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Article

Influence of Lifestyle Factors and Traditional Practices on Oral Health Status of School Children

Alssa Uqaily ^{1,*}, Renoka Kumari ¹, Muhammad Bilal ^{1,*}, Sana Mirza ^{2,*} and Uzma Zareef ³

- ¹ Institute of Dentistry, Liaquat University of Medical and Health Sciences, Pakistan
- ² Department of Oral Pathology, Institute of Dentistry, Liaquat University of Medical and Health Sciences, Pakistan
- ² Department of Oral Pathology, Liaquat College of Medicine and Dentistry, Pakistan
- * Correspondence: bilalkkdigri@gmail.com (A.U.); alssauqaily110@gmail.com (M.B.); sana.mirza@lumhs.edu.pk (S.M.)

Abstract

This study was aimed to investigate the effect of lifestyle behaviors, traditional oral health practices, dietary patterns, and stress-related conditions on the oral health status of schoolchildren at NJV Government School, Karachi, based on questionnaire responses and clinical examination findings. Among 142 students between 10 and 16 years old, a quantitative cross-sectional study was taken at one point in time. Rather than relay on self-reports, actual oral exams followed World Health Organization protocols. These examinations recorded decayed, missing, or filled teeth (DMFT), gum health, presence of dental plaque, bad breath, and tooth discomfort. Though surveys provided behavior data, clinical findings confirmed the results based on physical signs. Statistical analyses were performed by using SPSS software, Including both descriptive and inferential methods, with statistical significance set at $p<0.05$. Among the study participants, 46.5% had dental caries, 41.5% reported tooth sensitivity, and 38% exhibited gingival bleeding. A statistically significant association was observed between brushing frequency and dental caries ($p=0.007$). In contrast, dental caries showed no significant relationship with betel nut chewing, miswak use, or snack consumption. Gingival bleeding was significantly associated with tooth sensitivity ($p=0.027$). The conventional therapies and lifestyle habits indicated no significant interaction with the evaluated oral health outcomes. Daily hygiene practices were the main factor influencing schoolchildren's oral health status, with brushing frequency appearing as a significant predictor of caries experience. The majority of lifestyle factors and conventional oral practices have no effect.

Keywords: oral health; oral hygiene; schoolchildren

1. Introduction

Oral diseases are among the most prevalent chronic health conditions affecting children globally, with dental caries and gingival diseases contributing to pain, missed educational opportunities, and diminished quality of life. In Pakistan, recent meta-analytic evidence estimated the national prevalence of dental caries among children to be 56.6%, with figures for Sindh province at approximately 58.9%. [1] Localized surveys show even higher burdens, reporting 74% prevalence in Quetta [2] and as high as 91.3% among 5- to 11-year-old children in Karachi's Ibrahim Hyderi community. [3] Though often overlooked, today's food landscape fuels tooth decay in children. Easy reach of sugary treats shapes daily habits across nations. Research spanning multiple regions shows clear links between these eating patterns and dental problems in young populations. Sweet drinks play a central role, appearing regularly in diets worldwide. Findings from large-scale reviews support this connection without ambiguity. [4] These results show that more research is necessary to completely understand how daily activities and environmental factors affect children's dental health in learning settings.

Alongside diet, lifestyle choices also have an impact on oral health: sedentary behavior and prolonged screen time are associated with poor brushing habits, distracted eating, and a higher consumption of cariogenic snacks, while family routines and parental supervision have a major influence on daily oral care. Children who are exposed to screens more frequently and eat during screen time have higher caries counts and worse oral hygiene practices, according to cross-sectional research conducted on school-age children. This suggests that lifestyle clustering (screen use, snacking, irregular toothbrushing) increases risk. These behavioral linkages make schools a logical setting to both measure and intervene on multiple, interacting lifestyle risk factors. [4,5]

In addition to sugar intake, dental health is influenced by physical activity and dietary quality. The role that systemic health and overall nutritional status play in the development of oral disease is highlighted by population-level analyses that link children and adolescents' increased caries risk to low levels of physical activity and inadequate dietary intake of essential minerals (like calcium). This evidence implies that multi component lifestyle assessments not only frequency of sugary snacks but also diet quality and activity patterns are important when investigating caries and periodontal outcomes in school cohorts.[6]

Alongside these modern lifestyle determinants, traditional oral care practices persist in many communities and may affect clinical status in both protective and adverse ways. Recent randomized trials and meta-analyses show that oil pulling and chewing sticks made from *Salvadora persica* (miswak) can lower microbial load and occasionally perform similarly to traditional toothbrushing for plaque control, though results vary by technique and user training, and some studies report greater gingival abrasion or recession when misused. The frequency, implementation and cultural acceptance of traditional methods must be evaluated in order to accurately interpret clinical data and develop culturally relevant suggestions. [7,8]

The evidence to date highlights that children's oral health is influenced by a wide range of factors such as dietary sugars, snack consumption, screen time and sedentary behaviors, overall nutrition and physical activity, caregiver knowledge, and cultural practices. Yet, comprehensive and context specific data for effective school-based interventions remain scarce. School based and community interventions have reduced caries and improved behaviors in some settings, but effectiveness depends on tailoring to local habits, resources and cultural practices. For NJV government school, a focused study that measures (a) dietary and screen time behaviors, (b) physical activity and nutritional markers, (c) parental/caregiver practices and literacy, and (d) the prevalence and technique of traditional oral practices will fill an important gap and directly inform culturally sensitive, school based preventive strategies. [9,10]

2. Materials and Methods

A quantitative, cross-sectional study was done to investigate the influence of lifestyle factors, traditional oral health practices, and dietary habits on the oral health status of schoolchildren. The study was conducted at NJV Government School, Karachi

A structured questionnaire-based strategy, combined with a clinical oral examination, was applied for data collection. The questionnaire consisted of both closed-ended and multiple-choice questions designed to assess oral hygiene behaviors, lifestyle patterns (including betel nut use, dietary behaviors, and stress-related factors), traditional practices (such as miswak use, salt rinses, and home remedies), and self-reported oral health results.

Participants who met the inclusion criteria and agreed to take part in the study were included using a convenience sampling method.

The collected data were organized using Microsoft Excel and analyzed using SPSS version 26. descriptive statistics, such as frequencies, percentages, and averages, were employed to the results. Chi-square test was done to check the association and a p-value of < 0.05 was considered as statistically significant.

The study was approved ethically by the Research Ethics Committee of Liaquat University of Medical and Health Sciences (LUMHS/REC/-1128). Written informed consent was obtained from

parents/guardians, and verbal consent was taken from the children. Participation was completely voluntary, and all answers were kept completely private. Throughout the reporting and publication process, no personally identifiable information was revealed.

3. Results

A total of 142 students from NJV Government School participated in the study. Demographic data of the participants are summarized in Table 1.

Table 1. Demographic characteristics of participants (n = 142).

Variable	Category	N(Counts)	%(Percentage)
Age (years)	10-12	14	9.9
	13-15	87	61.3
	16-18	41	28.9
Gender	Female	30	21.1
	Male	112	78.9
Residence	Hostler	116	81.7
	Day Scholar	26	18.3

Social habits and oral hygiene practices of participants are summarized in Table 2.

Variables	Category	N (counts)	%(Percentage)
Brushing frequency	Multiple/day	60	42.3
	Once/day	73	51.4
	Occasional/none	9	6.3
Dental floss use	Yes	7	4.9
	No	135	95.1
Miswak use	Yes	3	2.1
	No	139	97.9
Snack frequency	None	47	33.1
	1–2/day	87	61.3
	≥ 3/day	8	5.6
Neglect brushing when stressed	No	36	25.4
	Sometimes	69	48.6
	Often	37	26.1
Use of home remedies	Yes	29	20.4
	No	113	79.6
Oral habits	Betel nuts	51	35.9
	Tobacco	2	1.4
	None	89	62.7
Dental-treatment concerns	Has concern	111	78.2
	No concern	31	21.8

Table 3. Prevalence of oral-health conditions.

Variables	Category	N (counts)	%(Percentage)
Dental caries status	Has dental problem	66	46.5
	No dental problem	76	53.5
Tooth sensitivity	Yes	59	41.5
	No	83	58.5
Gum bleeding	Yes	54	38.0
	No	88	62.0
Staining/discoloration	Yes	27	19.0
	No	115	81.0
Bad breath / mouth ulcers	Has symptoms	5	3.5
	No symptoms	137	96.5
Dental caries status	Has dental problem	66	46.5
	No dental problem	76	53.5
Tooth sensitivity	Yes	59	41.5
	No	83	58.5
Gum bleeding	Yes	54	38.0
	No	88	62.0
Staining/discoloration	Yes	27	19.0
	No	115	81.0
Bad breath / mouth ulcers	Has symptoms	5	3.5
	No symptoms	137	96.5

Significance of association between oral hygiene habits and dental caries are summarized in Table 4. Association between oral health symptoms are also present in Table 4.

Table 4. Association Between Oral Hygiene Habits and Dental Caries and oral health symptoms.

Variables Tested	χ^2 Value	df	p-value Significance
Brushing frequency × Dental caries	9.802	2	0.007 (significant)
Snack frequency × Dental caries	0.689	2	0.709(Not significant)
Miswak use × Dental caries	0.502	1	0.479(Not significant)
Gender × Dental caries	0.894	1	0.345(Not significant)
Gum bleeding × Tooth sensitivity	4.893	1	0.027 (significant)
Oral habits × Tooth discoloration	1.461	1	0.227 (Not significant)
Toothache × Dental caries	2.642	1	0.104 (Not significant)
Stress neglect × Oral hygiene	3.068	1	0.080 (Not significant)
Floss use × Dental caries	2.180	2	0.336 (Not significant)

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Stress neglect × Oral hygiene	3.068	1	0.080 (Not significant)
Floss use × Dental caries	2.180	2	0.336 (Not significant)

4. Discussion

The results of this study show that caries, gum bleeding, and tooth sensitivity are common among teenage students at NJV Government School, along with poor oral hygiene habits. Despite awareness of oral hygiene importance, there remains a gap between knowledge and Regular practice, a trend also reported in earlier national and international studies. [11–13] Most participants brushed once daily, while very few used dental floss or traditional aids such as miswak [14], indicating incomplete oral care routines comparable to findings from similar populations in Karachi and other developing regions [11,15]. This demonstrates that awareness by itself does not ensure good dental hygiene because environmental and behavioral factors are important.

The frequency of brushing was strongly associated with dental caries; this indicates the importance of regular brushing and maintaining oral hygiene. Other studies have also found similar results that Infrequent brushing leads to increases plaque accumulation and risk of dental caries.[16] Some past studies also suggested that snack frequency and diet pattern are important factors affecting oral health, However in this study no clear association was observed between these factors and oral health outcomes.[17] The discrepancy may be due to differences in study focus, as previous studies focused more on diet related factors instead of brushing habits, In addition differences in eating habits, meal timing, and level of supervision, particularly among hostel residents, may influence these outcomes.

As compared with regional findings, The prevalence of dental caries, along with associated problems including bleeding gum and tooth sensitivity was lower than that reported in urban populations from Karachi [13] but greater figures observed in rural environment. [15] Following pattern may be explained by the hostel environment, where students typically have access to basic oral hygiene facilities but get limited supervision. These regional variations across Pakistan shows the significant role of lifestyle and environmental factors affecting health outcomes.[18]

A significant connection was observed between gum bleeding and tooth sensitivity. According to previous studies, students who experienced gum bleeding are at greater risk to report tooth sensitivity. [19] Academic pressure and hostel living conditions were identified as major stressors in this population, indicating that psychological and environmental factors may influence oral hygiene behaviors.[20] Furthermore, the continued practice of betel nut chewing among participants aligns

with earlier reports documenting harmful oral habits among South Asian adolescents.[21] Beyond that point lies evidence reinforcing the idea that customs tied to culture often block progress toward better dental health hygiene in South Asian youth.

5. Conclusions

This study indicates that the poor oral hygiene of hostel students is significantly associated with a low level of awareness and lack of availability of supervised hygiene programs, and no or limited reinforcement to maintain oral health. Therefore, it is essential for structured school-based programs that educate about stress and its management, the importance of effective brushing habits, as well as discourage deleterious practices, to be enforced. Modeling after effective global school-based oral health programs, like preventive and behavior-oriented education in Pakistan, can help bridge the gap between knowledge and application into routine practice for the better health of children.

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Data Availability Statement: Data is available upon request.

Conflicts of Interest: The authors declare no conflict of interest.

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