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The Impact of Oral Health Status on Daily Performances Using the Child-OIDP Index Among 12-14-Year-Old Children in Residential Schools of Bangalore

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Abstract **Background**: Oral health-related quality of life (OHRQoL) provides a subjective dimension to oral health assessment that complements clinical indices. Residential schoolchildren represent a unique population in whom the impact of oral diseases on daily functioning has not been well studied. **Methods**: A cross-sectional study was conducted among 520 children aged 12-14 years from 10 residential schools in Bangalore, selected through stratified random sampling. Oral examinations were carried out using the WHO Oral Health Assessment Form (2013). The Child-Oral Impacts on Daily Performances (Child-OIDP) index was administered through structured interviews. Descriptive statistics and inferential tests (t-test, ANOVA, chi-square) were applied, with significance set at $p<0.05$. **Results**: Among participants, 50% were 12 years, 18.1% were 13 years, and 30% were 14 years of age. Commonly reported oral problems included sensitive teeth (43.7%), gum bleeding (41%), and dental caries (35.8%). The mean DMFT score was 1.01, mean CPI score was 1.84, and mean DAI score was 13.8. The overall mean Child-OIDP score was 7.62, with no gender difference. Caries, gingival bleeding, toothache, and malocclusion significantly impacted daily performances such as eating, cleaning teeth, sleeping, smiling, and social interactions ($p<0.05$). **Conclusion**: Oral health significantly influences the quality of life of residential schoolchildren. Routine assessment of OHRQoL should be incorporated into oral health needs assessments and school dental programs.

Key Words Oral Health, Child-OIDP, Quality of Life, Residential Schools, Bangalore, Adolescents

INTRODUCTION

The World Health Organization redefined health in 1948 as "a state of complete physical, mental, and social well-being and not merely the absence of disease and infirmity" [1]. Oral health is an essential part of this holistic definition, as it directly influences vital daily functions such as eating, speaking, and smiling, while also affecting self-esteem and interpersonal relationships. Poor oral health, particularly when untreated during childhood and adolescence, can impair growth, nutrition, learning capacity, and psychosocial development [2].

Traditional oral health assessments have relied primarily on normative, clinician-centred indicators such as caries indices, periodontal measurements, and occlusal assessments. While these measures are valuable for disease surveillance and treatment planning, they often fail to capture how children actually perceive their oral health or how these conditions affect their everyday lives [2-4]. This gap is particularly important in paediatric populations, where developmental, social, and emotional factors strongly influence the perception of health and well-being.

In this context, the Child-Oral Impacts on Daily Performances (Child-OIDP) index was specifically developed to measure the frequency and severity of oral health impacts on the daily lives of children and adolescents. It is designed to evaluate eight domains of everyday functioning: eating, speaking, cleaning teeth, sleeping, emotional stability, smiling, schoolwork, and social contact [5]. The tool captures both functional and psychosocial consequences of oral conditions, which are often overlooked in traditional assessments. Moreover, its psychometric properties have been validated across diverse populations, confirming its reliability and cultural adaptability [6].

Adolescents living in residential schools form a unique and often under-researched subgroup. Living away from parents, they may lack consistent guidance in oral hygiene practices, have restricted dietary control, and face psychosocial stressors linked to institutional living. Such environments can exacerbate risk factors for oral diseases and magnify their impact on quality of life. Despite these vulnerabilities, little is known about how oral health conditions affect daily performances among children in residential school settings [7].

Therefore, the present study was undertaken to assess the impact of oral health status on daily performances using the Child-OIDP index among 12-14-year-old children in residential schools of Bangalore. By integrating normative clinical indicators with subjective quality-of-life assessments, this study aims to provide a more comprehensive understanding of the oral health needs of this underrepresented population.

METHODS

Study Design and Setting

A school-based cross-sectional study was carried out among residential schoolchildren in Bangalore between [insert study dates]. Ethical clearance was obtained from the Institutional Review Board of Rajarajeswari Dental College and Hospital. Written informed consent was taken from school authorities and parents, and assent from participating children.

Sampling

Bangalore district was divided into North and South strata. From each stratum, five residential schools were selected by simple random sampling. From each school, 52 children aged 12-14 years were examined, yielding a total sample size of 520. Sample size was calculated using prevalence estimates from a pilot study (80%), with 5% precision and 95% confidence level, rounded to 520 for equal distribution.

Inclusion Criteria

- Children aged 12-14 years residing in hostels of selected schools.
- Children with parental consent and personal assent.

Exclusion Criteria

- Medically compromised children.
- Day scholars in residential schools.
- Children unwilling to participate.

Data Collection

OHRQoL Assessment: The Child-OIDP index was administered through structured interviews. Children first identified oral health problems experienced in the last 3 months, followed by rating their impact on eight daily performances (eating, speaking, cleaning teeth, sleeping, emotional state, smiling, studying/working, social contact).

Clinical Examination

Oral examinations were performed using the WHO Oral Health Assessment Form (2013). Caries experience (DMFT), periodontal status (CPI), and malocclusion (DAI) were recorded. Examinations were conducted in classrooms under natural light using mouth mirrors and CPI probes.

Calibration

The examiner underwent calibration prior to data collection. Intra-examiner reliability was assessed on 50 children not included in the study ($\kappa = 0.86$).

Statistical Analysis

Data were analysed using SPSS v25. Descriptive statistics (mean, SD, frequency) were computed. Chi-square test was applied for categorical variables, while independent t-test and ANOVA were used for mean comparisons. Significance was set at $p<0.05$.

RESULTS

Demographics

Of 520 children examined, 260 were male and 260 females. The age distribution was: 12 years - 270 (50%), 13 years - 94 (18.1%), 14 years - 156 (30%).

Self-Perceived Oral Problems

The most common problems reported were sensitive teeth (43.7%), gum bleeding (41%), dental caries (35.8%), toothache (33.5%), and malpositioned teeth (29.8%).

Clinical Findings

Caries prevalence: A total of 198 children (38.1%) had caries; mean DMFT = 1.01. Females had significantly higher DMFT than males ($p<0.05$).

Periodontal status

We observed that 40.8% had healthy gingiva, 55.4% bleeding on probing, 5.7% calculus; mean CPI = 1.84.

Malocclusion

Dental crowding (16.1%), spacing (7.6%), maxillary irregularity (5.7%), mandibular irregularity (4.2%); mean DAI = 13.8.

Child-OIDP Scores

The overall mean Child-OIDP score was 7.62 (males: 7.61; females: 7.63; $p>0.05$).

Impact on Daily Performance (Table 1,2)

- Caries significantly affected eating, cleaning teeth, and sleeping ($p<0.05$)
- Gingival bleeding impacted eating and cleaning teeth ($p<0.05$)
- Toothache affected eating, sleeping, and social interactions ($p<0.05$)
- Malocclusion (crowding and spacing) impacted smiling, social interactions, and emotional state ($p<0.05$)

Table 1: Mean Scores of Child-OIDP among Males and Females

Gender	N	Mean
Male	260	7.61
Female	260	7.63
Total	520	7.62

Table 2: Impact of Dental Caries on Daily Performance (Child-OIDP Scores)

Performance	Caries Free (n=322, Mean ± SD)	Caries (n=198, Mean ± SD)	p-value
Eating and enjoying food	0.30 ± 1.11	0.55 ± 1.50	0.029*
Speaking clearly	0.33 ± 1.11	0.39 ± 1.73	0.514
Cleaning teeth	1.25 ± 1.64	1.58 ± 1.83	0.032*
Sleeping and relaxing	0.42 ± 1.43	0.75 ± 1.69	0.015*
Smiling without embarrassment	1.23 ± 2.31	1.52 ± 2.41	0.173
Emotional state	1.77 ± 1.86	1.94 ± 1.48	0.276
School/social roles	1.29 ± 0.99	1.56 ± 1.41	0.095
Social contact	1.35 ± 2.30	1.56 ± 1.80	0.286
Total OIDP	6.42 ± 4.67	7.95 ± 5.02	0.005*

*Significant at p<0.05

DISCUSSION

The prevalence of dental caries in the present study was 38.1%, which is comparable to findings reported in Davangere (37.25%) [8]. However, it was lower than the prevalence observed in Guntur (50.19%) [11], Bhubaneswar (49.5%) [14], Maharashtra (73%) [9], and Delhi (52.3%) [10]. These variations may be attributed to differences in geographical distribution, dietary practices, oral hygiene behaviours, and methodological approaches used in the respective studies [24].

The prevalence of oral impacts was high, with 82.3% of children experiencing at least one daily performance affected during the past three months, as assessed by the Child-OIDP index. Similar results have been reported in other regions, including Pune (86.9%) [19], Thailand (85.2-89.8%) [3,12], and Brazil (80.7-88.7%) [13,20]. The most frequently perceived oral problems in the present study were tooth sensitivity, gum bleeding, dental caries, toothache, and malposition of teeth. These findings are consistent with studies by Bernabé *et al.* [23] and Castro *et al.* [13], where sensitive teeth, bleeding gums, toothache, and malpositioned teeth were among the leading self-reported concerns.

In terms of malocclusion, dental crowding was observed in 16.1% of children, which was lower than that reported in Guntur (55%) [11], Davangere (38.2%) [16], and Udaipur (40.2%) [17]. Similarly, dental spacing was present in 7.6%, considerably lower than findings from Guntur (25.2%) [11], Davangere (26.5%) [16], and Udaipur (27.1%) [17]. The discrepancies may be attributed to parafunctional habits such as thumb sucking, tongue thrusting, or mouth breathing, as well as dentoalveolar discrepancies and variations in jaw size. Maxillary and mandibular irregularities (>1 mm) were present in 5.7% and 7.7% of children, respectively, much lower than the prevalence reported in Guntur (30.8% and 29.2%) [11], Davangere (25.6% and 19.3%) [16], and Udaipur (27.1% and 28.3%) [17]. Genetic and environmental differences may partly explain these variations.

The mean Child-OIDP score in this study was 7.62, which is similar to results from Brazil (7.1) [13] but higher than those reported in Spain (5.24) [18]. Among the different domains, cleaning the mouth and eating were the most affected performances, aligning with the findings of Castro *et al.* [13] and Supananthaporn *et al.* [19].

Dental caries was found to significantly impact daily performances, particularly eating, cleaning teeth, and sleeping. This is consistent with studies from Tanzania [20], Brazil [13], Bangkok [19], Udupi [21], and Thailand [22]. In the present study, caries-related impacts on eating and sleeping corroborated the findings of Krisdapong *et al.* [22].

Malocclusion was also associated with significant impacts on OHRQoL. Mbawalla *et al.* [20] reported that condition-specific Child-OIDP scores showed strong discriminative ability with respect to malocclusion. Similarly, Bernabé *et al.* [23] demonstrated that specific occlusal traits such as overjet, spacing, open bite, and maxillary irregularity were linked to negative impacts on daily performances.

Overall, the present findings confirm that oral health conditions, particularly caries, gingival bleeding, and malocclusion, substantially impair functional and psychosocial aspects of daily life among residential schoolchildren. In contrast, calculus showed inconsistent associations, suggesting it may not directly affect self-perceived daily functioning compared to other oral conditions.

CONCLUSIONS

OHRQoL assessment using the Child-OIDP index revealed that oral diseases substantially affect the daily lives of residential schoolchildren. Dental caries, gingival bleeding, malocclusion, and toothache were the most impactful conditions. Integrating OHRQoL assessment with normative indicators can guide school oral health programs, resource allocation, and policy planning.

Limitations

The cross-sectional design restricts causal inference. Recall bias from the 3-month recall period and examination in non-clinical settings may have influenced results. Future longitudinal and interventional studies, including qualitative exploration of children lived experiences, are recommended.

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