



# **An Evaluation on Use of Stress Ball Exercise on Stress Management among Student Population – A Cross Section Study**

**R. Srivarsan<sup>1</sup>, G. Sridevi<sup>2\*</sup> and S. Preetha<sup>2</sup>**

<sup>1</sup>Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai-77, Tamil Nadu, India.

<sup>2</sup>Department of Physiology, Saveetha Dental College and Hospital, Saveetha Institute of Medical and Technical Sciences, Chennai-77, Tamil Nadu, India.

## **Authors' contributions**

*This work was carried out in collaboration among all authors. Author RS Literated search, survey, data collection, analysis, manuscript wrote author GS Study designed, data verification, manuscript drafted. All authors read and approved the final manuscript.*

## **Article Information**

DOI: 10.9734/JPRI/2021/v33i47B33150

Editor(s):

(1) Dr. Dharmesh Chandra Sharma, G. R. Medical College & J. A. Hospital, India.

Reviewers:

(1) Fatemeh Kazemi-Lomedasht, Pasteur Institute of Iran.

(2) Gizem Ozluk Cilak, Hitit University, Turkey.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/74393>

**Received 05 August 2021**

**Accepted 10 October 2021**

**Published 04 November 2021**

**Original Research Article**

## **ABSTRACT**

**Background:** Stress ball is a new favourite gadget people like to use to fight stress, reduce tension. But there are not many scientific reports on the benefits of stress ball exercises.

**Objective:** the present study aimed to investigate the level of stress among student population and the effectiveness of the use of stress ball exercises among student population.

**Methods:** A cross sectional study was conducted through a convenience sampling method. The participants were administered with a self developed questionnaire consisting of 17 questions. The responses were collected using google forms. Descriptive statistics, frequency analysis and chi square test was used to analyze the data.

**Results:** Males are more stressed than female in college environment and after stress ball exercise students feels reduced irritability and nervousness thus using stress ball exercise during stress management is more significant.

**Conclusion:** The study concluded an innovative finding that Majority of the student population were stressed due to academic reasons and respondents feel that stress ball users showed a satisfactory recovery from their stress.

*Keywords: Stress; stress ball; acute stress; chronic stress; innovative.*

## 1. INTRODUCTION

Feeling of emotional or physical tension is stress. Anything which makes you feel frustrated, angry and nervous may make you feel stressed. Sometimes anxiety may also make you feel stressed. There are two types of stress, Acute stress and Chronic stress which are discussed below. Acute stress is short term stress which goes away quickly. Our team has extensive knowledge and research experience that has translate into high quality publications [1–20]. Doing something new may cause acute stress. Some common reasons for acute stress are having a fight with a partner or skiing down a steep slope. Acute stress actually helps you to manage dangerous situations [21]. Each and every would have faced acute stress one time or another [22].

Chronic stress is long term stress which lasts for a longer period of time. Usually it is caused due to money problems or maybe due to unhappy marriage life or trouble at work. Any type of stress which lasts more than a week or months is chronic stress. This type of stress may lead to health problems also [21,23].

Our body reacts to stress by releasing hormones like oxytocin which will act on our brain and make the brain more alert, cause your muscles to tense and increase your stress. In the short term these hormones are good because it makes you feel free and helps you to handle the situation causing stress [23].

In chronic stress your body stays alert but it also increases blood pressure, risk of heart disease, diabetes and obesity also sometimes it leads to depression also menstrual problems [24]. Our team has extensive knowledge and research experience that has translate into high quality publications [25–29].

Some activities will result in reducing stress like stress ball exercise, breaking pencil, meditation, hearing songs etc. Stress balls are the new favorite gadget people like to use to fight stress, reduce tension and also, in some ways, help in anger management [30]. Stress ball is about 7cm in diameter and sphere-shaped sponge ball. Acts

as a distraction device, Improves nervous system, Rehabilitates after an injury, Mini workout for the body and Improves the quality of life. Stress [31]. Since stress affects various aspects of the life, people turn to look into various stress relieving strategies and stress relieving gadgets. One such commonly used gadget is a stress ball. Reports have revealed the scientific applications of this gadget and many people widely use it during their working hours and leisure hours as well. So the novelty of study planned to investigate the level of stress among the student population and how the use of stress ball have changed their life of student population.

## 2. MATERIALS AND METHODS

The present cross-sectional study was conducted among student population of Saveetha dental college. The inclusion criteria were students who were regularly using stress ball as a gadget for stress relief most of the time. Exclusion criteria was students suffering from any mental illness and psychosomatic illness or use of anti-depressants. The study assessed the student experiences after their regular use of stress ball using a self-developed questionnaire prepared in Google forms and circulated as an online questionnaire. Questionnaire consisted of 17 closed ended questions to evaluate frequency of stress ball exercise usage and rate the overall relief from stress. The responses of the participants were noted and Frequency analysis and chi square test was done by SPSS 23 software.

## 3. RESULTS

The results were extracted from the responses of the participants in the questionnaire.

In this present study, about 77.5 percent of respondents were in the age group of 21-25 whereas the rest of 22.5 percent of respondents were in the age group of 16-20. About 65.7 percent of respondents were males whereas the rest of the respondents were females. For the following question “Are you stressed in your college environment?” About 77.5 respondents answered yes (Fig. 1). For the following question

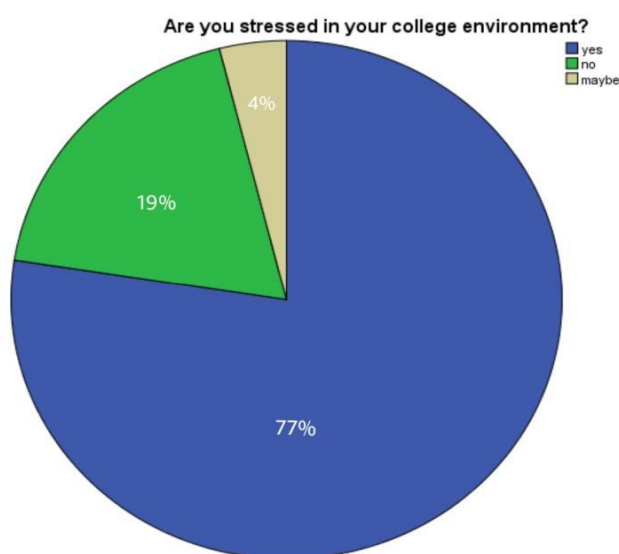
“what is the reason for stress” about 71.6 percent of respondents have answered personal reasons. For the following question of “which of the following symptoms you experience during stress” about 38.6 percent of the respondents have answered loss of appetite. For the following question “what mode of relaxation do you prefer” about 50 percent of the respondents have answered dancing. For the following question “do you feel dryness of mouth” about 46.1 percent of the respondents have answered that it applies to them to some degree, or some of the time. For the following question “I tended to over-react to situation” about 59.8 percent of respondents have answered that it applies to them to a considerable degree or a good part of time. For the following question “I find difficult to relax” about 40.2 percent of the respondents have answered that it applies to them to some degree, or some of the time. For the following question “I felt sad and depressed” about 49 percent of the respondents have answered that it applies to them to some degree, or some of the time. For the following question “Do you use stress ball exercise regularly” about 40.2 percent of the respondents have answered that they do not do stress ball exercise regularly. For the following question “Are you feeling better after stress ball exercise” about 40.8 percent of the respondents have answered that they sometimes feel better after stress ball exercise (Fig. 2). For the following question “Do they feel that your stress

ball exercises reduced your anger” about 56.1 percent of the respondents have answered never. For the following question “Do you feel that your stress ball exercises have reduced your irritability and nervousness” about 83.7 percent of the respondents have answered sometimes (Fig. 3). For the following question “What is your experience about stress ball exercise” about 54.1 percent of the respondents have answered that it is satisfying and liking (Fig. 4). For the following question “Have the use of a stress ball changed your food intake” about 87.8 percent of the respondents have answered never. For the following question “Rate your happiness scale after stress ball exercise” about 39.8 percent of the respondents have rated it to be 75%.

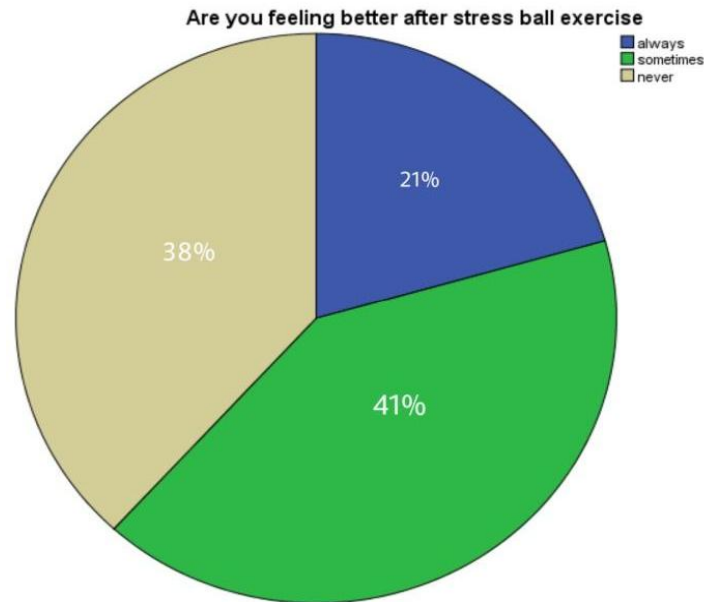
### 3.1 Cross Tab Evaluation

The association between gender of students and experience of stress ball exercise was analyzed. Males feel more satisfied compared to females soon after stress ball exercise. Pearson Chi-square test value  $p = 0.008$  ( $p < 0.05$ ) (Fig. 5).

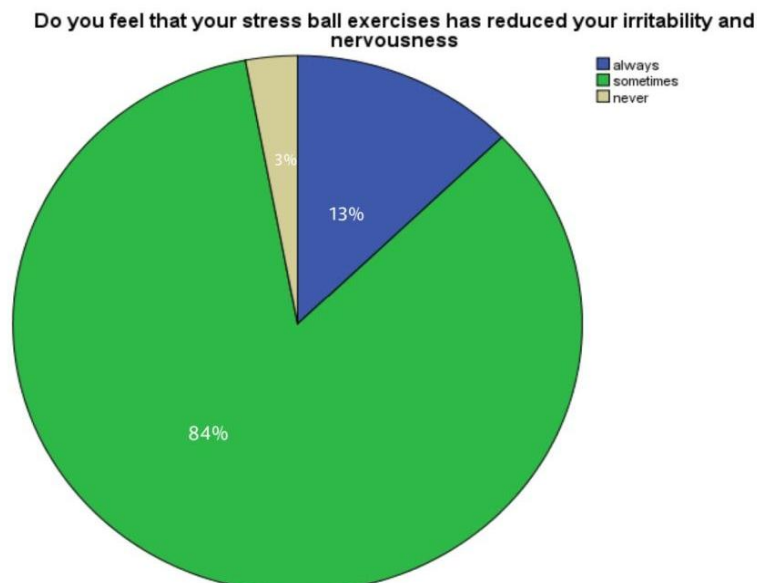
The association between gender of students and whether they were stressed were analyzed. Males feel more stressed than females in college environments. Pearson Chi-square value  $p = 0.012$  ( $p < 0.05$ ) (Fig. 6).



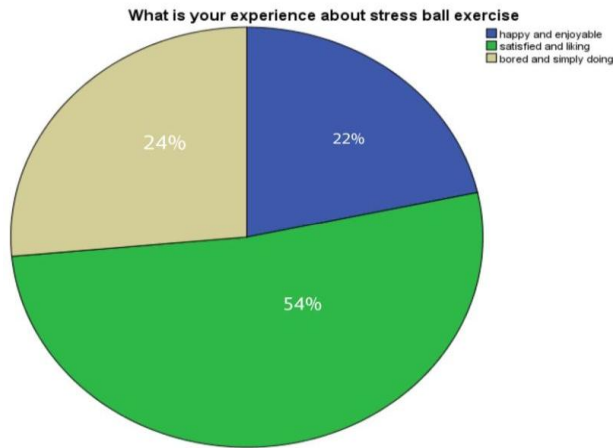
**Fig. 1. Shows responses of students who are stressed in the college environment. About 77% of students feel stressed, 19% of students don't feel stressed and 4% students sometimes feel stressed. Blue represents students who are stressed due to the college environment. Green represents students who are not stressed and brown represents students who feel stressed sometimes in college environments.**



**Fig. 2. Shows students' feelings after stress ball exercise. About 41% of students sometimes feel better after stress ball exercise, 21% of students always feel better after stress ball exercise and 38% of students don't feel anything. Green represents students who feel happy sometimes, blue represents students who are feeling good after stress ball exercise and brown shows students who do not feel anything**



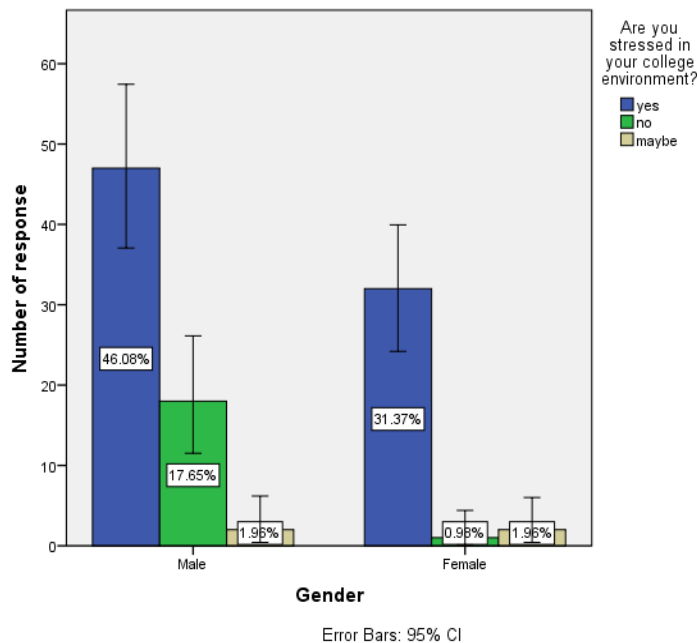
**Fig. 3. Shows responses of students who feel stress ball exercise reduces irritability and nervousness. About 84% of students feels stress ball exercise sometimes reduce irritability and nervousness, 13% of students feels stress ball exercise always reduces irritability and nervousness and 3% of students feel stress ball exercise never reduces irritability and nervousness. Green represents students who feel stress ball exercise sometimes reduce irritability and nervousness, blue represents students who feels stress ball exercise always reduces irritability and nervousness and brown shows students who feel stress ball exercise never reduces irritability and nervousness**



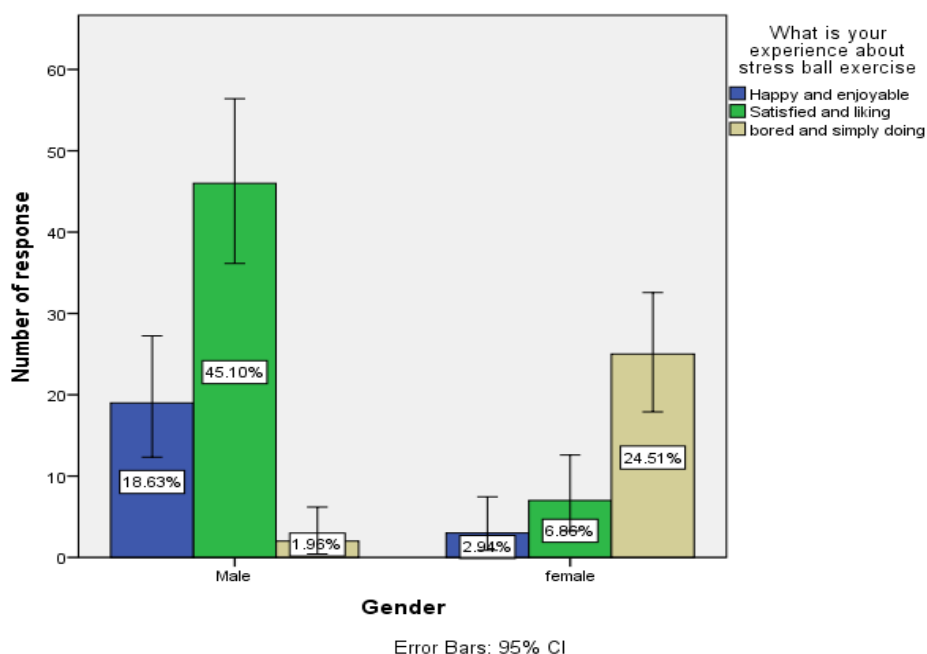
**Fig. 4.** Shows responses of experience of students after stress ball exercise. About 54% of students feel satisfied and liking soon after stress ball exercise, 22% of students feel happy and enjoying soon after stress ball exercise and 24% of students feel bored and simple soon after stress ball exercise. Green represents students who feel satisfied and liking soon after stress ball exercise, Blue represents students who feel happy and enjoying soon after stress ball exercise and brown represents students who feel bored and simple soon after stress ball exercise

BAR GRAPH

Crosstab evaluation:



**Fig. 5.** Bar graph showing comparison of responses between gender of students and students who are stressed due to the college environment. X-axis represents different gender (male and female) and Y-axis represents the number of responses of students who are stressed due to the college environment. Blue denotes students who responded yes, green denotes students who responded no and brown denotes students who responded maybe. Males feel more stressed than females in college environments with the Pearson Chi-square value  $p = 0.012$  which is statistically significant



**Fig. 6. Bar graph showing comparison of responses between gender of students and experience of stress ball exercise. X-axis represents gender of the students and Y-axis represents the number of responses students experience about the stress ball exercise. Blue denotes students who responded happy and enjoyable, green denotes students who responded satisfied and liking and brown denotes students who responded bored and simply doing. Males feel more satisfied compared to females soon after stress ball exercise with the Pearson Chi-square test value  $p = 0.008$  which is statistically significant**

#### 4. DISCUSSION

Stress balls are the new favorite gadget for people in the present world to fight stress, reduce tension. Scientific reports suggest that stress balls on a regular basis alleviates stress levels, sometimes even works faster than meditation to show benefits [32]. The results of the present study showed that male respondents perceived a higher level of stress due to academic reasons and huge syllabus. And stress ball usage had shown significant improvements on stress reduction among college students with high academic pressures.

The respondents in our study also reported that their experience about stress ball exercise was satisfied and loveable by them. They reported that stress ball exercises reduced their anger and stress levels to a considerable degree. Manipulation of the strain ball can stimulate the nerves that are present in your hands. These nerves are in communication with different parts of the brain - especially the limbic region - that are associated with your emotions. This stimulation works like acupressure in such a way

that stimulation of one area affects other parts of your body. It also results in mind diversion from stress and mood enhancement and it is one of the cheapest available remedies to fight stress [33].

Studies show that stress balls are very beneficial in reducing stress compared to other gadgets like Fidget spinners, doodling, knitting etc. There are many stress balls like scented coloured balls, rainbow giant stress balls, Mind panda empowering stress balls, Sweda handgrip strength trainer etc. All these are much efficient in enhancing relief from stress compared to other gadgets [27].

Certain studies on Stress balls called Egg seizers filled with a malleable gel can fit perfectly in the palm of your hand. Repeatedly squeezing the egg reduces tension and in turn, relieves stress. In addition to the psychological benefits, stress balls improve blood circulation and are utilized within the treatment of carpal-tunnel syndrome and arthritis [31].

## 5. LIMITATIONS OF THE STUDY

The limitations of study include only students of age group 16-25 years were included in the study. This population does not represent the total population. But this survey reported that overall satisfaction was obtained from stress in stress ball users

## 6. CONCLUSION

The present study concluded that stress ball users showed a remarkable recovery from any form of stress and this type of stress relaxing is cost effective and can be adopted for improvement for better quality of living.

## DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

## CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVALS

We conducted our research after obtaining proper IEC approval.

## ACKNOWLEDGEMENT

The authors would like to thank the study participants for their participation for their kind cooperation throughout the study.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Saraswathi I, Saikarthik J, Senthil Kumar K, Madhan Srinivasan K, Ardhanaari M,

- Gunapriya R. Impact of COVID-19 outbreak on the mental health status of undergraduate medical students in a COVID-19 treating medical college: A prospective longitudinal study. *PeerJ*. 2020;8:e10164.
2. Santhakumar P, Roy A, Mohanraj KG, Jayaraman S, Durairaj R. Ethanolic extract of capparid fruit ameliorates methotrexate-induced hepatotoxicity by activating Nrf2/HO-1 and PPAR $\gamma$  mediated pathways. *Ind J Pharm Educ*. 2021;55:s265–74.
3. Nambi G, Kamal W, Es S, Joshi S, Trivedi P. Spinal manipulation plus laser therapy versus laser therapy alone in the treatment of chronic non-specific low back pain: a randomized controlled study. *Eur J Phys Rehabil Med*. 2018;54:880–9.
4. Rajakumari R, Volova T, Oluwafemi OS, Rajesh Kumar S, Thomas S, Kalarikkal N. Grape seed extract-soluplus dispersion and its antioxidant activity. *Drug Dev Ind Pharm*. 2020;46:1219–29.
5. Clarizia G, Bernardo P. Diverse Applications of Organic-Inorganic Nanocomposites: Emerging Research and Opportunities: Emerging Research and Opportunities. IGI Global; 2019.
6. Prakash AKS, Devaraj E. Cytotoxic potentials of *S. cumini* methanolic seed kernel extract in human hepatoma HepG2 cells. *Environmental Toxicology*. 2019;34:1313–9. Available: <https://doi.org/10.1002/tox.22832>
7. Tahmasebi S, Qasim MT, Krivenkova MV, Zekiy AO, Thangavelu L, Aravindhan S, et al. The effects of oxygen-ozone therapy on regulatory T-cell responses in multiple sclerosis patients. *Cell Biol Int*. 2021;45:1498–509.
8. Wadhwa R, Paudel KR, Chin LH, Hon CM, Madheswaran T, Gupta G, et al. Anti-inflammatory and anticancer activities of Naringenin-loaded liquid crystalline nanoparticles *In vitro*. *J Food Biochem*. 2021;45:e13572.
9. Vivekanandhan K, Shanmugam P, Barabadi H, Arumugam V, Raj DDRD, Sivasubramanian M, et al. Emerging Therapeutic Approaches to Combat COVID-19: Present Status and Future Perspectives. *Frontiers in Molecular Biosciences*. 2021;8. Available: <https://doi.org/10.3389/fmolb.2021.604447>

10. Ezhilarasan D. Critical role of estrogen in the progression of chronic liver diseases. *Hepatobiliary Pancreat Dis Int.* 2020;19:429–34.
11. Egbuna C, Mishra AP, Goyal MR. Preparation of phytopharmaceuticals for the management of disorders: The development of nutraceuticals and traditional medicine. Academic Press; 2020.
12. Kamath SM, Manjunath Kamath S, Jaison D, Rao SK, Sridhar K, Kasthuri N, et al. *In vitro* augmentation of chondrogenesis by Epigallocatechin gallate in primary Human chondrocytes - Sustained release model for cartilage regeneration. *Journal of Drug Delivery Science and Technology.* 2020;60:101992. Available:https://doi.org/10.1016/j.jddst.2020.101992
13. Barabadi H, Mojab F, Vahidi H, Marashi B, Talank N, Hosseini O, et al. Green synthesis, characterization, antibacterial and biofilm inhibitory activity of silver nanoparticles compared to commercial silver nanoparticles. *Inorganic Chemistry Communications.* 2021;129:108647. Available:https://doi.org/10.1016/j.inoche.2021.108647
14. Bharath B, Perinbam K, Devanesan S, AlSalhi MS, Saravanan M. Evaluation of the anticancer potential of Hexadecanoic acid from brown algae *Turbinaria ornata* on HT–29 colon cancer cells. *Journal of Molecular Structure.* 2021;1235:130229. Available:https://doi.org/10.1016/j.molstruc.2021.130229
15. Gowhari Shabgah A, Ezzatifar F, Aravindhan S, Olegovna Zekiy A, Ahmadi M, Gheibihayat SM, et al. Shedding more light on the role of Midkine in hepatocellular carcinoma: New perspectives on diagnosis and therapy. *IUBMB Life.* 2021;73:659–69.
16. Sridharan G, Ramani P, Patankar S, Vijayaraghavan R. Evaluation of salivary metabolomics in oral leukoplakia and oral squamous cell carcinoma. *J Oral Pathol Med.* 2019;48:299–306.
17. RH, Hannah R, Ramani P, Ramanathan A, Jancy MR, Gheena S, et al. CYP2 C9 polymorphism among patients with oral squamous cell carcinoma and its role in altering the metabolism of benzo[a]pyrene. *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology.* 2020;130:306–12. Available:https://doi.org/10.1016/j.oooo.2020.06.021
18. PCJ, Pradeep CJ, Marimuthu T, Krithika C, Devadoss P, Kumar SM. Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study. *Clinical Implant Dentistry and Related Research.* 2018;20:531–4. Available:https://doi.org/10.1111/cid.12609
19. Wahab PUA, Abdul Wahab PU, Madhulaxmi M, Senthilnathan P, Muthusekhar MR, Vohra Y, et al. Scalpel versus diathermy in wound healing after mucosal incisions: A split-mouth study. *Journal of Oral and Maxillofacial Surgery.* 2018;76:1160–4. Available:https://doi.org/10.1016/j.joms.2017.12.020
20. Mudigonda SK, Murugan S, Velavan K, Thulasiraman S, Krishna Kumar Raja VB. Non-suturing microvascular anastomosis in maxillofacial reconstruction- a comparative study. *Journal of Cranio-Maxillofacial Surgery.* 2020;48:599–606.
21. Herman JP, Maroun M, Richter-Levin G. Good stress, bad stress and very bad stress. *Stress.* 2015;18:267–8. Available:https://doi.org/10.3109/10253890.2015.1087091
22. Oertel G. *Stress. Stress and Deformation;* 1996. Available:https://doi.org/10.1093/oso/9780195095036.003.0008
23. Davis J, Damron K. *Stress and stress hormones.* Oxford Handbooks Online; 2018. Available:https://doi.org/10.1093/oxfordhb/9780190299323.013.26.
24. Crandall R. *Occupational stress: A handbook.* CRC Press; 2020.
25. Rajendran R, Kunjusankaran RN, Sandhya R, Anilkumar A, Santhosh R, Patil SR. Comparative evaluation of remineralizing potential of a paste containing bioactive glass and a topical cream containing casein phosphopeptide-amorphous calcium phosphate: An *In vitro* study. *Pesquisa Brasileira Em Odontopediatria E Clínica Integrada.* 2019;19:1–10. Available:https://doi.org/10.4034/pboci.2019.191.61
26. Ashok BS, Ajith TA, Sivanesan S. Hypoxia-inducible factors as neuroprotective agent in Alzheimer's disease. *Clin Exp Pharmacol Physiol.* 2017;44:327–34.



27. Sureshbabu NM, Selvarasu K, Jayanth KV, Nandakumar M, Selvam D. Concentrated Growth Factors as an Ingenious Biomaterial in Regeneration of Bony Defects after Periapical Surgery: A Report of Two Cases. *Case Reports in Dentistry*. 2019;2019:1–6. Available:<https://doi.org/10.1155/2019/7046203>.
28. Mohan M, Jagannathan N. Oral field cancerization: An update on current concepts. *Oncol Rev*. 2014;8:244.
29. Menon S, Ks SD, RS, SR, SVK. Selenium nanoparticles: A potent chemotherapeutic agent and an elucidation of its mechanism. *Colloids Surf B Biointerfaces*. 2018;170: 280–92.
30. Höbek Akarsu R, Kuş B, Doğukan Akarsu G. Effects of valsalva maneuver, EMLA cream, and stress ball for pregnant women's venipuncture pain. *Altern Ther Health Med*; 2021.
31. Epstein. *The Big Book Of Stress Relief Games*. Tata McGraw-Hill Education; 2004.
32. PK, Kumar P. Academic stress among nursing students. *Nursing & Healthcare International Journal*. 2020;4. Available:<https://doi.org/10.23880/nhij-16000227>
33. Sarah Royal. Brain fart: A stress ball for mental recall. *RP Minis*. 2018;27. Available:<https://www.verywellmind.com/best-stress-balls-5095568>

© 2021 Srivasan et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<http://www.sdiarticle4.com/review-history/74393>