



Effect of Stress on Mental Health

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Stress can come from any event that makes an individual feel anxious, frustrated, depressed due to the inability to cope with the situation. Stress is caused due to various stressors stimulating responses in the individual's body. The stressors usually increase the potential of the individual to face a stressful situation and overcome it however if the stressors are constantly triggered they can cause physiological damage to the individual. Physiological impact includes high blood pressure, rapid breathing, aches and pains, in severe cases it can also lead to stroke. Stressors can also impact an individual emotionally and mentally by causing insomnia, depression and anxiety. Mental health is the state of the overall well-being of an individual which helps them to overcome anxiety and stressful situations and thereby increases the productivity of the individuals in order to contribute to the society. It is important to maintain good mental health in order to keep the individual healthy.

Aim: The study has been conducted to assess the overall mental health of the study population and thereby suggest ways in which we can deal with stress. Stress and anxiety can be managed by practising yoga, meditation, discussing problems with a counsellor or spending time with family and loved ones.

Materials and Methods: A cross-sectional survey was conducted among the population with a sample size of 100. A self administered structured questionnaire was prepared based on the effect of stress on mental health. It was circulated to participants through an online platform (google form). The statistics were done using SPSS software, chi-square test effect of stress on mental

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health was used to check the association and P value of 0.05 was said to be statistically significant. The pros of the survey is that individuals of different lifestyles and cultures were surveyed. This study was conducted among individuals of the age group 14-46 years. Simple random sampling method was the sampling method used to minimise the sampling bias.

Results: The p value obtained from statistical data analysis was 0.02 which is statistically significant. The results revealed that most of the individuals of the study population had experienced stress in their life and some of them were already aware about the ways in which they could overcome stress. This study provided alternate ways to overcome stress and anxiety for individuals experiencing stress in their day to day lives.

Keywords: Stress; emotionally; insomnia; depression; innovative.

1. INTRODUCTION

Stress is the body's natural response due to the inability to cope with the demands of the situation. Any demand that poses threat or challenge to the mental stability of an individual is called stress, the responses of the body are easily triggered which can be harmful for the individual [1]. Hormones of the body such as adrenaline, epinephrine, norepinephrine increase the fight and flight mechanism of the body because of which the individual experiences nervousness, alertness, sweating that increases the potential of the individual to respond to challenging hazardous situations, other physiological responses towards stress also include increased heart rate and rapid breathing. Factors that stimulate stress environmentally or naturally are referred to as stressors, increased number of stressors usually sabotage the state of mind of the individual [2-4]. Stressors are physical and mental responses in order to adapt to new situations, in a stressful situation stressors continue to stimulate the body frequently without relaxative periods, constant activation of stress responses causes wear and tear in the body [5]. There are various classifications of stressors such as physical, emotional, mental and social stressors which develop responses in the body. Emotional symptoms of stress include anxiety, sadness, insomnia, irritability, depression, panic attacks, whereas physical symptoms include headaches, tremors, aches and pains, digestive problems, muscular tension, rapid circulation of blood, an excessive increase of stressors impact the overall health of the individual leading to stroke or heart attack in severe cases. For adaptation to such situations, individuals develop unhealthy behaviour such as overeating, excessive shopping or browsing, alcoholism, drugs and smoking. However, such stressful situations can be tackled by doing yoga, meditation and maintaining a positive attitude during a stressful

situation [6]. Stress leads to the activation of a sympathetic nervous system that thereby leads to the release of catecholamines, this is a neuroendocrine mechanism. Hormones and neurotransmitters can perform either of the two functions or both the functions that are - suppression and enhancement. Acetylcholine is a neurotransmitter present in the brain that stimulates neuroendocrine enhancement, Adrenocorticotrophic hormone stimulates neuroendocrine enhancement. Catecholamines which contain a number of aromatic amines that act as neurotransmitters cause suppression of neuroendocrine mechanism and Vasopressin also called as, antidiuretic hormone leads to the enhancement of neuroendocrine mechanism.

They are helpful in responding to a certain stressful situation and help to tackle it [7]. Mental health on the other hand is the state of overall well-being of an individual which is important to cope up with normal stress situations that increases productivity in work and provides contribution to the society by the physical, emotional and social well-being of an individual. Stressor impacts on mental health leading to stressful adaptations [8,9,10]. The inability of an individual to adapt to stress increases the intensity of the stress experienced by them. Stressful situations impacting mental health can be managed by yoga and meditation and by being optimistic and having a positive attitude. Other ways to manage stress that affects the mental health of an individual can be managed by yoga and meditation, medications such as antidepressants, anti anxiety pills, tranquilisers which are sleep reducing agent that should be taken with the consultation of a doctor since in appropriate or high doses of these tablets in a serious damage to one's health. It is important to maintain sound mental health which is affected for leading a healthy and joyful life. This research is needed to access the overall mental health

scenario among the population. It is essential to create awareness about the various aspects and effects of stress on mental health and at the same time to provide helpful ways in overcoming such challenging situations. It will fulfil the deficiency which is created among people due to the unawareness of the impact of stress on mental health, its effects on ways in which this can be dealt with. Through the study we will be accessing the overall data of effects of visuals. The World health Organisation proposition is – no health without mental health. Mental health disorders lead to years of life loss for an individual, [11]. This study is helpful in accessing the overall data of stress among individuals and thereby provide ways to adapt to it and overcome them. The deficiency created among the population due to the unawareness of the impact of stress on mental health, its effects and ways in which we can overcome stress, which was fulfilled by accessing the overall data of stress among individuals thereby providing ways and methods to adapt and overcome, effect of stress on mental health.

2. MATERIALS AND METHODS

A cross-sectional survey was conducted among the population with a sample size of 100. A self administered structured questionnaire was prepared based on the effect of stress on mental health and consisted of 15 questions. It was circulated to participants through an online platform (google form). The statistics were done using SPSS software, chi-square test was used to check the association and P value of 0.05 was said to be statistically significant. The pros of the survey is that the individuals of different lifestyles and cultures were surveyed .This study was conducted among the individuals between the age group 14-46 . Simple random sampling method was the sampling method used to minimise the sampling bias. The outcome of the study is not generalisable due to the constrained sample size. This research is needed to access the overall mental health scenario among the population. It is required to create awareness about the various aspects and effects of stress on mental health and at the same time, overcoming stressful situations. The inclusion criteria for the study is primary health care population not depressed at baseline, psychological or educational intervention and the outcome of prevention of depression on mental health. The exclusion criteria for the study is primary health care population depressed at

baseline, pharmacological and physical interventions.

3. RESULTS AND DISCUSSION

The present study divulged that 49.5% (Fig. 1) of the study population had experienced stress in their life whereas 22.86% of the population were unable to analyse the symptoms of stress experienced by them. 47.62% of the study population experienced stress sometimes whereas 9.52% of the study population experienced stress very frequently, however, 31.43% rarely experienced stress in their life (Fig. 2). 40% of the study population underwent medical treatment and took medications such as anti anxiety pills, tranquilizers and other sleep producing agents with the prior consultation of a doctor in order to overcome stressful situations and to tackle anxiety (Fig. 3). 59.05% of the individuals did not take any medical treatment. The results revealed that most of the individuals of the study population had experienced stress in their life and some of them were already aware about the ways in which they could overcome stress (Fig. 4). 60% of the study population did not discuss their problems due to stress with anyone and dealt with it on their own however, 40% of the study population discussed their problems with their family, friends or a counselor as they thought it would be easier to overcome their problems by discussing it and knowing ways in which they can let go the situation (Fig. 5). Females applied alternate ways of overcoming stressful situations whereas males just went with the flow during stressful situations (Fig. 6). From the analysis of mental health it was found that most of the study population had a good mental state, it was found from the survey that 19.81% females had a good mental state whereas 1.89% females had poor mental state at that moment (Fig. 7). 11.32% males had good mental health and 1.89% males had very poor mental health. It was found that 25.4% females had experienced stress in their life whereas 19.81% females did not experience any stress in their life and 2.83% of the female population were not sure whether they have experienced stress in their life (Fig. 8). 19.81% males had experienced stress in their life whereas 17.92% were not sure whether they experienced stress in their life and 1.89% of the males did not experience any stress in their life, the results of the survey depicted that the majority of the study population had experienced stress in their life. The p value obtained from this study is 0.02 which is statistically significant.

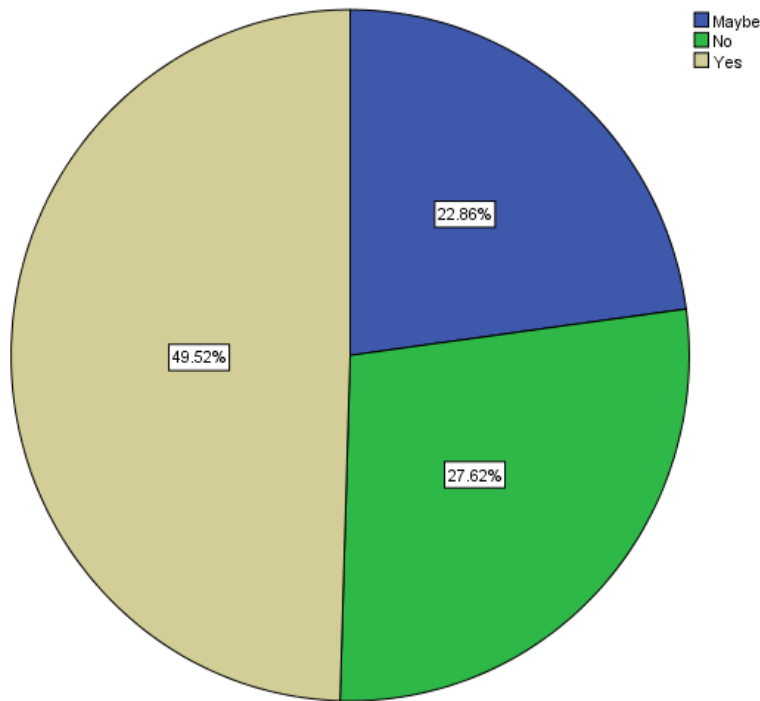


Fig. 1. Pie chart showing percentage distribution of individuals experiencing stress in their life; 49.5% (beige) of the study population had experienced stress in their life whereas 22.86% (blue) of the population were unable to analyse the symptoms of stress experienced by them. Blue represents maybe. Green represents no. Beige represents yes

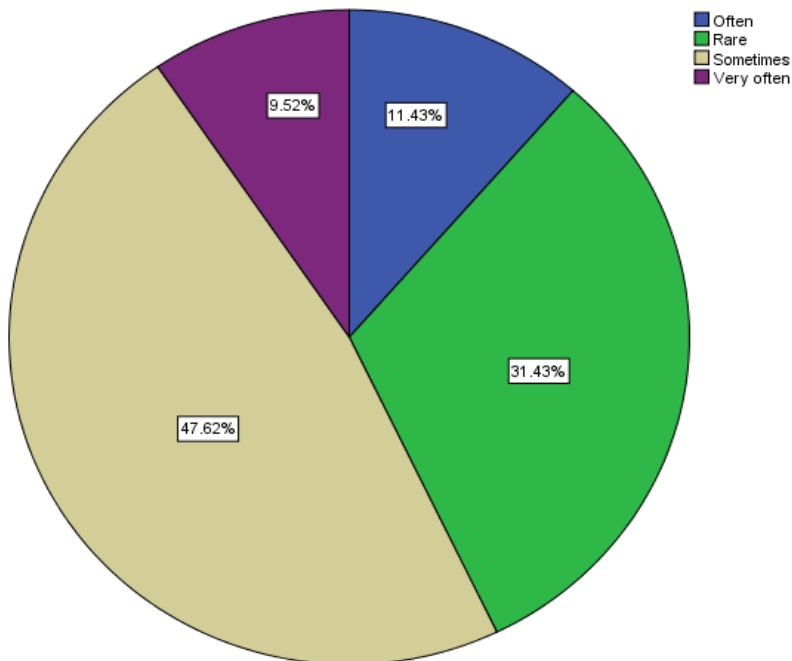


Fig. 2. Pie chart showing percentage distribution of the frequency of stress experienced by individuals 47.62% (beige) of the study population experienced stress sometimes whereas 9.52% (purple) of the study population experienced stress very frequently, however, 31.43% (green) rarely experienced stress in their life. Blue represents often. Green represents rare. Beige represents sometimes. Purple represents very often

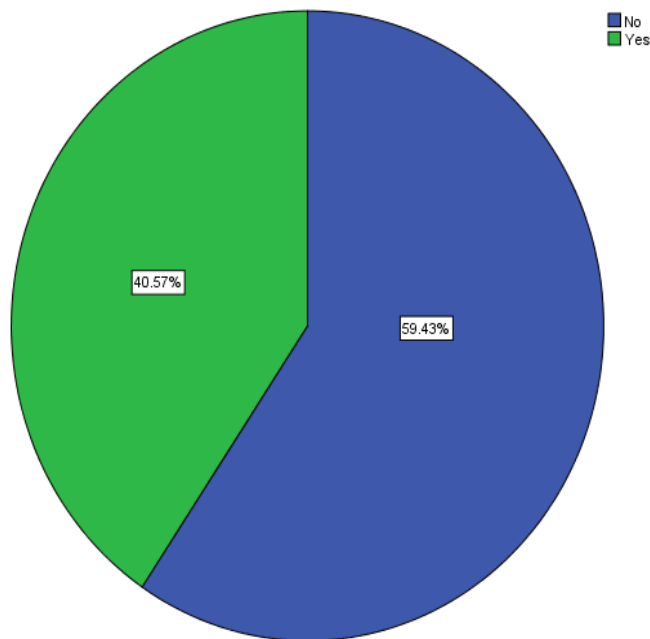


Fig. 3. Pie chart 3 showing percentage distribution of individuals who underwent medical treatment to overcome stress; It was found that 40% of the study (beige) population underwent medical treatment and took medications such as anti anxiety pills, tranquilizers and other sleep producing agents with the prior consultation of a doctor in order to overcome stressful situations and to tackle anxiety. 59.05% (Green) of the individuals did not take any medical treatment. Green represents yes. Blue represents no

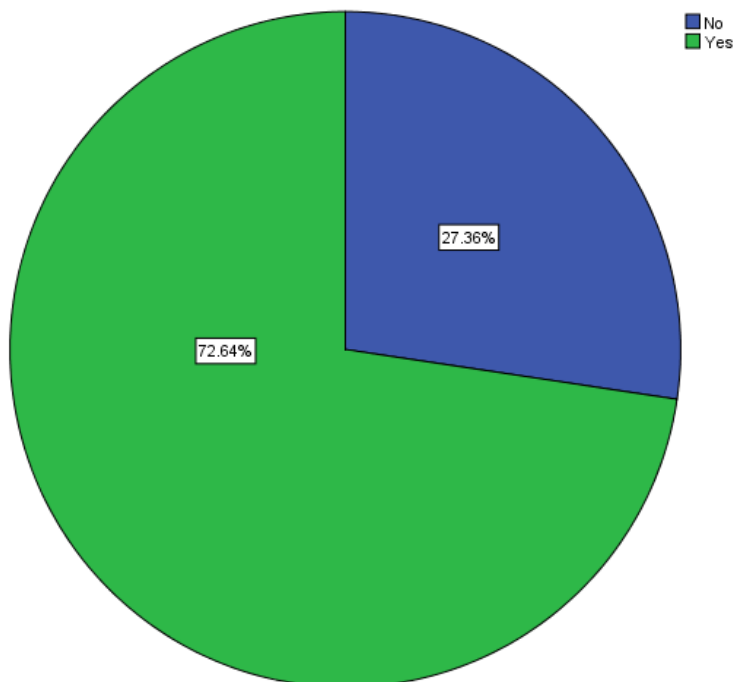


Fig. 4. Pie chart 4 showing the percentage distribution of stress situations, where 71.43% (beige) of the study population felt that it was normal for 14-23 years age group to experience stress and anxiety whereas 27.62% (green) thought that they should not stress over situations and find out ways in which they can fulfill the demand situations with a positive attitude. Green represents yes. Blue represents no

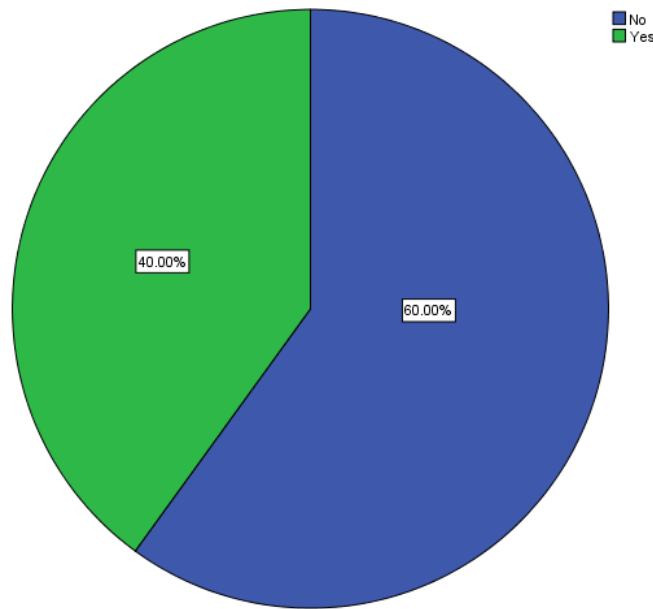


Fig. 5. Pie chart 5 represents 60% of the study population (blue) did not discuss their problems due to stress with anyone and dealt with it on their own however, 40% of the study population (green) discussed their problems with their family, friends or a counselor as they thought it would be easier to overcome their problems by discussing it and knowing ways in which they can let go the situation. Blue represents no. Green represents yes

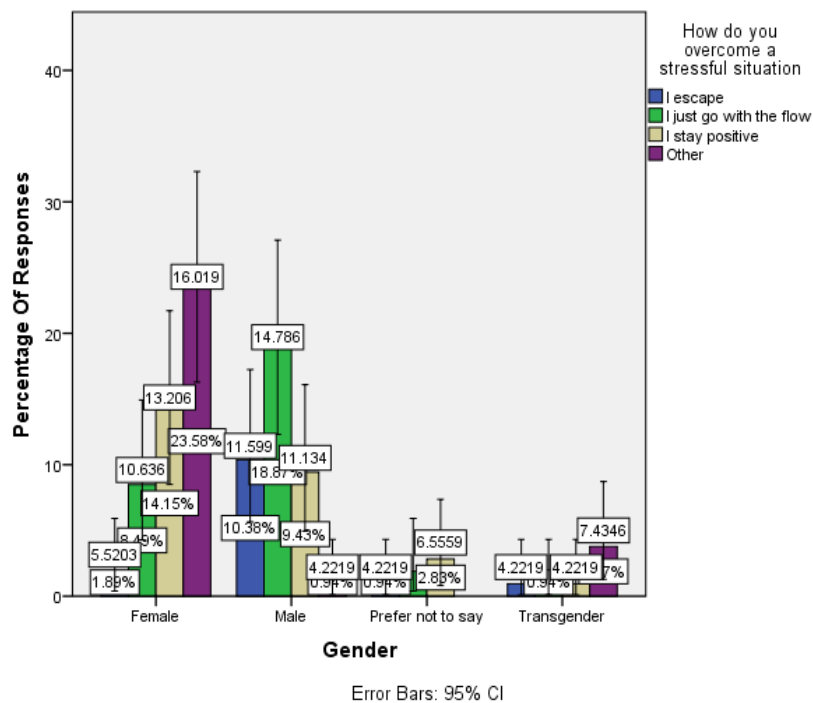


Fig. 6. Bar Graphs showing the correlations between the gender and the number of responses; X axis represents the gender and Y axis represents the count. Green represents I escape, Beige represents I just go with the flow, Purple represents I stay positive, and yellow Others. Females applied alternate ways of overcoming stressful situations whereas males just went with the flow during stressful situations. The p value obtained is 0.034 ($p < 0.05$) which is statistically significant

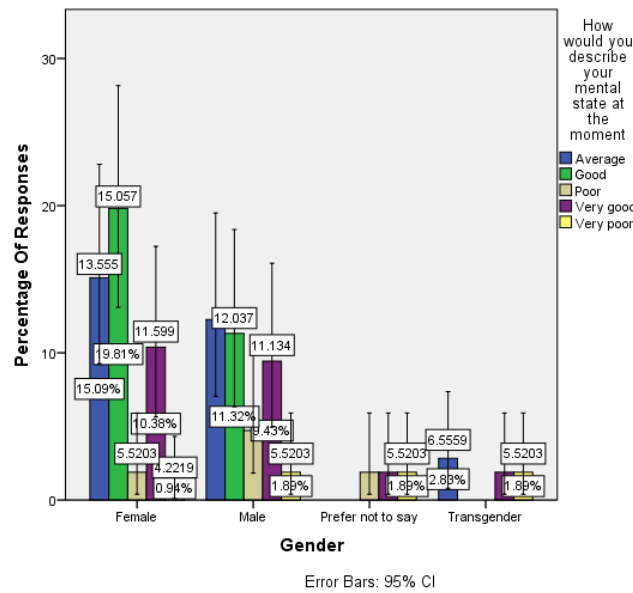


Fig. 7. Bar Graphs showing the correlations between the gender and the number of responses; X axis represents the gender and Y axis represents the count. Blue represents Average, Green represents Good, Purple represents Very Good, Yellow represents Very Poor. It was found from the survey that 19.81% females had a good mental state whereas 1.89% females had poor mental state at that moment. 11.32% males had good mental health and 1.89% males had very poor mental health. The p value obtained is 0.04 ($p < 0.05$) which is statistically significant.

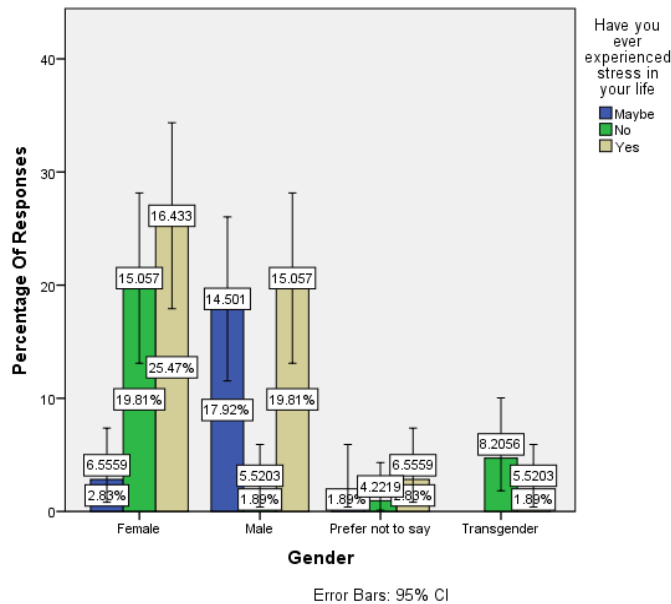


Fig. 8. Bar Graphs showing the correlations between the gender and the number of responses; X axis represents gender and Y axis represents the count. Blue represents Maybe, Green represents No, Beige represents Yes. It was found that 25.4% females had experienced stress in their life whereas 19.81% females did not experience any stress in their life and 2.83% of the female population were not sure whether they have experienced stress in their life. 19.81% males had experienced stress in their life whereas 17.92% were not sure whether they experienced stress in their life and 1.89% of the males did not experience any stress in their life. The p value obtained is 0.023 ($p < 0.05$) which is statistically significant

In the study population it was found that 35.3% females had undergone treatment through consultation from doctors for overcoming anxiety and stress whereas it was found that 39.5% of the males had undergone clinical treatment. In a previous research conducted by Carmen P Mclean, it was found that the prevalence rate of panic attacks and anxiety was 30.5% for women and 19.2% for men [12] EJ Mundel in his study found that 16.5% of females and 95% of males took medications for stress. Women spend hours doing work irrespective of whether they are employed or unemployed, they undergo greater amount of stress due to double the amount of work however their sleep pattern is interrupted with less amount of high quality sound sleep as compared to men [13]. Students believe that counselling can help them overcome their anxiety and stress issues by discussing the problems faced by them, they usually discuss problems related to family, relationships, academics and so on and learn ways in which they can deal with these situations [14,15]. Here, the discussion is about the experience by the teenagers and adults about stress. For the questions about stress, about 80% of the people say that they are affected by the stress in the past 3 months.

Nowadays, most teenagers are experiencing more stress than the people were in the 1970s and 80s [16]. Small amounts of stress may be desired, beneficial, and even healthy. Positive stress helps to improve athletic performance. It also plays a factor in motivation, adaptation, and reaction to the environment [17,18–23]. Excessive amounts of depression, however, may lead to stressful conditions. Stress can increase the risk of strokes, heart attacks, ulcers, dwarfism, and mental illnesses such as depression [24,25]. Stress can be external and related to the environment but may also be created by internal perceptions that cause an individual to experience anxiety or other negative emotions surrounding a situation, such as pressure and discomfort, which they then deem stressful [26,27–29]. Stress is a nonspecific response. It is neutral, and what varies is the degree of response. It is all about the context of the individual and how they perceive. The results of this study cannot be generalised due to the constrained sample size, there is lack of external validity in the study. The future scope of this study is that the sample size can be increased to make the study more generalizable. Our team has extensive knowledge and research

experience that has translate into high quality publications [30–34].

4. CONCLUSION

From this study it was concluded that the majority of individuals of this study population experienced stress and most of them discussed the problems faced by them with their friends and family. Most of the people kept a positive attitude during stressful situations whereas the remaining just went with the flow. Majority of the study population was aware about the adverse effects of stress on mental health and practiced ways in which they could overcome stress such as making time for their hobbies, practicing yoga and meditation and other methods including discussing problems with people and spending time with their loved ones.

CONSENT

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

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Bisschop MI, Isabella Bisschop M, Kriegsman DMW, Beekman ATF, Deeg DJH. Chronic diseases and depression: the modifying role of psychosocial resources. *Social Science & Medicine*. 2004;59(4):721-733. DOI:10.1016/j.socscimed.2003.11.038
2. Drown D. Work Design Characteristics as Moderators of the Relationship between Proactive Personality and Engagement; 2000. DOI:10.15760/etd.1073

3. Kamath SM, Manjunath Kamath S, Jaison D, 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. DOI:10.1016/j.jddst.2020.101992
4. Barabadi H, Mojab F, Vahidi H, et al. Green synthesis, characterization, antibacterial and biofilm inhibitory activity of silver nanoparticles compared to commercial silver nanoparticles. *Inorganic Chemistry Communications*. 2021;129:108647. DOI:10.1016/j.inoche.2021.108647
5. Toussaint L, Shields GS, Dorn G, Slavich GM. Effects of lifetime stress exposure on mental and physical health in young adulthood: How stress degrades and forgiveness protects health. *J Health Psychol*. 2016;21(6):1004-1014.
6. Azizli N, Atkinson BE, Baughman HM, Giammarco EA. Relationships between general self-efficacy, planning for the future, and life satisfaction. *Personality and Individual Differences*. 2015;82:58-60. DOI:10.1016/j.paid.2015.03.006
7. Khansari DN, Murgu AJ, Faith RE. Effects of stress on the immune system. *Immunology Today*. 1990;11:170-175. DOI:10.1016/0167-5699(90)90069-I
8. Crawford JR, Henry JD. The Depression Anxiety Stress Scales (DASS): Normative data and latent structure in a large non-clinical sample. *British Journal of Clinical Psychology*. 2003;42(2):111-131. DOI:10.1348/014466503321903544
9. 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. DOI:10.1016/j.molstruc.2021.130229
10. Gowhari Shabgah A, Ezzatifar F, Aravindhan S, et al. Shedding more light on the role of Midkine in hepatocellular carcinoma: New perspectives on diagnosis and therapy. *IUBMB Life*. 2021;73(4):659-669.
11. Rao P. No Health Without Mental Health: Enhancing Mental Health of Adolescents Girls. *Psyc Extra Dataset*;2012. DOI:10.1037/e670282012-056
12. Foa EB, McLean CP. The Efficacy of Exposure Therapy for Anxiety-Related Disorders and Its Underlying Mechanisms: The Case of OCD and PTSD. *Annu Rev Clin Psychol*. 2016;12:1-28.
13. Burgard SA, Ailshire JA. Gender and Time for Sleep among U.S. Adults. *Am Sociol Rev*. 2013;78(1):51-69.
14. D'Angelo B, Wierzbicki M. Relations of daily hassles with both anxious and depressed mood in students. *Psychol Rep*. 2003;92(2):416-418.
15. Egbuna C, Mishra AP, Goyal MR. Preparation of Phytopharmaceuticals for the Management of Disorders: The Development of Nutraceuticals and Traditional Medicine. Academic Press; 2020.
16. Twenge JM. iGen: Why Today's Super-Connected Kids Are Growing Up Less Rebellious, More Tolerant, Less Happy--and Completely Unprepared for Adulthood--and What That Means for the Rest of Us. Simon and Schuster; 2017.
17. Chinn RY, Diamond RD. Generation of chemotactic factors by *Rhizopus oryzae* in the presence and absence of serum: relationship to hyphal damage mediated by human neutrophils and effects of hyperglycemia and ketoacidosis. *Infect Immun*. 1982;38(3):1123-1129.
18. 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(8):1219-1229.
19. Clarizia G, Bernardo P. Diverse Applications of Organic-Inorganic Nanocomposites: Emerging Research and Opportunities. IGI Global; 2019.
20. Prakash AKS, Devaraj E. Cytotoxic potentials of *S. cumini* methanolic seed kernel extract in human hepatoma HepG2 cells. *Environmental Toxicology*. 2019;34(12):1313-1319. DOI:10.1002/tox.22832
21. Tahmasebi S, Qasim MT, Krivenkova MV, et al. The effects of oxygen-ozone therapy on regulatory T-cell responses in multiple sclerosis patients. *Cell Biol Int*. 2021;45(7):1498-1509.
22. Wadhwa R, Paudel KR, Chin LH, et al. Anti-inflammatory and anticancer activities of Naringenin-loaded liquid crystalline nanoparticles in vitro. *J Food Biochem*. 2021;45(1):e13572.
23. Vivekanandhan K, Shanmugam P, Barabadi H, et al. Emerging Therapeutic

- Approaches to Combat COVID-19: Present Status and Future Perspectives. *Frontiers in Molecular Biosciences*. 2021;8. DOI:10.3389/fmolb.2021.604447
24. Bonci D, Coppola V, Musumeci M, et al. The miR-15a-miR-16-1 cluster controls prostate cancer by targeting multiple oncogenic activities. *Nat Med*. 2008;14(11):1271-1277.
 25. Ezhilarasan D. Critical role of estrogen in the progression of chronic liver diseases. *Hepatobiliary Pancreat Dis Int*. 2020;19(5):429-434.
 26. Verweij PE, Voss A, Donnelly JP, de Pauw BE, Meis JF. Wooden sticks as the source of a pseudoepidemic of infection with *Rhizopus microsporus* var. *rhizopodiformis* among immunocompromised patients. *J Clin Microbiol*. 1997;35(9):2422-2423.
 27. 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.
 28. Santhakumar P, Roy A, Mohanraj KG, Jayaraman S, Durairaj R. Ethanolic Extract of *Capparis decidua* Fruit Ameliorates Methotrexate-Induced Hepatotoxicity by Activating Nrf2/HO-1 and PPAR γ Mediated Pathways. *Ind J Pharm Educ*. 2021;55(1s):s265-s274.
 29. 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(6):880-889.
 30. 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(4):299-306.
 31. R H, Hannah R, Ramani P, 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(3):306-312. DOI:10.1016/j.oooo.2020.06.021
 32. J PC, 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(4):531-534. DOI:10.1111/cid.12609
 33. Wahab PUA, Abdul Wahab PU, Madhulaxmi M, et al. Scalpel Versus Diathermy in Wound Healing After Mucosal Incisions: A Split-Mouth Study. *Journal of Oral and Maxillofacial Surgery*. 2018;76(6):1160-1164. DOI:10.1016/j.joms.2017.12.020
 34. 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(6):599-606.

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