



A Study on Physical Activity and Stress Levels among Undergraduate Medical Students

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Abstract

Introduction: Mental health issues among college students are a growing public health concern. The increasing rates of depression, anxiety and stress tend to interfere with their quality of life and educational attainment. Studies have also suggested high levels of stress in health care profession students. Especially, considerable amount of stress has been noted in medical students. The benefits of Physical activity on the mental health of students have been the focus of some researchers from across the globe. This study was conducted with the objective of comparing the levels of perceived stress among students who were physically active and those who were not.

Materials and Methods: This study was conducted in a random sample of 300 undergraduate medical students studying in a Medical college in kancheepuram district of Tamil Nadu. Their level of Physical activity was measured by the International Physical activity Questionnaire, and their stress levels were assessed by the Perceived Stress Scale.

Results: Out of the 300 students who participated in this study, 138 were males and 162 were females. The mean age of the participants was 20 years. Overall prevalence of high stress levels and low physical activity was 29.7% and 35 % respectively. Stress levels were high in students who demonstrated low physical activity compared to students who were highly active. This relationship was found to be statistically significant.

Conclusion: This study reiterates the importance of physical activity in reducing stress levels among medical students. Implementation of primary prevention strategies, such as, compulsory physical education programs at college level will go a long way in preventing stress and its long term effects in the student community.

Keywords-Stress, Physical activity, students.

Introduction

The Physical, Mental and Social wellbeing of our school and college students play a significant role in shaping this country's future. Studies have shown that mental health issues among college students are

a growing public health concern. The increasing rates of depression, anxiety and stress tend to interfere with their quality of life and educational attainment. ⁽¹⁾

The rising academic pressure also has a role to play during their school and college days. Though

studies have shown that around 60% of college students reported high levels of depression, anxiety and stress,⁽²⁾ there's been a significant lack of proper stress coping skills, and many of them resort to ineffective coping methods.^(3,4) Subjective experience of stressors can lead to poor quality of life, and can compromise their ability to cope with daily problems, and may ultimately influence the academic performance of the students.^(5,6)

Studies have also suggested high levels of stress in health care profession students.⁽⁷⁾ Especially, considerable amount of stress has been noted in medical students.⁽⁸⁾ The source of stress could be from anywhere. It could be from the continuous evaluation which the students are subjected to in the college, or the pressure to earn good grades in their examination.⁽⁹⁾ It is important to discuss the role of physical activity in prevention of stress in college students.

Physical activity is global term that refers to "any bodily movement produced by skeletal muscle that results in a substantial increase over the resting energy expenditure"⁽¹⁰⁾ Physical inactivity or sedentary lifestyle is defined as "a state when body movement is minimal and energy expenditure approximates the Resting metabolic rate (RMR)"⁽¹¹⁾. Apart from it's role in development of functional qualities like aerobic capacity, flexibility, muscle strength and motor skills, regular physical activity has a protective effect on a whole lot of health conditions from cardiovascular diseases to cancer⁽¹²⁾ Numerous studies have been conducted on the benefits of physical activity on mental health. Most of these studies highlight that those who engage in physical activity tend to have fewer stress symptoms compared to those who lead a more sedentary lifestyle.^(13,14) Mandatory physical education classes are part of the school curriculum, and it's incorporated in the school time table itself. But when a student comes out of the school and joins a college or university, it is mostly left to his or her wish. Hence, this study was conducted with the objective of comparing the stress levels in students who took part in regular physically activity and those who did not.

Materials and Methods

This cross-sectional study was done with both descriptive and analytical components. This study was conducted in a random sample of undergraduate students in a Medical college in kancheepuram district of Tamil Nadu. The sample

size was calculated assuming 25 % as the most probable prevalence of stress among college students and 20% of prevalence as the limit of accuracy and the Z value of 1.96, the sample size was calculated by the formula, $4 PQ/L^2$. The total sample size arrived at was 288. It was rounded of to 300, to account for any last minute dropouts. Out of the total number of 700 odd students in the medical college, 300 students, irrespective of their year of study, were chosen using simple random technique. The students were assured confidentiality, and an Informed consent was obtained from all the students who were willing to participate in the study.

On a pre-appointed day, the participants were requested to assemble in small groups, and they were administered the study questionnaire, which actually consisted of two parts. The first part had questions pertaining to age, sex and current residential status of the student, and the second part comprised of the standardised International Physical activity questionnaire (IPAQ) and the perceived stress scale (PSS). The data was analysed using statistical package for social sciences, version – 20.

Study Instruments

International Physical Activity questionnaire (IPAQ): Physical activity can be assessed by various methods, like time and motion studies, indirect calorimetry, motion sensors, doubly labelled water etc. But, most of these methods are costly and cannot be easily applied to large populations. Whereas, questionnaires are easy to administer, cost effective and can be used for large populations. One such instrument that is widely in use is the International Physical Activity Questionnaire (IPAQ) which consists of long and short versions. The purpose of this questionnaire was to obtain internationally comparable data on health related physical activity. (C-18) The validity and reliability studies of IPAQ were conducted in 12 countries spread over 6 continents. The results showed a Spearman's Rho around 0.8, indicating high reliability between repeated administrations of all version of IPAQ. The criterion validity had a median Rho of 0.3 against the CSA accelerometer for minutes of different activities. This particular study used the short form of the questionnaire. Based on the responses obtained, the participant's physical activity were categorised into three, low activity, Moderate activity or High activity.⁽¹⁵⁾

Perceived Stress Scale: The perceived stress scale (PSS) devised by Sheldon Cohen is one of the most

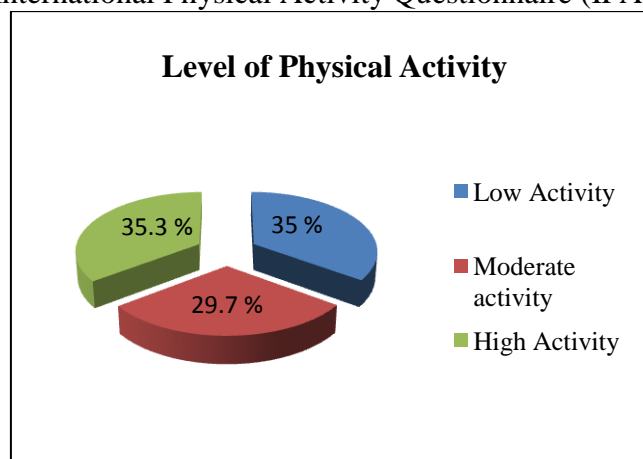
widely used psychological scale for measuring the perception of stress. It measures the degree to which the situations in one's life are appraised as stressful. The items were designed to trap how unpredictable, overloaded and uncontrollable, do the respondents find their lives. The PSS was designed to be used among population who had at least junior high school education. The questions are easy to understand, general in nature and, free of content that is specific to any subpopulation group. The 10 questions in the PSS ask about the thoughts and feelings during the last month. In each of the case, the respondents are asked how often they have felt in a certain way. The evidence of reliability and validity has been established.⁽¹⁶⁾

Results

A total of 300 students participated in this study. Out of that, 138 (46%) were male students and the rest 162 (54%) were females. The mean age of the study population was 20 years. About 225 (75%) of the students were residing in the hostel within the college campus, whereas, 75 (25%) of them were day scholars.

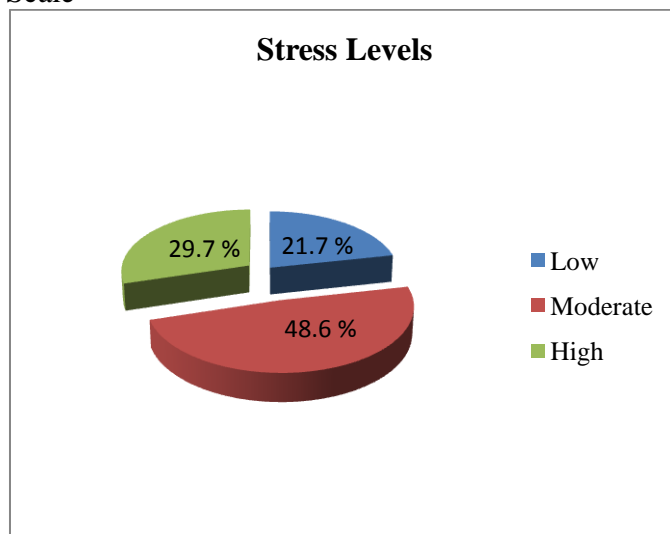
Based on their responses in the International Physical Activity Questionnaire, they were categorised as indulging in Low, Moderate or High physical activity. It was observed that 105 (35%) of the students exhibited low physical activity. The details are given in figure – I

Figure – I: Figure shows the Level of physical activity of the participants as assessed using the International Physical Activity Questionnaire (IPAQ)



Regarding the prevalence of stress among the study subjects, it was observed that nearly 89 (29.7 %) students had high levels of stress, whereas, only 21.7 % of the students had low stress levels. The details are given in figure -II.

Figure – II: Figure shows the stress levels of the participants interpreted using the Perceived Stress Scale



The difference in the level of physical activity among the male and the female students was analysed. It was observed that the female students reported more activity than the male students. Though, female students reported more activity than the male students, the difference was not found to be statistically significant. The details are given in table –I.

Table –I: Table showing the difference in Physical activity between male and female students

Sex	Level Of Physical activity			P-Value
	Low (n-105)	Moderate (n-89)	High (n-106)	
Male (n-138)	53	38	47	P = .508 (t =1.356, df =2)
Female (n-162)	52	51	59	

The stress levels of the female and male students was assessed using Perceived stress scale (PSS), it was observed that male students had lesser stress than female students. This difference in the stress levels between male and female students was found to be statistically significant. Refer table- II for more details.

Table – II: Table showing the difference in stress levels among male and female students

Sex	Stress levels			P-value
	Low stress (n-65)	Moderate Stress (n-146)	High stress (n-89)	
Male (n-138)	39	68	31	P = .008 (t =9.617, df =2)
Female (n-162)	26	78	58	

The reported level of physical activity and stress levels among the students were cross tabulated and analysed. It was observed that the stress levels were high if the participant indulged in low physical activity, whereas, high stress levels were less common in those participants who were moderately or highly active. This difference was found to be statistically significant. Details are given in table –III.

Table-III: Table showing the association between physical activity levels and stress levels among the participants

Level of Physical Activity	Stress Levels			P-Value
	Low Stress (n- 65)	Moderate Stress (n- 146)	High stress (n- 89)	
Low (n-105)	15	35	55	P = <.001 (t = 55.189, df =2)
Moderate (n- 89)	34	44	11	
High (n- 106)	16	67	23	

Discussion

This study, done in a cohort of medical college students in south India, showed that there is a statistically significant association between physical activity and psychological stress. The participants who had been indulging in regular physical activity in their college or elsewhere had low levels of stress, compared to those who had been less active. Similar findings were observed in a study done by Kim and McKenzie⁽¹⁷⁾ in the University of south Illinois. The researchers there went further to analyse how physical activity is conducive to reducing stress and enhancing the well-being of the students. All the participants in that study also mentioned that physical exercise was more effective in reducing stress than passive forms of leisure.’

This study also observed that about 30% of the students had high levels of stress and nearly 50% of them had moderate stress levels. And the stress levels in female students were higher than the male students. Similar findings were observed by studies done by Sharma et al⁽¹⁸⁾ in Madhya Pradesh, India, and another study done by Mohsin et al.⁽¹⁹⁾ in Pakistan. The above two studies reported that the overall stress levels were high among the students, and female students had higher levels of perceived stress than male students. Whereas, one more study done in India did not find much difference in stress levels between the sexes.⁽²⁰⁾

This study also observed that nearly one third (35.3%) of the students were less active physically. And even less than that (29.7%) were highly active. Similar findings were observed by many studies across the globe. In a study done in England⁽²¹⁾, it was observed that only 28% of the students in the 18-25 year age group achieved adequate physical activity levels. In another study done by the same author on physical activity levels in college students in Chennai, it was observed that nearly half (45.7%) students indulged in low activity, and only 17.1% of them were highly active.⁽¹⁵⁾

Thus, this study highlights two important issues facing the younger generation today. Low physical activity and high levels of Psychological stress. With the advent of technology and more, there’s a significant change in lifestyle of the present generation. Most of their leisure time activities are spent in sedentary pursuits. Combine this with inadequate and unsafe play areas, it becomes a deadly combination. Not only does the youth today engage in less physical activity, but most of their leisure is spent in sedentary pursuits. The second issue of concern is the high level of psychological stress among the student community in our country. The educational system in India by itself is a source of serious stress for the younger generation. Especially, for students who enter a Medical college in India after their schooling, it’s an all new atmosphere, which in itself can be a stressor. With the academic pressure bearing on him or her from the first day of entering a medical school, the student finds less time for adequate physical activity.

There’s scientific evidence to suggest the positive role of leisure time physical activity in reducing stress. But, unlike in schools, there are no compulsory structured Physical education programs in medical colleges in India. It’s high time that we have a relook at the policy/regulator level. Rather than concentrating more on secondary prevention activities, such as, establishing counselling clinics in colleges, let’s look at primary prevention modalities, like that of introducing compulsory physical education programs in colleges, so as to minimise the incidence of stress among the students. Primary prevention is always more cost effective and rewarding in the long term.

Limitation

The authors acknowledge that this study was conducted in a random sample of medical college students studying in one single medical college in

Tamil Nadu. Further studies need to be carried out across different geographies in the country so that the magnitude of the problem is assessed, and remedial measures recommended to the concerned authorities.

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