REVIEW ARTICLE

Psychological Determinants of Oral Health– A Review

Thara Chandran[1], Nagashree Savanur Ravindranath[2], Rekha Raju[3], Radha Gubbihal[4], Pallavi Swamy Kousalya[5], Sushi Kadanakuppe[6]

1- Post Graduate Student, Department of Public Health Dentistry, Vokkaligara Sangha Dental College And Hospital, Bengaluru. 2,6- Sr. Lec, Department of Public Health Dentistry, Vokkaligara Sangha Dental College And Hospital, Bengaluru. 3-Prof and Head, Department of Public Health Dentistry, Vokkaligara Sangha Dental College And Hospital, Bengaluru. 4,5-Reader, Department of Public Health Dentistry, Vokkaligara Sangha Dental College And Hospital, Bengaluru.

Correspondence to:
Dr.Thara Chandran.Vokkaligara Sangha Dental College and Hospital.
Contact Us: www.ijohmr.com

ABSTRACT

Various health determinants are interrelated throughout life and understanding this relationship provides insight into the connection between genetic factor, biological systems, neurobiology, human behaviour, individual characteristics and influences from social and psychological factors. This narrative literature review helps to enumerate the various psychological factors that determine oral health. This creates a better understanding of the oral diseases from a relatively less explored aspect and for the better management of oral diseases. Thus, the multidimensional model of causative factors of oral diseases is considered which includes the psychological factors, rather than the conventional biomedical model

KEYWORDS: Dental Caries,Oral Health, Oral Hygiene Behaviours, Periodontal Disease, Psychological Factors

INTRODUCTION

Health has always been an enigma to mankind. The health determinants unravels the complex mechanisms by which various factors influences one's health. Psychological factors can affect health directly. Chronically occurring environmental stressors affecting the hypothalamic–pituitary– adrenal axis cumulatively can harm health. Researches in the field of psycho-neuro-immunology and biochemistry reveal a link between socio-economic status, emotional conflicts, lifestyle, and health consequences. The stimulation of nervous system which is caused by emotional and mental functions modifies the immune system and results in health disorders. Stress is a major etiological agent that causes weakening of defense forces leading to a poor life style in those who have less control over their lives.[1]

The biopsychosocial model of health was theorized by psychiatrist George L. Engel which states that a combination of biological, psychological, and social factors explains the concept of health better than pure biological terms alone. The emergence of the cause of illness from the functioning of the individual's body is best explained by the biological component of the biopsychosocial model. Various psychological factors like lack of self-control, emotional turmoil, and negative thinking as potential causes for a health problem was explained by the psychological component of the biopsychosocial model. The third part of the biopsychosocial model, the social part investigates the role of different social factors such as socioeconomic status, poverty, culture, technology, and religion on health.[2]

People with severe mental illness have always been a vulnerable population to oral diseases. This can be due to an array of reasons such as the nature of psychological illness, lack of awareness of one's own oral health problems, dental phobia , neglected oral hygiene, poor access to health care facilities, the side effects of psychiatric drugs, improper diet and the knowledge and attitudes of dental professionals toward people with mental illness. Absence of motivation and apathy, unfavourable cooperation, poor adaptation to new prostheses, difficulty with mobility, fear of treatment, inadequate communication skills as well as financial considerations hinder dental treatment to these people difficult.[3] Psychological factors represent both negative and positive states and include states such as anxiety, depression, and happiness. Those with better mental health feel more at peace, are happy, calmer, and this will modify their perception of their actual oral health status.[4] This narrative literature review brings out various psychological factors affecting oral health.

The complications associated with dental decay and periodontal diseases are the major reasons for teeth loss that impair oral health.[5] Cariogenic bacteria, frequency of intake of fermentable carbohydrates and salivary dysfunction are the main causative agents of dental decay.[6] Subgingival microbial flora, genetic and environmental factors are the main etiological agents for periodontal diseases.[7] These factors may interact, but still they do not always fully explain the distribution of these diseases especially in the case of rapidly progressing forms. In the search for explanatory models of these pathologies, the attention of oral epidemiologists has

How to cite this article:
Chandran T, Ravindranath NS, Raju R, Gubbihal R, Kousalya PS, Kadanakuppe S. Psychological Determinants of Oral Health– A Review. Int J Oral Health Med Res 2016;3(1):189-194.

been attracted to psychosocial and behavioral factors.[8] Psychological stressors may influence the progression and course of dental diseases as negative behavioral changes are caused in relation with alterations in host resistance. The host response is modulated by multiple signalling systems via various neuroendocrine and neuronal pathways.[9] The study by Dumitrescu AL showed that various psychological factors like anxiety, depression, self-esteem, intelligence quotient, sense of coherence, personality, bipolar disorders, eating disorders, psychoactive substances and optimism were associated with self-rated dental health and oral health behaviours.[2]

VARIOUS PSYCHOLOGICAL DETERMINANTS

The various psychological factors that affect oral health are described below.

Anxiety: Anxiety is explained as a constant, nonspecific and often irrational worry with increased arousal in generally safe situations or interactions which results in significant impairment of everyday functionality. One's own past traumatic experiences, or the negative perceptions of dental treatment experiences heard from others can lead to anxiety regarding forthcoming dental treatment. The dental team often come across dental anxiety among patients for many factors, the most common being those of the noise, vibration of the drill and injections. As dentally anxious patients are reluctant to seek dental care, they rarely benefit from regular check-ups which provide preventive and curative actions. In the absence of adequate dental treatment, oral symptoms will inevitably worsen, resulting in more severe oral health problems, which often require more intensive, urgent, and expensive treatments.[10]

Wennstrom A et al. reported that individuals with high Dental Anxiety were more likely to have fewer teeth and poor perceived oral health. Viswanath D et al. conducted a study on school children which demonstrated a direct relationship of Dental anxiety with dental caries.[11,12] Dentally anxious students had a high decayed, missing and filled tooth surface index.

Dental anxiety also called dental phobia or dentophobia, dentist phobia can be managed with behavioral techniques, sedation, and even general anaesthesia. The current management includes cognitive behavioral therapy, relaxation therapy, computer-assisted relaxation learning, hypnotherapy, group therapy, individual systematic desensitization and pharmacological management.

Depression: Depression in psychiatry refers to a mental state of depressed mood characterized by feelings of sadness, despair, and discouragement. Depression is currently classified as 'primary' or 'secondary' based on the possible cause of the individual's illness, the effect of genetic make-up, medical or psychological causes and external stress factors.[13] People with severe depression have poorer oral and dental health characterized by increased levels of untreated decay, gingivitis and periodontal disease, poor oral hygiene, soft tissue lesions and disease, tooth loss and toothlessness at an earlier age and an increased risk of oral cancer due to the use of tobacco and alcohol. A study by Hugo FN et al. showed that depressive symptoms may act as determinants of caries.[14] Park SJ et al. showed the negative relation between depression and oral health status.[15] The study showed that participants with lifetime depression brushed their teeth less frequently and were found that while experiencing dental problems did not receive any treatment.

For a patient who reports a history of depression, initiation of dental hygiene or dental therapy is preceded by consultation with the client's psychiatrist. Preventive education is an important component of dental hygiene care for individuals with major depression disorder. Both the affected individual and family members should receive instruction in plaque control. The oral and systemic side-effects of antipsychotic medication can have a significant impact on oral health and pose patient management problems in treatment planning. Dry mouth (xerostomia) is the most common oral side-effect of anti-depression medication; it increases the risk of caries, periodontal disease, and oral infections. Artificial salivary products are recommended to help manage xerostomia.[16] Daily supplemental fluoride therapy and antimicrobial rinses are indicated to control caries and periodontal disease. Dietary counseling is needed to help individuals understand the relationship between consumption of carbohydrates and reduced attention to plaque control to a decline in oral health status. Depending upon the client's oral health status, more frequent dental hygiene appointments may be indicated. Examinations and prophylaxis with fluoride therapy may need to be as frequent as every three months or more to help the individual maintain oral health. Use of vasoconstrictors should be limited to procedures that require haemostasis or profound anaesthesia; Epinephrine increases the risk of hypertensive crisis and stroke.[17]

Self Esteem: Self-esteem and can be defined as a personal perception of an individual's worthiness in connection with a person's social world which has both positive and negative ends and is derived from the reflected appraisal of others. Where the appraisal is negative, the level of self-esteem is likely to be low. While the image of the self is of great importance throughout the life of the individual, it is of particular interest in adolescence. The individual with high self-esteem feels able to cope with adversity and is sufficiently competent to achieve success, whereas the individual with low self- esteem feels helpless and inadequate.[18] A high self-esteem is seen to be positively correlated with good oral hygiene behaviors. A study by Honkala S et al and Dumitrescu AL et al. showed that people with a high self-esteem had good oral hygiene practices.[19,20]

Intelligence Quotient: The capacity of mind comprising of reasoning, planning, solving problems, thinking, learning and linguistic skills, and comprehending ideas together constitute intelligence. Intelligence of a person can be measured as intelligence quotient (IQ) which is his unique trait. Wechsler defined intelligence as "an individual's ability to adapt and constructively solve problems in the environment. "Whereas, IQ is defined as the "Relative intelligence of an individual expressed as a score on a standardized test of intelligence".[21]

A person's understanding of information, instructions, causes and consequences is affected significantly by his intelligence. It also affects one's ability to handle distress, communicate feelings and adequate behaviour in a dental setting. Children with low IQ require longer time to adapt to the the dental treatment situation. A child's dental anxiety and his intelligence is found to be strongly associated. The level of cooperation during dental treatment and IQ have a direct relation.[22] Navit S et al. in a study revealed a significant relation between IQ and moderate gingivitis. The study did not show any significant relationship between IQ and dental caries[23].A study by Jain M et al. on adolescent and adults showed that oral health status of a mentally retarded population was poor and was influenced by etiology of the disability and I.Q. level.[24] Virk P et al. showed an increased risk for dental caries due to a lower IQ level in orphan children.[25]

Sense of Coherence: The sense of coherence (SOC) reflects an individual's ability to deal with difficult or stressful events. It is a component of the salutogenic theory, which focuses on the origins of health and well-being and not on disease. An individual's sense of coherence consists of three components: the idea that the stimuli from one's environment are structured, predictable and explicable (comprehensibility), the feeling that sufficient resources are available to deal with the stressors (manageability) and the feeling that the challenges are worthy of investment and engagement (meaningfulness).[26]

Firstly, a strong sense of coherence helps to cope up with the inherent stressors of day to day life (mental pathway) and is strongly related to personality factors like neuroticism. Secondly, a strong sense of coherence is also believed to promote the beneficial use of the resources (behaviour pathway) in order to maintain, or move to, a healthy state. A third pathway underlying the hypothesized influence of the sense of coherence is the physiological pathway, which shows the impact on physical health through changes in the neuroimmune and endocrine system[27]. Individuals with a strong sense of coherence tend to make proper utilization of the oral health resources. Freire MCM et al and Lindmark U et al and demonstrated that sense of coherence was significantly associated positively with several oral health–related behaviors, attitudes towards oral health and knowledge.[28,29]

Personality: The term "personality trait" refers to the personal characteristics that are exposed in a particular pattern of behaviour during a variety of situations.[30] The biological theory of personality explains that anatomical structures which are located in the brain contribute to personality traits. This evolves from neuropsychology, according to which the structure of the brain relates to various psychological processes and behaviours. Studies show that the expression of a personality trait is a matter of the volume of the brain cortex it is associated with. Specific periodontal conditions associated with psychosocial variables include chronic periodontitis, necrotizing ulcerative gingivitis, chronic and experimental gingivitis.[31] The personality assessment helps to understand the ways and efforts made by the person to deal with the psychological stress triggered by manifestations of a disease and its treatment. Studies have shown the association between health and personality factors, and quality of life or subjective well-being. Jumana K et al. found that personality profiles like neuroticism, extraversion and openness affect dental perceptions, play an important role in shaping satisfaction with dentition, and help with the prediction of the dental impact on daily living.[32] A study by Thomson MW showed that personality is a risk factor for clinical disease status, with respect to dental caries and its sequelae.[33] Oliveira FC et al. demonstrated that personality traits showed significant influences on oral impacts on daily performance among patients under periodontal maintenance.[34]

Bipolar Disorder: People with Bipolar Disorder presents with dramatic mood swings, which range from being extremely 'high' to very depressed, sad and hopeless feeling, then reverts back again to the 'high' state, often with periods of normal mood in between. These mood changes are accompanied by severe changes in energy and behaviour. The periods of highs and lows correspond to episodes of mania and depression, both of which have very different and notable symptoms. Sometimes the episodes of mania or depression include the symptoms of psychosis, with hallucinations and/or delusions.[35]

During depressive episodes, patients have very poor oral hygiene which predisposes to dental caries and periodontal diseases which often proceeds to an unmanageable situation. Due to neglected oral health, any existing prostheses often become ill-fitting and have to be discarded. While during maniac episodes, there is an excessive use of oral health aids which cause an increase in the incidence of cervical abrasion and mucosal or gingival lacerations.[36]

Medical pharmacotherapy for bipolar disorder can result in moderate to severe xerostomia, which further compounds the severity of any dental disease. The sequelae of reduced salivary flow are rapid increase in the extend of dental deterioration, mucosal dryness and dysphagia. Increase in the incidence of rampant cervical caries can be attributed partly to the anticholinergic effects of lithium and other psychotropic medications, and mainly due to the increased use of candies or sweetened beverages by patients to provide some form of oral lubrication. High caffeine intake and heavy smoking

often seen in these patients exacerbate the drying effects of various medications. Hyposalivation also causes an increased incidence of Candidal infections, fissuring of the corners of the mouth (perleche) and lips, and difficulty in chewing, speaking and swallowing.[37]

Eating Disorders: Eating disorders are associated with a number of different behaviors which manifest either singly or in combination, and can affect both general health and oral health. All eating disorders are due to a specific psychopathology causing an excessive importance of eating habits, body shape, and weight, as well as the ability to control them.[38]

Eating disorders are divided into two main diagnoses:-

- Anorexia nervosa, which is characterized mainly by underweight and food restriction.
- Bulimia nervosa characterized by binge eating and inappropriate compensatory behaviors, through self-induced vomiting, excessive exercise and use of laxatives.

The onset of an eating disorder, its expression, and intensity vary between individuals. So the same individual may have had different eating disorder diagnoses in combination with more healthy or less healthy periods during life.[38] Studies of oral health in eating disorder patients have produced much information. However, while some results relating to oral complications like dental caries and salivary disorders are contradictory, the results regarding dental erosion and bulimic behaviour are more consistent. Another difficulty regarding studies of oral complications in eating disorder patients is that while some complications like dental erosion and dental caries are permanent, others like gingivitis, xerostomia and mucosal lesions are more likely to reflect the particular expression and intensity of the disease.[39] Johansson A-K et al. found eating disorder patients to present with dental problems, burning tongue, dry/cracked lips, dental erosion, and gingival bleeding.[40]

Psychoactive Substances: An important issue faced today is regarding the use of illicit and licit substances, which has increased worldwide recently, with both health and social consequences that includes the loss of productive years and lives of victims[41].The prevalence of specific drugs in order from most to least common was marijuana, extra medical use of prescription medications, cocaine, hallucinogens, amphetamine, and heroin. Substance misuse has been linked to pathological oral changes. Alcohol use, especially in association with tobacco use, has been identified as a potential risk factor for cancer. However, even in the absence of smoking, alcohol consumption is associated with an increased risk of developing oral cancer. Talamini and colleagues reported a fivefold increased risk of developing oral cancer in non-smokers who consumed, on average, five or more alcoholic drinks a day. Furthermore, in their meta-analysis of 26 studies, Bagnardi and colleagues found that daily alcohol consumption of 25, 50 and 100 grams was associated with a pooled relative risk of developing oral and pharyngeal cancer of 1.75, 2.85 and 6.01, respectively.[42]

Regular cannabis smoking was associated strongly with periodontal disease. Marijuana use has been associated with dysplastic changes and premalignant lesions within the oral mucosa, owing to cannabis smoke's carcinogenic action. Pathological conditions, including candidiasis, epithelial dysplasia, and bruxism, have been associated with opioid addiction. Opiates, amphetamines, marijuana and alcohol use are associated with xerostomia, promote plaque and calculus collection and increase the incidence and severity of caries and periodontal disease. Cocaine use is associated with gingival lesions, erosion and abrasion of tooth surfaces, and bruxism. Carolyn Brown et al. found a significant dose–response relationship between intake alcohol frequency, duration, and oral cancer risk.[43] Smoking and dental health behaviour were negatively associated.[44,45]

Optimism: Optimism is regarded as the generalized expectation of positive outcomes in the future, and it has been found to associate with several positive health outcomes. Optimism is associated with lower levels of bodily pain, and lack of optimism has been found to be a major contributing factor in explaining the relation between pain and pain-related distress.[46] Optimists may respond better to stress while pessimists have shown higher levels of cortisol, the "stress hormone." Kirsi Sipila et al. found optimism as an independent psychosocial determinant of pain experience which has to be taken into account in assessing the facial pain prognosis, and the various modes of treatment.[47] Brennan DS et al. demonstrated that high optimism was associated with fewer missing teeth and less negative impact on quality of life.[48] A study by Ylostalo PV on Finnish adults showed that Optimism was related to self-reported oral health.[49]

Not enough data is available due to lack of coordinated research in this area. Psychological factors are major barriers to seeking professional dental care which can lead to deterioration of dentition, and a range of psychosocial problems. Research in this field can benefit dentists in the management of these patients using both pharmacological and behavioral techniques.

CONCLUSION

Oral health is an inseparable aspect of general health. Many chronic diseases share the common risk factor for oral diseases. There has been a recent advancement in understanding the role of psychological factors in affecting oral health. This changes the previous biological aspect of disease to a psychological one.

Although oral diseases are mainly affected by behaviors determined by psychological factors, dentists have not seriously considered psychosocial pathways in its etiology, diagnosis, and treatment. But a sound understanding of the psychological pathways of the behaviors strongly linked to oral diseases, and how

psychological factors affect the response of tissues to pathogens, is essential for diagnosis and improving interventions. The relative ineffectiveness of intervenetions stems from the failure to take psychological pathways into account.

The increased prevalence of many subjective oral complaints in patients with psychological disturbances indicates the significant psychopathological role of these determinants. Several factors are identified as culprits of poor oral health in patients with psychological disorders, the major ones being saliva reducing medications, inadequate diet, and apathetic nature of these patients. Taking into consideration the multi-factorial influence on oral health status, various oral health promotion and intervention programs should be implemented for the improvement of these risk groups.

REFERENCES

1. Kieffer JM, Hoogstraten J. Linking oral health, general health, and quality of life. Eur J Oral Sci.2008; 116: 445–450.
2. Dumetrisecu A, Dogaru BC, Dogaru CC. Instability of self esteem and affective liability as determinants of self reported oral health status and oral health related behaviours. The Journal of Contemporary Dental Practice 2008;9(1):42-46.
3. Page LA, Thomson WM, Ukra A, Baker SR. Clinical status in adolescents: is its impact on oral health-related quality of life influenced by psychological characteristics? Eur J Oral Sci 2013;121:182–187.
4. Engel G L. "The need for a new medical model: A challenge for biomedicine". Science 1977;196:129–136.
5. Montandon A, Zuza E, Toledo BE. Prevalence and reasons for tooth loss in a sample from a dental clinic in Brazil.Int J Dent 2012; 2012:719750.doi: 10.1155/2012/719750
6. Burt BA, Eklund SA, Morgan K. "The effects of sugars intake and frequency of ingestion on dental caries increment in a three-year longitudinal study," Journal of Dental Research 1988;67(11):1422–1429
7. Tatakis DN, Kumar PS.Etiology and pathogenesis of periodontal diseases.Dental clinics of North America2005;49(3):491-516.
8. Locker D, Gibson B. The concept of positive health: a review and commentary on its application in oral health research. Community Dent Oral Epidemiol 2006; 34:161–73.
9. Wimmer G, Janda M, Wieselmann-Penkner K, Jakse N, Polansky R, Pertl C. Coping with stress: its influence on periodontal disease. J Periodontol 2002;73:1343–51.
10. Crego A, Carrillo DM, Armfield JM, Romero M. From public mental health to community oral health: the impact of dental anxiety and fear on dental status .Frontiers in public health 2014; 2(16):1-3.
11. Wennstrom A, Wide Boman U, Stenman U, Ahlqwist M, Hakeberg M.Oral health, sense of coherence and dental anxiety among middle-aged women. Acta Odontologica Scandinavica 2013;71:256–62.
12. Viswanath D, Krishna AV. Correlation between dental anxiety, sense of coherence (SOC) and dental caries in school children from Bangalore North: A cross-sectional study. J Indian Soc Pedod Prev Dent 2015;33:15-8.
13. Paykel E.The classification of depression. British Journal of Clinical Pharmacology 1983;15: 155–59.
14. Hugo FN, Hilgert JB, de Sousa LR, Cury JA. Depressive Symptoms and Untreated Dental Caries in Older Independently Living South Brazilians. Caries Research2012;46(4):376-84.
15. Park SJ et al. Association of oral health behaviors and status with depression: results from the Korean National Health and Nutrition Examination Survey, 2010. Journal of Public Health Dentistry 2014;74:127–138.
16. Griffiths J. How depression can impact on oral health. Dental Nursing 2008;4(11):622-26.
17. Johannsen P. Dental plaque, gingival inflammation, and elevated levels of interleukin-6 and cortisol in gingival crevicular fluid from women with stress related depression and exhaustion. Journal of Periodontology 2006;77(8), 1403-09.
18. Macgregor DM, Balding JW. Self-esteem as a predictor of toothbrushing behaviour in young adolescents. J ClinPeriodontol 1991;18:312 -16.
19. Honkala S, Honkala E, Al-Sahli N. Do life or school satisfaction and self-esteem indicators explain the oral hygiene habits of schoolchildren? Community Dent Oral Epidemiol 2007;35: 337–47.
20. Dumitrescu AL, Zetu L, Teslaru S. Instability of self-esteem, self-confidence, self-liking, self-control, self-competence and perfectionism: associations with oral health status and oral health-related behaviours. The Journal Of a Contemporary Dental Practice 2012;12(3):136-141.
21. Wayne et al. Stanford-Binet and WAIS IQ Differences and Their Implications for Adults with Intellectual Disability. Intelligence 2010;38(2): 242–248.
22. .Kumar S, Sharma J, Duraiswamy P, Kulkarni S. Determinants for oral hygiene and periodontal status among mentally disabled children and adolescents. J Indian Soc Pedod Prevent Dent 2009;29(4);46-51.
23. Navit S. Interrelationship of intelligence quotient with caries and gingivitis. Journal of International Oral Health 2014; 6(4):56-62.
24. Jain M. Oral health status of mentally disabled subjects in India. Journal of Oral Science 2009;51(3):333-340.
25. Virk P, Jain RL, Pathak A, Sharma U, Rajput JS. Inter-relationship of intelligence-quotient and self- concept with dental caries amongst socially handicapped orphan children. J Indian Soc Pedod Prev Dent 2012;30:127-32.
26. Antonovsky A. Unravelling the mystery of health. How people manage stress and stay well. San Francisco, London: Jossey-Bass, 1987.
27. Feldt T, Metsapelto RL, Kinnunen U. Sense of coherence and five-factor approach to personality conceptual relationships. Eur Psychol 2007;12:165–72.
28. Freire MCM, Sheiham A, Hardy R. Adolescents' sense of coherence, oral health status, and oral health-related behaviours. Community Dent Oral Epidemiol 2001; 29: 204–12.
29. Lindmark U, Hakeberg M, Hugoson A. Sense of coherence and its relationship with oral health–related behaviour and knowledge of and attitudes towards oral health. Community Dent Oral Epidemiol 2011; 39: 542–553.
30. Becker BC. Karp CL. Becker W and Berg L. Personality differences and stressful life events. Differences between treated periodontal patients with and without maintenance. J ClinPeriodontol 1988; 15: 49-52.
31. Trombelli L, Scapoli C, Tatakis DN, Grassi L. Modulation of clinical expression of plaque-induced gingivitis: effects of personality traits, social support and stress. J ClinPeriodontol 2005; 32: 1143–1150.

32. Jumana K, Mahmoud K, Khaled Q, Firas A.M. Personality and oral health. Journal of Contemporary Dental Practice.2009;10(6)1-16.
33. Thomson M W. Personality and oral health. Eur J Oral Sci. 2011;119(5): 366–372.
34. Oliveira F.C. Oral Impact on Daily Performance, Personality Traits, and Compliance in Periodontal Maintenance Therapy. Eur Psychol 2011;82(8):1146-54.
35. Moreno C, Laje G, Blanco C, Jiang H, Schmidt A, Olfson M. National trends in the outpatient diagnosis and treatment of bipolar disorder in youth. Arch Gen Psychiatry 2007; 64: 1032-1039.
36. Friedlander AH, Birch NJ. Dental conditions in patients with bipolar disorder on long-term lithium maintenance therapy. Spec Care Dentist 1990; 10(5):148–51.
37. Engel G L. "The need for a new medical model: A challenge for biomedicine". Science 1977;196:129–136.
38. Aranha AC, Eduardo CP, Cordas TA. Eating disorders. Part I: psychiatric diagnosis and dental implications. J Contemp Dent Pract 2008; 9: 73–81.
39. Lo Russo L, Campisi G, Di Fede O, Di Liberto C, Panzarella V, Lo Muzio L. Oral manifestations of eating disorders: a critical review. Oral Dis 2008; 14: 479–484.
40. Johansson AK, Norring C, Unell L, Johansson A. Eating disorders and oral health: a matched case–control study. Eur J Oral Sci 2012; 120: 61–68.
41. Marques TCN, Sarracini KLM, Cortellazzi KL, et al. The impact of oral health conditions, socioeconomic status and use of specific substances on quality of life of addicted persons. BMC Oral Health. 2015;15:38.
42. Bagnardi V, Blangiardo M, La Vecchia C, Corrao G. A meta- analysis of alcohol drinking and cancer risk. Br J Cancer 2001; 85(2):1700-05.
43. Cancela MC. Alcohol intake and oral cavity cancer risk among men in a prospective study in Kerala, India. Community Dent Oral Epidemiol 2009; 37: 342–349.
44. Petersen PE. Smoking alcohol consumption and dental health behavior among 25-44-year-old Danes. Scand J Dent Res. 1989; 97(5):422-31.
45. OkamotoY, Tsuboi S, Suzuki S, Nakagaki H, Ogura Y, Maeda K. and Tokudome S, Effects of smoking and drinking habits on the incidence of periodontal disease and tooth loss among Japanese males: a 4-yr longitudinal study. Journal of Periodontal Research 2006; 41: 560–566.
46. Scheier MF, Carver CS. Optimism, coping, and health: assessment and implications of generalized outcome expectancies. Health Psychol 1985; 4(3): 219-47.
47. Sipila K, Ylostalo PV, Eke E, Zitting P, Knuuttila ML.Association between optimism and self-reported facial pain. Acta Odontol Scand. 2006;64(3):177-82.
48. Brennan DS, Spencer AJ. Social support and optimism in relation to the oral health of young adults.International Journal of Behavioural Medicine 2012;19(1):56-64.
49. Ylostalo PV, Eke E, Knuuttila MLE. Coping and optimism in relation to dental health behaviour– a study among Finnish young adults. Eur J Oral Sci 2003;111: 477–482.

Source of Support: Nil
Conflict of Interest: Nil