

# The precedence and viability of yoga in the lives of D3-dental students, dental practitioners, and dental patients

Roquaiya Nishat<sup>1</sup>, Lipsa Bhuyan<sup>2</sup>, Sumaiya Nezam<sup>1</sup>, Sarita Singh<sup>1</sup>,  
Mishan Manohar Jaiswal<sup>1</sup>, Rajat Singh<sup>3</sup>

<sup>1</sup>Department of Dentistry, Nalanda Medical College Hospital, Patna, Bihar, <sup>2</sup>Department of Oral Pathology and Microbiology, Kalinga Institute of Dental Sciences, KIIT Deemed to be University, Bhubaneswar, Odisha, <sup>3</sup>Department of Pedodontics and Preventive Dentistry, Buddha Institute of Dental Sciences and Hospital, Patna, Bihar, India

## ABSTRACT

Dentistry as a profession is quite demanding and challenging and is also associated with occupational hazards like musculoskeletal disorders and stress-related problems. The practice of yoga has been proven to be efficacious in management of quite a lot of stress and lifestyle disorders. It strengthens one physically, mentally, and emotionally. Moreover, yoga can also be used in the management of dental patients for stress-related oral conditions like lichen planus, burning mouth syndrome, aphthous ulcers, etc., Yoga has also been found to have antiinflammatory, antianxiety effect, and also a lot of other beneficial effects. This review emphasizes on the relevance of yoga in the dental profession, from the practitioners, students, and patients viewpoint. Data pertaining to the subject was obtained after a thorough search of the PubMed literature and Google search engine.

**Keywords:** Anxiety, ergonomics, musculoskeletal disorders, stress-related conditions, yoga

## Introduction

The word “yoga” has been derived from Sanskrit word “yuz,” meaning “union” or “to unite.”<sup>[1]</sup> Yoga is an ancient Indian technique, philosophy, and practice that connects the body, breathing, and mind to energize and balance an individual as a whole.<sup>[2]</sup> It can be defined as a Hindu spiritual and esthetic discipline which includes breath control, simple meditation, and adoption of specific body postures for health and relaxation.<sup>[3]</sup>

Yoga has been found to improve cardiorespiratory efficiency, dexterity, strength, steadiness, stamina, flexibility, endurance, neuro-musculo-skeletal functioning, sleep quality, and

cognitive functions. It also increases the alpha rhythm, interhemispheric coherence, and homogeneity in brain. Alteration in brain blood flow and brain metabolism and modulation of neuro-endocrine axis are also linked to yogic practices.<sup>[4,5]</sup>

The dental profession is not alien to occupational hazards such as musculoskeletal disorders, psychological problems, dermatitis, respiratory disorders, eye insults, infectious diseases, percutaneous exposure incidents, allergic reactions, radiation, and noise.<sup>[6]</sup> The literature shows ample evidence proving the efficacy of yoga in the management of several of these conditions.<sup>[1,7]</sup> This review emphasizes on the relevance of yoga in the dental profession, from the practitioners, students, and patients viewpoint. A thorough search of PubMed database and Google search engine was done to collect the data pertaining to the subject.

**Address for correspondence:** Dr. Sumaiya Nezam, Pedodontics and Preventive Dentistry, Nalanda Medical College Hospital, Agamkuan Flyover, Sadikpur, Patna, Bihar - 800 007, India.

E-mail: sumaiyanezam786@gmail.com

Received: 17-09-2019

Revised: 17-09-2019

Accepted: 16-10-2019

Published: 10-12-2019

### Access this article online

#### Quick Response Code:



Website:  
www.jfmipc.com

DOI:  
10.4103/jfmipc.jfmipc\_784\_19

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

**How to cite this article:** Nishat R, Bhuyan L, Nezam S, Singh S, Jaiswal MM, Singh R. The precedence and viability of yoga in the lives of D3-dental students, dental practitioners, and dental patients. J Family Med Prim Care 2019;8:3808-13.

## Yoga in Primary Health Care

Complementary and alternative medicine (CAM) are a set of diverse health practices and products that are typically not considered to be part of conventional medicine, and these techniques are nowadays being used for the management of a variety of conditions.<sup>[8]</sup> Yoga, a commonly used CAM technique, has been proven efficacious in the prevention and treatment of several chronic diseases including cardiovascular diseases, type II diabetes, musculoskeletal disorders, anxiety, depression, and other stress-related disorders.<sup>[9]</sup> Ponte *et al.* performed a quasi-experimental study to investigate the role of yoga in primary health care and concluded that yoga significantly improved the psychological quality of life.<sup>[10]</sup> Casey Health Institute, an integrative medicine center, in Maryland, USA, incorporated yoga therapy into primary care and have shown effective results.<sup>[11]</sup> Yoga has, thus, been proven to be an effective tool in primary health care.

### Relevance of Yoga for Dental Students and Practitioners

#### Musculoskeletal disorders

Musculoskeletal disorders are injuries of muscles, ligaments, tendons, nerves, blood vessels, bones, and joints, which can result in pain in the neck, shoulder, arm, wrist, hands, upper and lower back, hips, knees, and feet.<sup>[12]</sup> Dentistry is considered to be a high risk profession in terms of acquiring musculoskeletal disorder due to ergonomic factors such as uncomfortable and static position with repetitive movements of arms and hands in combination with postural loads of upper back and head, wrong positioning of body, and limited body movement while performing the dental procedures for long duration of time.<sup>[13,14]</sup> Moreover, the dental professionals tend to bend their backs, over flex and twist their neck, and raise their arms and shoulders in order to gain more visibility and accessibility which can result in overstraining of muscles and ligaments and pressurize the nerve roots, thus resulting in pain.<sup>[15]</sup> This may dwindle the quality and efficiency of one's practice.

Several studies have reported the incidence of musculoskeletal disorders among dental professionals. Hayes *et al.* reported a prevalence of general musculoskeletal pain ranging between 64% and 93% among dentists, dental hygienists, and dental students in which back and neck pain was the most common for dentists, while hand and wrist pain was more prevalent among dental hygienists.<sup>[16]</sup> According to Shams-Hossaini *et al.*, the prevalence of musculoskeletal pain ranged between 0.5 and 70%.<sup>[17]</sup> In a scenario like this, yoga can come to the rescue. The literary evidence indicates the importance of yoga in the management of musculoskeletal disorders.

Monson *et al.* reported bi-weekly practice of yoga sessions to be beneficial in decreasing musculoskeletal pain in dental hygiene students.<sup>[18]</sup> Koneru and Tanikonda reported the prevalence of

musculoskeletal pain in dentists to be 34.5% and also established a significant role of physical activity on the quality and quantity of work-related musculoskeletal disorders, in which yoga was found to be more effective than other modes of physical activities.<sup>[19]</sup> Deolia *et al.* studied the effect of yoga as a therapeutic aid for the treatment of physical hazards among dental interns aged between 21 and 24 years and reported reduction in backaches and headaches, thereby proving its efficacy.<sup>[20]</sup> According to a systemic review by McCaffrey and Park, yoga intervention was found to be moderately feasible and likely to be equal to or superior to exercise or usual care for reducing pain and pain medication use in various musculoskeletal disorders.<sup>[2]</sup> Chismark *et al.* reported that complementary and alternative medicine therapies like yoga helped in the management of chronic musculoskeletal pain, improved quality of life, reduced work disruptions, and, hence, enhanced career satisfaction.<sup>[21]</sup>

Yoga involves asanas (different body postures) and pranayamas (breathing exercises) which helps the mind to focus and achieve relaxation.<sup>[22]</sup> Yoga improves the body's flexibility, posture, range of motion and function, and also builds muscle strength which reduces strain on the back, neck, shoulders, muscles, and joints, thus helping in the management of musculoskeletal disorders.<sup>[15,18,23]</sup> The varied practiced asanas improve blood circulation, increase the spine flexibility and rejuvenate it, thus reducing the incidence of backache.<sup>[24]</sup> Thus, practicing yoga on a daily basis can be beneficial for dental professionals and help in maintaining a pain and stress-free healthy lifestyle.

#### Stress and anxiety

Dentistry as a profession is considered to be quite challenging and stressful. Factors such as time and scheduling pressure, management of uncooperative patients, and highly technical and intensive nature of work may act as stressors for the dental professionals.<sup>[25]</sup> Dental education too has been found to be associated with noteworthy amount of stress, wherein stress has been found to increase with the year of study.<sup>[26]</sup> Various studies have reported that factors such as gender, year of study, marital status, first choice of admission, financial problems, living arrangement, examinations and grades, workload, and patients to be the stressors in dental students.<sup>[27]</sup> This stressful lifestyle could result in a lot of complications in the longer run which would adversely affect one's health. This alarming rise in stress in the dental community needs addressing and timely interventions to maintain the professionals physical, mental, and psychological health. The ages-old Indian practice of yoga can be effectively used in stress management and boosting the health conditions of an individual. Stress has been found to be inversely proportional to yoga.<sup>[1]</sup>

Streeter hypothesized that stress can induce autonomic imbalance, decreased parasympathetic activity, increased sympathetic activity, under activity of GABA system, and increased allostatic load. They also hypothesized that Yoga could reduce stress levels

by stimulating the vagus nerve and reducing the allostatic load which in turn positively regulates the parasympathetic and GABA system.<sup>[28]</sup> Literary evidence also suggests that yoga down regulates the hypothalamic-pituitary-adrenal axis and also the sympathetic nervous system.<sup>[29]</sup> Stress reduction results in improved personal well being, reduced anxiety and depression levels, better sensory-motor coordination, and improved handgrip endurance, thus improving the overall personality and performance of an individual.<sup>[30]</sup>

Shankarapillai *et al.* assessed the efficacy of yoga in reducing the dental students anxiety prior to and during a periodontal surgical procedure and concluded that yogic breathing had a significant effect on reduction of stress and anxiety levels of the students.<sup>[31]</sup> Tripathi *et al.* conducted a study to establish preliminary evidence for the psychophysiological effects of yoga on stress in young-adult college students and concluded that yoga had positive effects on a psychophysiological level that lead to decreased levels of stress in college students.<sup>[32]</sup> Yogic practices can work wonders, especially in students, by improving their concentration, mental performance, emotional stability, and thus enhancing their academic performances and personality as a whole.

Cocchiara *et al.* published a systematic review to analyze and summarize the current knowledge regarding the use of yoga to manage and prevent stress and burnout in healthcare workers and concluded that yoga was found to be effective in the management of stress in healthcare workers and also stressed the necessity to implement methodologically relevant studies to attribute significance to such evidence.<sup>[33]</sup>

## Relevance of Yoga for Dental Patients

### Stress-related oral health conditions

Literary evidence suggests that stressed individuals report poorer oral health.<sup>[34]</sup> Shankardass hypothesized two pathways via which chronic stress could result in long-term oral disease development. First, stressed individuals tend to cope in unhealthy ways such as substance abuse and poor diet which can nurture oral diseases. Second, chronic stress could result in dysfunctional physiological systems which in turn would affect the underlying mechanism of disease progression.<sup>[35]</sup> Various stress-related conditions can affect the oral cavity including aphthous ulcers, myofascial pain dysfunction syndrome (MPDS), oral lichen planus, xerostomia, burning mouth syndrome, and bruxism.<sup>[36]</sup> Moreover, irregular eating habits could result in gastric refluxes which ultimately would result in dental erosion.<sup>[37]</sup> Xerostomia would culminate in halitosis, dental caries, and periodontal diseases, all of which affect the quality of life.

Practicing yoga has been effectively proven to reduce stress levels and induce the sense of calmness in individuals, which could help in the management of several stress-induced oral conditions. Khan *et al.* studied the effectiveness of yoga in patients with MPDS and compared the effects with ongoing conventional

noninvasive treatment modalities. They reported that these yoga asanas in combination with conventional noninvasive therapies showed better results in MPDS patients as compared to either modalities alone.<sup>[38]</sup> Moreover, breathing techniques of yoga prevent drying of mouth and throat, which in turn would reduce the incidence of halitosis and dental caries. In addition, yoga asanas like forward bends, twists, and inverted poses have been proven to increase salivary secretion.<sup>[23]</sup> Garcia-Sesnich *et al.* reported yogic practice named Kundalini yoga had an immediate effect on salivary cortisol levels and perceived stress after 3 months of practice.<sup>[39]</sup> Singh *et al.* studied the effect of rhythmic breathing exercises of yoga in maintenance of oral health and gingival bleeding and reported significant reduction in debris, calculus value, oral hygiene, and gingival index.<sup>[40]</sup> Sudhanshu *et al.* incorporated yogic practices in the treatment of periodontal disease along with conventional dental therapy and reported reduced plaque index, mean probing pocket depth, clinical attachment loss, and bleeding on probing on combining the two techniques, thus concluding yoga accelerates the treatment outcomes by combating stress, which is a major factor affecting the treatment of periodontal disease.<sup>[41]</sup>

### Inflammatory conditions

Inflammation can act as a crucial contributing factor for the progression of several diseases such as diabetes mellitus, hypertension, insulin resistance syndrome, coronary artery disease, Alzheimer's disease, and periodontal diseases via proinflammatory cytokines like IL-1, IL-6, IL-8, TNF  $\alpha$ , and CRP.<sup>[42,43]</sup> Moreover, literary evidence suggests chronic inflammation to influence tumor promotion, survival, proliferation, invasion, angiogenesis, and metastases and is thus considered a risk factor for most of the cancers including oral cancer.<sup>[44]</sup>

Shete *et al.* studied the effect of yoga training on inflammatory cytokines and C reactive proteins in healthy adults exposed to occupational hazards and reported significant changes in cholesterol, LDL, IL-6, TNF  $\alpha$ , and CRP level.<sup>[42]</sup> Rajbhog *et al.* evaluated the effect of yoga practices on selected proinflammatory and antiinflammatory cytokines among industrial workers and concluded that the yoga group had significantly lower levels of IL-1  $\beta$  and increase in IL-10 as compared to control group, wherein, IL-1 $\beta$  is a proinflammatory cytokine and IL-10 an antiinflammatory cytokine.<sup>[45]</sup> Vijayaraghava *et al.* studied the effect of yoga practice on TNF- $\alpha$  and IL-6 levels and lipid profile and concluded that regular practice of yoga lowers basal TNF- $\alpha$  and IL-6 levels.<sup>[46]</sup> Yoga can reduce the oxidative stress, proinflammatory cytokine level, and also enhance immunity, which would aid in the reduction of chronic gingival and periodontal inflammation and, hence, improve the periodontal health.<sup>[41]</sup> Katuri *et al.* performed a cross-sectional pilot study to find the association of yoga practice with periodontal disease by measuring serum cortisol level and reported that individuals practicing yoga on a regular basis had low serum cortisol, anxiety, and depression levels, thereby better periodontal health.<sup>[47]</sup>

## Orofacial development

Myofunctional therapy, an adjunct used in interceptive orthodontics includes facial and tongue exercises to promote proper tongue position, improved breathing, chewing, and swallowing. These, when used in early formative years, can aid in reducing the severity of malocclusion. Moreover, these exercises can also be used in the interception of deleterious habits such as thumb sucking, mouth breathing, tongue thrusting, and bruxism which could result in or worsen malocclusion.<sup>[47]</sup> In addition to these, myofunctional therapy also improves proprioception, tone, and mobility.<sup>[48]</sup> Various components of yoga including postures and breathing exercises can be effectively used in myofunctional therapies which would aid in proper orofacial development.<sup>[23,49]</sup>

## Others

Yoga can also be helpful in the management of substance abuse such as tobacco and alcohol which can result in morbidity and mortality. Breathing exercises and meditation can help an individual to relax, and thus help in control the urges.<sup>[23]</sup> According to a review published by Jha *et al.*, alternate nostril breathing can result in immediate reduction in the strength of urges to smoke.<sup>[50]</sup> Moreover, it also increases the mental and physical strength, both of which are required to manage the withdrawal symptoms.

Yoga helps in relaxation, which will help in reducing the anxiety of patients, and thus make them more cooperative. Kakodhar *et al.* reported reduction in anxiety levels of the patients after a 10-min chair side yoga session before extraction.<sup>[51]</sup> Similarly, a study by Lovas *et al.* stated that rapid relaxation by focusing on breathing for a period of 2–3 min before administering local anesthesia helped to reduce anxiety and also diminished the amount of anesthesia required.<sup>[52]</sup>

Kaswala *et al.* reported regular practice of yoga along with use of proton pump inhibitors (PPI) resulted in the improvement of severe symptoms of gastroesophageal reflux disease (GERD) which were initially refractory to PPI alone and also prevented the necessity of invasive procedures.<sup>[53]</sup> A very common oral manifestation of GERD is dental erosion, and yogic practices may help in the prevention of this regressive condition.

Villemure *et al.* suggested that regular and long-term yoga practice improved pain tolerance by dealing with sensory inputs and potential emotional reactions attached to those inputs leading to a change in insular brain anatomy and connectivity. They stated that these yoga practitioners could tolerate pain more than twice as long as matched controls and also had more gray matter in multiple brain regions.<sup>[54]</sup> Thus, yoga can be used in the management of painful conditions.

Yoga has also been found to have positive effect on cardiorespiratory fitness. Sovova *et al.* in their study found that those who practiced yoga for at least an hour a day showed better performance in spiroergometry under maximal exercise testing

than the control group. The yoga group showed statistically significant higher maximum performance per kilogram and maximum oxygen consumption per kilogram per minute.<sup>[55]</sup> Hence, by maintaining the cardiorespiratory fitness, yoga also contributes to the overall well being of an individual.

Yogic intervention has been found to be efficacious in the management of psychophysiological reactions and stress in cancer patients.<sup>[56,57]</sup> One of the most common cancer-related toxicity is insomnia, which may increase morbidity and mortality. Literary evidence indicates yoga to be effective for improving insomnia and sleep quality impairment in cancer patients and survivors.<sup>[57]</sup> Agarwal published a review of evidence-based research on the role of yoga in cancer care and concluded that yoga improved the physical and psychological symptoms, quality of life, and markers of immunity of the patients, thus providing a strong support for yoga's integration into conventional cancer care.<sup>[58]</sup>

## Adverse Effects

Some yoga poses are too complex, require practice, and are not to be attempted by novices, or would result in injuries. Moreover, yoga can also cause injuries if done in a wrong way. Thus, adequate precautions and measures should be taken, Cramer *et al.* performed a systemic review of adverse events associated with yoga and reported fractures, ligament tears, joint injuries, fibrocartilagenous injuries, lumbar disc annular tears, and myositis ossificans to be the most common entities. In addition to these, glaucoma, orbital varices, peripheral neuropathy, stroke, transient headache, and pneumothorax were the lesser reported adversities.<sup>[59]</sup> Meshramkar *et al.* reported a case of dental erosion, wherein the patient vomited on an empty stomach to clean his gastrointestinal tract as a part of yoga for over 12 years.<sup>[60]</sup> Practices like these should be avoided as it will have a detrimental effect on the patient.

## Conclusion

Yoga can be an effective alternative to combat the various occupational hazards associated with the profession of dentistry and it also has been proven to be beneficial for a variety of oral health-related conditions. Moreover, it also has a positive effect on psychological stress. An added advantage of practicing yoga is the fact that it is not meticulous and painstaking and can be easily done in small sessions. Therefore, practicing yoga every day for a small period of time would undo the damage caused by the strenuous lifestyle, rejuvenate an individual, and, hence, provide a holistic approach to life.

## Acknowledgements

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## Financial support and sponsorship

Nil.



## Conflicts of interest

There are no conflicts of interest.

## References

- Singh K, Singh P, Oberoi G. Effect of yoga on promotion of oral health. *Int J Dentistry Res* 2017;2:18-21.
- McCaffrey R, Park J. The benefits of yoga for musculoskeletal disorders: A systemic review of the literature. *J Yoga Phys Ther* 2012;2:100-22.
- Vijender K, Saurabh B, Raju S. Yoga in dental practice: A new perspective. *Int J Curr Adv Res* 2016;5:734-5.
- Bhavanani AB. Yoga for dental professional: Scope and simplified practices. *J Sci Dent* 2017;7:1-11.
- Madanmohan T, Bhavanani AB. Physiological benefits of yoga practices: A brief review. *Int J Tradit Complement Med* 2016;1:31-43.
- Reddy KS, Majumder DSP, Doshi D, Kulkarni S, Reddy BS, Reddy PM. Occupational hazards in dentistry. *J Res Adv Dent* 2017;6:110-22.
- Kulkarni A, Nair P, Kulkarni T, Patil K, Kodgi A, Sasane R. Occupational hazards in dentistry: A review. *I J Pre Clin Dent Res* 2015;2:49-55.
- Barnes PM, Bloom B, Nahin RL. CDC National Health Statistics Report #12. Complementary and Alternative Medicine Use Among Adults and Children: United States, 2007. Available from: [http://www.cdc.gov/nchs/nhis/nhis\\_nhsr.htm](http://www.cdc.gov/nchs/nhis/nhis_nhsr.htm).
- Jeter PE, Slutsky J, Singh N, Khalsa SBS. Yoga as a therapeutic intervention: A bibliometric analysis of published research studies from 1967 to 2013. *J Altern Complement Med* 2015;21:586-92.
- Ponte SB, Lino C, Tavares B, Amaral B, Bettencourt AL, Nunes T, *et al.* Yoga in primary health care: A quasi-experimental study to access the effects on quality of life and psychological distress. *Complement Ther Clin Pract* 2019;34:1-7.
- Ross A, Williams L, Pappas-Sandonas M, Touchton-Leonard K, Fogel D. Incorporating yoga therapy into primary care: The casey health institute. *Int J Yoga Ther* 2015;25:43-9.
- Alghadir A, Zafar H, Iqbal ZA. Work-related musculoskeletal disorders among dental professionals in Saudi Arabia. *J Phy Ther Sci* 2015;27:1107-12.
- Feng B, Liang Q, Wang Y, Andersen LL, Szeto G. Prevalence of work-related musculoskeletal symptoms of the neck and upper extremity among dentists in China. *BMJ Open* 2014;4:e006451.
- Kumar VK, Kumar SP, Baliga MR. Prevalence of work-related musculoskeletal complaints among dentists in India: A national cross-sectional survey. *Indian J Den Res* 2013;24:428-38.
- Bhushan P, Gautam A, Bhushan P, Kumar K. Musculo-skeletal disorders among dentist and yoga pose. *J Med Dent Sci Res* 2016;3:25-31.
- Hayes M, Cockreil D, Smith DR. A systemic review of musculoskeletal disorders among dental professionals. *Int J Dent Hyg* 2009;7:159-65.
- Shams-Hossaini NS, Vahdati T, Mohammadzadeh Z, Yeganeh A, Davoodi S. Prevalence of musculoskeletal disorders among dentists in Iran: A systemic review. *Mater Sociomed* 2017;29:257-62.
- Monson AL, Chismark AM, Cooper BR, Krenik-Matejcek TM. Effects of yoga on musculoskeletal pain. *J Dent Hyg* 2017;91:15-22.
- Koneru S, Tanikonda R. Role of yoga and physical activity in work related musculoskeletal disorders among dentists. *J Int Soc Prev Community Dent* 2015;5:199-204.
- Deolia SG, Rizhana A, George J, Ingle H, Bonde R. Effects of yoga as a therapy for physical and psychological hazards in dentists in Wardha region. *Yoga Mimamsa* 2017;49:68-75.
- Chismark A, Asher G, Stein M, Tavoc T, Curran A. Use of complementary and alternative medicine for work related pain correlates with career satisfaction among dental hygienists. *J Dent Hyg* 2011;85:273-84.
- Monk-Turner E, Turner C. Does yoga shape body, mind and spiritual health and happiness: Differences between yoga practitioners and college students. *Int J Yoga* 2010;3:48-54.
- Deshpande A. Relevance of yoga in dental education. *Yoga Mimamsa* 2018;50:10-15.
- Sandhu KS, Nidhi G, Mohit B, Preety G, Sahil T. Yoga-A boon for oral health. *Unique J Ayurvedic Herb Med* 2016;4:20-1.
- Tangade PS, Mathur A, Gupta R, Chaudhary S. Assessment of stress level among dental school students: An Indian Outlook. *Dent Res J (Isfahan)* 2011;8:95-101.
- Uraz A, Tocak YS, Yozgatligil C, Cetiner S, Bal B. Psychological well-being, health, and stress sources in Turkish dental students. *J Dent Educ* 2013;77:1345-55.
- Basudan S, Binanzan N, Alhassan A. Depression, anxiety and stress in dental students. *Int J Med Educ* 2017;8:179-86.
- Streeter CC, Gerbarg PL, Saper RB, Ciraulo DA, Brown RP. Effects of yoga on the autonomic nervous system, gammaaminobutyric acid, and allostasis in epilepsy, depression and post traumatic stress disorder. *Med Hypothesis* 2012;78:571-9.
- Khalsa SB. Yoga as a therapeutic intervention: A bibliometric analysis of published research studies. *Indian J Physiol Pharmacol* 2004;48:269-85.
- Ayoub F, Fares Y, Fares J. The psychological attitude of patients toward health practitioners in Lebanon. *N Am J Med Sci* 2015;7:452-8.
- Shankarapillai R, Nair MA, George R. The effect of yoga in stress reduction for dental students performing their first periodontal surgery: A randomized controlled study. *Int J Yoga* 2012;5:48-51.
- Tripathi MN, Kumari S, Ganpat TK. Psychophysiological effects of yoga on stress in college students. *J Educ Health Promot* 2018;7:43.
- Cocchiara AR, Peruzzo M, Mannocci A, Ottolenghi L, Villari P, Polimeni A, *et al.* The use of yoga to manage stress and burnout in healthcare workers: A systematic review. *J Clin Med* 2019;8:E284.
- Vasilioiu A, Shankardass K, Nisenbaum R, Quinonez C. Current stress and poor oral health. *BMC Oral Health* 2016;16:1-8.
- Shankardass K. Place-based stress and chronic disease: A systems view of environmental determinants. In: O'Campo P, Dunn JR, editors. *Rethinking Social Epidemiology: Towards a Science of Change*. New York: Springer Publishing Company; 2012. p. 117-8.
- Kaur D, Behl AB, Isher PP. Oral manifestations of stress-related disorders in the general population of Ludhiana. *J Indian Acad Oral Med Radiol* 2016;28:262-9.
- Makino M, Masaki C, Tomoeda K, Kharouf E, Nakamoto T,

- Hosokawa R. The relationship between sleep, bruxism behaviour and salivary stress biomarker level. *Int J Prosthodont* 2009;22:43-8.
38. Khan AA, Srivastava A, Paassi D, Devi M, Chandra L, Atri M. Management of myofascial pain dysfunction syndrome with meditation and yoga: Healing through natural therapy. *Natl J Maxillofac Surg* 2018;9:155-9.
  39. Garcia-Sesnich JN, Flores MG, Rios MH, Aravena JG. Longitudinal and immediate effect of kundalini yoga on salivary levels of cortisol and activity of alpha-amylase and its effect on perceived stress. *Int J Yoga* 2017;10:73-80.
  40. Singh K, Singh P, Oberoi G. Effect of yoga on dental care: Pranayama techniques or rhythmic breathing exercises on the oral hygiene and gingival bleeding. *Int J Applied Dent Sci* 2017;3:91-5.
  41. Sudhanshu A, Sharma U, Vadiraja HS, Rana RK, Singhal R. Impact of yoga on periodontal disease and stress management. *Int J Yoga* 2017;10:121-7.
  42. Shete SU, Verma A, Kulkarni DD, Bhogal RS. Effect of yoga training on inflammatory cytokines and C reactive protein in employees of small scale industries. *J Educ Health Promot* 2017;6:76.
  43. Raison CL, Capuron L, Miller AH. Cytokines sing the blues: Inflammation and the pathogenesis of depression. *Trends Immunol* 2006;27:24-31.
  44. Aggarwal BB, Shishodia S, Sandur SK, Pandey MK, Sethi G. Inflammation and cancer: How hot is the link? *Biochem Pharmacol* 2006;72:1605-21.
  45. Rajbhog PH, Shete SU, Verma A, Bhogal RS. Effect of yoga module on pro-inflammatory and anti-inflammatory cytokines in industrial workers of Lonavla: A randomized controlled study. *J Clin Diagn Res* 2015;9:CC01-5.
  46. Vijayaraghava A, Doreswamy V, Narasipur OS, Kunnivil R, Srinivasamurthy N. Effect of yoga practice on levels of inflammatory markers after moderate and strenuous exercise. *J Clin Diagn Res* 2015;9:CC08-12.
  47. Katuri KK, Dasari AB, Kurapati S, Vinnakota NR, Bollepalli AC, Dhulipalla R. Association of yoga practice and serum cortisol levels in chronic periodontitis patients with stress related anxiety and depression. *J Int Soc Prev Community Dent* 2016;6:7-14.
  48. Khemka S, Thosar N, Baliga S. Oral gymnastics-Way to a harmonious dentition. *Int J Contemp Dent Med Rev* 2015;2015:010215. doi: 10.15713/ins.ijcdmr.57.
  49. Homem MA, Vieira-Andrade RG, Falci SGM, Ramos-Jorge ML, Marques LS. Effectiveness of orofacial myofunctional therapy in orthodontic patients: A systematic review. *Dental Press J Orthod* 2014;19:94-9.
  50. Jha RK, Li HP. Effects of alternate nostril breathing on quitting smoking. *Int J Sci Invent Today* 2017;6:329-37.
  51. Kakodhar PV, Patil SV, Kumar SN. The effect of short yoga intervention on the anxiety and comfort level of dental patients reporting for extraction. *Int Sci Yoga J Sense* 2016;6:6-13.
  52. Lovas JG, Lovas DA. Rapid relaxation-practical management of preoperative anxiety. *J Can Dent Assoc* 2007;73:437-40.
  53. Kaswala D, Shah S, Mishra A, Patel H, Patel N, Sangwan P, *et al.* Can yoga be used to treat gastroesophageal reflux disease? *Int J Yoga* 2013;6:131-3.
  54. Villemure C, Ceko M, Cotton VA, Bushnell MC. Insular cortex mediates increased pain tolerance in yoga practitioners. *Cereb Cortex* 2014;24:2732-40.
  55. Sovova E, Cajke V, Pastucha D, Malincikova J, Radova L, Sovova M. Positive effect of yoga on cardiorespiratory fitness: A pilot study. *Int J Yoga* 2015;8:134-8.
  56. Chandwani KD, Ryan JL, Peppone LJ, Janelins MM, Sprod LK, Devine K, *et al.* Cancer related stress and complementary and alternative medicine: A review. *Evid Based Complement Alternat Med* 2012;2012:979213.
  57. Mustian KM, Janelins M, Peppone LJ, Kamen C. Yoga for the treatment of insomnia among cancer patients: Evidence, mechanisms of action, and clinical recommendations. *Oncol Hematol Rev* 2014;10:164-8.
  58. Agarwal RP, Maroko-Afek A. Yoga into cancer care: A review of the evidence-based research. *Int J Yoga* 2018;11:3-29.
  59. Cramer H, Krucoff C, Dobos G. Adverse events associated with yoga: A systemic review of published case reports and case series. *PLoS One* 2013;8:e75515.
  60. Meshramker R, Patil SB, Patil NP. A case report of patient practising yoga leading to dental erosion. *Int Dent J* 2007;57:184-6.