



## Effect of yoga on Depression, Anxiety and Stress levels among First year medical students: A non- randomized study

Aman G<sup>1</sup>, Vijayadas Muradi<sup>2</sup>

<sup>1</sup>Post -graduate, <sup>2</sup>Associate professor

Department of Physiology

MS Ramaiah Medical college, MSRIT Post, Bengaluru 560054, Karnataka India

Submitted: 05-04-2022

Accepted: 20-04-2022

### ABSTRACT

**Background:** Anxiety and stress are very common among medical students and depression is considered as one of the major mental issue. All these problems start in the first year. These elements will have an adverse effect on overall performance. Yoga has become a popular way of life and a cost-effective therapy to deal with these major medical issues. The effect of yoga on depression, anxiety, and stress levels among first-year medical students is investigated in this study.

**Methods:** This was a non-randomized study that took place in the medical college's yoga lab. The study enlisted the participation of 125 medical students between the ages of 18 and 23. Students gave their consent after being informed and yoga was practiced for a year under supervision. Asana, Pranayama, and Meditation were all included in the yoga practice. At the time of recruitment and at the end of the study period, all individuals were given the validated self-assessment questionnaire DASS21, as a pre-test and post-test. A paired t-test was used in the statistical analysis. The data was analysed with the use of statistical software SPSS 22.0.

**Results:** Anxiety and Stress levels after yoga were lowered and statistically significant with p value < 0.001. Anxiety levels decreased by 36.0 % from 13.21 to 7.08 (p < 0.001), and stress levels decreased by 16.8 %, from 14.76 to 11.23 (p < 0.001). Depression level also reduced but it was not statistically significant

**Conclusion:** Regular yoga practice lowered depression, anxiety, and stress levels, according to present study. As a result, yoga can be taught in medical schools so that future healthcare practitioners can maintain their own health and treat patients effectively, as well as encourage yoga practice for a healthy lifestyle.

**Key words:** Depression, Anxiety, Stress, DASS21, Yoga.

### I. INTRODUCTION

Medical students are subjected to a variety of mental works and attempting to learn vast information in a restricted amount of time available might cause academic stress. During various stages of their education, medical students face substantial amount of stress. Early in medical school, stress and anxiety emerge, and they may worsen with time, leading to stress-related illness and poor performance<sup>1</sup>. According to researchers, the most stressful scenarios students faced in medical school were the pressure to perform well on tests, as well as the preparation for the same and taking of exams<sup>2</sup>. Continuous exposure to stress, however, may have a harmful influence on students' physical and mental health after they reach certain levels of stress<sup>3,4</sup>.

Yoga has a number of well-known benefits, including an improved sense of well-being, increased physical endurance, and noticeable changes that suggest stress reduction. Yoga as a stress management and relief tool helps people overcome stress and improve their quality of life. Yoga improves sleep quality and insomnia by increasing relaxation and producing a balanced mental state<sup>5,6</sup>. DASS 21 are internationally recognised metrics for assessing levels of anxiety, depression and stress. When an individual believes that environmental demands are greater than his or her ability to adjust, he or she is said to be stressed. Chronic stress can cause long-term or permanent changes in emotional, physiological, and behavioural responses. Anxiety and mood disorders, aggressive attitude, low immunity, medical morbidity, structural alterations in the CNS and these are all risks associated with prolonged exposure to acute and chronic stressors<sup>6</sup>

Highly competitive curriculum, strong academic competition, and excessive demands on physical, emotional, intellectual, financial, and social coping abilities could all contribute to high levels of stress at professional institutions. These,



as well as few of other factors, may play a role in medical students' high stress levels.<sup>7</sup>

Yoga has gained widespread acceptance as a non-pharmacologic method of reduction in stress and anxiety reduction as well as general wellness modality.<sup>8,9</sup> The word Yoga is derived from the Sanskrit word yuj . It means “ yoking or “unity” .Pranayama (breathing exercise), asana (movement), and dhyana (meditation) are among the eight limbs of yoga, as outlined by the philosopher Patanjali<sup>10</sup>. Student mental health is a growing public health concern that requires scalable and appealing solutions. Mental health problems are becoming more common among university students all across the world<sup>11</sup>. The number of students in the world is increasing and the student period could be a great time to introduce mental health interventions<sup>12</sup>. Distress is linked to lower well-being, scholastic impairment, and negative socioeconomic consequences<sup>13</sup>. Nearly half of the disease load in young adults is due to mental health issues. In recent years, students willingness to seek help has improved and stigma has diminished. However, most universities mental health services are insufficient to meet the need.

Investing in the mental health of young adults will have long-term health and economic benefits . Many students regard their troubles as a regular aspect of college life and they prefer to deal with them on their own. Mental health activities should be focusing on the promotion of well-being as well as the relief of mental discomfort .

Yoga, a popular and widely accessible mind–body activity is safe and may be very cost-effective when practiced in large groups. A typical yoga class varies in style depending on the teacher but it often consists of physical postures, breathing methods and short meditation exercises, with or without yoga philosophy teachings. Although there is an increasing body of research on yoga, few randomized controlled trials (RCTs) have included students. A recent meta-analysis evaluating the benefits of yoga, meditation, or mindfulness on student distress found beneficial results after the intervention.

As part of a larger public health plan to alleviate discomfort among students, this study has been conducted and hypothesized that yoga would result in favorable psychological and physiological changes, resulting in improved students mental health.

## II. MATERIALS AND METHODS

The institutional Ethics Committee gave the approval for the study. This included 125 first-

year MBBS students from Bengaluru's M.S Ramaiah Medical College. Students gave their consent after being informed. This study has been conducted from January to December 2020, for the duration of one year. Regular practice was done in the yoga lab of the institution. It was a non-randomized study. DASS21 [Depression Anxiety and Stress scale -21] validated self-assessment questionnaire was administered at the time of recruiting and at the conclusion of the study period. On the first day, each participant will do yoga for roughly 55-60 minutes under the supervision of a yoga trainer, and the next six days of the week, they will do yoga independently. Depression, anxiety, and stress levels will be measured using DASS21 questionnaire at the beginning of yoga practice and at the end of one year, following completion of yoga .

Medical students aged between 18 and 23 years, apparently normal health status, interested to practice regularly and physically capable of doing yoga are included in the study. People who have been doing Pranayama, Yoga, or Meditation for at least a year, any chronic illnesses, alcoholics and tobacco chewers are excluded from the study.

### DASS 21 - scale –

The DASS-21 [Depression, Anxiety, and Stress Scale - 21 Items] is a 21-item questionnaire that assesses depression, anxiety, and stress. The Depression, Anxiety, and Stress scale -21 items is a collection of three self-report scales used to assess depression, anxiety, and stress.

Each of the three DASS-21 scales has seven items, which are separated into subscales that have identical content. Dysphoria, hopelessness, life devaluation, self-deprecation, lack of interest/involvement, anhedonia, and lethargy are all assessed on the depression scale. The Anxiety scale measures autonomic arousal, skeletal muscle effects, situational anxiety, and subjective anxious effect experience. The stress scale is sensitive to levels of chronic non-specific arousal. It measures trouble relaxing, anxious alertness, and being quickly upset/agitated, as well as being irritable/over reactive and impatient. The scores of relevant items are added together to provide depression, anxiety, and stress scores.

The DASS-21 is based on a dimensional, not a categorical, view of psychological pathology. The assumption on which the DASS-21 development was based on research data and the differences between the depression, anxiety and the stress experienced by normal subjects and clinical populations are essentially differences of degree. For traditional severity designations (normal,



moderate, and severe), the following cut-off scores are recommended: To get the final score on the DASS-21, the values must be multiplied by 2 to get the final score.<sup>14</sup>

Yoga session include the following:  
Asanas, Pranayama and Meditation

**Asana :**

- Suryanamaskar – 6 min
- Padmasana or Sukhasanana – 2 min
- Pawanmuktasana – 4 min
- Bhujangasana – 4 min
- Vajrasana – 2 min
- Savasana – 6 min

**Pranayama :**

- Bhastrika, –6 min
- Nadishodhna pranayama – 8 min
- Bhramari – 6 min
- Kapalbhathi- 6 min

**Meditation :** 10 minutes and focus will be on breath of oneself

### III. STATISTICAL ANALYSIS AND RESULTS :

The results of continuous measures are reported as Mean SD) [Min-Max], whereas categorical measurements are presented as Number ( percent ). The statistical significance of the differences in scores will be determined using the Paired t-test and the Paired Proportion Test [Improvement]. The data will be examined using SPSS 22.0 statistical software. In the present study the degree of depression has fallen by 3.2 percent with  $p = 0.335$ . Anxiety and stress levels after yoga were lowered and statistically significant with  $p$  value  $< 0.001$  in both anxiety and stress categories. Anxiety levels decreased by 36.0 percent from 13.21 to 7.08 ( $p < 0.001$ ), and stress levels decreased by 16.8 percent from 14.76 to 11.23 ( $p < 0.001$ ). Table 1-4 summarises the findings of the investigation. In the present study, in **Table 1** in the Depression-Frequency Distribution of subjects in the Pre- and Post-Assessment Study, it was discovered that the  $P = 0.335$ , Not Significant, Paired Proportion Test was quite good, showing a 3.2 percent improvement. It can be deduced from **Table 2** that when the Frequency Distribution of Patients in Anxiety category in Pre- and Post-Assessment Studies was analyzed,  $P < 0.001$  was found. There was a 36.0 percent improvement using the Paired Proportion Test.

**From Table 3** on analysis it can be deduced that the  $P = 0.048^*$ , significant, Paired proportion test and an Improvement of 16.8 percent in our study

for the Stress- Frequency distribution of patients in pre- and post-assessment. **Table 4** shows that when the study was conducted employing the Student-t-test (paired), depression levels decreased with a  $p$  value of 0.108 and a 3.2 percent improvement, but the difference was not statistically significant. However, anxiety and stress levels after yoga decreased and were statistically significant with  $p$  values of  $< 0.001$  in both anxiety and stress categories

### IV. DISCUSSION

Many medical students are facing depression, anxiety and stress during their academic period. It starts early in their medical training and may increase over a period of time

The present study was to observe the effect of yoga on depression, anxiety and stress levels in the beginning and at the end of one year of yoga practice on first year medical students. The goal of this study was to conduct a yoga methodologically which may be an interesting alternative for students who require quick and flexible mental health assistance.

According to the results of the present study, the degree of depression has fallen. Anxiety and stress level also decreased. Jadhav et al found that yogic interventions reduced stress among medical students<sup>15</sup>. In addition, N.R. Nugent et al also got significant evidence for the advantages of hatha yoga on IL-6 in chronically depressed people who had an inadequate response to antidepressants<sup>16</sup>

In a study by Padmaja Kachi et al, they also found decrease in anxiety level after yoga practice by assessment through DASS21 scale.<sup>17</sup> In another study by Kishlay Kumar et al, found that yoga and Meditation is documented to reduce stress levels in regular practitioners. Statistical analysis has shown decrease in morning serum cortisol level which is significant in yoga group after the study. Control group have shown increase in cortisol level after three months of study<sup>18</sup>

The integration of a yoga programme to the medical school curriculum could be a viable alternative in order to reduce the potentially negative psychological burden on medical students. When taught by a trained yoga instructor, yoga is affordable, potentially gratifying, and safe. To increase the evidence base, studies on meditation, yoga, and mindfulness must be conducted and reported with greater rigor in order to provide outcomes that are closer to their empirical truth. We also urge that a standard typology for meditation, yoga, and mindfulness therapies be developed, as well as future



research that includes active placebo and control comparisons. In the end, this will help us to have a better knowledge of how to implement non-clinical solutions that preserve and promote mental health in student populations.

Regular yoga practice lowered depression, anxiety, and stress levels, according to this study and this could be due to the shift in autonomic balance towards parasympathetic system.

## V. CONCLUSION

Anxiety and stress levels among students were reported to be lowered by regular yogapractice in this study. Therefore, yoga can be taught in medical schools so that future healthcare practitioners can maintain their own health and effectively treat patients, as well as encourage yoga practice for a healthy lifestyle.

## Clinical implications and Future Scope :

For future first-year batches, it is recommended that students continue to practice yoga on a regular basis so that they can reduce their anxiety and stress levels and incorporate this practice into their patient treatment.

**Conflict of interest:** None

**Source of funding:** Self

## LEGENDS TO TABLE :

**Table 1:** Depression- Frequency distribution of patients in pre and post assessment studied

**Table 2:** Anxiety- Frequency distribution of patients in pre and post assessment studied

**Table 3:** Stress- Frequency distribution of patients in pre and post assessment studied

**Table 4:** Comparison of Depression, Anxiety and Stress at pre and post assessment of patients studied

**Table 1:** Depression- Frequency distribution of patients in pre and post assessment studied

Depression	Pre	Post	% Difference
Normal (0-9)	56(44.8%)	60(48%)	3.2%
Mild (10-13)	19(15.2%)	19(15.2%)	0.0%
Moderate (14-20)	24(19.2%)	28(22.4%)	3.2%
Severe (21-27)	16(12.8%)	10(8%)	-4.8%
Extremely severe (28+)	10(8%)	8(6.4%)	-1.6%
<b>Total</b>	<b>125(100%)</b>	<b>125(100%)</b>	-

**P=0.335, Not a big deal. Improvement of 3.2% in the paired proportion test**

**Table 2:** Anxiety- Frequency distribution of patients in pre and post assessment studied

Anxiety	Pre	Post	% Difference
Normal (0-7)	33(26.4%)	78(62.4%)	36.0%
Mild (8-9)	14(11.2%)	9(7.2%)	-4.0%
Moderate (10-14)	29(23.2%)	22(17.6%)	-5.6%
Severe (15-19)	18(14.4%)	8(6.4%)	-8.0%
Extremely severe (20+)	31(24.8%)	8(6.4%)	-18.4%
<b>Total</b>	<b>125(100%)</b>	<b>125(100%)</b>	

**Significant improvement of 36.0 percent, P<0.001\*\*, Paired proportion test**

**Table 3:** Stress- Frequency distribution of patients in pre and post assessment studied

Stress	Pre	Post	% Difference
Normal (0-14)	70(56%)	91(72.8%)	16.8%
Mild (15-18)	23(18.4%)	12(9.6%)	-8.8%
Moderate (19-25)	12(9.6%)	10(8%)	-1.6%
Severe (26-33)	15(12%)	9(7.2%)	-4.8%
Extremely severe (34+)	5(4%)	3(2.4%)	-1.6%
<b>Total</b>	<b>125(100%)</b>	<b>125(100%)</b>	-

**Improvement of 16.8 percent, P=0.048\*, significant, Paired proportion test****Table 4:** Comparison of Depression, Anxiety and Stress at pre and post assessment of patients studied

Variables	Pre	Post	Difference	t Value	P Value
Depression	12.64±9.36	11.24±9.42	1.39	1.61	0.108
Anxiety	13.21±8.68	7.08±6.77	6.12	8.15	<0.001**
Stress	14.76±9.08	11.23±8.83	3.52	4.19	<0.001**

- The t-test for students is a type of test that is used to determine (paired)
- Depression levels decreased with a p value of 0.335 and a 3.2 percent improvement, but the difference was not statistically significant. However, anxiety and stress levels decreased after yoga, and the difference was statistically significant with a p value of <0.001 in both anxiety and stress categories.

**REFERENCES**

- [1]. Akshay Yadav, Ruchi Kothari<sup>1</sup>, Pradeep Bokariya<sup>2</sup>, Subodh S Gupta<sup>3</sup>, Bhaskar C. Harinath<sup>4</sup> et al. J Mahatma Gandhi Inst Med Sci 2017;22:129.
- [2]. Tiwari VK, Singh V, Kumar D, Mittal M, Asthana AB et al. Is yoga an effective modality of stress reduction within medical population; a qualitative study within MBBS students of BRD medical college, Gorakhpur. Int J Res Med Sci 2018;6:581-4
- [3]. Malathi, a. Damodaran, n. Shah, g. Krishnamurthy, p. Namjoshi & s. Ghodke psychophysiological changes at the time of examination in medical students before and after the practice of yoga and relaxation Indian J. Psychiat, 1998, 40 (1), 35-40
- [4]. Dyrbye, L.N., Thomas, M.R., & Shanafelt, T.D. (2006). Systematic review of depression, anxiety, and other indicators of psychological distress Among U.S. and Canadian medical students. Acad. Med, 81(4), 354-373.
- [5]. Eisenberg, D., Speer, N., & Hunt, J.B. (2012). Attitudes and beliefs about treatment among College students with untreated mental health problems. Psychiatric Services, 63(7), 711-713.
- [6]. Hunt, J., & Eisenberg, D. (2010). Mental health problems and help-seeking behaviour among college students. Journal of Adolescent Health, 46(1), 3-10.
- [7]. Jané-Llopis, E., & Barry, M.M. (2005). What makes mental health promotion effective? Promotion & Education, 12(2\_suppl), 47-54.
- [8]. Erskine, H. E., Moffitt, T. E., Copeland, W. E., Costello, E. J., Ferrari, A. J., Patton, G., ... Scott, J. G. (2015). A heavy burden on young minds: The global burden of mental and substance use disorders in children and youth. Psychological Medicine, 45(7), 1551-1563.
- [9]. Harrer, M., Adam, S.H., Baumeister, H., Cuijpers, P., Karyotaki, E., Auerbach, R.P., ... Ebert, D.D. (2019). Internet interventions for mental health in university students: A systematic review and meta-analysis. International Journal of Methods in Psychiatric Research, 28(2), e1759.
- [10]. Jiang, X.-l., Zheng, X.-y., Yang, J., Ye, C.-p., Chen, Y.-y., Zhang, Z.-g., & Xiao, Z.-j. (2015). A systematic review of studies on the prevalence of insomnia in university students. Public Health, 129(12), 1579-1584.
- [11]. Kim, H. G., Cheon, E. J., Bai, D. S., Lee, Y. H., & Koo, B. H. (2018). Stress and heart rate variability: A meta-analysis and review of the literature. Psychiatry Investigation, 15(3), 235-245. doi:10.30773/pi.2017.08.17
- [12]. Pallesen, S., Bjorvatn, B., Nordhus, I. H., Sivertsen, B., Hjørnevik, M., & Morin, C. M. (2008). A new scale for measuring insomnia: The bergen insomnia scale. Perceptual and Motor Skills, 107(3), 691-706.
- [13]. Patton, G.C., Sawyer, S. M., Santelli, J.S., Ross, D. A., Afifi, R., Allen, N.B., ... Viner, R.M. (2016). Our future: A lancet commission on adolescent health and wellbeing. The Lancet, 387(10036), 2423-2478.
- [14]. Lovibond, S.H. & Lovibond, P.F. (1995). Manual for the Depression Anxiety & Stress Scales. (2nd Ed.) Sydney: Psychology Foundation.
- [15]. Jadhav, S. G. and Havalappanavar, N.B. effect of Yoga Intervention on Anxiety and Subjective Wellbeing Journal of the Indian Academy of Applied Psychology, January 2009, Vol. 35, No.1, 27-31.
- [16]. Nicole R. Nugent, Leslie Brick, Michael F. Arme, Audrey R. Tyrka, Kathryn K. Ridout & Lisa A. Uebelacker (2019): Benefits of Yoga on IL-6: Findings from a



- Randomized Controlled Trial of Yoga for Depression, Behavioral Medicine, DOI: 10.1080/08964289.2019.1604489
- [17]. Padmajakanchi . Interventional Study to Find Out Effect of Yoga on Anxiety and Stress among MBBS Students , Global Journal of Medical Research: K Interdisciplinary 2016;16(2):06-11
- [18]. Kislayk, Vinay S, Devesh K , Asthana AB ,Divya M . Effect of yoga and meditation on serum cortisol level in first year medical students . International journal of research in medical sciences . 2018;6:1699-703