International Journal of Yoga, Physiotherapy and Physical Education
ISSN: 2456-5067
Impact Factor: RJIF 5.24
www.sportsjournal.in
Volume 3; Issue 5; September 2018; Page No. 12-16

Assessment of level of physical fitness and level of mental stress in exercising and non-exercising physiotherapy students

Priyanka Sharma[1*], Rahul Sharma[2], Avi Choudhary[3], Hemlata Vats[4], Jyoti Kataria[5], Mohd Asif[6]
[1] Assistant Professor, Banarsidas Chandiwala Institute of Physiotherapy, Kalkaji, New Delhi, India.
[2] Senior Research Fellow, Department of Neurology, AIIMS, New Delhi, India
[3, 6] Assistant Professor, Banarsidas Chandiwala Institute of Physiotherapy, Kalkaji, New Delhi, India
[4] Assistant Professor, Institute of Applied Medicine & Research, Ghaziabad, Uttar Pradesh, India
[5] Assistant Professor, School of Physiotherapy, Delhi Pharmaceutical Sciences & Research Society, Delhi, India

Abstract
Background & Objectives: The Physical Fitness index measures the physical fitness for Muscular work & the ability to recover from the work. For living a healthy life it is important to have healthy body as well as healthy mind. Budding Physiotherapists should have good combination of Physical & Mental Health for better efficacy. Mental stress is a feeling of strain and pressure. Also this is one type of psychological pain. Mental stress can be measured by how we feel it with the help of perceived stress scale. The Present study was undertaken to compare and correlate level of physical fitness and level of mental stress in exercising and non-exercising Physiotherapy students.
Method: 220 participants were taken, 110 in each group. Modified Harvard step test and Perceived Stress Scale questionnaire were used to compare and correlate physical fitness and mental stress respectively amongst the 2 groups, i.e. Exercising Physiotherapy Students & Non- Exercising Physiotherapy Students.
Data Analysis: Statistical analysis was done using MS –Excel. Unpaired t test & Correlation Coefficient were calculated.
Result: The study showed higher physical fitness and lower mental stress level in exercising group and positive correlation between physical fitness and mental stress.
Conclusion: The Present study was done to assess the Physical Fitness and level of Mental Stress in Exercising and Non-Exercising Physiotherapy Students which showed better Physical Fitness and lower Mental stress levels among exercising group than those of non-exercising Physiotherapy Student group. Physical Fitness and mental stress have inversely proportional, very significant, moderate in strength correlation between them. This means that increase in Physical fitness level causes decrease in level of Mental Stress.

Keywords: physical fitness index, physiotherapy students, mental stress, modified Harvard step test, perceived stress scale, exercising individuals

1. Introduction

Physical Activity (PA) is "any bodily movement produced by skeletal muscles that result in energy expenditure [1]. Above resting (basal) levels [2] PA broadly encompasses exercise, sports, and physical activities done as part of daily living, occupation, leisure, and active transportation". Also implicit in this definition is that PA is a physical stressor, though not necessarily an uncomfortable one. Exercise is a behavioural subset of PA and is defined as "Physical activity that is planned, structured, and repetitive and has as a final or intermediate objective the improvement or maintenance of physical fitness". Dissimilarly, sedentarianism is "activity that involves little or no movement or PA, having an energy expenditure of about 1–1.5 metabolic equivalents (METs). Examples are sitting, watching television, playing video games, and using a computer" [3]. These definitions connote that PA behaviours are specific to a person, situation, and context. Also, they suggest that these concepts are quantified in terms of mode, frequency, duration, and intensity [4].

Physical Fitness is defined as ability to carry-out daily tasks with vigour and alertness with-out undue fatigue with ample energy to enjoy leisure time pursuits, to meet unusual situations and unforeseen emergencies [5].

Physiotherapists have a role in advising and assisting the population to use physical activity to keep active and keep healthy [6].

Physiotherapy students during the course of physiotherapy education is subjected to different kinds of stressors predominantly the pressure of academics leading to the successful completion of the educational course. Physical & mental fitness are the key to such a successful outcome [7].

Physical activity in children and young people can improve self esteem, reduce anxiety and depression and improve motor skills [6].

Exercise is something with which you can reduce the mental stress as well as maintain the fitness. Rest other techniques of reducing mental stress might be difficult for some individuals to perform. It requires patience and peace which is difficult to

get as the individuals at this age have responsibilities towards their family and work. Doing exercises helps the individuals to participate actively. This helps in mental stress reduction and maintains or increase fitness [8].

So, in order to evaluate cardiopulmonary efficiency in Exercising & Non- Exercising Physiotherapy Students & to determine the physical efficiency in these students and plan suitable strategies if necessary, this study was planned. There is a dire need to know the physical fitness level of our upcoming Physiotherapists. They can be sensitized to pursue a healthy life style right from the beginning of their career. The physical fitness index (PFI) measures the physical fitness for muscular work and the ability to recover from the work. Perceived stress scale measures the degree to which situations in one's life are appraised stressful.

Thus this study was taken to assess the level of physical fitness and level of mental stress in exercising and non-exercising Physiotherapy students.

Material & methods

The study was given ethical approval by Ethical Review Committees as well as the Departments of Physiotherapy. All ethical requirements including confidentiality of responses and informed consent were stringently ensured throughout the project. The study was conducted during March-May 2018.

A cross sectional Study was conducted in three of the reputed Institutes of Physiotherapy, New Delhi & NCR. A sample size of 220 was used. Convenience sampling was used to draw the sample for this study. All consenting physiotherapy students studying in the institute were included in the study sample.

Inclusive criteria

1. Healthy young male & female Physiotherapy students
2. Age between 17 to 23 years

Exclusive Criteria

1. Student with Musculoskeletal, Neurological, Cardiovascular or Respiratory disorder which might affect the outcome of the study.
2. History of Drug intake, Alcohol & Smoking

Methodology

The participants were divided into two groups i.e. Exercising Physiotherapy Students Group and Non-exercising Physiotherapy Students Group. Participants who exercised regularly for more than 2 months were included in exercising group and participants who did not exercise for more than 2 months were included in non exercising group. The exercising Physiotherapy Students were exercising for more than 2 months, moderate to high intensity, for 45min to 1 hour- 3 to 4 times a week, performing various types of exercises such as aerobic, strengthening, zumba, yoga, mat exercises, ball exercises etc. Participants who had any Orthopaedic, Neurological, psychiatric or psychological condition, and individuals performing any kind of mental stress relieving technique were excluded from the study. Participants had to perform a Modified Harvard Step test and fill the Perceived Stress Scale Questionnaire. Modified Harvard step test was done to check the Physical fitness of the Physiotherapy Students. A stepper of 20" height was taken for the test. Participants were asked to step up and down for 3 minutes, at a speed of one step/2 sec. Pulse rate was taken post test at 1-1.5, 2-2.5, and 3-3.5. Using the following formula the fitness index was calculated.

Formula

Physical fitness index= $totaltimeinsec * 100 / totalpulsecount * 2$

Rating fitness index:

- Excellent: >96
- Good: 83-96
- Average: 68-82
- Low average: 54-67
- Poor: <54

Perceived stress scale was used to assess the level of mental stress perceived by the participants. A questionnaire was given, which had 10 questions and the participants had to circle the number to indicate how often they felt or thought a certain way. [Scale 1]

The numbers were

0=Never
1=Almost never
2=Sometimes
3=fairly often
4=Very often

The total score was given out of 40. Score was interpreted as:
0-13: Low mental stress
14-26: Moderate mental stress
27-40: High mental stress

Table 1: Profile of subjects

Exercising or Not	No. of Subjects	Age	BMI
Exercising Group	110	20.6±4	22.54±7
Non- Exercising Group	110	20.2±8	21.89±5

Statistical analysis

Descriptive statistics, frequency, means (SD) etc were estimated as appropriate. Crude associations were assessed using Odds ratio, Pearson Chi -square test and t-test. All P values were considered significant at < 0.05. Variables with a significant p-value were further evaluated using multiple logistic regression analysis to determine their adjusted association with awareness of organ donation, and motivation to donate. All odds ratios were reported with a 95% confidence interval. Tables and figures were used for an all-inclusive viewing of results.

Results

Aim was to assess the Physical Fitness and level of Mental Stress in exercising and non-exercising Physiotherapy Students.

Comparing Physical Fitness Index (PFI) of both the groups; exercising group has higher mean value compared to Non-Exercising Physiotherapy Student group. Which means that the Physical Fitness among Exercising Group is more than the Non-Exercising Physiotherapy Students group. (Figure 1)

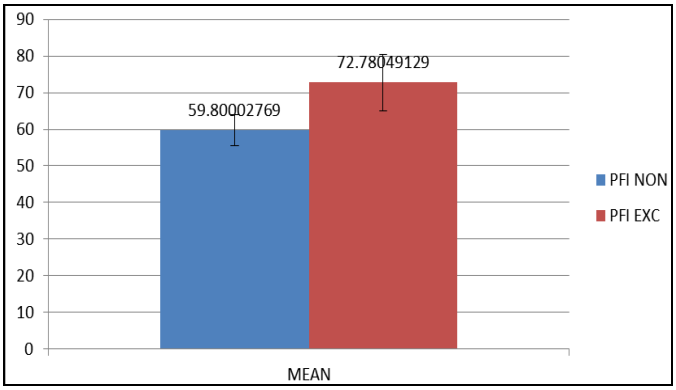

Fig 1: Comparing PFI between Exercising and Non- Exercising Physiotherapy Students group

Comparing mental stress level of both the groups; Exercising Physiotherapy Student group has lower mean value compared to Non-Exercising Physiotherapy Student group. Which means that level of mental stress is less in exercising group than non-exercising group. (figure 2)

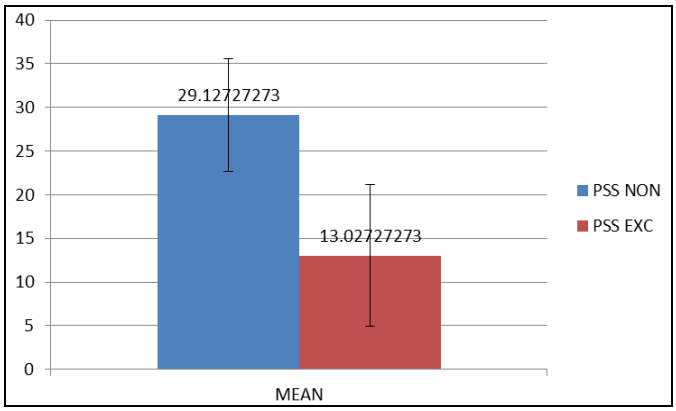

Fig 2: Comparing PSS between Exercising and Non- Exercising Physiotherapy Students group

Table 2

	PFI Non-Exercising Physiotherapy Students Group	PFI Exercising Physiotherapy Students Group
Mean	59.80002769	72.78049129
Standard Error	0.405762646	0.738401382
Median	61.2244898	69.76744186
Mode	61.2244898	68.18181818
Standard Deviation	4.255674536	7.744419027
Sample Variance	18.11076576	59.97602607
Kurtosis	-0.382230048	2.649122714
Skewness	-0.779752267	1.58899121
Range	15.2173913	34.7826087
Minimum	50	65.2173913
Maximum	65.2173913	100
Sum	6578.003046	8005.854042
Count	110	110

Comparing PFI between Exercising and Non- Exercising Physiotherapy Students group

Table 3

	PSS Non-Exercising Physiotherapy Students Group	PSS Exercising Physiotherapy Students Group
Mean	29.12727	13.09090909
Standard Error	0.620623	0.769470151
Median	28	12
Mode	27	12
Standard Deviation	6.509145	8.070271024
Sample Variance	42.36897	65.1292744
Kurtosis	3.282881	-0.528802607
Skewness	-1.00174	0.558290577
Range	39	33
Minimum	3	2
Maximum	42	35
Sum	3204	1440
Count	110	110

Comparing PSS between Exercising and Non- Exercising Physiotherapy Students group

Discussion

The aim of the present study was to assess the Physical Fitness and level of Mental Stress in Exercising and Non-Exercising Physiotherapy Students. Modified Harvard Step Test and perceived stress scale Methods were used to assess physical fitness and mental stress, respectively.

This study was done to observe the effect of exercise on physical fitness and mental stress in Physiotherapy Students & also to correlate the physical fitness and mental stress among them. Results for the study shows that there is significant difference in physical fitness in both the groups. Physical fitness is more among the exercising group (mean:72. 87) as compared to non-exercising group(mean:59.80). It might be due to the fact that physiological changes associated with

exercise including endorphin and monoamine levels, or reduction in the levels of the stress hormone cortisol may exert an influence on mood [9].

Results of this study is similar to the study done by Disha Jagad *et al* in which they assessed physical fitness index (PFI) and Mental Stress level in Exercising & Non-Exercising individuals [8]. Exercising Group had higher mean value of PFI as compared to the non- Exercising Group.

Multiple studies have confirmed that health benefits are associated with physical activity, including cardiovascular and muscular fitness, bone health, psychosocial outcomes, and cognitive and brain health [10].

Physical activity also improves mental health and is important for health and optimal function of muscles, bones and joints [11]. physical activity can promote healthy cognitive and psychosocial function.

The benefits of physical activity exhibit a dose-response relationship; the higher the amount of physical activity, the greater the health benefits. Given the significant health benefits afforded by physical activity, considerable efforts should be made to promote this vital agent of health [12].

The other component, which is mental stress, shows that there is decrease in level of mental stress with regular exercise in exercising group (Mean: 13.09) than non-exercising group (Mean: 29.12)

While stress may have a direct effect on health (e.g., dysregulation of hormonal axes), indirect routes toward maladaptation also likely exist For instance, stress is related to declining physical function over time and obesity which contributes to cardiovascular disease. Another likely factor is impaired health/lifestyle practices and maladaptive behaviors, such as decreased exercise and PA and increased sedentariness [13].

Stress ful events appear to accumulate from the earliest days of life, and this cumulative adversity may have a profound impact on a wide range of health outcomes [14].

Psychological stress has a deleterious effect on a wide range of physical and mental health outcomes with accumulating evidence that health practices/maladaptive behaviors may mediate these relationships [15].

Evidence suggests that increasing physical activity and physical fitness may improve academic performance and that time in the school day dedicated to recess, physical education class, and physical activity in the classroom may also facilitate academic performance [16].

Exercise is an effective method for improving perceived stress, stress symptoms, and quality of life [17].

Conclusion

The Present study was done to assess the Physical Fitness and level of Mental Stress in Exercising and Non-Exercising Physiotherapy Students which showed better Physical Fitness and lower Mental stress levels among exercising group than those of non-exercising Physiotherapy Student group. Physical Fitness and mental stress have inversely proportional, very significant, moderate in strength correlation between them. This means that increase in Physical fitness level causes decrease in level of Mental Stress.

Limitation

One of the limitations of this study is its confinement to few universities, which mandates studies from more universities to generalize the results.

Future scope

Large sample size and incorporating exercise i.e. Increase in Physical fitness Level, in daily lives of middle aged & elderly people to get healthy body as well as stress free healthy mind.

Conflict of Interest

None Declared

Funding Support

None

References

1. Caspersen CJ, Powell KE, Christenson GM. Physical-activity, exercise, and physical-fitness— definitions and distinctions for health-related research. Public Health Rep. 1985; 100(2):126-31.
2. USDHHS. Physical activity and health: a report of the Surgeon General. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion; Atlanta, 1999.
3. Owen N, Healy GN, Matthews CE, *et al.* Too much sitting: the population health science of sedentary behavior. Exerc Sport Sci. Rev. 2010; 38(3):105-13.
4. Garber CE, Blissmer B, Deschenes MR, *et al.* Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: guidance for prescribing exercise. Med Sci Sports Exerc. 2011; 43(7):1334-59.
5. Mc Ardle, WD. *et al.* 2nd ed. Essentials of Exercise physiology, USA: Lippincott Williams and Wilkins, 2000, 365,
6. General Meeting of the European Region of the WCPT, European Region of the World Confederation for Physical Therapy (WCPT), 2016.
7. Dharmesh Parmar, Vishwas Vaghela. Study of physical fitness index using modified Harvard step test in relation with body mass index in physiotherapy students, International Journal of Recent Advances in Multidisciplinary Research. 2015; 2(12):075-1077.
8. Disha Jagad, Shweta Manwadkar. Assessment of Level of Physical Fitness and Level of Mental Stress in Exercising and Non-Exercising Individuals. International Journal of Science and Research (IJSR); 2018; 7(5):202-207.
9. Acute and chronic effects of exercise on tissue sensitivity to glucocorticoids. Duclos M, Gouarne C, Bonnemaison D J Appl Physiol (1985). 2003; 94(3):869-75.
10. Strong WB, Malina RM, Blimkie CJ, Daniels SR, Dishman RK, Gutin B, *et al.* Evidence based physical activity for school-age youth. Journal of Pediatrics. 2005; 146(6):732-737.
11. The Importance of Exercise as a Therapeutic Agent. Rabindarjeet Singh Malays J Med Sci. 2002; 9(2):7-16.

12. The Health Benefits Of Physical Activity And Cardiorespiratory Fitness, James McKinney *et al*, BCMJ, 2016; 58(3):131-137
13. Hamer M. Psychosocial stress and cardiovascular disease risk: the role of physical activity. Psychosom Med. 2012; 74(9):896-903.
14. Miller G, Chen E, Cole SW. Health psychology: developing biologically plausible models linking the social world and physical health. Annu Rev Psychol. 2009; 60:501-24.
15. McEwen BS. Stress, adaptation, and disease: allostasis and allostatic load. Ann N Y Acad Sci. 1998; 840:33-44.
16. Educating the Student Body: Taking Physical Activity and Physical Education to School. Committee on Physical Activity and Physical Education in the School Environment; Food and Nutrition Board; Institute of Medicine; Kohl HW III, Cook HD, editors. Washington (DC): National Academies Press (US). 2013.
17. Atlantis E, Chow CM, Kirby A, *et al.* An effective exercise-based intervention for improving mental health and quality of life measures: a randomized controlled trial. Prev Med. 2004; 39(2):424-34.