Journal of
Oral Health and Oral Epidemiology

https://johoe.kmu.ac.ir
doi:10.34172/johoe.1828
J Oral Health Oral Epidemiol 2026;15:1828

Original Article

Prevalence and Lifestyle Risk Indicators of Non-Carious Cervical Lesions

Amir-Hossein Nasrollahizadeh[1], Faeze Hamze[2*], Seyed-Masoud Sajedi[3]

[1]Shahed Dental School, Shahed University, Tehran, Iran
[2]Operative Dentistry Department, Shahed Dental School, Shahed University, Tehran, Iran
[3]Oral and Dental Disease Department, Shahed Dental School, Shahed University, Tehran, Iran

***Corresponding Author:** Faeze Hamze, Emails: faeze.hamze1363@gmail.com, f.hamzeh@shahed.ac.ir

Abstract

Background: Because of the conflicting data on possible risk factors for the elevated prevalence of non-carious cervical lesions (NCCLs), we conducted this study to investigate whether modern lifestyle patterns affect the occurrence of NCCLs.

Methods: A total of 450 patients were selected randomly, and intraoral examinations to detect NCCLs were performed by two calibrated dentists with inter-evaluator reliability. Afterward, the participants completed a questionnaire on demographics, oral hygiene regimen, medical conditions, diet, parafunctional habits, and some lifestyle data. The data were statistically analyzed using independent t-test, chi-squared test, Mann-Whitney U test, and logistic regression analysis ($\alpha = 0.05$).

Results: The NCCL prevalence was 28%. Four factors, including age, antidepressant use, brushing force, and bruxism, significantly affect the occurrence of NCCLs ($P = 0.047$, 0.0001, 0.0001, and 0.0001, respectively). Gender, occupation, education level, income, acidic food/beverage intake, screen time, sleep duration, time of sleep at night, and gastroesophageal reflux/nausea were not significantly associated.

Conclusion: Understanding NCCL risk indicators is crucial for preventive programs. Some medical conditions, demographic, or habitual risk factors are more important.

Keywords: Antidepressant, Bruxism, Brushing, Lifestyle, Tooth abrasion

Citation: Nasrollahizadeh A, Hamze F, Sajedi S. Prevalence and lifestyle risk indicators of non-carious cervical lesions. J Oral Health Oral Epidemiol 2026;15:1828. doi:10.34172/johoe.1828

Received: January 6, 2026, **Revised:** July 19, 2026, **Accepted:** October 12, 2026, **ePublished:** October 28, 2026

Introduction

Orodental health is a major factor determining the quality of life in human society. Also, certain lifestyle habits can severely affect the onset and development of different dental defects.[1-3] Among these, non-carious cervical lesions (NCCLs) of teeth are a clinical condition that is closely linked to lifestyle patterns, habitual behaviors, and parafunctions.[4-7] In fact, NCCLs are not caused by bacterial invasion or dental caries; rather, they are defined as saucer- or wedge-shaped loss of tooth structure in the cervical area near the cementoenamel junction (CEJ).[8-10] These lesions are quite prevalent in dental observations, and some studies report them as the second leading cause of tooth restoration in permanent dentitions.[11] Moreover, some NCCLs are discovered during routine clinical examinations, even when patients are unaware of their existence.[4] In either case, NCCLs should be carefully monitored in the population because they can cause hypersensitivity, plaque accumulation, tooth fractures, and aesthetic concerns.[12] Therefore, NCCLs have emerged as a major concern in dental public health, and understanding their etiology is critical.[3,13,14] Although several studies have been conducted to evaluate various risk factors for NCCLs, there are still controversial approaches in this subject.[3-6] In particular, some evidence has shown that modern lifestyle patterns may elevate stress levels, depressants, changes in sleep patterns, long hours of media exposure, and even bruxism.[7,15-21] All of these factors could affect the onset of NCCLs[22-25] but this is currently in doubt.

NCCLs are an irreversible loss of tooth structure, and identifying potential risk factors is important for preventing this tooth morbidity in society; this concern is especially relevant when new reports claim the prevalence of NCCLs in adults is as high as 85% in some instances.[26] This growing prevalence may support the impact of modern lifestyles on the occurrence of NCCL. For instance, stress-induced bruxism has been introduced as a reflection of the 21st century in human society.[27] Furthermore, most of the literature agrees that bruxism is one of the primary indicators that can contribute to the development of NCCLs.[14] So, it could be concluded that modern lifestyle patterns would lead to this exacerbated prevalence of NCCL. However, other habitual factors associated with modern living, such as increased consumption of antidepressants,

© 2026 The Author(s); Published by Kerman University of Medical Sciences. This is an open-access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

prolonged screen time, and altered sleep patterns, have been less investigated in NCCL research.

Therefore, because of the lack of available data, the aim of the current study is to explore the prevalence and possible risk factors of NCCLs, with a focus on variables associated with modern lifestyles in human society.

Methods

This cross-sectional descriptive study was completely adjusted according to previous research[28-30] and Helsinki guidelines for human investigations; it was approved by the local ethics committee (1404.001.IR.SHAHED.REC), and all patients signed informed consent before participating in the study.

Sample Size Calculation

Based on the systematic review by Teixeira et al.[1] the overall prevalence of NCCL was 46.7%. Considering the confidence level as 95% ($\alpha = 0.05$) and the margin of error as 0.05, the sample size was obtained as 450 patients by the following formula:

$$n = z^2pq/d^2$$

To ensure random sampling, these 450 patients were selected from 10 different dental clinics in five geographic areas of the city (north, south, east, west, and central part of the city).

Inclusion and Exclusion Criteria

The subjects were enrolled in the study among regular dental attendees between 15 and 89 years old. Inclusion criteria included the ability to understand and read the questionnaire, good health, and at least four eligible unrestored teeth.[5]

The study excluded patients with full-arch porcelain/composite laminate veneers, full-mouth fixed/removable prostheses, full-coverage restorations on any of the four minimum present teeth, trismus, or those unable to complete the questionnaire due to mental or physical disability.[5]

Before starting the work, the procedures were fully explained to the patient, and the patient's consent to enter the study was obtained.[26] Since the study was not interventional, patients did not receive any instructions regarding eating and drinking restrictions.

Calibration of the Examiner

Two examiners who performed the clinical assessments were calibrated by reviewing 15 NCCL patients who attended the clinic (Operative Dentistry Department, Shahed Dental School, Tehran, Iran) over two working days.[31] If the clinicians disagreed with each other, the case was examined by the third dentist, who was more experienced, and the NCCL diagnosis was confirmed or rejected while it was discussed with the others.[32] After that, at least 10 patients were evaluated by both examiners, and an inter-evaluator reliability of 0.9 on Cohen's Kappa was obtained.

Clinical Examination

For the clinical examination, conducted in the morning (8–12 am), the participants were seated in a dental chair under an examination light. Cotton rolls were used for isolation, and the teeth were carefully examined using a sterile mirror and dental probe, as outlined in the WHO Oral Health Survey basic method (2016).[32] The existence of NCCLs on each tooth was recorded on a dental chart. In more detail, the isolated teeth underwent visual and tactile examinations. Macroscopically, loss of tooth structure at the cervical third (that may extend to the mid or occlusal third in severe cases) of the buccal surface was recorded as NCCL, while hard, mineralized tissue was felt on tactile examination, or a sclerotic appearance (yellowish/brown color, manifested as shiny or glassy).[31] Carious lesions were excluded because they showed visible cavitation, demineralized soft tissue, or a rough texture.[33]

Questionnaire

Prior to the study, a researcher designed a questionnaire consisting of six demographic questions and eight questions on habits[34] according to available documentation.[5,6,22,35,36] The validity and reliability of this questionnaire were investigated in the first step.[37] The content validity index (CVI) was 0.88 when it was reviewed by a panel of experts in the Department of Restorative Dentistry, and the interclass correlation coefficient (ICC) was 0.85 after three weeks (reliability) when the questionnaire was filled by a sample population consisting of 20 people.[37]

After completing the clinical examination and recording existing NCCL on the dental chart, the patient was asked to fill in the questionnaire while the dentist supervised the process and helped as needed. The questionnaire had two distinct parts. First, the demographic information included gender, age, education level (illiterate, below diploma, diploma, bachelor's degree, master's degree, doctorate), occupation (unemployed, housewife, employee, retired, self-employed), and income (below or more than 200 million IRR, categorized as low or high income, respectively). The second part of the questionnaire addressed potential indicators of NCCL development such as oral hygiene regime (toothbrushing force with was grouped as forceful or normal), medical conditions (gastroesophageal reflux, frequent stomachache that leads to nausea, and using anti-depressant drugs), diet (intake of acidic foods and beverages which was ranked in three groups including < 1, 1-4, or ≥ 5 days in a week), parafunctional habits (tooth clenching/bruxism that was just recorded as self reprting), and lifestyle pattern (time of going to bed at night, sleeping duration, and screen time) (Supplementary File).

Statistical Analysis

The data were statistically analyzed using independent t-test, chi-squared test, Mann-Whitney U test, and logistic regression analysis ($\alpha = 0.05$).

Results

Our results showed that 126 of 450 participants had NCCL. Hence, the NCCL prevalence was 28% in our population. The mean number of affected teeth in each person was 4.5. As shown in Table 1, only a few participants had generalized NCCLs (over 14 lesions), but most had 1 to 6 affected teeth.

Table 2 shows the association between demographic variables and NCCL. Based on the results, participants with NCCL had a significantly higher mean age ($P = 0.047$). However, gender, occupation, education level, and income did not significantly affect the prevalence of NCCL ($P > 0.05$).

Table 3 shows the relationship between influencing factors and NCCLs. Based on the results, acidic food/beverage intake, screen time, sleep duration, bedtime, and gastroesophageal reflux/nausea did not significantly affect NCCL prevalence ($P > 0.05$). Meanwhile, three factors, antidepressant drug use, brushing force, and bruxism, significantly affected the occurrence of NCCLs ($P = 0.0001$, 0.0001, and 0.0001).

Table 1. Number of teeth containing NCCL in the studied population

Number of teeth with NCCL	Frequency	Percentage
1.00	18	14.3
2.00	30	23.8
3.00	7	5.6
4.00	25	19.8
5.00	7	5.6
6.00	16	12.7
7.00	3	2.4
8.00	4	3.2
9.00	3	2.4
10.00	6	4.8
12.00	1	.8
14.00	3	2.4
15.00	1	.8
18.00	1	.8
21.00	1	.8
Total	126	100.0

Logistic Regression

Our backward logistic regression showed that age, antidepressant use, brushing force, and bruxism could be considered predictive factors in NCCLs ($P = 0.016$, 0.009, 0.001, and 0.0001, respectively).

In more detail, for each additional year of age, the odds of NCCL increased by 2% (OR = 1.02).

Also, using antidepressant drugs, heavier brushing force, and bruxism increased the OR to 2.2, 2.3, and 2.6, respectively.

Discussion

The primary conclusion of this study was the significant correlation between age, the use of antidepressant medications, increased brushing force, and bruxism and the occurrence of NCCL, which aligns with numerous previous reports.[3,8,14,24,38]

One of the most interesting findings of our research is the increased odds of NCCL associated with using antidepressant medications. These types of drugs are unfortunately prevalent in contemporary society,[17,18] and their side effects dictate careful monitoring by dentists.[25] Nevertheless, there is very sparse available data on this

Table 2. The association between demographic variables and NCLL

Variable		With Lesion	Without lesion	*P* value
		Mean (SD)	Mean (SD)	
Age		40.33 (13.75)	37.35 (14.52)	0.047*
		Number (%)	Number (%)	
Sex	Male	56 (44.4)	146 (45.1)	0.906**
	Female	70 (55.6)	178 (54.9)	
Occupation	Unemployed	22 (17.5)	88 (27.2)	0.149**
	Housewife	35 (27.8)	68 (21.0)	
	Employee	22 (17.5)	46 (14.2)	
	Retired	2 (1.6)	10 (3.1)	
	Self-employed	45 (35.7)	112 (34.6)	
Education level	Illiterate	2 (1.6)	9 (2.8)	0.602**
	Below diploma	17 (13.5)	48 (14.8)	
	Diploma	49 (38.9)	110 (34.0)	
	Bachelor's degree	37 (29.4)	84 (25.9)	
	Master's degree	14 (11.1)	42 (13.0)	
	Doctorate	7 (5.6)	31 (9.6)	
Income	High	47 (37.3)	94 (29.0)	0.089**
	Low	79 (62.7)	230 (71.0)	

*Independent t-est
**Pearson's chi-squared test

Table 3. The relationship between influencing factors and NCLL

Variable		With lesion	Without lesion	*P* value*
		Number (%)	Number (%)	
Acidic food/beverage intake	5 days or more	27 (21.4)	45 (13.9)	0.147
	1 to 4 days	65 (51.6)	184 (56.8)	
	Less than 1 day	34 (27.0)	95 (29.3)	
Screen time	No use	3 (2.4)	5 (1.5)	0.628
	Less than 1 hour	11 (8.7)	44 (13.6)	
	1 to 2 hours	18 (14.3)	41 (12.7)	
	2 to 3 hours	21 (16.7)	65 (20.1)	
	3 to 4 hours	25 (19.8)	55 (17.0)	
	More than 4 hours	48 (38.1)	114 (35.2)	
Sleeping duration,	Less than 7 hours	44 (34.9)	118 (36.4)	0.271
	7 to 8 hours	53 (42.1)	158 (48.8)	
	8 to 9 hours	20 (15.9)	29 (9.0)	
	9 to 10 hours	3 (2.4)	6 (1.9)	
	More than 10 hours	6 (4.8)	13 (4.0)	
Time of sleeping at night	Early	72 (57.1)	199 (61.4)	0.405
	Late	54 (42.9)	125 (38.6)	
Gastroesophageal reflux/nausea	Without reflux	96 (76.2)	265 (81.8)	0.181
	With reflux	30 (23.8)	59 (18.2)	
Using antidepressant drugs	Not on medication	98 (77.8)	293 (90.4)	0.0001
	On medication	28 (22.2)	31 (9.6)	
Brushing force	Normal	81 (64.3)	271 (83.6)	0.0001
	Forceful	45 (35.7)	53 (16.4)	
Bruxism	Without bruxism	86 (68.3)	281 (86.7)	0.0001
	With bruxism	40 (31.7)	43 (13.3)	

*Pearson's chi-squared test

subject and, to the best of our knowledge, there is no current literature that explains the relationship between these drugs and NCCL occurrence. Meanwhile, these medications are often prescribed to patients with depression who frequently have TMJ disorders or clenching in conjunction with their depression.[7,15] Furthermore, xerostomia is a main side effect when antidepressants are consumed.[16,23] On the other hand, it has been documented that NCCLs are more frequently observed in patients with xerostomia.[14] Consequently, xerostomia and variations in occlusal loading may be considered as two potential mechanisms that explain the increased incidence of NCCLs in individuals who use antidepressants. This finding in our study is noteworthy, and we strongly recommend further research on this topic to explore the relationship between antidepressant medications and NCCLs.

We found an NCCL prevalence of 28%. Although this prevalence is lower than other reports,[1,3,6,14] it remains a considerable public health issue and underscores the significance of these lesions, given their high prevalence, highlighting the need to investigate risk factors and prevention. For example, our results suggest that brushing techniques focusing on applied force should be better taught in society. Similarly, other researchers also argued for more NCCLs in heavy brushing.[6] Another preventive strategy could be considered using a nightguard in bruxers because several reports like ours documented bruxism as a significant risk factor for NCCLs.[4,5] In fact, both heavy brushing force and bruxism are important preventable factors that most studies agree significantly impact NCCL occurrence.[14]

Moreover, in line with numerous prior studies,[3,8,38] we also observed that NCCL occurrence increases with age. This phenomenon may be explained by changes in tooth microstructure in the elderly, which become more brittle due to increased sclerosis, making teeth more likely to fracture under occlusal loads.[8,38] Additionally, cumulative occlusal stress over many years contributes to a higher incidence of NCCLs in older patients.[3] In this regard, Omosebi et al. reported age as a significant risk indicator for NCCL and found a moderate positive correlation between age and lesion depth, as well as sclerotic degree.[31] Their findings confirm the hypothesis that age affects tooth structure, leading to NCCL. Omosebi et al. had a broad age inclusion criterion ranging from 18 to 60 years,[31] which closely aligns with our specified range. Within this range, dentin microstructure would undoubtedly vary from youth to older age. Interestingly, Fontelle et al, with a considerably narrower spectrum of 18- to 40-year-old patients, also reported a significant association between age > 30 and NCCL.[3] Therefore, it is again confirmed that as patients pass each decade of life, they should be more

monitored and receive preventive care for possible NCCL, while dentists should be more aware of it during routine oral examinations.

According to our results, gender had no significant effect on NCCL occurrence, which is in accordance with some studies[3] but in contrast with some others.[31] Omosebi et al. reported more NCCLs in males and explained this by a more powerful muscular structure leading to heavier brushing habits in males, as well as heavier occlusal force. They also reported that male subjects preferred coarser brush bristles than females.[31] We strongly suggest more investigation on this subject in future studies.

However, the consumption of acidic foods and beverages did not significantly influence the occurrence of NCCLs in our research. This finding is quite controversial with most previous studies[5,6,8,14] and should be investigated further prior to making a definitive statement. Yet, we believe earlier documentation indicating a higher incidence of NCCLs due to increased acidic consumption is more valid than our findings. It is possible that this observation was not adequately addressed in our questionnaire. In fact, a frequently acidic environment can dissolve tooth mineral content, which can lead to lesions.[5,6,8,14] Therefore, we think our study had limitations and lacked adequate analysis of acidic consumption. We strongly suggest more detailed evaluation of this phenomenon in future studies.

Overwhelmingly, the most important strength and novelty of our study was investigating the impact of using antidepressant drugs on NCCL occurrence because these medications are increasingly used in society. Whilst their side effects on salivary secretion have been frequently stated,[16,23] their role in NCCLs has not been investigated.

Meanwhile, the most important limitation of our study was our sample size. A larger study population would better represent society. Therefore, we strongly suggest a larger sample size in future studies. Also, we did not observe a relationship between expected longer screen time or changes in sleep hours and NCCL. We think this observation may reflect a limitation of our questionnaire. Because these may not be adequately captured, we strongly suggest surveying these two phenomena in future studies. In fact, people with longer screen time or abnormal sleep hours are expected to have more NCCLs because both habits can affect the body, for example by elevating stress levels.[19,20] Excessive stress usually leads to bruxism and changes in occlusal forces[7,15,20] that could increase the chance of NCCL, as discussed earlier.[4,5] Furthermore, long screen time and shifting sleep hours have been documented to influence caries risk.[22] Therefore, we strongly suggest more comprehensive studies exploring their effect on NCCL because modern lifestyle has strongly changed these two habits.[19,20]

Conclusion

Under the limitations of the current study, we concluded that some demographic (age) and behavioral (heavy brushing) and medical conditions (bruxism and using antidepressant drugs) could increase the odds of NCCL. However, we did not observe any relationship between NCCL and the other factors investigated.

Authors' Contribution

Conceptualization: Faeze Hamze, Seyed-Masoud Sajedi
Data Curation: Faeze Hamze
Formal Analysis: Faeze Hamze, Amir-Hossein Nasrollahizadeh
Investigation: Amir-Hossein Nasrollahizadeh
Methodology: Faeze Hamze
Project Administration: Faeze Hamze, Seyed-Masoud Sajedi
Supervision: Faeze Hamze
Resource: Faeze Hamze, Seyed-Masoud Sajedi
Validation: Faeze Hamze
Visualization: Amir-Hossein Nasrollahizadeh
Writing–Original Draft: Faeze Hamze
Writing–Review & Editing: Faeze Hamze, Amir-Hossein Nasrollahizadeh

Competing Interests

Authors declare that they have no competing interests.

Data Availability

The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

Declaration of Generative AI and AI-Assisted Technologies

The authors declare that no artificial intelligence (AI) or AI-assisted technologies were used at any stage of the research, analysis, visualization, or writing of this manuscript. The authors assume full responsibility for the entirety of the content presented.

Ethical Approval

The local committee approved this study (1404.001.IR.SHAHED.REC).

Funding

The authors received no funding.

Supplementary File

Questionary File.

References

1. Teixeira DN, Thomas RZ, Soares PV, Cune MS, Gresnigt MM, Slot DE. Prevalence of noncarious cervical lesions among adults: a systematic review. J Dent 2020;95:103285. doi:10.1016/j.jdent.2020.103285
2. Goodacre CJ, Eugene Roberts W, Munoz CA. Noncarious cervical lesions: morphology and progression, prevalence, etiology, pathophysiology, and clinical guidelines for restoration. J Prosthodont 2023;32(2): e1-18. doi:10.1111/jopr.13585
3. Fontelle GA, do Nascimento FY, de Barros Silva PG, Rolim JP. Risk Factors associated with noncarious cervical lesions. J Clin Exp Dent 2024;16(7): e873-8. doi:10.4317/jced.61349
4. Alvarez-Arenal A, Alvarez-Menendez L, Gonzalez-Gonzalez I, Alvarez-Riesgo JA, Brizuela-Velasco A, deLlanos-Lanchares H. Non-carious cervical lesions and risk factors: a case-control study. J Oral Rehabil 2019;46(1):65-75. doi:10.1111/joor.12721
5. Kitasako Y, Ikeda M, Takagaki T, Burrow MF, Tagami J. The prevalence of non-carious cervical lesions (NCCLs) with or without erosive etiological factors among adults of different ages in Tokyo. Clin Oral Investig 2021;25(12):6939-47. doi:10.1007/s00784-021-03984-8
6. Penoni DC, da Silva Nunes Gomes Miranda M, Sader F, Vettore MV, Leão ATT. Factors associated with noncarious cervical

lesions in different age ranges: a cross-sectional study. Eur J Dent 2021;15(2):325-31. doi:10.1055/s-0040-1722092
7. Wieczorek T, Jodkowska A, Orzeszek S, Wieckiewicz M, Michalek-Zrabkowska M, Mazur G, et al. Why am I grinding and clenching? Exploration of personality traits, coping strategies, oral parafunctional behaviors, and severe sleep bruxism in a polysomnographic study. Front Psychiatry 2024;15:1362429. doi:10.3389/fpsyt.2024.1362429
8. Zuza A, Racic M, Ivkovic N, Krunic J, Stojanovic N, Bozovic D, et al. Prevalence of non-carious cervical lesions among the general population of the Republic of Srpska, Bosnia and Herzegovina. Int Dent J 2019;69(4):281-8. doi:10.1111/idj.12462
9. Alvarez-Arenal A, Alvarez-Menendez L, Gonzalez-Gonzalez I, Jiménez-Castellanos E, Garcia-Gonzalez M, deLlanos-Lanchares H. The role of occlusal factors in the presence of noncarious cervical lesions in young people: a case-control study. Oper Dent 2019;44(1): E12-22. doi:10.2341/18-028-c
10. Patano A, Malcangi G, De Santis M, Morolla R, Settanni V, Piras F, et al. Conservative treatment of dental non-carious cervical lesions: a scoping review. Biomedicines 2023;11(6):1530. doi:10.3390/biomedicines11061530
11. Shellis RP, Addy M. The interactions between attrition, abrasion and erosion in tooth wear. Monogr Oral Sci 2014;25:32-45. doi:10.1159/000359936
12. Pikdöken L, Akca E, Gürbüzer B, Aydil B, Taşdelen B. Cervical wear and occlusal wear from a periodontal perspective. J Oral Rehabil 2011;38(2):95-100. doi:10.1111/j.1365-2842.2010.02137.x
13. Turssi CP, Kelly AB, Hara AT. Toothbrush bristle configuration and brushing load: effect on the development of simulated non-carious cervical lesions. J Dent 2019;86:75-80. doi:10.1016/j.jdent.2019.05.026
14. Goyes HD, Pérez JD, de la Cruz MC, Gutierrez B. Noncarious cervical lesions-an approach to the associated factors: a cross-sectional study. World J Dent 2025;16(9):801-12. doi:10.5005/jp-journals-10015-2703
15. Saracutu OI, Manfredini D, Bracci A, Ferrari Cagidiaco E, Ferrari M, Colonna A. Self-reported mandible bracing and teeth clenching are associated with anxiety and depression traits in a group of healthy young individuals. J Oral Facial Pain Headache 2024;38(4):85-90. doi:10.22514/jofph.2024.041
16. Teoh CX, Thng M, Lau S, Taing MW, Chaw SY, Siskind D, et al. Dry mouth effects from drugs used for depression, anxiety, schizophrenia and bipolar mood disorder in adults: systematic review. BJPsych Open 2023;9(2): e53. doi:10.1192/bjo.2023.15
17. Thapar A, Eyre O, Patel V, Brent D. Depression in young people. Lancet 2022;400(10352):617-31. doi:10.1016/s0140-6736(22)01012-1
18. Lunghi C, Dugas M, Leclerc J, Poluzzi E, Martineau C, Carnovale V, et al. Global prevalence of antidepressant drug utilization in the community: protocol for a systematic review. BMJ Open 2022;12(5): e062197. doi:10.1136/bmjopen-2022-062197
19. Nakshine VS, Thute P, Khatib MN, Sarkar B. Increased screen time as a cause of declining physical, psychological health, and sleep patterns: a literary review. Cureus 2022;14(10): e30051. doi:10.7759/cureus.30051
20. Meydila M, Wijaya M, Angreni I. Effects of excessive screen time on neurodevelopment, learning, memory, mental health, and neurodegeneration: a scoping review. In: Kristianti T, ed. Literature Review Practices in Psychology: Contemplative Papers from 2023 Undergraduate Students. Jejak Publisher; 2024. p. 65.
21. Polmann H, Réus JC, Massignan C, Serra-Negra JM, Dick BD, Flores-Mir C, et al. Association between sleep bruxism and stress symptoms in adults: a systematic review and meta-analysis. J Oral Rehabil 2021;48(5):621-31. doi:10.1111/joor.13142
22. Asaka Y, Sekine M, Yamada M, Tatsuse T, Sano M. Association of short sleep duration and long media use with caries in school children. Pediatr Int 2020;62(2):214-20. doi:10.1111/ped.14075
23. Branco NT, Dos Santos Soares AR, Dutra DJB, Ferreira RC, Moreira AN, Zina LG, et al. Salivary factors associated with noncarious cervical lesions: a systematic review. Arch Oral Biol 2024;162:105945. doi:10.1016/j.archoralbio.2024.105945
24. Belenda González I, Montero J, Gómez Polo C, Pardal Peláez B. Evaluation of the relationship between bruxism and/or temporomandibular disorders and stress, anxiety, depression in adults: a systematic review and qualitative analysis. J Dent 2025;156:105707. doi:10.1016/j.jdent.2025.105707
25. Alcázar-Hernández JM, Pecci-Lloret MR, Guerrero-Gironés J. Oral manifestations in patients in treatment with antidepressants: a systematic review. J Clin Med 2024;13(22):6945. doi:10.3390/jcm13226945
26. Morakhia D, Asthana G, Parmar R, Mathirat A, Tamuli R. Clinical evaluation of etiological co-variables, characteristics, and treatment modalities of noncarious cervical lesions. J Conserv Dent Endod 2025;28(4):371-6. doi:10.4103/jcde.Jcde_55_25
27. Smyczek J, Słomian M, Grudnik K, Grudnik M, Jagielski M, Pisarek S, et al. Everyday tensions: bruxism as a reflection of 21st-century stress - narrative review of literature. Wiad Lek 2025;78(7):1403-10. doi:10.36740/WLek/205602
28. Nekouei AH, Baneshi MR, Shahravan A, Haghani J, Sharifi H, Haghdoost A. Comparative performance of four prevalence estimators for untreated dental caries: application to KERCADRS phase III study. J Oral Health Oral Epidemiol 2026;15(1):1-9. doi:10.34172/.johoe.2509.1793
29. Mohamed ZU, Penmetsa A, Cheeli S, Peddi R, Mettapalli Sai P, Akula S. Assessment of OXIS contact areas in primary molars using intraoral camera in West Godavari district, India (2025): a cross-sectional study. J Oral Health Oral Epidemiol 2026;15(1):1-5. doi:doi:10.34172/johoe.2508.1777
30. Ravi K, Prasad V, Priyadharshini I, Jagadeson M. A comparison of subjective and objective caries risk assessment methods. J Oral Health Oral Epidemiol 2024;13(2):67-71. doi:10.34172/johoe.2307.1573
31. Omosebi TO, Adebayo GE, Omoruyi CO, Soledolu TE, Adebiyi KE, Amaechi BT. Clinical features of non-carious cervical lesions: an observational clinical study. Clin Cosmet Investig Dent 2026;18:585513. doi:10.2147/ccide.S585513
32. Meka Giridhara S, Chandrappa V, Penmatsa C, Kadidal U, Peddi R, Manumanthu Venkata R. Prevalence of tooth mortality among 6-13 year-old school children. J Oral Health Oral Epidemiol 2025;14(1):1-5. doi:10.34172/johoe.2501.1705
33. Towle I, Krueger KL, Hirata K, Kubo MO, Hara AT, Irish JD, et al. Non-carious cervical lesions in wild primates: implications for understanding toothpick grooves and abfraction lesions. Am J Biol Anthropol 2025;188(2): e70132. doi:10.1002/ajpa.70132
34. Hashemipour MA, Saeedi G, Afshari Z, Ganjalikha Nassab AR. Awareness and performance of dentists and general practitioners regarding dry mouth. J Oral Health Oral Epidemiol 2025;14(1):1-7. doi:10.34172/johoe.2403.1630
35. Crisóstomo JV, Bezerra BO, da Ponte Melo MG, Rocha-Novais PM, de Moraes MD. Prevalence of non-carious cervical lesions and cervical dentinary hypersensitivity in undergraduate students. Rev Odontol UNESP 2021;50: e20210051. doi:10.1590/1807-2577.05121
36. Ogawa M, Ogi H, Nakamura D, Nakamura T, Izawa KP.

Association between insufficient sleep and dental caries among preschoolers in Japan: a cross-sectional multicentre study. Eur J Investig Health Psychol Educ 2021;12(1):1-10. doi:10.3390/ejihpe12010001

37. Alaee A, Navabi N, Chamani G, Afshari Z, Estabraghi E, Sharifzadeh SS. A cross-sectional study on epidemiological trends and determinants influencing self-monitoring of oral mucosal conditions at Kerman dental school, Iran (2021-2022). J Oral Health Oral Epidemiol 2026;15(1):1-6. doi:10.34172/johoe.2504.1730
38. Igarashi Y, Yoshida S, Kanazawa E. The prevalence and morphological types of non-carious cervical lesions (NCCL) in a contemporary sample of people. Odontology 2017;105(4):443-52. doi:10.1007/s10266-017-0300-y