



Original Research Article

Association Between Beverage Consumption Patterns and Oral Sensitivity Among Adults in Karachi: A Cross-Sectional Study.

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Abstract: Background: Oral sensitivity is a typical issue that may have a negative influence on oral hygiene habits, drinking and eating. Maleficent acidic drinks have been proposed to be causative factors or factors that cause oral sensitivity due to their erosive properties on the teeth hard tissue. Nonetheless, sales of evidence on relationships between beverage habits and oral sensitivity among adults, especially in Pakistan are scarce. The purpose of conducting this study was to investigate the relationship that exists between beverage habit and oral sensitivity that is self-reported with self-reported oral sensitivity among adults in Karachi, Pakistan. **Methods:** A cross-sectional analytical study on 375 adult participants of 18 years and above was carried out using structured self-administered questionnaire which was administered using online resources. A non-probability convenience sampling technique was used in recruiting the participants. The data on the demographic variables, oral hygiene habits, drinking habits, and self-reported oral health outcomes were gathered. The data were summarized using descriptive statistics and chi-square test was used to determine the association between the frequency of beverage consumption and the outcome of oral health. $p < 0.05$ was set as the statistical significance. **Results:** The majority of participants were aged 18–25 years (71.7%), female (62.7%), and undergraduate students (48.8%). Acidic beverage consumption was common, with 48.3% of participants reporting consumption one to three times per week and 41.9% reporting consumption for more than five years. Self-reported tooth sensitivity was reported by 29.3% of participants, dental caries within the previous 12 months by 31.7%, and tooth erosion by 11.7%. No statistically significant associations were observed between the frequency of acidic beverage consumption and tooth sensitivity ($\chi^2 = 11.338$, $p = 0.183$), dental caries ($\chi^2 = 2.729$, $p = 0.604$), or tooth erosion ($\chi^2 = 13.942$, $p = 0.083$). **Conclusion:** The consumption of acidic beverages was prevalent among the study group but there was no statistically significant relationship between beverage consumption frequency and self-reported oral sensitivity outcomes, dental caries or tooth erosion. Although statistically significant relationships were not detected, the prevalence of the use of acidic drinks indicates the need to encourage good nutrition and preventive dental care. It is proposed that future longitudinal studies that use objective clinical examination and multi-variable analysis can elucidate the relationship between beverage consumption patterns and oral health outcome better.

Keywords: acidic drinks; drinks; Oral sensitivity; dentine hypersensitivity; periodontal caries; tooth erosion; cross-sectional research.

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INTRODUCTION

Oral sensitivity is frequently experienced by dental patients and it is generally a brief, acute response of discomfort after being exposed to cold or heat, sweet or acidic foods, or other touchable stimuli. It is often associated with the dentine hypersensitivity, where the exposure to dentine can be conveyed to the oral environment through the exposed dentine and its open dentinal tubules [1]. According to the hydrodynamic theory, these external stimuli cause fluid movements in the dentinal tubules stimulating pulpal nerve endings, resulting in the typical painful sensation [2]. The discomfort lasts only a short time but can have adverse effects on the normal course of daily activities, which can include eating, drinking, brushing of teeth, and oral hygiene. The everyday behaviors related to oral sensitivity can thus be identified and serve as an aid to enhance prevention and patient education.

Oral health is applicable to the dietary practices as many drinks that are consumed frequently contain sugars, acids, or both. Acidic drinks in this study are those of low PH which are acidic as a consequence of naturally occurring or added acids, such as citric, phosphoric, carbonic, malic, ascorbic acids. Other products under this category are carbonated soft drinks, energy drinks, sport drinks, packaged fruit juices, flavored drinks, iced teas, sparkling drinks. This could occur with regular intake of such drinks such that the oral pH drops below a critical point at which enamel is susceptible to dissolution, thus accelerating demineralization and alkaloid teeth loss. Past studies have studied dental erosion as well in association with the consumption of beverages [4]. The continuous contact with the acids in food can cause gradual loss of minerals, erosive damage of teeth, and ultimate exposure of the dentine. As dental tubules are exposed, thermal and chemical stimulants are able to more easily trigger the movement of fluids in the tubules and cause discomfort.

This may rely on the drink that an individual opts to consume as well as on how the consumption is done which is why oral-health relevance of beverage intake can be a variable factor. Regular consumption, imbibing of food, slow or long swallowing, swishing, and holding a drink in the mouth could lengthen the amount of acid to the tooth surfaces [5]. Repeating sipping over the day or taking acidic drinks outside the mealtime in this case may thus relate to increased exposure of teeth to acidic conditions. An elaborate evaluation of drinking behavior is thus required as opposed to basing the assessment on the type of drinks.

Previous research has revealed a linkage between dental tissue resorption, dental tissue and beverage consumption and dental tissue sensitivity symptoms. Erosive tooth wear has also been identified as a contributing factor among adults to cervical dentine hypersensitivity [6]. Research in the laboratory has

demonstrated that energy drinks can cause the loss of the smear layer on the dentinal tubules of the root dentine suggesting that there is a potential biological pathway between cervical dentine hypersensitivity and energy drinks [7]. Consumption of sweetened drinks daily has also been linked to increased levels of dental caries and higher risk of tooth erosion as compared to non-consumption [8]. In Pakistan, oral-health issues like tooth sensitivity and dental caries were reported by young adults who drank sweetened drinks [9]. Another local study showed that there was a strong correlation between the consumption of fizzy drinks and dental sensitivity among the university students [10]. Likewise, a study done on a population of Pakistani college students noted correlation between beverages consumption and caries, sensitivity, development of plaque or calculus and staining of teeth [11].

Many studies have been performed to assess the relationship between the consumption of acidic beverages and dental caries or erosive tooth wear, but relatively few studies have been conducted to determine oral sensitivity as an outcome and at the same time include multiple beverage consumption patterns including frequency, duration, amount, temperature and drinking habits. More so, there is scanty evidence on adult populations in Pakistan. The beverage preference in adults could be inclined based on work schedules, social habits, stress levels, living styles and availability of beverages in the market. Since such behaviors might vary within the populations, more study of the relationships between the oral sensitivity and the beverage consumption habits in adults is aroused.

The purpose of the current study was to examine how beverage consumption and self-reported oral sensitivity relate in Karachi, Pakistan, in adults. Secondary outcomes were self-reported tooth erosion and caries in the mouth. Findings can be used in oral health promotion and can serve as baseline with the future analytical and longitudinal research.

METHODOLOGY

The study was a cross-sectional analysis study within the span of six months to determine the relationship between the oral sensitivity and drinking habit among the adults. The population under study was made up of adults who were willing and aged 18 years and above to take part and give an informed consent. Those people who could comprehend the online questionnaire and thus fill it in were incorporated in the study. The participants who were actively undergoing active dental treatment which may lead to oral sensitivity and those who were diagnosed with oral diseases that affect dental sensitivity, those that had a systemic diagnosis that may lead to oral health or pain perceptions and those who submitted substantially incomplete questionnaires and those who were identified as duplicates during the data screening were not included in the analysis.

Single-population proportion formula was used to calculate the sample size: $n = Z^2 P (1 - P) / d^2$ where Z was assumed to be 1.96 based on the 95% level of confidence, P was assumed to be 50 percent because there were no local estimates of prevalence, and d was assumed to be 5 percent margin of error. According to this calculation, we needed at least 384 participants. The target population of about 375 participants was considered based on the feasibility concerns and expected response rates. The study used a non-probability convenience sampling that ensures the recruitment of eligible participants online and using social media networks in the study period.

The data were obtained through the use of the structured self-administered questionnaire that was designed after reviewing the pertinent literature on the consumption patterns of beverages, oral health behaviors, and oral sensitivity. The questionnaire was divided into four parts with demographic details, beverage drinking habits, oral health habits and awareness and experiences with oral sensitivity. The items were formulated in order to respond to the study aims and were checked on the basis of clarity, relevance, and completeness and thus administered. It was administered as a questionnaire by first having it face validated by senior faculty members.

The questionnaire was sent out electronically on the internet. At the start of the questionnaire, an informed consent statement was read out to the subject and he/she

had to mention that they received the information prior to the survey. Involvement was purely voluntary and personally identifiable information was not gathered. All participants were kept in confidence and were anonymous in the study. Self-reported oral sensitivity was taken as the main outcome variable and every feature of the beverages like the type, frequency and amount taken were considered to be the independent variables. Other potential demographic data, oral hygiene variables were also gathered.

IBM SPSS Statistics version 27.0 was used to enter and analyze the data. Participant characteristics and the variables of the study variables were summarized using descriptive statistics such as frequencies, percentages, means and standard deviations. An appropriate statistical test was used to identify the relationship between the consumption habits and the extent of oral sensitivity, that is, Chi-square test was used to test categorical variables. A p-value that was lower than 0.05 was deemed to be statistically significant.

The PRIDE Center of Research and Learning Institute Ethical Review Board (ERB) Committee gave the study ethical approvals prior to data collection (Reference No. PRIDE/ ERB/2026/099). All participants were provided with electronic informed consent and complete the survey. All data were kept safely and analyzed in a aggregated form to protect privacy and confidentiality of the participants.

RESULTS

This paper offers a thorough evaluation of the drinking behaviors and the relationship with oral health outcomes of 375 participants. The results are discussed in the background of the demographic and professional attributes of the subjects, which mostly depict a young adult group (Table 1).

Most of the respondents were in the age category (18 to 25 years) (71.7), then there were 26 to 35 years (21.1), and finally 36 and above (7.1). Almost two-thirds of the sample (62.7%), consists of females with males at 37.3%. In terms of educational level, nearly half the sample consisted of undergraduates (48.8%), with the next largest proportion of graduates (39.2%), postgraduates (8.5%), and people with secondary education (3.5%). With regard to occupation, about half of the respondents were students (49.3%), and 37.9% were occupied, 6.7% were self employed and 6.1% were not.

Table 1. Sociodemographic Characteristics of Participants (N = 375)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18 - 25	269	71.7
	26 - 35	79	21.1
	36 - 45	13	3.5
	Above 45	13	3.5
Gender	Female	235	62.7
	Male	140	37.3
Professional Qualification	Undergraduate	183	48.8
	Graduate	147	39.2
	Postgraduate	32	8.5
	Secondary	13	3.5
Occupation	Student	185	49.3
	Employed	142	37.9
	Self-employed	25	6.7
	Unemployed	23	6.1

The beverage consumption patterns showed that non-water beverages, especially acidic beverages were widely taken by the respondents (Table 2). Almost half of the respondents (48.3) noted to drink the acidic drinks one to three times per week and 11.5% as four to six times per week. 8.0% of the participants reported taking acidic beverages daily and 2.4% took them more than once a day. On the other hand, 28.3% said they never or seldom took such foods.

In terms of the length of consumption, 41.9% of respondents had over five years of consuming acidic drinks. The majority of the participants (56.8) claimed that they drank around one glass or cup (250ml) at a time. Moreover, 33.9% had an habit of adding sugar to their drink and over fifty percent (53.9) had a habit of consuming a drink that is at cold temperature.

Table 2. Beverage Consumption Characteristics Among Participants

Variable	Category	Frequency (n)	Percentage (%)
Frequency of Acidic Beverages	1-3 times per week	181	48.3
	Never/Rarely	106	28.3
	4-6 times per week	43	11.5
	Daily	30	8.0
	More than once daily	9	2.4
Duration of Consumption	More than 5 years	157	41.9
	1–3 years	96	25.6
	3–5 years	82	21.9
	Less than 1 year	40	10.7
Average Amount per Occasion	1 glass/cup (approx. 250ml)	213	56.8
	Less than 1 glass/cup	116	30.9
	2 glasses/cups or more	46	12.3
Added Sugar	No	247	65.9
	Yes	127	33.9
Consumption Temperature	Cold	202	53.9
	Room temperature	91	24.3
	Hot	82	21.9

The proportion of the self-reported oral health conditions showed that variability of the tooth sensitivity and dental caries were prevalent issues among the interviewees in the study (Table 3). About 29.3 percent of the respondents said they had experienced tooth sensitivity, and 31.7 percent had been diagnosed with dental caries in the last 12 months. Moreover, 11.7% mentioned that they had been told by a dentist about the worn-down teeth that indicated tooth erosion.

Table 3. Distribution of Self-Reported Oral Health Outcomes

Outcome	Response	Frequency (n)	Percentage (%)
Tooth Sensitivity	No	181	48.3
	Yes	110	29.3
	Maybe	84	22.4
Caries Diagnosis (Last 12 Months)	No	256	68.3
	Yes	119	31.7
Tooth Erosion (Worn-down teeth)	No	279	74.4
	Not sure	49	13.1
	Yes	44	11.7

Chi-square tests were carried out to examine the association between the number of times acidic beverages are taken and oral health (Table 4). The interaction between the consumption of an acidic drink and tooth sensitivity was not statistically significant ($\chi^2(11) = 11.338, p = 0.183$). On the same note, there was no found significant correlation with dental caries diagnosis ($\chi^2(2) = 2.729, p = 0.604$). The correlation between the erosion of teeth and the consumption of acidic beverages only barely passed a threshold of significant value ($\chi^2(2) = 13.942, 0.083$) but it never passed the traditional value of a statistically significant difference.

Table 4. Chi-square Analysis of the Association between Acidic Beverage Consumption Frequency and Oral Health Outcomes

Predictor	Outcome	Chi-Square	p-value	Significance
Frequency of Acidic Beverages	Tooth Sensitivity	11.338	0.183	Not Significant
	Caries Diagnosis	2.729	0.604	Not Significant
	Tooth Erosion	13.942	0.083	Not Significant

DISCUSSION

In this study, beverage intake patterns and their association with self-reported oral health outcomes were studied in 375 participants who were mostly young adults. There was a preponderance of people between the ages of 18-25 years and students in the sample which is understandable given the fact that recent surveys on oral-health behavior among university and college students are dominated by young individuals, since they are often reported to show a higher exposure to acidic and sugar-sweetened beverages as well as poor consistency in translating oral-health knowledge into protective behavior (21-22). The beverage and outcome patterns would be expected to be due to, but not unrelated by the preponderance of undergraduate respondents in the current sample.

Acidic drinks were widespread in this cohort: over 2/3 of the participants in the study claimed to have consumed at least one acidic beverage at least once per week, and almost 40 percent had made durations of drinks lasting longer than 5 years. This trend is consistent with a growing body of data showing that acidic drinks, such as those advertised as having a favorable nutritional content, such as flavored or vitamin-enriched waters, are being taken up in large amounts by young adults and have quantifiable erosive capabilities on enamel even at short durations of contact (12,13). It is also interesting, that the opportunity to drink beverages cold and added sugar in approximately one third of the cases is also typical of the participants of the current sample, as the cold temperature and the addition of sugar were both reported to raise the cariogenic and erosive potential of a low pH beverage (14,15). Combined, the consumption profile observed here, frequent, long-lasting, and commonly sweetened consumption represents the exact same pattern that recent *in vitro* and clinical research has attributed to surface enamel mineral depletion and progressive softening (13,16).

The ranges of self-reported oral health outcomes observed in this research (tooth sensitivity 29.3, caries diagnosis 31.7 and possible erosion 11.7) are within the range reported in other studies of young adults and students and are in line with recent studies that have identified consuming acidic foods and beverages as one of the strongest anamnestic predictors of erosive tooth wear effect (25,26).

Even with this uniformity in descriptive prevalence, the chi-square test failed to disclose any statistically significant relationships between frequency of consumption of acidic drinks, and tooth sensitivity, caries diagnosis, or tooth erosion though there was a small margin by which the relationship between the variables was close to being significant. This observation is in contrast to growing literature that

shows that there is a strong dose-response between exposure to acidic beverages and erosive tooth wear; indeed, a recent systematic review and meta-analysis reported significantly high odds of erosive tooth wear by regular consumers of acidic beverages and acidic foods (26). It is possible that this phenomenon can be attributed to several reasons. First, erosive tooth wear and caries are multivariate conditions, and their clinical presentation is influenced by other factors not reflected in a straightforward frequency-based questionnaire, such as the salivary buffering capacity, brushing technique and timing relative to acid exposure, the use of protective toothpaste formulations, the way a drink is sipped, versus holding it in the mouth (16,26). Second, it is possible that there was some misclassification due to oral health outcomes being self-reported and not clinically confirmed, especially in the case of early-stage erosion, which may be simple to detect without clinical assessment on the part of individuals (12,18). Third, the distributions of categories of consumption used in this sample are fairly even, which could have restricted the statistical power to test if there is a true underlying association, in particular with low prevalence outcomes like clinically confirmed erosion.

The disjuncture between known biological risk and the null finding of statistics noted here also echoes more recent knowledge-attitude-practice studies, which have consistently reported high levels of awareness of the harms of acidic and sugary drinks in young adults and health-proximate cohorts, but no consistent evidence that such awareness is actually translated into reduced consumption or better preventive behavior (21,22,23,24). This implies that educational messages that lack behavioral or environmental support might not be enough to change the consumption habits underlying erosive and cariogenic threat.

A lack of a substantial association also needs to be made along with the general body of information regarding the consequences of consuming sugar-sweetened drinks (e.g. dental caries, periodontitis and other non-communicable diseases), whose causes are tied together by common inflammatory and metabolic mechanisms (17,18,19,20). Although the current study concentrated on hard tissue outcomes, the high incidence of added sugar in one-third of the participants beverage habits indicated that there could be more to oral health burden related to beverage consumption in this population other than the outcomes in this study.

The study has a number of limitations which ought to moderate interpretation of findings. The cross-sectional nature of the study does not allow making causal inference about oral health outcomes and the beverage consumption. All oral health lives were self-reported instead of being confirmed clinically by examination or

a tested index such as DMFT or the Basic Erosive Wear Examination which might have introduced a recall or social desirability bias and could be a potential cause of the non-significant associations described, whereas studies that involved dietary recall in addition to clinical examination found a significant relationship (17). Also, the questionnaire failed to illuminate possible confounders like oral hygiene behaviors, fluoride, salivary flow, or gastroesophageal reflux, which have been found to be significant modifiers of risk to erosive tooth wear in recent meta-analytic research (26).

The net effect of these findings is that consumption of acidic beverages is widespread and maintained in this age group of young adults and self-reported oral health complaints were widespread, especially the caries and the sensitivity, although it could not prove that the dose-response relationship between taking this consumption and its frequency is statistically significant in the sample. Since there is currently solid biological plausibility of acid-induced dental-damage, reported in current clinical and in vitro studies, (12,13,14,15,16,25,26), future studies based on clinical examination, objective dietary assessment, and sufficiently-powered samples are justified to elucidate this relationship. Meanwhile, oral health promotion interventions targeting young adults can be improved by going beyond the education on awareness to practical behavior means such as spending less time in contact with acid, not holding acidic drinks in the mouth or by scheduling oral health appropriately in relation to exposure to acids which has been noticed to fall short of bridging the gap between knowledge and behavior in this group over and over (21,22,23,24).

CONCLUSION

This cross-sectional study compared levels of beverage use with self-reported oral sensitivity in Karachi, Pakistan among adults. The level of acidic beverages consumption among the study participants was high, with the significant number of the participants describing both regular and long-term intake. Tooth sensitivity and dental caries which were self-reported were also common. Nevertheless, there was a statistically significant correlation between self-reported oral sensitivity, dental caries and tooth erosion and the frequency of drinking acidic beverages.

Statistical significance was not proved, but, since long-term use of acidic drinks was found to have an adverse effect on dental hard tissues in past experimental and longitudinal trials, the overall intake of acidic drinks witnessed in this study is clinically relevant. The data indicate that the frequency of beverage consumption is perhaps not a sufficient factor to explain oral sensitivity, which tends to be a multi-factorial effect, comprising a combination of oral hygiene, fluoride exposure, salivary protective, dietary as well as individual beverage drinking behavior (sipping duration, beverage temperature, and particular consumption time).

The findings underscore the need to seek the promotion of evidence-based oral health education toward promoting better choices of beverages and proper preventive oral hygiene among adults. In future studies, sampling needs to be conducted using probability-based methods, objective clinical examination has to be used to establish oral health outcome, and multivariate analysis technique should be used to consider the possibility of confounding factors. They also recommend longitudinal studies that will further explain the temporal dependence involved in the consumption behavior and oral sensitivity of the drinks and reinforce the evidence that has been given about the preventive measures of oral health.

REFERENCES

1. Katirci G, Uzer Celik E. The prevalence and predictive factors of dentine hypersensitivity among adults in Turkey. *BMC Oral Health.* 2023;23:474. doi:10.1186/s12903-023-03137-1.
2. West NX, Lussi A, Seong J, Hellwig E. Dentin hypersensitivity: pain mechanisms and aetiology of exposed cervical dentin. *Clinical Oral Investigations.* 2013;17(Suppl 1):S9-S19. doi:10.1007/s00784-012-0887-x.
3. Inchingolo AM, Malcangi G, Ferrante L, Del Vecchio G, Viapiano F, Mancini A, et al. Damage from carbonated soft drinks on enamel: a systematic review. *Nutrients.* 2023;15(7):1785. doi:10.3390/nu15071785.
4. Schmidt J, Huang B. Awareness and knowledge of dental erosion and its association with beverage consumption: a multidisciplinary survey. *BMC Oral Health.* 2022;22:35. doi:10.1186/s12903-022-02065-w.
5. O'Toole S, Bartlett D. The relationship between dentine hypersensitivity, dietary acid intake and erosive tooth wear. *Journal of Dentistry.* 2017;67:84-87. doi:10.1016/j.jdent.2017.10.002.
6. Alcântara PM, Barroso NFF, Botelho AM, Douglas-de-Oliveira DW, Gonçalves PF, Flecha OD. Associated factors to cervical dentin hypersensitivity in adults: a transversal study. *BMC Oral Health.* 2018;18:155. doi:10.1186/s12903-018-0616-1.
7. Pinto SCS, Bandeca MC, Silva CN, Cavassim R, Borges AH, Sampaio JEC. Erosive potential of energy drinks on the dentine surface. *BMC Research Notes.* 2013;6:67. doi:10.1186/1756-0500-6-67.
8. Hasheminejad N, Malek Mohammadi T, Mahmoodi MR, Barkam M, Shahravan A. The association between beverage consumption pattern and dental problems in Iranian adolescents: a cross-sectional study. *BMC Oral Health.* 2020;20:74. doi:10.1186/s12903-020-01065-y.
9. Niaz A, Sana R, Bahar R, Rizwan M, Spugmai M. Sweetened beverages consumption and self-reported oral health among young adults: a cross-

- sectional study in Peshawar. *Pakistan Journal of Health Sciences.* 2024;5(11):149-154. doi:10.54393/pjhs.v5i11.2512.
10. Zaidi A, Abdul Karim A, Mohiuddin S, Khan A, Syed A, Jehangir M, Afzal I. Dental sensitivity associated with consumption of fizzy drinks: a cross-sectional study. *Pakistan Journal of Medicine and Dentistry.* 2018;7(4):71-75.
11. Al Hussaini SH, Shah SLS, Shujaat NG, Nasir Z. Relationship between the consumption of beverage use and its effects on oral health: beverage consumption and oral health. *Pakistan Journal of Health Sciences.* 2024;5(6):161-164. doi:10.54393/pjhs.v5i06.1531.
12. Buzatu BLR, Buzatu R, Galuscan A, Luca DA, Rosianu RS, Baleanu O, Vlase T, Jumanca D. Assessing the impact of acidic drinks on the structural integrity of enamel and their consequences for dental aesthetics. *Rom J Oral Rehabil.* 2024;16(4):46-53.
13. Erosive impact of acidic "healthy" beverages on dental enamel: a systematic review (2013–2025). *Preprints.org.* 2025. doi:10.20944/preprints202505.1016.v1.
14. Alsulaimani, A. F., Irgsous, M. S., Aldurgham, S. A., Almutairi, Y. M., Habib, Y. Z., & Mazi, A. F. (2025). Assessing long-term impact of soft drinks and acidic beverages on dental health. *International Journal Of Community Medicine And Public Health*, 12(10), 4769–4773.
15. Arafa A, Filfilan SS, Fansa HA. Erosive effect of beverages on surface hardness and ultra-structure of deciduous teeth enamel. *Pediatr Dent J.* 2022;32(3):186-192. doi:10.1016/j.pdj.2022.08.001
16. Inchingolo F, Dipalma G, Azzollini D, et al. Advances in preventive and therapeutic approaches for dental erosion: a systematic review. *Dent J.* 2023;11(12):274.
17. Hassan HI, Othman SM. Sugar-sweetened beverage consumption and its association with dental caries among adolescents in Erbil, Iraq: a cross-sectional study. *Cureus.* 2024;16(4):e58471.
18. Li Y, Meng L, Zhang Y, et al. Association between sugar-sweetened beverage consumption and childhood overweight and obesity: a cross-sectional study in Beijing, China. *Front Nutr.* 2025;12:1686320.
19. Alves-Costa S, et al. Sugar-sweetened beverage consumption and periodontitis among adults: a population-based cross-sectional study. *J Clin Periodontol.* 2024.
20. Howard Meharry Adolescent Caries Study Group. Sugar-sweetened beverage consumption and caries prevalence among underserved Black adolescents. *J Public Health Dent.* 2024.
21. Wang W. Knowledge, attitude, and practice of patients with oral diseases toward oral examinations: a cross-sectional survey study. *Front Public Health.* 2024;12:1424503.
22. Bayingana JM, et al. Knowledge, attitude and practices towards oral health among secondary school students in Huye district, Rwanda. *Afr Health Sci.* 2024;24(1):250-261.
23. Oral health knowledge, attitudes, and practices among female public health and nutrition university students in Qatar. *Front Public Health.* 2024;12:1405439.
24. Oral health knowledge, attitudes, and practices among university students in Bangladesh: a cross-sectional study. *Discov Public Health.* 2025;22.
25. Karadeniz BKK, Karaman E. Effects of different toothpastes against erosive tooth wear of enamel and dentine in vitro. *BMC Oral Health.* 2024;24(1):1-10.
26. Marschner F, Kanzow P, Wiegand A. Systematic review and meta-analysis on prevalence and anamnestic risk factors for erosive tooth wear in the primary dentition. *Int J Paediatr Dent.* 2024.