THE INFLUENCE OF CHRONIC STRESS ON ORAL HEALTH: A LITERATURE REVIEW

Wpływ przewlekłego stresu na zdrowie jamy ustnej: przegląd literatury

Piotr Suski[1], Oskar Dominik Tokarczuk[2], Jakub Rybowski[3], Gabriela Durlej[4], Monika Biniek[5], Kacper Buczek[4]

1. *Dental Office, Corten Dental, Poland*
2. *Orthodontic Office, NZOZ Ortomix, Poland*
3. *Medical University of Lublin, Student Research Group at the Chair and Department of Oral Medicine, Poland*
4. *Medical Department, Medical University of Lublin, Poland*
5. *Dental Office, Biniek Clinic, Poland*

Piotr Suski – 0009-0003-6339-9143
Oskar Dominik Tokarczuk – 0000-0003-3020-3266
Jakub Rybowski – 0009-0002-6860-7805
Gabriela Durlej – 0009-0000-5632-0423
Monika Biniek – 0009-0009-7290-2138
Kacper Buczek – 0009-0005-0521-3536

Abstract

Chronic stress, particularly in the context of post-traumatic stress disorder, has significant implications for oral health due to its multifaceted physiological, psychological, and behavioral effects. This review outlines the key mechanisms and clinical consequences of chronic stress on oral health outcomes, drawing on findings from a systematic review of 16 studies. Post-traumatic stress disorder has been strongly associated with an increased prevalence of periodontitis, bruxism, xerostomia, and temporomandibular disorders. Chronic activation of the stress response disrupts autonomic regulation and systemic immune function, exacerbating oral health conditions. Behavioral factors such as poor oral hygiene and increased tobacco use further contribute to periodontal disease, while psychological stress amplifies pain perception in conditions like temporomandibular disorders and chronic orofacial pain. Pharmacological treatments for post-traumatic stress disorder, including selective serotonin reuptake inhibitors, while effective in managing psychological symptoms, frequently cause hyposalivation, leading to xerostomia and increased risk of dental caries and periodontal disease. Bruxism, prevalent among individuals with post-traumatic stress disorder, is strongly linked to elevated stress levels, resulting in significant wear and damage to teeth, as well as contributing to orofacial pain and temporomandibular disorders. Insomnia and sleep disturbances, common among post-traumatic stress disorder sufferers, impair immune function and tissue regeneration, further heightening susceptibility to oral infections and delaying wound healing. The bidirectional relationship between post-traumatic stress disorder and chronic orofacial pain underscores the need for integrated care that addresses both physical and psychological health. Multidisciplinary approaches incorporating trauma-informed care and tailored oral health interventions are critical for mitigating the oral health challenges faced by individuals with post-traumatic stress disorder. These strategies not only improve oral health outcomes but also enhance overall well-being by addressing systemic inflammation and psychological distress. Future research should focus on optimizing treatment protocols and fostering collaboration between dental and mental health professionals.

Streszczenie

Przewlekły stres, szczególnie w kontekście zespołu stresu pourazowego, ma istotny wpływ na zdrowie jamy ustnej ze względu na swoje złożone skutki fizjologiczne, psychologiczne i behawioralne. W niniejszym przeglądzie przedstawiono kluczowe mechanizmy oraz implikacje kliniczne przewlekłego stresu dla zdrowia jamy ustnej, opierając się na wynikach systematycznego przeglądu literatury obejmującego 16 badań. Zespół stresu pourazowego jest silnie powiązany z wyższą częstością występowania periodontopatii, bruksizmu, kserostomii oraz zaburzeń stawu skroniowo-żuchwowego. Przewlekła aktywacja odpowiedzi na stres zaburza regulację autonomiczną i funkcje układu immunologicznego, pogłębiając problemy zdrowotne jamy ustnej. Czynniki behawioralne, takie jak zaniedbywanie higieny jamy ustnej czy zwiększone spożycie tytoniu, dodatkowo przyczyniają się do rozwoju chorób przyzębia, podczas gdy stres psychologiczny nasila percepcję bólu w schorzeniach takich jak zaburzenia stawu skroniowo-żuchwowego i przewlekły ból twarzy. Farmakoterapia zespołu stresu pourazowego, w tym stosowanie selektywnych inhibitorów wychwytu zwrotnego serotoniny, choć skuteczna w leczeniu objawów psychologicznych, często prowadzi do hiposaliwacji, powodując kserostomię oraz zwiększone ryzyko próchnicy i chorób przyzębia. Bruksizm, częsty u pacjentów z zespołem stresu pourazowego, jest silnie związany z podwyższonym poziomem stresu, co skutkuje znacznym zużyciem i uszkodzeniem zębów oraz przyczynia się do bólu twarzy i zaburzeń stawu skroniowo-żuchwowego. Bezsenność i zaburzenia snu, powszechne wśród osób z zespołem stresu pourazowego, osłabiają funkcje układu odpornościowego i regenerację

tkanek, co zwiększa podatność na infekcje jamy ustnej oraz opóźnione gojenie się ran. Dwukierunkowa relacja między zespołem stresu pourazowego a przewlekłym bólem twarzy podkreśla potrzebę zintegrowanej opieki, uwzględniającej zarówno aspekty fizyczne, jak i psychiczne. Podejście wielodyscyplinarne, obejmujące opiekę dostosowaną do traumatycznych doświadczeń oraz ukierunkowane interwencje stomatologiczne, jest kluczowe dla łagodzenia problemów zdrowotnych jamy ustnej u pacjentów z zespołem stresu pourazowego. Takie strategie poprawiają nie tylko zdrowie jamy ustnej, ale także ogólne samopoczucie, redukując stan zapalny i stres psychologiczny. Przyszłe badania powinny koncentrować się na optymalizacji protokołów leczenia oraz współpracy między specjalistami z zakresu zdrowia psychicznego i stomatologii.

Keywords: PTSD; post-traumatic stress disorder; oral health; chronic stress

Słowa kluczowe: PTSD; zespół stresu pourazowego; zdrowie jamy ustnej; przewlekły stres

DOI 10.53301/lw/203563

Received: 26.01.2025

Accepted: 31.03.2025

Corresponding author:
Oskar Dominik Tokarczuk
Orthodontic Office, NZOZ Ortomix,
25 Bursaki Str., 20-150 Lublin
e-mail: tokarczukoskar@gmail.com

Introduction

The intricate relationship between mental and physical health plays a significant role in oral health outcomes. Psychological conditions, such as depression and anxiety, often lead to the neglect of oral hygiene practices, resulting in a higher prevalence of dental caries, periodontal disease, and other oral pathologies. For instance, individuals with severe mental illness may exhibit reduced self-care abilities, contributing to poor oral health outcomes and increased risk of oral infections [1, 2]. Moreover, systemic conditions like diabetes mellitus or cardiovascular disease are strongly linked to oral health deterioration, emphasizing the bidirectional connection between systemic health and oral well-being [3].

Post-traumatic stress disorder (PTSD) is a psychological condition that can result from exposure to traumatic events, such as warfare, accidents, physical violence, or other extreme stressors. PTSD affects overall health, including oral health, and can lead to both physiological and psychological consequences for the oral cavity and teeth. PTSD is characterized by persistent re-experiencing of the traumatic event, avoidance behaviors, and negative alterations in cognition and mood. While PTSD is the most widely recognized disorder following trauma exposure, other stress-related conditions, such as acute stress disorder and generalized anxiety disorder, share overlapping symptoms, including intrusive thoughts and hypervigilance.

However, PTSD is distinct in its prolonged duration and intensity, often leading to significant functional impairment [4]. PTSD poses significant challenges to the mental health of military personnel, often exacerbated by their exposure to combat and operational stressors. Studies reveal that military service is inherently associated with elevated rates of PTSD, depression, and anxiety disorders [5].

Emerging evidence suggests that PTSD has a direct and multifaceted impact on oral health. Individuals with PTSD are more prone to bruxism (teeth grinding). This behavior may occur as a result of chronic stress, a common symptom of PTSD. Stress leads to increased muscle tension, and teeth grinding is one of the physiological mechanisms through which the body responds to this tension, especially during sleep.

PTSD is also frequently associated with poor oral hygiene, which can lead to oral mucositis and periodontal diseases. Chronic stress and depression, both common among PTSD sufferers, contribute to decreased motivation to maintain proper oral care, which in turn increases the risk of caries and gum disease [6].

Pharmacological treatments, particularly antidepressant medications such as selective serotonin reuptake inhibitors (SSRIs), are a cornerstone in managing PTSD and other mood disorders. Despite their efficacy, these medications frequently produce adverse effects on oral health, including hyposalivation (reduced salivary flow) [7]. Hyposalivation can lead to xerostomia (dry mouth), which in turn promotes the development of dental caries, periodontal disease, and oral discomfort [8]. Additionally, the use of certain antidepressants has been linked to changes in oral microbiota and impaired wound healing, further complicating oral health outcomes [9].

Insomnia and other sleep disturbances, common in PTSD, may also contribute to the deterioration of oral health. Poor sleep reduces the body's ability to regenerate, which can weaken immune function and make individuals more susceptible to infections, including those affecting the oral cavity [10].

These behaviors, combined with psychological stressors, contribute to a cycle of worsening oral and systemic health. The aim of this review is to synthesize the available literature on the impact of PTSD and stress on oral health, highlighting the challenges faced in clinical dentistry and outlining the need for further research to improve treatment protocols in this area.

Material and methods

The literature review was conducted utilizing the PubMed database to ensure comprehensive coverage of relevant studies. The inclusion criteria for article selection were as follows: availability in either Polish or English, and

thematic focus on the relationship between stress – specifically PTSD – and oral health. Particular emphasis was placed on studies exploring the physiological, psychological, and behavioral pathways through which PTSD affects oral health outcomes. After applying these criteria, 14 articles were deemed eligible and included in the final review, providing a robust foundation for analyzing the interplay between PTSD and oral health.

Discussion

PTSD and periodontal health

PTSD is strongly associated with a higher prevalence of periodontitis, primarily due to both behavioral and physiological factors. Tagger-Green et al. reported that individuals with PTSD exhibit a significantly higher prevalence of severe periodontal disease (66.2%), which was attributed to neglected oral hygiene, increased tobacco use, and systemic immune system alterations caused by chronic stress [11]. Similarly, Muhvić-Urek et al. demonstrated that Croatian war veterans with PTSD displayed markedly worse oral health outcomes, including advanced periodontal disease and tooth loss, when compared to individuals without PTSD [12].

In addition to these clinical findings, De Oliveira Solis et al. highlighted that PTSD alters pain perception during periodontal probing. Patients with PTSD reported significantly higher pain scores (VAS >40 mm) compared to controls, despite no significant differences in periodontal clinical parameters. This underscores the role of psychological factors in modulating the experience of oral pain [13].

PTSD and bruxism

Bruxism, both during wakefulness and sleep, is commonly reported among individuals with PTSD. Tagger-Green et al. observed a notably high prevalence of bruxism (90.1%) among PTSD patients, which they linked to elevated stress levels and parafunctional behaviors [11]. Similarly, De Oliveira Solis et al. reported that PTSD patients are over three times more likely to exhibit awake bruxism, a condition frequently accompanied by orofacial pain [14].

Knibbe et al. further confirmed that PTSD severity correlates with higher rates of both awake (48.3%) and sleep bruxism (40.1%), with significantly greater prevalence compared to the general population (p <0.001) [15]. Importantly, therapeutic interventions targeting both physical and psychological symptoms have shown promise. Wörner et al. demonstrated that combined therapies, including splint therapy, massage, and jaw exercises, significantly reduced bruxism-related symptoms and improved quality of life in PTSD patients [16]. Furthermore, PTSD-focused treatments have been shown to reduce bruxism prevalence over time, highlighting the importance of trauma-informed care approaches [17].

PTSD and temporomandibular disorders

Temporomandibular disorders (TMD) represent another critical issue among patients with PTSD. Al-Khudhairy et al. found that PTSD exacerbates TMD symptoms, resulting in chronic pain, a lowered pain threshold, and diminished treatment efficacy [18]. Minervini et al. demonstrated that more than half (56.2%) of war veterans with PTSD exhibited signs of TMD, including pain on muscle palpation and disc displacement, compared to only 20.18% in non-exposed controls [19].

The association of chronic orofacial pain and TMD in PTSD patients is further supported by De Leeuw et al., who reported that 15% of individuals with chronic orofacial pain also exhibited PTSD symptoms. These patients experienced more severe pain and greater psychological distress compared to those without PTSD [20]. Yap et al. emphasized the significant role of psychological factors in amplifying TMD-related pain, noting high rates of depression (39%) and somatization (55%) among TMD patients [21]. The negative impact of TMD on oral health-related quality of life (OHRQoL) has also been well documented. Almoznino et al. observed that TMD patients frequently reported severe physical pain and psychological discomfort, which impaired daily functioning [22]. Similarly, Miettinen et al. found that women with TMD exhibited significantly worse OHRQoL, with depression and somatization being major contributing factors [17].

PTSD and poor oral hygiene

PTSD is closely linked to poor oral hygiene practices, significantly contributing to oral health deterioration. Tagger-Green et al. attributed the elevated prevalence of periodontitis among PTSD patients to neglected daily oral hygiene and increased tobacco use, which are often associated with chronic stress and psychological distress [11]. Similarly, Muhvić-Urek et al. reported that war veterans with PTSD exhibited poorer overall oral health, including more severe periodontal conditions and greater tooth loss, compared to the general population [12].

Conclusions

The reviewed evidence underscores a strong association between PTSD and various oral health issues, particularly periodontal disease, bruxism, xerostomia, and temporomandibular disorders (TMD). PTSD significantly exacerbates these conditions, as seen in higher rates of severe periodontal disease, TMD, and bruxism among PTSD patients compared to controls. Psychological comorbidities – such as depression and somatization – further amplify pain perception and impair oral health, particularly in TMD patients.

The bidirectional relationship between PTSD and chronic orofacial pain suggests that these conditions mutually exacerbate one another, underscoring the need for integrated care that addresses both physical and psychological health. Interventions focusing on trauma-specific treatments have shown promise, with evidence of reduced severity of TMD and bruxism, improved pain management, and enhanced quality of life.

Both xerostomia, temporomandibular joint pain, and periodontal disease are common health issues among individuals with PTSD, associated with both the direct effects of post-traumatic stress and its indirect consequences, such as dysregulation of the autonomic

nervous system, medication use, and neglect of oral hygiene.

Addressing these interrelated health issues requires a multidisciplinary approach that includes both psychological and dental aspects. It is important for individuals with PTSD to be aware of these potential health problems and to regularly consult with a dentist and mental health professionals to effectively manage both the emotional and physical aspects of their health.

Tailored oral health care strategies, incorporating mental health evaluations and interventions, are essential for managing PTSD-related oral health disturbances. Such approaches not only improve oral health outcomes but may also mitigate systemic inflammation and enhance overall well-being. These findings highlight the critical need for a multidisciplinary approach in the treatment of PTSD patients with oral health challenges.

References

1. Kisely S. No mental health without oral health. Can J Psychiatry, 2016; 61: 277–282. doi: 10.1177/0706743716632523
2. Kisely S, Baghaie H, Lalloo R, et al. A systematic review and meta-analysis of the association between poor oral health and severe mental illness. Psychosom Med, 2015; 77: 83–92. doi: 10.1097/PSY.0000000000000135
3. Ho HD, Satur J, Meldrum R. Perceptions of oral health by those living with mental illnesses in the Victorian Community – The consumer's perspective. Int J Dent Hyg, 2018; 16: e91–e98. doi: 10.1111/idh.12278
4. Stein DJ, McLaughlin KA, Koenen KC, et al. DSM-5 and ICD-11 definitions of posttraumatic stress disorder: investigating "narrow" and "broad" approaches. Depress Anxiety, 2014; 31: 494–505. doi: 10.1002/da.22279
5. O'Toole BI, Marshall RP, Grayson DA, et al. The Australian Vietnam Veterans Health Study: III. Psychological health of Australian Vietnam veterans and its relationship to combat. Int J Epidemiol, 1996; 25: 331–340. doi: 10.1093/ije/25.2.331
6. Asiri A, Nazir MA, Alsharief M et al. Effect of psychological distress on oral health: a cross-sectional study. Oral Health, 2024; 24: 1508. doi: 10.1186/s12903-024-05319-x
7. Bhatia A, Sharma RK, Tewari S, et al. Effect of fluoxetine on periodontal status in patients with depression: A cross-sectional observational study. J Periodontol, 2015; 86: 927–935. doi: 10.1902/jop.2015.140706
8. Aguiar JC, Gomes EP Fonseca-Silva T, et al. Fluoxetine reduces periodontal disease progression in a conditioned fear stress model in rats. J Periodontal Res, 2013; 48: 632–637. doi: 10.1111/jre.12049
9. Branco-de-Almeida LS, Franco GC, Castro ML, et al. Fluoxetine inhibits inflammatory response and bone loss in a rat model of ligature-induced periodontitis. J Periodontol, 2012; 83: 664–671. doi: 10.1902/jop.2011.110370
10. Abbas MA, Shajikumar V, Bashir S, et al. The complex relationship between insomnia and post-traumatic stress disorder (PTSD): A systematic review. J Popul Ther Clin Pharmacol, 2024; 31: 2663–2669. doi: 10.53555/0vr5j213
11. Tagger-Green N, Nemcovsky C, Gadoth N, et al. Oral and dental considerations of combat-induced PTSD: A descriptive study. Quintessence Int, 2020; 51: 678–685. doi: 10.3290/j.qi.a44809
12. Muhvić-Urek M, Uhač I, Vukšić-Mihaljević Ž, et al. Oral health status in war veterans with post-traumatic stress disorder. J Oral Rehabil, 2007; 34: 1–8. doi: 10.1111/j.1365-2842.2006.01674.x
13. de Oliveira Solis AC, Araújo AC, Corchs F, et al. Impact of post-traumatic stress disorder on oral health. J Affect Disord, 2017; 219: 126–132. doi: 10.1016/j.jad.2017.05.033
14. de Oliveira Solis AC, Corchs F, Duran EP, et al. Self-reported bruxism in patients with post-traumatic stress disorder. Clin Oral Investig, 2024; 28: 152. doi: 10.1007/s00784-024-05534-4
15. Knibbe W, Lobbezoo F, Voorendonk EM, et al. Prevalence of painful temporomandibular disorders, awake bruxism, and sleep bruxism among patients with severe post-traumatic stress disorder. J Oral Rehabil, 2022; 49: 1031–1040. doi: 10.1111/joor.13367
16. Wörner F, Eger T, Simon U, et al. Lifespan of splints in a sample of German soldiers hospitalized with post-traumatic stress disorder in combination with sleep bruxism and painful temporomandibular disorder. Oral Health Prev Dent, 2024; 22: 249–256. doi: 10.3290/j.ohpd.b5569645
17. Miettinen O, Lahti S, Sipilä K. Psychosocial aspects of temporomandibular disorders and oral health-related quality of life. Acta Odontol Scand, 2012; 70: 331–336. doi: 10.3109/00016357.2011.654241
18. Al-Khudhairy MW, Al-Mutairi A, Al Mazyad B, et al. The association between post-traumatic stress disorder and temporomandibular disorders: a systematic review. Cureus, 2022; 14: e31896. doi: 10.7759/cureus.31896
19. Minervini G, Franco R, Marrapodi MM, et al. Post-traumatic stress, prevalence of temporomandibular disorders in war veterans: Systematic review with meta-analysis. J Oral Rehabil, 2023; 50: 1101–1109. doi: 10.1111/joor.13535
20. De Leeuw R, Bertoli E, Schmidt JE, Carlson CR. Prevalence of post-traumatic stress disorder symptoms in orofacial pain patients. Oral Surg Oral Med Oral Pathol Oral Radiol Endod, 2005; 99: 558–568. doi: 10.1016/j.tripleo.2004.05.016
21. Yap AU, Tan KB, Chua EK, Tan HH. Depression and somatization in patients with temporomandibular disorders. J Prosthet Dent, 2002; 88: 479–484. doi: 10.1067/mpr.2002.129375
22. Almoznino G, Zini A, Zakuto A, et al. Oral health-related quality of life in patients with temporomandibular disorders. J Oral Facial Pain Headache, 2015; 29: 231–241. doi: 10.11607/ofph.1413