

Effect of Dance Aerobics on Stress in Physiotherapy Students

Shilpa Khandare¹, Khayathi Padia², Tushar J. Palekar³, Manisha Rathi⁴

^{1,2,3,4}Dr. D. Y. Patil Vidyapeeth, Dr. D. Y. Patil College of Physiotherapy, Pimpri, Pune 411018, India

Abstract: *Dance Aerobics is said to have an effect on the psychological, behavioural and emotional responses. The literature shows high level of perceived stress among students. Hence, this study is aimed at evaluating the effect of Dance Aerobics on Stress in Physiotherapy students by using PSS score. The objectives of this study are to assess the Perceived Stress in physiotherapy students with assessment of PSS and to evaluate the effect of Dance Aerobics on perceived stress. One Hundred and Twenty Two voluntarily participating physiotherapy students were assessed and PSS score was taken. Experimental study design carried out on 46 students who were meeting the inclusion criteria. Outcome measure was Perceived Stress Scale. Perceived Stress Scale Score pre mean for screened participants was 25 (± 4.07), post mean 17.65 (± 4.85) and $p < 0.001$. Thus, this study concludes that there is significant reduction in Perceived Stress by Dance Aerobics Intervention on stress among physiotherapy students.*

Keywords: Dance Aerobics, Stress, PSS, Physiotherapy Students

1. Introduction

The World Health Organisation described Physical fitness as “the ability to carry out daily tasks with vigour and alertness, without undue fatigue, and with ample reserve energy to enjoy leisure pursuits and meet unforeseen emergencies”. It is essential that everyone should exercise regularly to maintain their health and fitness and should follow a judiciously sensible diet. Aerobic Dance Exercise is comprehensive, safe and time-efficient and thus it is a convenient mode of exercise. Two definitions from the dictionary are interesting. Aerobics helps to increase the amount of oxygen carried by the blood and strengthening of the heart and lungs achieved by any system of sustained exercise.

Dancing is to move your feet and body rhythmically in time to the beats of music. When these are combined, they result in an exciting, safe, and highly effective form of exercise for people of any age, and of any fitness level and can be enjoyable. Dance Aerobics has evolved as one of the most popular and widely used exercise modes in the world over the past three decades. Well-trained aerobics instructors play the role of fitness professionals who have the detailed information and skill regarding body mechanics, physiological processes and the changes in human body when it is subjected to various forms of exercises. As it is a skilled science, it is incorporated by trained professionals for the maximal benefit of the clients. It is an activity available for everyone and suitable for all population groups.

Putman defined aerobic dancing as a kind of physical activity with low impact, moderate time and with special music that to motivate among participants. Aerobic dance and perceived wellbeing are related to each other. There are positive effects of aerobic dancing on physiological and mental well-being. Also, according a research on aerobics dance protocol for 3 months, a positive relationship between physical and psychological well-being has been concluded³³. Also a study by Mohsin Shah et al suggested that there was a significant

level of stress perceived by students The mean score of perceived stress scale was found to be 30.84.

“Stress is a condition or feeling that a person experiences when they perceive that the demands exceed the personal and social resources the individual is able to mobilize”- Psychologist Richard S. Stress is a detrimental experience for most people⁵. In health care training it is extremely challenging students to deal with and adapt to its complex learning process. Some individuals may find Health care education to be a stressful experience as this may negatively affect the emotional well-being and educational performance of the students⁸. To let stress become student’s way of living in college is very, harmful because some stress levels can lead to a terrible effect. That may completely change the student’s life and it may result to failure³.

A study done by Dr. Tushar Palekar et al. aimed to evaluate the perceived stress, sources and severity of level of stress in physiotherapy students showed the mean PSS score of 20.50 and thus concluding there is presence of high level of stress in physiotherapy students.

Dance Aerobics is said to have an effect on the psychological, behavioral and emotional responses³¹. Thus, it is important to reduce the perceived stress of the students and give them a brighter side of life by enrolling into fitness activities like dance aerobics.

2. Methodology

2.1 Study Design

One Hundred and Twenty Two voluntarily participating physiotherapy students were assessed for PSS score. Experimental study design carried out on 46 students who were meeting the inclusion criteria of $PSS \geq 20$. Outcome measure was Perceived Stress Scale. The students who were medically ill diagnosed by physician, the ones with Physical disabilities, on treatment for any psychological disorders and

Persons going to the gym or already enrolled for other physical activities

2.2 Procedure

Written consent was taken from all the voluntary participants. Questionnaire was given which included PSS score. The participants were made to do appropriate markings and fill the formats. On the basis of the PSS score ≥ 20 , 46 participants were identified to be in the moderate + category of stress. The cut off value is taken on the basis of previous research work done¹. The mean PSS for 122 students was 18.23. The procedure was explained to all participants satisfying the inclusion criteria. Pre-assessment was done for Pulse rate, Respiratory rate, Blood pressure, BMI and EMG biofeedback Activity along with PSS scoring.

2.3 Perceived Stress Scale Scoring

Each item on the scale is evaluated on a 5-point scale starting from never (score 0) to almost always (score 4). Reverse scoring is done for positively formulated items. The scorings of each item is added, with high scores representing more perceived stress. PSS-10 scores are found by reversing the marks on the four optimistic objects for example, 0=4, 1=3, 2=2 etc. PSS score about 13 are reflected as average. Scores of 20 or greater are well-thought-out as high stress level.

2.4 Intervention

Dance Aerobics intervention that was done included moderate to vigorous level exercises carried for 30mins 4 days a week, including various stretching and warm up exercises for first 5 minutes, aerobics dance for 25 minutes followed by cool down for 5 minutes. Participants were given instructions according to the movements. They were supposed to wear gym clothing or loose clothes with proper sport shoes. Participants were requested to get their water bottles to maintain hydration. Tailor made protocol was given. The dance segments are performed in 4 or 8 counts and then segments add up. Usually, 4 sets of 8 beats steps should add up to 32 counts in a set and then repeated to 64 counts for sets. Feet and arms are moved in synchrony with music and the steps are simplified for understanding of members. After 3 months of training the patients who previously had stress on PSS scale will be reassessed for stress on PSS score. The data was statistically analysed using Paired t - Test.

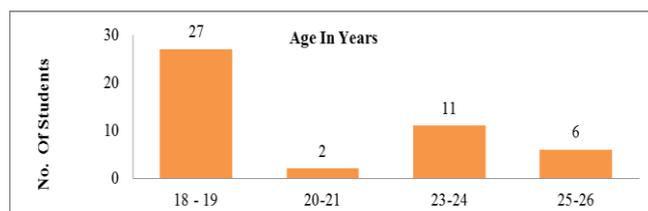
| Workout Plan | Exercises | Duration |
|----------------|---------------------------------------|----------|
| Warm up | Stretching and general body exercises | 05 mins |
| Dance Aerobics | Dance Aerobics steps in 8 beat counts | 25 mins |
| Cool down | Stretching and relaxation | 05 mins |

3. Results

Table 1: Demographic Data and Mean PSS Score

| Mean AGE | Mean PSS (n=122) | PSS \geq 20 |
|----------|-------------------|---------------|
| 19.24 | 18.23 | N = 46 |

Graph 1: Age Distribution of Participants

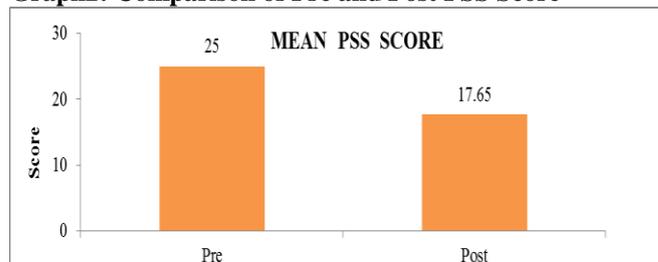


The age of the Mean age (19.24 years) and Mean PSS score (18.23) of the 122 screened physiotherapy students are shown. It also shows number of participants with PSS score \geq 20.

Table 2: Comparison of Pre and Post Perceived Stress Score

| PSS | Pre | Post |
|-----------------|--------|-------|
| Mean | 25 | 17.65 |
| SD | 4.072 | 4.85 |
| Mean Difference | 7.348 | |
| t Value | 8.320 | |
| p value | <0.001 | |

Graph2: Comparison of Pre and Post PSS Score



The comparison of pre and post comparison of Perceived Stress Scale Score of the participants. The pre mean for screened participants was 25 (± 4.07) and the post dance aerobics mean for 46 participants was found to be 17.65 (± 4.85). The statistical analysis according to paired t- test showed significant improvement in Perceived Stress Scale Score ($p < 0.001$).

4. Discussion

This study was aimed to determine the effect of dance aerobics intervention on perceived stress in physiotherapy students using Perceived Stress Scale. Studies on stress reduction with dance aerobics have not yet been reported in the literature. In this study, physiotherapy students reported a higher level of perceived stress. The study done by Dr. Tushar Palekar et al. suggested that there is high level of stress in physiotherapy students.¹ They also suggested that in other countries as well, there were varied levels of stress found in health care learners and physiotherapy students. The amount and chronicity of stress varies amongst individual students according to their curricula, evaluation system etc. Result of our research supports the present evidence of literature, demonstrating that physical therapy graduation students are subjected to various stressors that may unfavourably affect their health in both ways: physically and psychologically¹. The results supported the research hypothesis and we evaluated mean perceived stress among

physiotherapy students of 18.23. This result is supported by a study done by Dr. Tushar Palekar from Dr. D. Y. Patil College of physiotherapy who found the mean PSS score to be 20.50 among the students. The researcher also reported that 74% of the students experienced stress for some duration throughout their physiotherapy education due to various precipitating factors.

The significant reduction is advocated to be an outcome of physiologic changes caused by aerobic exercises². Results showed that there were positive effects of stress reduction due to aerobic dance training and these were coherent with Schiffer et al. and Hui et al. who showed aerobic dancing had a positive affect psychological well-being.³³ According to the scores during post-test, the present results highlighted the positive role of aerobic dancing classes environmental and its climate on positive effects of psychological well-being and stress reduction as suggested by Dr. Pallavi Sawant². Also it seems that aerobic dancing class's climate can affect maintaining and enhancing well-being.²⁹

The Central Nervous System's neural control mechanisms finely control human motions. The cerebellum serves as the major comparing, evaluating, and integrating centre to fine tune muscular activity. Numerous muscular functions are controlled by the spinal cord and other subconscious areas of the CNS. Automatic muscular movements and responses are processed and initiated by the reflex arc. The muscle's movement function determines the number of muscle fibers a single motor unit may contain. The fiber-to-neuron ratio is relatively small for fine and complicated movement patterns, whereas for gross movements, a single neuron may innervate several thousand muscle fiber units.

The anterior motor neurons transmit the action potential from spinal cord to the muscle via neuromuscular transmission process. Dendrites receive impulses and then pass them to the cell body. The axon transmits the impulse in one direction only and mainly towards the muscle. The neuromuscular junction (NMJ) is the crossing point between the motor neuron and its motor unit of the muscle. Neurotransmitter released at the neuromuscular junction activates the muscle. The impulses- Excitatory or inhibitory continuously keep passing through these synaptic junctions between neurons and the muscle. The excitation thresholds of the neurons altered by these impulses either increase or decrease the firing rate³⁵.

A large degree of disinhibition aids exercise performance as it allows for maximal activation of a muscle's motor units during an all-out, high-power output exercise. Thus, in our study we found a significant reduction in stress as assessed by Perceived Stress Scale.

5. Conclusion

Thus, this study concludes that there is significant reduction of Perceived Stress by Dance Aerobics Intervention on stress among physiotherapy students.

References

- [1] Dr. Tushar J. Palekar, M. G. Mokashi. Perceived Stress, Sources and Severity of Stress among Physiotherapy Students in an Indian College. *Indian Journal of Physiotherapy and Occupational Therapy*. 2013 July-September. 10.5985/j.0973-5674.7.3.079
- [2] Dr. Pallavi Sawant, Dr. J.V.Gadkari. The Efficacy of Cooper Protocol Dance Aerobics in Causing Physiological Changes in the Endurance Capacity of Middle Aged Women. *International Journal of Basic & Applied Physiology*. 2014, Vol 3 (1) page numbers 47-50.
- [3] Vinothini Padmananthan, Deepashini H., Jafarzadeh Esfehali Ali, N S Senthil Kumar. Education Stress and Coping Strategies among Physiotherapy Students. *International Journal of Health Sciences and Research* ISSN: 2249-9571. 2013 august 8. Volume 3. Page numbers 7-16.
- [4] Sanjeev Kumar, J. P. Bhukhar. Stress level and coping strategies of college students. *Journal of Physical Education and Sports Management*. 2013 January Vol. 4(1): pp. 5-11,
- [5] Marwan Zaid Bataineh. Academic Stress among Undergraduate Students: The Case of Education Faculty at King Saud University. *International Interdisciplinary Journal of Education – January 2013, Volume 2, Issue 1*.
- [6] Ross, Shahnnon E. & et al. "Source of Stress Among College Students". *College Student Journal* JUN-99 vol. 33 issue 2
- [7] Fazaila Sabih, Farah Rashid Siddiqui, Muhammad Naveed Baber. Assessment of stress among physiotherapy students at Riphah Centre of Rehabilitation Sciences. *J Pak Med Association*.
- [8] A study of stress sources among college students in Taiwan Cheng Kai-Wen Kaohsiung Hospitality College; *Journal of Academic and Business Ethics*
- [9] Stress and the College Students. National Health Ministries, PC (USA), Created 7.2004 / Rev. 2. 2006.
- [10] Level of stress and coping strategies used by nursing interns- Charanjeet Singh, Sunita Sharma, Ravinder Kumar Sharma.
- [11] The influence of an undergraduate curriculum on development of students' academic belief systems Clare M. Kell, 14th International World Physical Therapy Congress, Barcelona, Spain, 7–12 June 2003.
- [12] "Obesity Reduction Black Intervention Trial (ORBIT): Six-month Results" by Melinda R. Stolley, Marian L. Fitzgibbon, et al *Obesity* (2008) 17, 100–106. DOI:10.1038/oby.2008.488
- [13] "24-weeks Pilates-aerobic and educative training to improve body fat mass in elderly Serbian women" by Pedro Jesús Ruiz-Montero (Department of Physical Education and Sport, Faculty of Physical Activity and Sport, University of Granada, Granada, Spain) and et al *Dove Press Journal: Clinical Interventions of Aging*, 31st January 2014.
- [14] "The Effect of Walking Exercise on Physical Fitness and Serum Lipids in Obese Middle-aged Women: Pilot Study" Sang-Ho Lee PhD (Research Institute of Sport

- Science, Kyungwoon University, Republic of Korea) and et al. in *J. Phys. Ther. Sci.* 25: 1533–1536, 2013.
- [15] A qualitative investigation of attitudes towards aerobic and resistance exercise amongst overweight and obese individuals by Nicola Guess in *Guess BMC Research Notes* 2012, 5:191.
- [16] “Muscle Use During Exercise: A Comparison of Conventional Weight Equipment to Pilates With and Without a Resistive Exercise Device” by Jerrold S. Petrofsky, PhD, JD, et al. - *The Journal of Applied Research* Vol. 5, No. 1, 2005.
- [17] “Promoting Moderate-Vigorous Physical Activity in Overweight Minority Girls” by Norma Olvera, et al. - Hindawi Publishing Corporation *International Journal of Pediatrics* Volume 2010, Article ID 415123, 7 pages, DOI:10.1155/2010/415123.
- [18] “Effects of Exercise in the Treatment of Overweight and Obese Children and Adolescents: A Systematic Review of Meta-Analyses” by George A. Kelley - Hindawi Publishing Corporation *Journal of Obesity*, Volume 2013, Article ID 783103.
- [19] “Recruitment of Obese Black Women Into a Physical Activity and Nutrition Intervention Trial” by Lisa K. Sharp, Marian L. Fitzgibbon, and Linda Schiffer-*Journal of Physical Activity and Health*, 2008, 5, 870-881; 2008 Human Kinetics, Inc.
- [20] “Physical Activity Patterns in the National Weight Control Registry” by Victoria A. Catenacci, et al. *Obesity* (2008) 16, 153–161. doi:10.1038/oby.2007.
- [21] Effects of Moderate-Intensity Exercise on Physiological, Behavioral, and Emotional Responses to Family Caregiving: A Randomized Controlled Trial by Abby C. King; *Journal of Gerontology: Medical Sciences* 2002, Vol. 57A, No. 1, M26–M36
- [22] Effect of exercise, heat stress, and hydration on immune cell number and function. Joel B Mitchell 28 December 2015
- [23] Effect of exercise, heat stress, and hydration on immune cell number and function” Article in *Medicine & AMP Science in Sports & AMP Exercise* • December 2002 Impact Factor: 3.98.
- [24] Exercise and Physical Activity Clinical Outcomes and Applications by Peter Kokkinos, et al.: *Exercise in Cardiovascular Disease*
- [25] “The Effects of Exercise Training on Anxiety” by Matthew P. Herring, *American Journal of Lifestyle Medicine*
- [26] “Perceived Stress, Sources and Severity of Stress among medical undergraduates in Pakistani Medical School” by Mohsin Shah, et al. Shah et al. *BMC Medical Education* 2010, 10:2
- [27] “A study to compare the effectiveness of gsr biofeedback training and progressive muscle relaxation training in reducing blood pressure and respiratory rate among highly stressed individuals” by *Indian J Physiol Pharmacol* 2007; 51 (3) : 296–300
- [28] “Perceived Sources of Stress Among Greek Dental Students” by Argy Polychronopoulou: *Journal of dental education*(2005).
- [29] Schiffer T, Klienret J, Sperlich B, et al. Effects of aerobic dance and fitness program on physiological and psychological performance in men and women. *Fitness* 2009; 5(2): 37-46.
- [30] Hui E, Chui BT, Woo J. Effects of dance on physical and psychological well-being in older persons. *Arch Gerontol Geriatr* 2009; 49(1): e45-e50.
- [31] “Textbook of Exercise Physiology” – Mc Ardle.