

# Analysis of Stress Reduction following Yoga Exercise among Undergraduate Students of Physical Therapy

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## ABSTRACT

*This experimental study aims to assess the effects of yoga exercises for the stress management of undergraduate students of Physical Therapy. Classes of yoga were conducted among physical therapy undergraduate students. Total of 30 participants male and female were selected through simple random technique and PSS-14 questionnaire was used to record the pre and post data of participants. Those students who were already diagnosed patients of any mental illness, taking anti-depressant medications, smokers, having any abnormality and had any recent surgery, were excluded from the study. Yoga training sessions were held for 6 weeks (3 time/weeks). Pre and post data were analyzed by SPSS version 23. The result shows that the pre yoga exercise Sessions mean value was 38.23 with a standard deviation of 2.918 and the post yoga exercise sessions mean value was 19.83 with a standard deviation of 6.735. The p-value was <0.05, indicating a highly significant difference. The results concluded that exercises were found to be effective in relieving the stress level and significant results were observed in students doing yoga exercises.*

**Keywords:** Exercise, Physical Therapy, Stress, Undergraduate students, Yoga.

## INTRODUCTION

Stress can be defined as a disruption in the body's internal environment caused by a perceived threat, fear, or challenge, leading to a disturbance in physiological functions triggered by the presence of a stressor (Sivananda, 2008; Wheeler, 2007). According to American Psychological Association, anxiety is defined as, "triggering of emotions in response to stressful situation, feeling of tension and worried thoughts" (Appelbaum et al., 2018). Sources of stress are described as "any situation or set of conditions that bother individual daily life experiences and make them to cope with it" (Bernstein et al., 2008). There are various types of sources (stressor). Work stressors include increase workload, poor management, discrimination, long working hours and harassment. Life stressors include death, divorce, financial problems, health conditions, natural disaster (Adolphs, 2013; Goldberg, 2018).

The source that results in stressful events in students includes financial problems, academic burden and responsibilities (Phinney et al., 2003; Stevenson, 2010). In alarm stage it is fight or flight response of the body in which activation of sympathetic nervous system results in release of certain hormones. In this stage, certain

body mechanisms are triggered including, increase blood pressure, heart rate, low-density lipoprotein, blood glucose level, protein breakdown, alteration in memory processes, release of inflammatory cells, where emotional disturbances include, fear, anxiety and depression (Casper, 2018; Jackson, 2013).

According to many researches, a significant percentage of medical students are currently experiencing stress due to many circumstances that have been identified. The main highlighted source was academic load and this in turn also producing negative impact on their studies (Bernstein et al., 2008; Shields, 2001).

Stress is inversely proportional to the student's academics i.e., increase in stress level results in decrease academic performance of the students. Stress affects the productivity of students, ability to concentrate and generate new ideas and decreases capability to retain information for long time period.

Yoga is a key factor for the mental and emotional health of a person. Yoga is a science of the mind and the human condition, how our feelings are stored in our bodies, and how they influence our actions and thoughts. Casper (2018), and Stephens (2012) say that it shifts you from the sympathetic nervous system to the parasympathetic

nervous system, or from a state of stress and fear to a state of calm and relaxation. Yoga changes how we deal with stress and how we feel about it, as well as boosting our self-esteem, enhancing our sense of well-being, and making us feel relaxed and calm (Malathi et al., 1999; Schmitter et al., 2008).

Yoga is an ancient Indian art of harmonizing the body and mind through various practices. These include physical poses, breathing exercises, and meditation or relaxation. Yoga has evolved over 5,000 years of history, and has adapted to modern culture by changing its attire from a loincloth to a leotard and leggings (Georg, 2001; Saat et al., 2015). Yoga is a popular way of exercising the body and mind by using as an as (physical poses) as the main method. This helps to improve the control and well-being of both the body and mind (Mittal et al., 2018; Sivananda, 2008).

## MATERIALS & METHODS

An experimental study was conducted through classes of yoga among physical therapy undergraduate students. 30 participants male and female were selected through simple random technique. Those students who were already diagnosed patients of any mental illness, taking anti-depressant medications, smokers, having any abnormality and had any recent surgery, were excluded from the study. Yoga training sessions were held for 6 weeks (3 time/weeks).

Warm up yoga exercises session was conducted with the Surya Namaskar (Sun Salutation) with the different pose of; Salutation Position (Samasthiti), Raised Arm Position (Tadasana), Hand To Foot Position (Uttanasana), Equestrian Position (Ashwa Sanchalanasana), Mountain Position (Adhomukha Svanasana), Eight Limbs Position (Ashtanga Namaskara), Cobra Position (Bhujangasana), Mountain Position (Adhomukha Svanasana), Equestrian Position (Ashwa Sanchalanasana), Hand To Foot Position (Uttanasana), Raised Arm Position (Tadasana) and Salutation Position (Samasthiti).

After the warm up class start with sequence of the yoga exercises; Sukhasana (Easy Pose), Bidhalasana (Cat Pose), Utthita Balasana (Extended Child Pose), Balasana (Child Pose), Tadasana (Mountain Posture), Adhomukha Svanasana (Downward-Facing Dog Stretch), Vrksasana (Tree Pose) Virabhadrasana Ii (Warrior Pose 2), Uthita Parsvakonasana (Extended Side Angle Pose), Uthita Trikonasana (Extended Triangle Pose), Garudasana (Eagle Pose), Parivrtta Ardha Prasarita Padottasana (Wide-Legged Standing Forward Fold), Ashta Chandrasana (Crescent Pose), Salabhasana (Locust Pose), Apanasana (Wind-Relieving Or Knees To Chest Pose), Supta Parivartasana (Reclined Spinal Twist), Eka Pada Rajkapotanasana Pref (Pigeon Pre), Dandasana (Staff Pose), Paschimottanasana (Intense Back Stretch), Upavistha Konasana (Wide-Angle Seated Forward Bend), Baddhakonasana (Fixed Angle Pose) and

Viparita Karani (Inverted Pose) after the completion of all exercises of yoga class Cool down Yoga Exercise were conducted of; Savasana (Corpse Pose), Ustrasana (Camel Pose) and Happy Baby (Ananda Balasana).

Data were obtained using updated version of perceived stress scale "PSS-14" (Andreou et al., 2011). PSS-14 was first developed by Sheldon Cohen and his colleagues and became most widely used psychological instrument for measuring nonspecific perceived stress since 1983. It assesses the degree to which participants evaluate their life to be stressful during past month PSS-14 scores are obtained by reverse coding items 4, 5, 6, 7, 9, 10, and 13 and then summing the reverse coded items with the remaining items.

The PSS-14 contains 14 items. Each item is rated on a 5-point scale ranging from never (1), almost never (2), sometimes (3), fairly often (4) and very often (5). The highest score of PSS-14 determines the highest level of stress perceived by the students. PSS scores for low stress were set ranging from 0-18, scores ranging from 19-36 were considered moderate stress and scores ranging from 37-56 corresponded to high stress (Shields 2001; Soorih et al., 2018).

The questionnaires were distributed among the students pre and post of the exercises training program. Following yoga exercises conducted in the study. The data were then analyzed and evaluated using SPSS Version 21.0, with paired t-test being applied to both groups. Statistical significance was set at  $\leq 0.05$ .

## RESULTS

The mean age of participants was  $21.12 \pm 1.70$  years. Table 1 shows the pre and post response value of PSS-14 question, the finding cognized the effects of yoga exercises improve the participants stress level. Table 2 shows the pre-yoga exercise sessions mean value was 38.23 with a standard deviation of 2.91 and the post yoga exercise sessions mean value was 19.83 with a standard deviation of 6.73. The difference was very significant, with a p-value of less than 0.05.

This means that the outcomes before and after doing yoga exercises were not the same by chance, and that there was a big drop in the average values after doing yoga exercises. Specifically, the data showed a substantial decrease in stress levels. Before the yoga exercise sessions, the mean value was 38.23 with a standard deviation of 2.91. Following the yoga sessions, the mean stress level dropped dramatically to 19.83 with a standard deviation of 6.73.

This significant reduction, supported by a p-value of less than 0.05, implies that the observed improvements were unlikely to have occurred by chance. Overall, the results emphasize the beneficial impact of yoga exercises on reducing stress among the participants.

**Table 1.** Pre and post perceived stress of participants did Yoga exercises.

Questions	Pre-Frequency (Percentage)					Post- Frequency (Percentage)				
	Never	Almost never	Some Times	Fairly often	Very often	Never	Almost never	Some times	Fairly often	Very often
1. Have you been upset in the last month because of the unexpected things?	0 (0)	3 (10)	14 (46.7)	6 (20)	7 (23)	6 (20)	12 (40)	7 (23.3)	3 (10)	2 (6.7)
2. Have you felt in the last month that you failed to control important things?	0 (0)	6 (20)	8 (26.7)	11 (36.7)	5 (16.7)	6 (20)	12 (40)	9 (30)	3 (10)	0 (0)
3. Last month have you felt stressed and nervous?	0 (0)	5 (16.7)	9 (30)	9 (30)	7 (23.3)	5 (16.6)	14 (46.6)	6 (20)	5 (16.66)	0 (0)
4. Last month have you deal successfully with irritating life hassles?	3 (10)	17 (56.7)	7 (23.3)	3 (10)	0 (0)	1 (3.3)	6 (20)	17 (56.7)	4 (13.3)	2 (6.7)
5. During the last month have you felt that you were able to cope up the important changes happening in life effectively?	5 (16.6)	20 (66.7)	4 (13.3)	1 (3.3)	0 (0)	4 (13.3)	11 (36.6)	9 (30)	6 (20)	0 (0)
6. During the Last month have you felt confident enough to solve the personal problems?	8 (26.7)	15 (50)	5 (16.7)	2 (6.7)	0 (0)	0 (0)	1 (3.3)	6 (20)	15 (50)	8 (26.7)
7. Have you felt during the last month that the things were going according to the way you want?	6 (20)	16 (53.3)	7 (23.3)	0 (0)	1 (3.3)	2 (6.7)	8 (26.7)	11 (36.7)	8 (26.7)	1 (3.3)

Questions	Pre-Frequency (Percentage)					Post- Frequency (Percentage)				
	Never	Almost never	Some Times	Fairly often	Very often	Never	Almost never	Some times	Fairly often	Very often
8. Last month have you found that you could not cope up with all things that you had to do?	2 (6.7)	4 (13.3)	10 (33.3)	13 (43.3)	1 (3.3)	6 (20)	19 (63.3)	4 (13.3)	0 (0)	1 (3.3)
9. During the last month have you been able to manage frustrations of your life?	6 (20)	19 (63.3)	5 (16.7)	0 (0)	0 (0)	0 (0)	3 (10)	8 (26.7)	14 (46.7)	5 (16.7)
10. During the last month have you felt that you were on top of things?	10 (33.3)	17 (56.7)	2 (6.7)	0 (0)	1 (3.3)	0 (0)	0 (0)	11 (36.7)	15 (50)	4 (13.3)
11. During the last month have you been annoyed because of the uncontrolled things?	0 (0)	4 (13.3)	10 (33.3)	11 (36.7)	5 (16.7)	8 (26.7)	15 (50)	5 (16.7)	1 (3.3)	1 (3.3)
12. Have you found during the last month that yourself you were thinking about things that you want to achieve?	1 (3.3)	1 (3.3)	14 (46.7)	11 (36.7)	3 (10)	6 (20)	14 (46.7)	6 (20)	2 (6.7)	2 (6.7)
13. Have you been able to control during the last month that way you want to spend time?	11 (36.7)	12 (40)	4 (13.3)	2 (6.7)	1 (3.3)	1 (3.3)	0 (0)	8 (26.7)	15 (50)	6 (20)
14. During the last month have you felt that you are unable to overcome the difficulties piling up so high?	1 (3.3)	0 (0)	10 (33.3)	17 (56.7)	2 (6.7)	7 (23.3)	13 (43.3)	5 (16.6)	3 (10)	2 (6.7)

**Table 2.** Mean comparison of perceived stress before and after the session of Yoga exercises.

Sessions	Mean	p-value
Pre-Yoga Exercises Sessions	38.23 (2.91)	0.00
Post Yoga Exercises Sessions	19.83 (6.73)	0.00

## DISCUSSION

Number of authors all over the world have investigated the level of stress/ anxiety and its effects among different population. Zare et al. (2018) have also worked on same lines, who assessed the depression, anxiety and stress among school children and found out that level of stress, depression and anxiety was high among them studying in both private and public sectors. In another study on the level of stress and its sources revealed that greater stress was found among physiotherapy students and the major reason was workload (Jacob et al., 2012; Joshi, 2006). A study was carried out by another author in which he has identified the consequences of stress and its relation with co- curricular activities and academic performance.

The results revealed that stress rate was high among students however participation in co-curricular activities has affected their academic performance but it has no effect on the level of stress (Georg, 2001; Saat et al., 2015). Mittal et al (2018) study concluded that stress was common among medical students especially during their exams. However, it has also affected their performance level as well. Chelsey (2014) and Nosaka et al. (2018) in their studies concluded that stress can be relieved by practicing yoga and it is also beneficial in the improvement of health. Parshad (2004) in their study concluded that yoga played a major role in the reduction of cardiorespiratory diseases and it also reduces the risk factors of various other diseases and also minimizes the stressful conditions. Chong et al. (2011) study also revealed that yoga exercise has an essential role in the reduction of stress among the healthy individuals. It also plays an important role in the prevention of differential occupation related injuries and thus performance of an individual at work can be enhanced. Exercise can positively predict mental health, which is consistent with previous studies and physical activity can improve general health and happiness. Current study shows that the yoga exercise plays a role to reduce the stress level of students. A habit of exercise like yoga may be beneficial for students to reduce the stress level during the education time frame.

## CONCLUSION

It has been concluded from the study that majority of the students were stressed and unable to handle their personal problems neither they were found confident in dealing

with stress. Students under stress were prescribed with yoga exercises. The results showed that exercises were found to be effective in relieving the stress level and significant results were observed in students doing yoga exercises. So, it has been concluded that yoga exercises were found to be effective in relieving the stress and coping up with irrational life hassles or problems.

## DECLARATION

**Authors' Contribution Statement:** Soniha Aslam served as the principal author, leading the research design, data collection, and manuscript preparation. Noman Ahmed contributed to data analysis and provided critical revisions to the manuscript. Faraz Khan assisted in data collection and contributed to the drafting and final approval of the manuscript. The authors declare no conflict of interest.

**Conflict of Interest:** The authors declare no conflict of interest.

## REFERENCES

- Adolphs, R. (2013) The biology of fear. *Current Biology*, 23(2); 79-93
- Advin Tist, Bernstein, D.A, Penner, L.A, Stewart, A.C & Roy, E.J. (2008). *Psychology*. 8<sup>th</sup> ed. Boston New York: Houghton Mifflin Company
- Casper, J., Schmitz, J., Bräsen, J. H., Khalifa, A., Schmidt, B. M., Einecke, G., & von Vietinghoff, S. (2018). Renal transplant recipients receiving loop diuretic therapy have increased urinary tract infection rate and altered medullary macrophage polarization marker expression. *Kidney International*, 94(5), 993-1001.
- Chong, C. S., Tsunaka, M., & Chan, E. P. (2011). Effects of yoga on stress management in healthy adults: a systematic review. *Alternative Therapies in Health and Medicine*, 17(1), 32.
- Goldberg J. (2018) Childhood trauma, DNA methylation of stress-related genes, and depression: findings from two monozygotic twin studies. *Psychosomatic Medicine*, 80(7).
- Jackson, E. M. (2013). Stress relief: The role of exercise in stress management. *ACSM's Health & Fitness Journal*, 17(3), 14-19.

- Jacob, T., Gummesson, C., Nordmark, E., El-Ansary, D., Remedios, L., & Webb, G. (2012). Perceived stress and sources of stress among physiotherapy students from 3 countries. *Journal of Physical Therapy Education*, 26(3), 57-65.
- Joshi, K. S. (2006). *Yogic Pranayama: Breathing for Long Life and Good Health*. Orient Paperbacks.
- Mittal, R., & Kumar, R. (2018). Exam stress in MBBS students and the methods used for its alleviation. N. Shields, (2001). Stress, active coping, and academic performance among persisting and nonpersistent college students, *Journal of Applied Biobehavioral Research*. 6(2); 65–81
- Nosaka, M., & Okamura, H. (2015). A single session of an integrated yoga program as a stress management tool for school employees: Comparison of daily practice and nondaily practice of a yoga therapy program. *The Journal of Alternative and Complementary Medicine*, 21(7), 444-449.
- Parshad, O. (2004). Role of yoga in stress management. *The West Indian Medical Journal*, 53(3), 191-194.
- Phinney, J. S., & Haas, K. (2003). The process of coping among ethnic minority first-generation college freshmen: A narrative approach. *The Journal of Social Psychology*, 143(6), 707.
- Saat, N. Z., Sazlina, K., Siti Aishah, H., Ghazali, A. R., Dzairudzee, R., Nur Zaidah, Z., ... & ACWMR, W. (2015). Relationship between Co-Curriculum Activity, Stress and Academic Performance among University Student. In *Proceedings of the 3rd International Conference on Business, Law and Corporate Social Responsibility (ICBLCSR'15) May* (pp. 5-6).
- Schmitter, M., Liedl, M., Beck, J., & Rammelsberg, P. (2008). Chronic stress in medical and dental education. *Medical Teacher*, 30(1), 97-99.
- Sivananda, S. (2008). *Mother Ganga*. Sivananda Press.
- Stephens, M. (2012). *Yoga sequencing: Designing transformative yoga classes*. North Atlantic Books.
- Stevenson, A. (2010). *Oxford dictionary of English*. Oxford University Press, USA.
- Wheeler, C. M. (2007). *Ten simple solutions to stress, how to maintain tension. Start enjoying our life*. USA. New harbinger publications Inc.
- Zare, V. R., Ramesh, B., & Kokiwar, P. (2018). Assessment of "depression, anxiety and stress" among students of schools at RHTC area catered by private medical college in South India. *International Journal of Community Medicine and Public Health*, 5(7), 3116-3120.

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