



# Chronic Stress in Children and Adolescents: The Impact of Oral Health

Luciana de Barros Correia Fontes, Juliana de Lima Teixeira\*, Clara Franciely da Mota Sousa, Brenda Rocha Borba de Andrade, Nayara Ferreira da Silva, Ana Camilly Oliveira da Costa, Brigida Sheyla Damaso Bem, Gabriela de Souza Ferreira, Niedje Siqueira de Lima, Maria da Conceicao de Barros Correia and Katia Maria Goncalves Marques

Federal University of Pernambuco, Brazil

\*Corresponding author: Juliana de Lima Teixeira, Federal University of Pernambuco Rua Ester Foigel, 110, ap. 1102, Iputinga. 50721-440, Recife, Pernambuco, Brazil

Received: 📅 April 12, 2019

Published: 📅 April 22, 2019

## Abstract

The aim of this mini review was to inform possible changes in oral conditions related to chronic stress in children and adolescents. It was considered a literature review in the PubMed, Lilacs and Scielo databases according to the descriptors Oral Health; Stress, Psychological; Child and Adolescent. It was also adopting the inclusion and exclusion criteria. Six articles were selected. There was a consensus on the relationship between stress and poor oral health condition, but there is a lack of articles lack of information about the impact of chronic stress with specific oral problems in this age group.

**Keywords:** Oral health; Stress; Psychological; Child; Adolescent

## Introduction

Stress is nonspecific response of the body to aggressions of a physical, psychic and infectious order capable of disturbing its equilibrium. The excess of stress can produce alterations at any neuroendocrine level of the organism thus establishing the stress / disease relationship, which explains the participation of psychic factors in the development of certain conditions in the oral health [1].

Early life experiences are fundamental in shaping both the development of the stress response system and how an individual responds to stress across the lifespan. Exposure to a wide range of adversity (low socioeconomic status, child maltreatment, parental depression, etc.) has been associated with the development of internalizing syndromes (i.e., depression, anxiety), and dysregulation of stress-sensitive systems-in particular, the Hypothalamic-Pituitary-Adrenal (HPA). Profiles of high and/or sustained cortisol (rising morning cortisol and eventual hyperactivation during acute stress exposure) elevation during psychosocial stress were associated with child anxiety symptoms and risk for internalizing disorders [2].

Biomarkers of chronic stress are described, including primary mediators (glucocorticoids, catecholamines, and cytokines) and secondary outcomes (neurologic, immune, metabolic, cardiovascular, respiratory, and anthropometric) of the chronic stress response. The incorporation of chronic stress biomarkers into pediatric research studies may provide valuable insight into the mechanisms through which stressful environments “get under the skin” and ultimately inform efforts to promote health and reduce inequities among children exposed to adversity [3].

Oral biofilm and its molecular analysis provide a basis for investigating various dental research and clinical questions. Knowledge of biofilm composition leads to a better understanding of cariogenic and periopathogenic mechanisms. Microbial changes taking place in the oral cavity during childhood are of interest for several reasons. The evolution of the child oral microbiota and shifts in its composition need to be analyzed further to understand and possibly prevent the onset of disease. At the same time, advanced knowledge of the natural composition of oral biofilm is needed [4].

Salivary glands produce a bicarbonate-rich fluid containing digestive and protective proteins and other components to be delivered into the gastrointestinal tract. Its function is under strict control of the autonomic nervous system. Salivary electrolyte and fluid secretion are primarily controlled by parasympathetic activity, while protein secretion is primarily triggered by sympathetic stimulation. Stress activates the hypothalamic - pituitary - adrenal axis. The peripheral limb of this axis is the efferent sympathetic/adrenomedullary system. Stress reaction, even if it is sustained for long, does not cause obvious damage to salivary glands. However, stress induces dramatic changes in the constituents of secreted saliva. Since salivary protein secretion is strongly dependent on sympathetic control, changes in saliva can be utilized as sensitive stress indicators, salivary stress biosensors, such as amylase, cortisol, heat shock proteins and other compounds [5].

Individuals with greater perceived stress also report poorer oral health, and that this relationship is modified by dental insurance and socioeconomic position. It is necessary more investigations about psychological stress in the development of oral disease [6].

The aim of this mini review was to inform possible changes in oral conditions related to chronic stress in children and adolescents. A systematic search was performed of the PubMed, Lilacs and Scielo databases, adopting the descriptors (Advanced Search): Oral Health; Stress, Psychological; Child and Adolescent. There were included articles of any date or language. The exclusion criteria included works with no scientific paper format, repeated articles or with different age groups.

Evaluating the associations between gingivitis, emotional status and quality of life in 64 students, between 11 to 12 years old, Silva et al. [7] concluded that older children are more likely to experience gingival bleeding. The presence of gingivitis in children may be associated with worse psychological well-being, possibly compromising the quality of life.

Baad & Jagtab [8] studied the behavior disorders in children between 5 to 15 years and their correlations to the stress and orofacial findings. According to these authors behavior disorders with orofacial lesions was more common in age group of 8 to 10 years. The children were continuously under stress, which manifested in the form of various orofacial disorders or oral lesions associated with deleterious oral habits.

Rodríguez-Archilla & Raissouni [9] in a study to analyses the Recurrent Aphthous Stomatitis (RAS) showed that main clinical characteristics were family story of RAS, first episode at  $\geq 10$  years of age, one lesion per episode, localization at the tongue, recurrent episodes per year, stress as predisposing factor, symptom disappears in 2 days and healing of lesions in 8 days.

Tikhonova et al. [10] conducted a review about stress-related changes in saliva and dental caries. They identified 232 reports and included six studies in their review. All studies were conducted in

children and used salivary cortisol as stress marker. The studies varied by design, types of stressors, children's caries experience, methods of saliva collection. Four studies reported a positive association between saliva cortisol levels and caries while the other two reported no association. These authors concluded that there is lack of evidence about an association between stress-related changes in saliva and caries. Well-designed longitudinal studies with rigorous measurement technics for stress, saliva and dental caries are necessary. This will help to generate new insights into the multifactorial etiology of caries and provide evidence for a rational method for its control.

Arman et al. [11] evaluated the relationship between stress and self-perceived oral health status among high school students population, with a representative sample of 200 15 to 19-year-old students from Lithuania. These authors demonstrated a high prevalence of stress and that increased stress level might be a risk indicator and have negative outcome to oral health, particularly gastroesophageal reflux disease, bruxism signs, dental decay and gum problems.

Al-Khotani et al. [12] investigated if psychosocial problems in children and adolescents are associated with Temporomandibular Disorders with pain (TMD-pain) and TMD without pain (TMD-painfree) when compared to children and adolescents without TMD. The authors selected 456 children and adolescents, between 10 to 18 years of age in 20 schools in Jeddah, the major city in South Arabia. They observed that TMD-pain in children and adolescents does not seem to affect the social activities. However, TMD-pain seem to have a strong association to emotional, behavior and somatic functioning, with higher frequencies of anxiety, depression, somatic problems, aggressive behavior and thought problems, than children and adolescents without TMD-pain.

## Conclusion

Six articles were selected. There was a consensus on the relationship between stress and poor oral health condition, but there is a lack of information about the impact of chronic stress with specific oral problems in this age group in longitudinal studies.

## References

1. Esguep SA, Soto M, Rojas G (1997) Psychological disorders in the etiopathogenesis of the oral mucous pathology. *Rev Fac Odontol Univ Chile jul-dic 15(2)*: 15-23.
2. Laurent HK, Gilliam KS, Wright DB, Fisher PA (2015) Child anxiety symptoms related to longitudinal cortisol trajectories and acute stress responses: evidence of developmental stress sensitization. *J Abnorm Psychol 124(1)*: 68-79.
3. Condon EM (2018) Chronic stress in children and adolescents: a review of biomarkers for use in pediatric research *Biol Res Nurs 20(5)*: 473-496.
4. Santigli E, Koller M, Klug B (2017) Oral biofilm sampling for microbiome analysis in healthy children. *J Vis Exp 31(130)*: e56320.
5. Keremi B, Beck A, Fabian TK, Szabo G, Nagy A, et al. (2017) Stress and salivary glands *Curr Pharm Des 23(27)*: 4057-4065.

6. Vasiliou A, Shankardass K, Nisenbaum R, Quiñonez C (2016) Current stress and poor oral health BMC Oral Health16(1): 88.
7. Silva PL, Barbosa TS, Amato JN, Montes AB, Gavião MB (2015) Gingivitis, psychological factors and quality of life in children Oral Health Prev Dent 13(3): 227-235.
8. Baad RK, Jagtap K (2012) The study of role of stress in children with behavior disorders and orofacial lesions. J Contemp Dent Pract Jul 13(4): 559-561.
9. Rodríguez Archilla A, Raissouni T (2018) Clinical study of 200 patients with recurrent aphthous stomatitis Gac Med Mex 154(2): 166-171.
10. Tikhonova S, Booi L, D Souza V, Crosara KTB, Siqueira Wl, Emami E (2018) Investigating the association between stress, saliva and dental caries: a scoping review BMC Oral Health Mar 18(1): 41.
11. Arman K, Petruninaitė A, Grigalauškinė R, Slabšinkienė E (2016) Stress experience and effect on self-perceived oral health status among high school students Stomatologia 18(3): 75-79.
12. Al Khotani A, Naimi Akbar A, Gielset M, Albadawi E, Bello L, et al. (2016) The associations between psychosocial aspects and TMD pain related aspects in children and adolescents. J Headache Pain 17: 30.

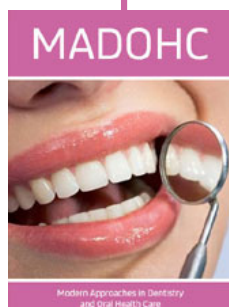


This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article Click Here:

[Submit Article](#)

DOI: [10.32474/MADOHC.2019.03.000167](https://doi.org/10.32474/MADOHC.2019.03.000167)



### Modern Approaches in Dentistry and Oral Health Care

#### Assets of Publishing with us

- Global archiving of articles
- Immediate, unrestricted online access
- Rigorous Peer Review Process
- Authors Retain Copyrights
- Unique DOI for all articles