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OBESITY, POCRESCOPHOBIA AND ORAL HEALTH

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ABSTRACT

Oral health plays a crucial role in obesity management. Scientific evidence suggests an association between obesity and oral diseases, including periodontal disease, dental caries, tooth erosion, xerostomia, and dentinal hypersensitivity. Maintaining optimal oral health is essential for obese patients, as compromised dentition or oral discomfort can influence dietary habits. However, managing oral health in obese individuals can be challenging due to anatomical limitations and lifestyle choices. A profound knowledge of obesity and its manifestations is essential for oral health professionals to raise awareness and provide patients with comprehensive care.

Pocrescophobia also known as obesophobia, is an intense fear of gaining weight. It affects both adolescent women and men, manifesting as an irrational dread associated with weight gain. Like other phobias, obesophobia falls under the umbrella of anxiety disorders, leading to exaggerated anxiety when discussing or thinking about weight gain. Individuals with this fear may go to extreme lengths to avoid weight gain, which can increase the risk of developing eating disorders. Stress can lead to bruxism, wear away the occlusal surfaces and incisal edges, resulting in flat, shorter teeth. Smooth V-shaped cavities arise when lateral stresses surpass physiological limitations, resulting in gum recession and tooth discomfort. Canker sores, xerostomia, and lichen planus have all been linked to stress.

By addressing both obesophobia and obesity as well as oral health, patients' overall well-being and quality of life can be improved.

Keywords: *obesity, oral health, phobic disorders, pocrescophobia.*

“Obesity is the biggest disease of Mankind – bigger than even cancer. Your self-confidence is low and you become mentally sick”

Jackky Bhagnani

Obesity is considered as the fifth biggest cause of death globally (1). The prevalence of overweight and obesity among children and adolescents aged between 5 to 19 has increased considerably, from 8% in 1990 to just over 20% in 2022 (2). According to World Health Organization estimates, more than 2.5 billion adults aged 18 and older were overweight in 2022 (2). Of these, nearly 890 million adults were obese (2). 43% of adults aged 18 and over (43% of men and 44% of women) were obese (2). From 1990, the global prevalence of adult obesity has more than doubled, and adolescent obesity has quadrupled (2). In 2022, around 37 million children under the age 5 were overweight (2). Overweight and obesity were once thought to be a problem in high-income countries, but they are now

becoming more common in low- and middle-income countries, particularly in urban areas (2).

People are becoming concerned about the rise in weight gain and associated risk factors. The extreme, irrational and overwhelming fear of gaining weight or getting fat is termed as pocrescophobia also known as obesophobia which originated from two greek words “obese” which means fat and “phobia” which means fear (3). People who suffer from this phobia will go to extremes to avoid weight gain. They may bring their own food everywhere to control what they eat, criticize themselves excessively, eat very small portions of food and engage in harsh dieting, exercise too much, prevent eating-related activities, and spend a lot of time and money on ways to look, feel, or be thinner, including procedures like liposuction. Pocrescophobia can result in underweight or malnutrition. However, their anxiety of gaining weight persists. It is often connected to and occur in conjunction with other mental illnesses such as (4):

- Anorexia Nervosa
- Bulimia Nervosa

- Avoidant restrictive food intake
- Body dysmorphic disorder
- Orthorexia Nervosa
- Obsessive Compulsive Disorder

OBESITY AND SYSTEMIC HEALTH

Obesity is becoming a major public health concern, harming our entire health. It is linked to type 2 diabetes, hypertension, and cardiovascular disease. Obesity and overweight have been linked to elevated blood pressure, which is a major cause of stroke and chronic renal disease. Metabolic syndrome is inextricably linked to obesity (5). Raised waist circumference, high triglyceride levels, high blood pressure, raised fasting blood glucose, and low HDL levels may be present (5). Obese individuals are more likely to develop severe liver disease, cirrhosis, and even liver failure, it may raise the risk of developing some malignancies, gout and osteoarthritis. Sleep apnea and asthma are frequent conditions caused by irritated and restricted airways (5).

OBESITY AND ORAL HEALTH

A bidirectional association exists between oral and systemic health. Individuals general health is influenced by their oral health, which includes the preservation of the perioral tissues, craniofacial complex, periodontal tissues, and dentition. Urbanization and modernization, together with unfavorable dietary trends aimed at increasing fat and sugar consumption while reducing roughage intake, have all led to the development of unhealthy eating patterns. As a result, oral health deteriorates and BMI increases. It is thought that inflammation plays an important role in the link between oral disease and obesity. Dental caries, periodontitis, and tooth loss may be connected with a higher BMI or obesity, whereas a healthy mouth may be associated with a lower BMI. Promoting general and oral health should go along as one, as similar risk factors can be addressed (6).

Obesity and Salivary Glands. The salivary glands are one of the primary structures impacted by obesity and its comorbidities, as they are responsible for the release of a variety of enzymes and growth factors required for the biological balance and protection of the oral cavity. It was recently discovered that an imbalance between the amounts of reactive oxygen species (ROS) and antioxidants can play a crucial role in the development of pathologies in the salivary gland (submandibular gland, parotid gland) (7).

Obesity and Saliva. Mod er et al. found that childhood obesity is associated with a reduction of the flow rate of stimulated whole saliva compared to

individuals of normal weight, which is linked to dental caries, demonstrating the negative impact of obesity on oral health. Obese adolescents have higher levels of proinflammatory cytokines in their crevicular fluid compared to those of normal weight (8). This is similar to the hyper-inflammatory reaction observed in obese adults by Flink et al., indicating that inflammatory mediators play a role in the hypofunction of the salivary glands (9). Obese individuals have different saliva characteristics, including altered concentrations of sialic acid, phosphorus, and peroxidase activity, as well as decreased flow of stimulated saliva. These changes are correlated with tooth caries and periodontal disease. Salivary alterations, such as phosphate, sialic acid, protein, and immunoglobulin levels, as well as peroxidase activity, could explain the reason why obese children are more likely to develop dental caries (9).

Obesity and Dental Caries. Salivary glands and saliva play an important role in dental health by building and maintaining soft and hard tissues. When saliva flow is restricted, oral health issues such as dental caries develop, which are still one of the most common disorders. According to studies conducted in Norway (10) and Saudi Arabia (11), having an above-average waist circumference was strongly correlated with an increase in dental caries among adolescents. Waist circumference is considered to be a more accurate and sensitive anthropometric marker of central adiposity than body mass index.

Obesity and Periodontitis. Periodontitis develops as a result of an interaction between dental plaque biofilm and the host's immune response to modifiable factors like obesity. Saito et al. were the first to report a link between obesity and periodontal disease in humans (10). Since then, many researchers have investigated the relationship between obesity and periodontal disease using various obesity metrics such as BMI, waist-hip ratio, body fat, and so on. The study by Ghadah Abu-Shawish et al (2022) revealed a strong link between BMI and periodontitis in Indonesian individuals (12). As a result, BMI can be used to determine the risk of developing periodontitis.

Obesity and Gingivitis. Obesity and gingivitis are mutually supportive disorders. Obese people have more gingivitis than usual. Hydroxyproline has long been regarded as a biomarker for collagen degradation. It has been connected to gingivitis and periodontitis, as well as active neutrophil matrix metalloproteinase. JM Goodson determined that obesity increases gingivitis, and gingivitis promotes obesity by a process involving neutrophil activation and collagen degradation, which results in hydroxyproline release (13).

Obesity and Dental Development. Obesity in children and teenagers is linked with a rise in

height and bone age. In addition, children who are underweight or overweight may experience variations in tooth eruption. In 2018, a study in Chennai, India, found that obese children have delayed tooth eruption (14). Another study by Sindelarova et al. on the association between obesity and the timing of permanent tooth eruption found that obese children had permanent teeth earlier than normal children (15). Disruption of normal permanent tooth growth might result in the premature appearance of new teeth, which can interfere with treatment planning. Failure to receive timely treatment might result in increasing oral problems such as inadequate occlusion, crowding, and oral hygiene.

Obesity and Tooth Erosion. Obese people are at risk of tooth erosion due to vitamin deficiencies, soft drink use, gastric reflux syndrome, and vomiting. Obesity and bariatric surgery are linked to an increased risk of dental wear. Increased prevalence of gastroesophageal reflux and vomiting, which lowers the pH in the oral cavity is consequently a major risk factor for erosive dental wear; and recommended postoperatively, small yet frequent meals (4-6 meals/day), which shortens the regeneration period for the saliva, is of great importance for the hard tissue protection. Cui Yang (2021) revealed that a significant number of obese individuals are at high risk for erosive dental wear and could experience increased pulp exposure, resulting in avitalization of the teeth (16).

Obesity and Tooth Loss. Another rising public health concern is tooth loss, which is a result of repeated exposure to untreated oral conditions such dental caries and periodontal disease (17,18). An extreme result of losing teeth is edentulism, which is characterized by having no teeth at all in the mouth. It is also known to lower an individual's quality of life. Severe tooth loss is the 36th most common chronic condition affecting life expectancy worldwide, impacting 2% of the population, according to the Global Burden of Diseases study (19). Obesity is also considered a risk factor for tooth loss. The growth of adipocytes constricts blood vessels that provide cellular nutrients. This scenario promotes the recruitment of macrophages to the core of adipose tissue, worsening the inflammatory load through upregulation feedback. As a result, the inflammatory state lowers the immunological threshold, making overweight individuals more prone to periodontal disease, which is a leading cause of tooth loss. Irrespective of the difficulties in determining the primary cause of tooth loss, obesity is known to increase the risk of both dental caries and periodontal disease (20).

IMPACT OF POCRESCOPHOBIA ON ORAL HEALTH

Pocrescophobia can develop at any age, but it is most commonly observed in adolescents. They are more sensitive to negative comments from their peers. Females are more likely to exhibit this condition than males. People with this phobia are much more likely to experience panic episodes. Obsession with weight and food can increase anxiety, therefore exacerbating the phobia. They frequently monitor their weight, are obsessed with whatever food they have and the exercise they do to maintain their weight. It leads to low blood pressure, a slower pulse than normal, lack of energy, lightheadedness, hyperhidrosis, mood swings, sleeping difficulties, hair thinning, hair loss, poor bone density, an increased risk of heart attack, and upset stomach (3,4).

Chronic stress accelerates the stress hormone, cortisol which contributes to greater periodontal deterioration (21,22). It is one of the most essential glucocorticoids, a hormone generated by the adrenal cortex. Glucocorticoids suppress immunity by reducing the generation of secretory immunoglobulins and neutrophil activity, thereby impairing defense against periodontal microbes (23). Exposure to cortisol altered the activity profile of the oral microbiome and stimulated the local host immune response, predisposing to periodontitis. (23). Stress is an important factor in teeth grinding and clenching, hence leading to temporomandibular disorders or bruxism (24). Excessive grinding and clenching wears away the occlusal surfaces and incisal edges, resulting in flat, shorter teeth. Smooth V-shaped cavities occur when lateral stresses surpass the physiologic level, followed by gum recession and tooth sensitivity (25). Canker sores, xerostomia and lichen planus are also thought to be associated with stress (26).

Management of pocrescophobia. The treatment combines psychotherapy and pharmacotherapy. Psychotherapy involves cognitive behavioral treatment, which includes exposure therapy. Antidepressants, benzodiazepines, and beta blockers are among the drugs used in pharmacotherapy.

- Cognitive behavioral therapy: The foundation for cognitive therapy lies on Beck's tri-part model of emotion, which claims that thoughts, feelings, and behaviors are connected (27). According to this hypothesis, modifying maladaptive thinking is offered as a way to alter the patient's maladaptive affect and behavior. This therapy employs a variety of techniques to address distorted thoughts, including identifying inaccurate thinking, examining the evidence for and against automatic thoughts, challenging and changing

maladaptive thoughts, altering problematic behaviors, and relating to others in more adaptive ways (27). Exposure therapy is a technique designed to help people confront their concerns. It directly targets avoidance by encouraging anxious individuals to approach feared stimuli, often in a gradual manner (28).

- Medications: Antidepressants like selective serotonin reuptake inhibitors (SSRIs) are prescribed more often, which includes escitalopram, sertraline, paroxetine, Venlafaxine, Clomipramine (a type of tricyclic antidepressant), moclobemide (a type of antidepressant from the monoamine oxidase inhibitor group of antidepressants), benzodiazepines which are categorised under minor tranquillisers are also used to treat such conditions. Beta blockers like propranolol are used to treat high blood pressure and heart palpitations in severe cases (29).

CONCLUSION

Obesity, pocrescophobia and oral health are all related in a complex cycle in which the fear of weight gain influences dietary choices. These choices affect both weight and oral health. Poor dental hygiene can have a negative impact on overall health and weight management. Being overweight or obese may increase the chance of developing periodontal disease, dental caries, or tooth loss. Promoting general and oral health as well as physical exercise should go hand in hand because shared risk factors may be weakened. Despite the fact that there is a strong link between oral health and pocrescophobia, further research is required to fully establish this relationship.

REFERENCES

1. Safaei M, Sundararajan EA, Driss M, Boulila W, Shapi'i A. A systematic literature review on obesity: Understanding the causes & consequences of obesity and reviewing various machine learning approaches used to predict obesity. *Computers in biology and medicine*. 2021 Sep 1;136:104754.
2. Obesity and Overweight [Internet]. who.int. WHO; 2024 [cited 2024 Apr 9]. Available from: www.who.int/news-room/fact-sheets/detail/obesity-and-overweight
3. Obesophobia (Fear of Gaining Weight). [my.clevelandclinic.org](https://my.clevelandclinic.org/health/diseases/22575-obesophobia-fear-of-gaining-weight). Cleveland Clinic; 2022 [cited 2024 Feb 15]. Available from: <https://my.clevelandclinic.org/health/diseases/22575-obesophobia-fear-of-gaining-weight>
4. Murphy N. What is Obesophobia ? cpdonline.co.uk. 2022 [cited 2024 Feb 15]. Available from:

<https://cpdonline.co.uk/knowledge-base/mental-health/what-is-obesophobia/>

5. Issrani R, Reddy J, Bader AK, Albalawi RFH, Alserhani EDM, Alruwaili DSR, Alanazi GRA, Alruwaili NSR, Sghaireen MG, Rao K. Exploring an Association between Body Mass Index and Oral Health-A Scoping Review. *Diagnostics (Basel)*. 2023 Feb 27;13(5):902.
6. Zalewska A, Knaś M, Gíndzieńska-Sieśkiewicz E, Waszkiewicz N, Klimiuk A, Litwin K, Sierakowski S, Waszkiel D. Salivary antioxidants in patients with systemic sclerosis. *J Oral Pathol Med*. 2014 Jan;43(1):61-8.
7. Roa I, Del Sol M. Obesity, salivary glands and oral pathology. *Colomb Med (Cali)*. 2018 Dec 30;49(4):280-287.
8. Modéer T, Blomberg CC, Wondimu B, Julihn A, Marcus C. Association between obesity, flow rate of whole saliva and dental caries in adolescents. *Obesity*. 2010;18:2367–2373. doi: 10.1038/oby.2010.63.
9. Flink H, Bergdahl M, Tegelberg A, Rosenblad A, Lagerlöf F. Prevalence of hyposalivation in relation to general health, body mass index and remaining teeth in different age groups of adults. *Community Dent Oral Epidemiol*. 2008;36:523–531. doi: 10.1111/j.1600-0528.2008.00432.x.
10. Gudipani RK, Albilasi RM, Alrewili O, Alam M, Patil SR, Saeed F. Association of body mass Index and Waist circumference with dental caries and consequences of untreated dental caries among 12- to 14-year-old boys: a cross-sectional study. *Int Dent J*. (2021) 71:522–9.
11. Saito T., Shimazaki Y., Sakamoto M. Obesity and periodontitis. *N. Engl. J. Med*. 1998;339:482–483.
12. Abu-Shawish G, Betsy J, Anil S. Is Obesity a Risk Factor for Periodontal Disease in Adults? A Systematic Review. *Int J Environ Res Public Health*. 2022 Oct 4;19(19):12684.
13. Goodson JM. Disease reciprocity between gingivitis and obesity. *J Periodontol*. 2020 Oct;91 Suppl 1(Suppl 1):S26-S34.
14. Parhiz S H, Zamanzadeh M, Ahmadi M, Arabi M, Zamanfar D. The Relationship between Body Mass Index and Dental Development in 5 to 6 Years Old Children in Sari. *Int J Med Invest* 2019; 8 (3) :29-39
15. Sindelarova R, Soukup P, Broukal Z. The relationship of obesity to the timing of permanent tooth emergence in Czech children. *Acta odontologica Scandinavica*. 2018;76(3):220-5.
16. Yang C, Hammer FJ, Reissfelder C, Otto M, Vassilev G. Dental Erosion in Obese Patients before and after Bariatric Surgery: A Cross-Sectional Study. *J Clin Med*. 2021 Oct 24;10(21):4902.
17. Gaio EJ, Haas AN, Carrard VC, Oppermann RV, Albandar J, Susin C. Oral health status in elders

- from South Brazil: a population-based study. *Gerodontology* 2012; 29: 214–223.
18. Chestnutt IG, Binnie VI, Taylor MM. Reasons for tooth extraction in Scotland. *J Dent* 2000; 28: 295–297.
 19. Marcenes W, Kassebaum NJ, Bernabe E et al. Global burden of oral conditions in 1990–2010: a systematic analysis. *J Dent Res* 2013; 92: 592–597.
 20. Chait A, DenHartigh LJ. Adipose tissue distribution, inflammation and its metabolic consequences, including diabetes and cardiovascular disease. *Frontiers in cardiovascular medicine*. 2020 Feb 25;7:22.
 21. Lu H, Xu M, Wang F, Liu S, Gu J, Lin S, Zhao L. Chronic stress accelerates ligature-induced periodontitis by suppressing glucocorticoid receptor- α signaling. *Experimental & molecular medicine*. 2016 Mar;48(3):e223-.
 22. Zhang J, Lin S, Luo L, Zhang Q, Jiao Y, Liu W. Psychological stress: neuroimmune roles in periodontal disease. *Odontology*. 2023 Jul;111(3):554-564. doi:10.1007/s10266-022-00768-8.
 23. Baumeister SE, Reckelkamm SL, Grabe HJ, Nauck M, Klinger-König J, Völzke H, Kocher T, Friedrich N, Holtfreter B. Cortisol and periodontitis: Prospective observational and Mendelian randomization studies. *Frontiers in Endocrinology*. 2023 Mar 15;14:1100985.
 24. Treatment - Phobia. [www.nhs.uk](https://www.nhs.uk/mental-health/conditions/phobias/treatment/). 2022 [cited 2024 Apr 10]. Available from: <https://www.nhs.uk/mental-health/conditions/phobias/treatment/#:~:text=Selective%20serotonin%20reuptake%20inhibitors%20>
 25. Banerji S, Mehta SB, Opdam N, Loomans B. *Practical procedures in the management of tooth wear*. John Wiley & Sons; 2019 Dec 4.
 26. Yap T, McCullough M. Oral medicine and the ageing population. *Australian Dental Journal*. 2015 Mar;60:44-53.
 27. Kaczurkin AN, Foa EB. Cognitive-behavioral therapy for anxiety disorders: an update on the empirical evidence. *Dialogues in clinical neuroscience*. 2015 Sep 30;17(3):337-46.
 28. Knowles KA, Tolin DF. Mechanisms of action in exposure therapy. *Current Psychiatry Reports*. 2022 Dec;24(12):861-9.
 29. Przysłańska A, Jasielska A, Ziarko M, Pobudek-Radzikowska M, Maciejewska-Szaniec Z, Prylińska-Czyżewska A, et al. Psychosocial predictors of bruxism. *BioMed research international*. 2019 Oct 13;2019.

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