing the cumulative financial burden on families. This is especially important considering the often significant financial demands associated with raising a child with IDD. The strengths of this study lie in its prospective design, which allows for the direct assessment of changes in OHRQoL following the intervention. The use of validated, parent/caregiver-reported outcome measures like the COHIP-14 and FIS-12 provides valuable insights into the real-world impact of OHR on the lives of these children and their families. The focus on children with severe behavioural disabilities and medical complexities, a population often excluded from routine dental care, further strengthens the significance of the findings. However, certain limitations should be acknowledged. The study relies on parent/caregiver reports, which, while valuable, may not fully capture the child's own perception of their oral health and quality of life. Future research could explore age-appropriate methods for directly assessing OHRQoL in children with IDD to provide a more comprehensive understanding. Additionally, the study does not include a control group, which limits the ability to definitively attribute the observed improvements solely to the OHR under GA.

While the significant changes observed strongly suggest a causal relationship, future studies could benefit from including a comparison group receiving alternative dental management strategies, where ethically feasible. Furthermore, the long-term effectiveness of OHR under GA on OHRQoL warrants further investigation through longitudinal studies with extended follow-up periods. Assessing the sustainability of the observed improvements and identifying factors that may influence long-term outcomes would provide valuable information for clinical practice and policy development. Despite these limitations, the findings of this study have significant implications for clinical practice, policy, and future research.

The evidence strongly supports the consideration of OHR under GA as an effective and beneficial treatment modality for improving the oral health and overall well-being of children with IDD who are unable to cooperate for conventional dental care. Increased awareness and access to this treatment option are crucial for addressing the significant oral health disparities experienced by this vulnerable population. Furthermore, the positive impact on family well-being underscores the broader societal benefits of investing in comprehensive oral healthcare for children with IDD. Future research should focus on further exploring the long-term impact of OHR under GA on OHRQoL, investigating potential predictors of treatment success, and evaluating the cost-effectiveness of this approach compared to other management strategies. Developing and validating child-centered OHRQoL measures for this population would also be a valuable contribution. Additionally, research exploring strategies to improve access to and acceptance of OHR under GA among families and healthcare professionals is warranted.

In conclusion, this prospective study provides robust evidence for the effectiveness of oral health rehabilitation under general anaesthesia in significantly improving the oral health-related quality of life of children with intellectual and developmental disabilities and their families. The substantial improvements observed across multiple domains highlight the profound benefits of this intervention in addressing the complex oral health needs of this vulnerable population, ultimately leading to enhanced well-being and reduced burden on their caregivers. These findings underscore the importance of considering OHR under GA as a critical component of comprehensive healthcare for children with IDD.

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