

Oral Health-related Quality of Life Assessed by Child: Oral Impacts on Daily Performances Index and Their Association with Dental Caries Prevalence and Gingival Bleeding Status of 12-year-old School Children in Bhubaneswar City

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ABSTRACT

Aim and objective: To assess the association, if any, between oral health-related quality of life (OHRQoL) measured using child oral impact on daily performances (C-OIDP) index and dental caries and gingival bleeding status among 12-year-old school children of Bhubaneswar city.

Materials and methods: A cross-sectional descriptive study was conducted, and the data were collected using child oral impacts on daily performances index, a closed-ended questionnaire among the 12-year-old school children of Bhubaneswar, Odisha, India, to find out the association between dental caries prevalence among gingival bleeding status. Data were analyzed using descriptive statistics, and Chi-squared tests were used to determine the significant differences in the variable of interest.

Results: The study population consists of 1,034 students, out of which 457 (44.2%) are males and 577 (55.8%) are females. A total of 463 (44.8%) children belonged to private schools, and 571 (55.2%) children belonged to government schools. The prevalence of dental caries among males was found to be 49.8% among males and 49.5% among females. A total of 58.8% of the school children presented the impact of oral problems in at least one of the eight daily performances evaluated by C-OIDP.

Conclusion: According to the current study, eating was the most negatively impacted of the eight daily performances; it was also evident that dental caries, gingival bleeding, and OHRQoL were associated.

Keywords: Oral health, Child oral impacts on daily performances, Dental caries, Gingival bleeding.

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INTRODUCTION

The concept of "need" in healthcare is multifaceted and involves not only clinically determined or professionally based measures, referred to as normative need, but also subjective measures of health. Normative need is traditionally assessed based on professional judgment, clinical guidelines, and medical standards. It is often objective and focuses on clinical aspects of illness. This form of need assessment is essential for determining the medically necessary services and interventions a population requires. It helps in planning healthcare services based on a standardized understanding of diseases and healthcare needs.

Subjective health measures consider the opinions, sentiments, and level of contentment with one's life quality of each individual. Subjective assessments go beyond clinical markers to offer insights into an individual's general well-being. It takes into account the experiences, preferences, and day-to-day effects of health issues on patients.

Both normative and subjective measurements are important, and this is acknowledged in an all-encompassing approach to healthcare planning and delivery. A more comprehensive understanding of healthcare demands is made possible by combining normative and subjective assessments, which pave the way for the creation of patient-centered and culturally sensitive healthcare services.

Subjective measures are a natural fit for the patient-centered care movement, which emphasizes the importance of patients' experiences, values, and preferences in the decision-making

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process related to their healthcare. Surveys of patient satisfaction and patient-reported outcomes help determine whether healthcare measures are suitable and beneficial from the patient's point of

view. It can be difficult to strike a balance between normative and subjective metrics because they don't always line up exactly. Nonetheless, recognizing and addressing each component leads to a healthcare strategy that is more all-encompassing. Effective healthcare planning, delivery, and assessment depend on a balanced strategy that takes into account both factors, eventually promoting patient-centered and comprehensive treatment.¹

The absence of disease is no longer the only factor that determines a person's health; today, optimal functioning as well as social and psychological well-being are all included. This viewpoint has led to the development of a multidisciplinary approach to health.² Today's clinicians recognize that quality of life goes beyond clinical signs and take into account all aspects of health when setting treatment goals. This more comprehensive viewpoint takes into account a person's social and psychological facets of existence. In particular, dental health can either positively or negatively impact one's level of personal well-being. Early childhood oral disorders can negatively impact a child's or child's family's functional, social, and psychological well-being. In this setting, the concept of health has changed to become more holistic, focusing on mental, social, and emotional well-being in addition to physical health in order to enhance total well-being.³

Treatments related to oral health can have a substantial impact on basic living functions like eating, speaking, and looking well, which can eventually have an impact on the overall quality of life, a multifaceted term that includes social, psychological, and physical well-being.¹ Oral health has effects on individuals as well as the general functioning of society. In light of this, sociodental indicators were created to evaluate the functional and psychological impacts of dental health on day-to-day functioning. Modern theories of health place a strong emphasis on the need to consider one's oral health in relation to their overall physical, mental, and social well-being. This comprehensive view emphasizes the significance of dental health for both individual function and enjoyment as well as its wider effects on the welfare of society.⁴

Oral health-related quality of life (OHRQoL) involves evaluating an individual's well-being from both personal and medical perspectives. This assessment considers factors such as function, psychology, social interactions, and pain/discomfort experiences. Oral diseases, particularly among a significant population, can profoundly impact various aspects of life, influencing function, appearance, relationships, and career opportunities. While OHRQoL instruments are commonly used for adults and the elderly, assessing children's oral health-related quality of life involves four dimensions, with functional factors, like the ability to chew, being crucial. To measure this in children, the oral impact on daily performances index (OIDP) is employed. The OIDP inventory gauges the physical, psychological, and social dimensions of daily life, enabling the detection and assessment of oral problems in terms of severity and impact.⁵

When evaluating how oral health affects a child's quality of life, special factors that are different from those for adults must be taken into account. Children are distinguished by two key traits: first, they have limited ability to make decisions about their dental health and must rely on parents or other carers. Second, there is a discernible difference between children and adults in terms of their capacity to autonomously maintain dental health. Furthermore, there is a considerable difference in the perception and experiences around oral health, which highlights the need for evaluation techniques that are specifically designed with children's unique characteristics in mind.⁶

As there was sparse data available on child oral health in Bhubaneswar city, this study was carried out with an aim to assess the association, if any, between OHRQoL measured using child-OIDP (C-OIDP) index and dental caries and gingival bleeding status among 12-year-old school children of Bhubaneswar city.

MATERIALS AND METHODS

The study, which was cross-sectional in nature, targeted 12-year-old pupils in the public education system of Bhubaneswar, Odisha, who were enrolled in formal education programs for both genders. The students registered in 6- and 7-year-old classes at government and private schools comprised the survey population, as per the guidelines published by the Odisha Primary Education Programme Authority (OPEPA) Bhubaneswar. It provided a detailed list of around 456 schools in the city, with both aided schools and private government on the list.

Male and female students who were 12 years old in Bhubaneswar city schools were included in the study. Students who were willing to provide their agreement to participate were taken into consideration. Those who did not cooperate with clinical assessment and with systemic disease were eliminated. Participants with braces were not allowed to participate in the research.

The sample size was calculated as 1,024, using an estimated prevalence of 60% and a design effect of 1, where the power of the study is 95%, the margin of error 5%, and a 95% confidence interval. The randomly selected sample included the criteria to accommodate for not conforming to the eligibility criteria or due to absence on the day of examination.

The Institutional Ethics Committee of the Kalinga Institute of Medical Sciences, KIMS, KIIT University assessed the proposed study and gave its approval with the number KIMS/KIIT/IEC/100/2016 on it. The state project director granted formal authorization to carry out the investigation. Written informed consent was provided for the study by the children who took part. After describing the goal of the study to the participants, consent was acquired. For 1 week, the group of 50 subjects participated in a pilot study in natural field settings on the school grounds. The evaluations from the pilot study were used to finalize the research protocol, proforma, and questionnaire, as well as to organize and carry out the primary investigation.

The examiner underwent calibration and training at the Kalinga Institute of Dental Sciences' Department of Public Health Dentistry in order to guarantee consistent interpretation, comprehension, and implementation of the oral examination criteria to reduce the range of possible diagnoses. The recorder for the study received prior training from Kalinga Institute of Dental Sciences' Department of Public Health Dentistry.

To verify the dependability of the examiner, a second examination was performed on the initial 5% of the sample and then on subsequent days using the same diagnostic standards. The exercise in calibration and the κ -value of 0.89. A recording clerk and one examiner conducted the clinical examination. The World Health Organization's Oral Health Assessment Form for Children, 2013, was followed in performing the examination. To evaluate bleeding from the gingiva and dental cavities, the American Dental Association specified that a type III clinical evaluation be performed. The examination was conducted with sufficient lighting, and the subjects were made to sit on a regular chair. There was strong consensus about intraexaminer dependability when the exam was conducted on the campuses of the individual colleges.

RESULTS

There were 1,034 pupils in the study population, of which 457 (44.2%) were male and 577 (55.6%) were female. Of the children, 463 (44.8%) attended private schools, and 571 (55.2%) attended government schools. It was discovered that, in terms of zone distribution, 350 (33.8%) youngsters belonged to the north, 341 (32.9%) to the Southeast, and 343 (33.1%) to the Southwest (Table 1).

The mean decayed, missing, filled teeth (DMFT) scores for males and females were found to be 1.3 ± 1.6 and 1.2 ± 1.9 , respectively. The results were not found to be statistically significant (Table 2).

The activities that had the maximum impact was eating 328 (31.7%), followed by cleaning 194 (18.8%), smiling 191 (18.5%), speaking 73 (7.1%), sleeping 66 (6.4%), social contact 61 (5.9%), emotional status 31 (3.0%) and study 6 (0.6%) and at least one of the above accounted to be 608 (58.8%) (Fig. 1).

The bivariate analysis among the mean C-OIDP scores among 456 males and 578 females was $2.5 (\pm 4.2)$ and $2.2 (\pm 3.3)$, respectively. There was no statistically significant difference between the mean scores among genders (0.236). The mean C-OIDP scores among 463 government school children and 571 private school children were $2.5 (\pm 4.1)$ and $2.2 (\pm 3.4)$. There was no statistically significant difference between the mean scores among schools (0.363). The mean C-OIDP scores for DMFT were found to be 2.9 ± 4.0 , and there was a statistically significant difference between mean scores

and DMFT (0.0001). The mean C-OIDP scores for gingival bleeding were found to be 2.8 ± 4.3 , and there was a statistically significant difference between mean scores and gingival bleeding (0.0001) (Table 3).

DISCUSSION

The C-OIDP index is a brief and cost-effective measure that has high applicability in public health and needs assessment; it has assessed oral impacts in relation to eight independent daily performances. The main contribution of this study was to adapt the C-OIDP index for 12-year-old Odia children. The study provided initial evidence in relation to reliability and validity.

The methods applied in the cross-cultural adaptation followed guidelines previously used in other validation studies and assured the equivalence of the original and adapted versions.^{7,8}

Caries Experience

The corresponding prevalence rates in students with caries experience was found to be 49.8% among males and 49.5% among females in the present study, which is similar to the study conducted by Kikwilu and Mandari, the prevalence of dental caries was found to be 50 and 54%, respectively.^{9,10} In a study conducted by Hjerpe et al. in two different districts, the prevalence of dental caries was found to be very low, 21.7% in the Kinandoni district and 22.4% in the Temeke district, respectively. In another study conducted by Nagarajappa et al., the prevalence of dental caries was found to be 41.6%, which is in accordance with the present study.¹¹ In a study conducted by Supanantaporn et al., the prevalence of dental caries was 55.63%, which is in accordance with the present study.¹²

The mean DMFT score for men and women in the current study was determined to be 1.30 for men and 1.25 for women. The government and private schools were found to have mean scores of 1.26 and 1.28, respectively. A study by Castro et al. indicated that the mean DMFT was 0.8, which is comparable to the current investigation.¹³ whereupon In contrast to the current study, the average value of the DMFT indicator was found to be 2.88 in a study by Sudeep et al.¹⁴

Child Oral Impacts on Daily Performances Scores and Association with Genders, School Type, Dentition Status, and Gingival Bleeding

The C-OIDP score was found to have a statistically significant association with clinical variables such as dental caries and gingival bleeding in the current investigation using bivariate analysis, which is consistent with a study by Castro et al.¹⁴ The mean OIDP

Table 1: Sociodemographic profile of the study population

Sociodemographic profile		Absolute frequency (n)	Relative frequency (%)
Gender	Males	457	44.2
	Females	577	55.8
School type	Private	463	44.8
	Government	571	55.2
Zone	North	350	33.8
	Southeast	341	32.9
	Southwest	343	33.1

Table 2: Mean DMFT score among males and females

Gender	DMFT score			
	Mean	N	Standard deviation	p-value
Male	1.3053	452	1.60506	0.667, NS
Female	1.2569	576	1.92194	
Total	1.2782	1028	1.78886	

Table 3: Bivariate analysis between C-OIDP index, gender, and clinical variables

	N	C-OIDP			
		Mean	Standard deviation	p-value	
Gender	Males	456	2.5433	4.27861	0.236, NS
	Females	578	2.2611	3.36702	
School type	Government	463	2.5048	4.15920	0.363, NS
	Private	571	2.2889	3.47599	
DMFT of >0	Absent	517	1.8375	3.49158	<0.0001, S
	Present	517	2.9336	4.00821	
Bleeding gingival units	Absent	562	1.9993	3.24080	<0.0001, S
	Present	472	2.8455	4.32623	

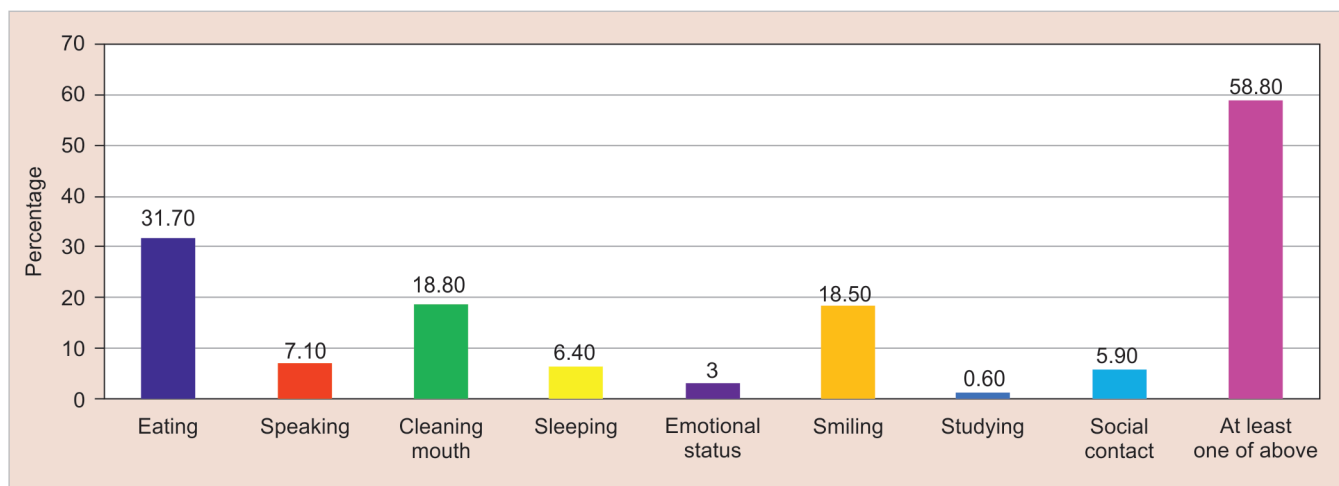


Fig. 1: Prevalence of oral impacts on daily performances (C-OIDP) in 12-year-old school children of Bhubaneswar city

score does not significantly differ between children attending government and private schools based on gender.

The children in our study were in the early stages of adolescence, which is why there was no gender difference in the OIDP scores, according to a similar study by Athira et al. There may be gender differences if we evaluate the same sample in late adolescence.¹⁵

Limitations

One of the main limitations of the current study was the age group. Given that children between the ages of 11 and 12 are the target audience for the C-OIDP index. A number of the papers have already been published. The samples were limited to those within the city limits since they were chosen in accordance with the Bhubaneswar zones. The study's cross-sectional design presents another drawback, as nonresponse may result in information about bias not being available.

CONCLUSION

According to the current study, eating was the most negatively impacted of the eight daily performances, followed by washing one's mouth, grinning, and oral issues such as sensitive teeth that had a greater negative influence. Taking into account the data, it was also evident that dental caries, gingival bleeding, and OHRQoL were associated, whereas no correlation was identified between genders, government school students, or private school students.

To raise the standard of living for school children in Bhubaneswar, dental professionals should provide oral health services and programs to promote oral health against gingivitis and dental cavities. Additionally, dental professionals can prioritize oral health care for school-age children based on the C-OIDP score, given the constraints of limited resources. Data on children's OHRQoL are still few despite the availability of certain research. There is a need for additional longitudinal studies evaluating the impact of therapies or changes over time, as well as research involving representative groups.

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