

Research Article

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Oral Health Status among Children between the Ages of 12 and 15 Attending Government and Private School Systems in Bareilly City

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ABSTRACT

Background: Statistics on the oral health status of children from various socioeconomic backgrounds are available through assessments of children's oral health status in public and private schools. The current study's objective is to evaluate and compare the levels of oral hygiene, gingival health, and caries experience among students attending government and private schools in Bareilly City.

Subjects and Methods: The study participants were selected using a stratified random sample technique combined with cluster sampling. The oral hygiene state, gingival status, and caries experience of 12 and 15-year-old students from three public and private schools were evaluated and compared. Three qualified and calibrated investigators used a mouth mirror and explorer while doing the test outside in the daytime.

Results: The research observes 604 kids in all, 331 from the government and 273 from private homes. Kids attend government schools had a mean oral hygiene index that was simplified (OHIS) that was greater (2.9 [1.1]) than kids attending private schools (0.6 [0.4]). Children attending government schools had higher mean gingival scores and mean decaying, missing, and filled tooth than those attending private schools. Students at government schools were far more likely to have poor oral hygiene, mild to severe gingivitis, and caries encounter.

Conclusion: Compared to children attending government schools, students who attend private schools had a considerably lower rate of oral illnesses. Therefore, in any statewide school oral health programs that are proposed, children from government schools should be given preference over those from private schools.

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Introduction

Overall wellness is inextricably linked to oral health. In the past 20 years, there has been a substantial improvement in the oral health of children and adolescents, particularly with regard to dental caries, in many developed countries [1-3]. This abrupt shift in the trend may be linked to changes in dietary behaviours, better dental hygiene routines, efficient fluoridation procedures, and the implementation of preventive programmes at schools [4, 5]. On the other hand, oral disorders are becoming more prevalent in many developing and underdeveloped nations [6, 7].

India, a developing economy, encounters numerous difficulties in meeting dental health demands. The vast majority of Indians live in rural areas [8]. It is important to comprehend the dental

hygiene practices that people adhere to as well as the prevalence and distribution of oral health issues. Such data are essential for developing appropriate programmes and policies for oral health. The right policies and programmes will help to establish the essential assistance and train the essential dental personnel to satisfy these needs. They will also help to increase public awareness and knowledge of the preventative and promotional aspects of oral care. The neglect of oral health as a result of widespread ignorance of dental disorders. [9, 10].

The population of India is around 40% made up of people under the age of 18 [11]. In our nation, there aren't many formalised school health programmes. In comparison to other demographic groups, school-aged children are easy to reach for any health promotion programmes intended to influence lifestyle changes. In many affluent nations, school health programmes have been successful in promoting health [12, 13]. The advantages of structured school

dental programmes are illustrated by the school dental nurse programme that was introduced in New Zealand in the early 20th century to address the oral health issues among school-age children [14].

Although a national health policy has been created, India currently lacks a national oral health guideline. This shows that oral health government leaders are careless and that our nation's lack of attention to its development of oral health. The importance of dental health to overall health and wellbeing must be made clear to lawmakers [15].

The adoption of school healthcare plans, if not oral health policies, may be able to meet the needs of 40 percent of schoolchildren in terms of oral health due to the restricted resources. According to current estimates, government schools make up 80% of all schools in the nation, making the government the primary supplier of education [16]. Urban locations are home to the majority of private schools, which typically serve students from medium, upper middle, and upper socioeconomic levels [17].

To make the greatest use of the limited resources available in the current situation, it is crucial to identify the risk groups. The evaluation of children's oral health status in public and private schools may give us a preliminary survey of the oral health status of children from various socioeconomic backgrounds. When policies and programs for school-aged children are developed, this helps to priorities the services to the high-risk groups. Surveys on the oral health of students in public and private schools in Bareilly City, Uttar Pradesh, India, were rare. In the current study, the oral health status of students in public and private schools was analyzed and contrasted.

Materials and Method

The cluster and stratified random sampling techniques were combined to choose the study subjects. The initial method for choosing the necessary number of schools for the study used two stages of cluster sampling. All of Bareilly City's neighbourhoods were identified in the first phase, and two neighbourhoods were selected at random from this list.

The secondary schools, both public and private, in the chosen areas were then listed. There were approximately 8–10 public and private schools in each community. Again utilising the lottery approach, three public and private schools from each of these localities were chosen at random. As a consequence, around one-third of the public and private schools in each community were chosen.

The principal investigator informed the teachers of the high schools that were chosen about the research setting, and after answering all of their questions, the headmasters of these schools gave their consent for the research to proceed. The headmasters of the selected schools provided a list of the students between the ages of 12 and 15, and each age group's students received a special identification code.

The male and female students from such schools were chosen using a stratified random sample. First, stratification was done for both the males and females in each of these age categories. Then, using a lottery system, the first or second number (either odd or even) was chosen, and after that, each substitute student from

this quantity onwards was chosen. As an outcome, each age and gender category of pupils was represented by 50% in the chosen schools. In addition to informed consent from their parents, each child provided verbal consent.

Parents' consent to carry out the clinical evaluation of the children was gained through the use of a circular distributed through the educational system. After receiving the students' and their parents' informed agreement, three qualified and calibrated evaluators examined the chosen schoolchildren over the course of three months, from November 2021 to January 2022.

Therefore, over course of a week, the researchers underwent training and calibration at the Government Dental College's Department of Public Health Dentistry. The oral hygiene index-simplified (OHI-S), gingival index (GI), and decayed missing filled tooth (DMFT) index kappa statistics for inter examiner reliability were 0.8, 0.7, and 0.9, respectively. The students were clinically examined on a plastic chair on the school's grounds during the daytime using a mouth mirror and an explorer. In the current study, a set of 30 mouth mirrors and explorers were employed. Utilizing the OHIS (Greene and Vermillion 1964), GI (Loe and Silness 1963), and DMFT index, the oral hygiene state, gingival health, and dental caries experience were evaluated (Klein, Palmer, Knutson 1938). [18] The youngsters underwent a clinical oral examination using a set of equipment that had been autoclaved. Depending on the gingival scores and the oral hygiene simplified level, the patients were split into four groups. Based on the DMFT score, the individuals were divided into two categories (caries free or caries frequent).

Table 1 illustrates the specifics of categorization and the parameters used. A data collection sheet was first used to enter the data. After entering the data onto a computer, Spss software version 23 was used for statistical analysis. Mean and standard deviation were used to express the OHIS, GI, and DMFT scores (SD). Frequencies and percentages were used to represent the distribution of study participants based on their level of oral hygiene, gingival health, and caries experience. Utilizing the t-test, Mann-Whitney U-test, and Chi-square test, statistical analysis was carried out. Fixed at 0.05 was the statistical significance level.

Results

In the current research, 604 kids in all were assessed. 331 of these came from public schools, while 273 did so from private institutions. The age and gender distribution of research participants did not differ statistically significantly.

The study population's average OHIS score was 1.9. (1.4 - SD). Children attending government schools had a mean OHIS score that was considerably higher (2.9 [1.1]) than those attending private schools (0.6 [0.4]). 39.1% of schoolchildren reported having good oral hygiene (mean OHIS score: 1.2).

For 38.7% of the research respondents, it was acceptable (mean OHIS score between 1.3 and 3) and for 22.2 percent, it was poor (mean OHIS >3). 86.4 percent of students from private schools had good oral hygiene, whereas none of the students from government schools did. In comparison to private schools (22.2 percent), students in government schools (40.5 percent) had considerably higher rates of poor oral hygiene [P 0.01].

Table 1: Age and Gender Composition of Students in Public and Private School

School	12 years (N (%))			15 years (N (%))			Total (age and gender combined) N (%)
	Males	Females	Male and females combined*	Males	Females	Male and females combined*	gender combined) N (%)
Government	86 (53.4)	75 (46.6)	161* (48.6)	87 (51.2)	83 (48.8)	170* (51.36)	331 (100)
Private	57 (52.3)	52 (47.7)	109* (39.9)	75 (45.7)	89 (54.3)	164* (60.1)	273 (100)
Total	143 (53)	127 (47)	270 (44.7)	162 (48.5)	172 (51.5)	334 (55.3)	604 (100)
Statistical inference				* χ^2 : 1.1, df: 1, P : 0.28			

Table 2: Mean OHI-S Score Among the Study participants school

	12 years (SD)			15 years (SD)			Total (age and gender combined)
	Males	Females	Male and females	Males	Females	Male and females	Mean (SD)
	mean	mean	combined mean	mean	mean	combined mean	
Government	3.5 (1.1)	2.1 (0.5)	2.8 (1.1)	3.4 (1.2)	2.5 (0.6)	3.0 (1.0)	2.9 (1.1)
Private	0.7 (0.3)	0.3 (0.1)	0.5 (0.3)	1.0 (0.5)	0.4 (0.2)	0.7 (0.5)	0.6 (0.4)
Total	2.3 (1.7)	1.4 (0.9)	1.9 (1.5)	2.3 (1.5)	1.4 (1.2)	1.9 (1.4)	1.9 (1.4)
Statistical inference	t value: 18.2 df: 141	value: 24.8 df: 125	t value: 20.7 df: 268	t value: 17.2 df: 160	t value: 33.3 df: 170	t value: 26.7 df: 332	t value: 33.3 df: 602
	$P<0.01$	$P<0.01$	$P<0.01$	$P<0.01$	$P<0.01$	$P<0.01$	$P<0.01$

Table 3: Distribution of Study Participants According to Oral Hygiene Status

School	N (%)			
	Good	Fair	Poor	Total
Government	0 (0)	197 (59.5)	134 (40.5)	331 (100)
Private	236 (86.4)	37 (13.6)	0 (0)	273 (100)
Total	236 (39.1)	234 (38.7)	134 (22.2)	604 (100)

Statistical inference χ^2 : 478.2, df: 2, $P<0.01$

Table 4: Prevalence of Mild, Moderate and Severe Gingivitis among the Study Participants

School	N (%)			
	Mild	Moderate	Severe	Total
Government	34 (10.4)	236 (72.2)	61 (18.4)	331 (100)
Private	232 (85.0)	41 (15.0)	0 (0)	273 (100)
Total	266 (44.0)	277 (45.9)	61 (10.1)	604 (100)

Statistical inference χ^2 : 343.3, df: 2, $P<0.01$

Table 5: Mean Gingival Score among the Study Participants

School	12 years (SD)			15 years (SD)			Total (age and gender combined)
	Males mean	Females mean	Male and females combined mean	Males mean	Females mean	Male and females combined mean	Mean (SD)
Government	1.4 (0.2)	1.1 (0.8)	1.3 (0.6)	2.0 (0.4)	1.6 (0.2)	1.8 (0.4)	1.56 (0.54)
Private	0.8 (0.3)	0.4 (0.2)	0.6 (0.3)	0.8 (0.4)	0.7 (0.3)	0.7 (0.3)	0.68 (0.32)
Total	1.2 (0.4)	0.8 (0.7)	1.0 (0.6)	1.4 (0.7)	1.2 (0.5)	1.3 (0.6)	1.16 (0.63)
Statistical inference	t value: 15.4 df: 141 $P < 0.01$	t value: 6.6 df: 125 $P < 0.01$	t value: 11.7 df: 268 $P < 0.01$	t value: 19.6 df: 160 $P < 0.01$	t value: 26.6 df: 170 $P < 0.01$	t value: 28.7 df: 332 $P < 0.01$	t value: 23.81 df: 602 P value: 0.001

GI: Gingival index, SD: Standard deviation

Table 6: Mean DMFT among the study participants

School	12 years (SD)			15 years (SD)			Total (age and gender combined)
	Males mean	Females mean	Male and females combined mean	Males mean	Females mean	Male and females combined mean	Mean (SD)
Government	0.8 (0.9)	0.7 (0.9)	0.7 (0.9)	0.8 (0.8)	0.9 (1.1)	0.8 (1.0)	0.79 (0.93)
Private	0.3 (0.7)	0.3 (0.5)	0.3 (0.6)	0.4 (0.7)	0.4 (0.6)	0.4 (0.7)	0.36 (0.62)
Total	0.6 (0.9)	0.5 (0.8)	0.6 (0.8)	0.6 (0.8)	0.6 (0.9)	0.6 (0.9)	0.6 (0.84)
Statistical inference	$P < 0.01$	$P = 0.02$	$P < 0.01$	$P = 0.01$	$P < 0.01$	$P < 0.01$	P value: 0.001

Mann–Whitney U-test applied. SD: Standard deviation, DMFT: Decayed missing filled teeth

Table 7: Dental caries prevalence among the study participants

School	N (%)		
	Caries free	Caries prevalent children	Total children
Government	160 (48.3)	171 (51.7)	331 (100)
Private	194 (71.1)	79 (28.9)	273 (100)
Total	354 (58.6)	250 (41.4)	604 (100)
Statistical inference	χ^2 : 31.8	df: 2	$P < 0.01$

Discussion

A person can communicate, eat, and interact with others without experiencing any difficulty or shame if their mouth is in good health [19]. Schools offer a venue for the promotion of oral health and general health to employees, family, and community members in addition to students [20]. Despite the fact that dental health is a crucial component of overall health, many developing nations' national health strategies and initiatives give little thought to dental health [15]. The purpose of the current research was to evaluate and compare the oral health condition of students in public and private schools, which may serve as a proxy for students from various socioeconomic backgrounds. When resources are limited, choosing the services for the most deserving is made easier by the identification of high-risk groups.

In the current research, a greater proportion of kids from private schools had good oral hygiene status than kids from government schools. Children from private schools have superior dental care utilization and oral hygiene practices [8, 21-23]. The findings supported the generally held belief that students at private schools

came from parents with a higher socioeconomic position than kids did in public schools. As a consequence, private school students' brushing habits, particularly in the morning, were closely observed.

According to a study by Lateef et al., more students who attend private schools (61.4 percent) have good dental hygiene than those who attend public schools (21 percent). Another study by Batwala et al. revealed decreased risks for calculus and plaque amongst students attending private schools (odds ratio [OR]: 0.4, 95 percent confidence interval (CI): 0.2-0.9). The decreased odds among students from private schools suggest that government school students have worse oral hygiene than students from private schools do. These and additional conclusions were supported by the data of our investigation [24-26].

Students in government schools had greater mean gingival scores and rates of moderate and severe gingivitis than did students in private schools in the current research. Shailee et al. reported healthy periodontium in 83.4 percent of individuals from private

schools compared to 16.6 percent of the 12-year-old students from government schools. Compared with students from government schools, students from private schools had a considerably larger percentage of 15-year-olds with healthy periodontium (28.4%) (14 percent).

Pupils in government schools were much more likely to have bleeding (51 percent and 53.2 percent) and calculus (58.8 percent and 24.8 percent) than were students in private schools (bleeding: 49 percent and 52.1 percent; calculus: 41.2 percent and 16.5 percent, respectively; among 12 and 15-year-olds). Comparing children from private schools to those who attended government schools, they came to the conclusion that the periodontal condition was generally good among the former group. The disparity was explained to students in government schools having relatively inconsistent oral hygiene habits, which may be related to their lower socioeconomic level and reduced use of dental services. Our study's results demonstrated those of this study and other studies, too [8].

The study subjects' average DMFT grade was 0.6 (0.8), with a frequency of 41.4 percent altogether. According to the National Oral Health Survey and Fluoride Mapping in India, 53.8 per cent of children aged 12, have dental caries. The current study's subjects were chosen from an area where fluoride is endemic. The beneficial effect conveyed by repeated exposures of the teeth to fluoridated water amongst our research subjects may be the cause of the lower DMFT value and lower prevalence of dental caries in the research analysis versus the national average. In the current research, kids in government schools had higher mean DMFT scores and dental caries high prevalence than kids in private schools.

Compared to students at private schools, government school students experienced more dental problems. This discrepancy was attributed to the kids at the government schools not knowing about, not being capable of affording or not using the dental care facilities available to them. Children in private schools had higher mean filled teeth on average, which was linked to parents' attitudes and dental knowledge, which were reflected in the children's upkeep of their oral health. Our survey's findings supported those from this and other studies, too [27, 28].

The current study in Bareilly City could be viewed as a pilot survey. The outcomes of the current investigation require statewide validation by a larger sample. This research will help the decision-makers consider implementing successful school-based preventative programs in schools with greater needs, if not concurrently in all schools [29-31].

Conclusion

Compared to pupils at private schools, children attending government schools had worse oral hygiene, gingival health, and dental caries status, according to the study's findings. While oral health care treatments should be made available to all children, government schoolchildren, who typically come from lower socioeconomic backgrounds, should receive priority access to these services. Due to limited resources, oral health interventions that are specifically geared toward children at high risk are urgently needed.

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