

## Assessment and Correlation of Physical Activity and Mental Health Status of Medical Students at One of the Medical Colleges of Karnataka, India

Swathe P<sup>1</sup>, Mayur Sherkhane<sup>2</sup>

<sup>1</sup>Post graduate student, <sup>2</sup>Professor, Department of Community Medicine, SDM College of Medical Sciences and Hospital, Shri Dharmasthala Manjunatheshwara University, Dharwad, Karnataka

**Correspondence :** Dr Mayur Sherkhane, Email : drmayurss@gmail.com

### Abstract:

**Introduction:** Physical inactivity and the associated health problems pose a current and growing threat to public health. People with sedentary behaviour are at higher risk of suffering from symptoms of anxiety and depression. Medical students suffer very high levels of psychiatric illness, depression, suicide, dependence on alcohol and drug abuse. **Objectives:** 1. To assess the level of physical activity and mental health status among medical students. 2. To compare the mental health status in relation to the adequacy level of physical activity among them. **Method:** Cross-sectional study was conducted among 145 undergraduate medical students. Data was collected using pre-tested and pre-designed proforma. International Physical activity Questionnaire short form (IPAQ-SF) and General Health Questionnaire-12 (GHQ-12) were used to assess level of physical activity and mental health status, respectively. Statistical analysis was done using SPSS version 27.0. Descriptive statistics and chi-square test was applied. **Results:** Among 145 medical students, 60% and 16.55% were found to have moderate and low physical activity. Distress and psychological distress was found to be among 27.59% and 22.75% students. It was found that, 50% of the participants, who were doing low level of physical activity were found to be distressed, which was found to be statistically significant. ( $\chi^2 = 10.826$ ,  $df = 4$ ,  $p = 0.02859073$ ). **Conclusion:** Physical activity and mental health are related proportionally. Regular physical activity has the potential to reduce anxiety, distress, and depression. Importance of physical activity, which has positive influence must be emphasised to reduce mental stress among medical students.


**Key Words :** Distress, Medical Student, Mental Health, Physical activity, Stress.

### Introduction:

As per WHO, physical activity is defined as any bodily movement produced by skeletal muscles that requires energy expenditure.<sup>[1]</sup> Regular physical activity is proven to prevent and manage non-communicable diseases (NCDs) such as heart disease, stroke, diabetes and breast and colon cancer. It also helps to prevent hypertension, overweight/obesity and can improve mental health, quality of life and well-being.<sup>[2]</sup>

Globally, women were less active than men accounting to 32% men and 23% women.<sup>[3]</sup> Around 1 in 3 women and 1 in 4 men do not do enough physical activity to stay healthy.<sup>[1]</sup> In high-income countries 41% of men and 48% of women were insufficiently physically active as compared to 18% of men and 21% of women in low-income countries (LICs).<sup>[4]</sup>

The term physical activity should not be confused with exercise, as it is a part/subgroup of physical activity. Exercise is planned, organized,

Quick Response Code	<b>Access this article online</b>	<b>How to cite this article :</b> Swathe P, Sherkhane M. Assessment and Correlation of Physical Activity and Mental Health Status of Medical Students at One of the Medical Colleges of Karnataka, India. Healthline. 2023; 14 (3): 219-224
	<b>Website :</b> www.healthlinejournal.org <b>DOI :</b> 10.51957/Healthline_535_2023	

repetitive movements carried out to maintain or improve health and fitness.<sup>[5]</sup> Physical inactivity is one of the leading risk factors for various NCDs, injuries and premature deaths worldwide and it also leads to shortening of life span by at least 3 to 4 years.<sup>[6]</sup>

Mental health is an integral and essential component of health. WHO defines Mental Health as a state of well-being in which an individual realizes his or her own abilities, can work productively, can cope with the normal stresses of life and is able to make a contribution to his or her community.<sup>[7]</sup>

Mental health problems like depression increases the risk for many physical health problems, particularly long-lasting conditions like diabetes, hypertension, cardiovascular disease and stroke.<sup>[8]</sup> Young adults are prone for psychological and emotional distress due to a wide variety of factors, like intense academic pressure, increased workload, financial concerns, sleep deprivation.<sup>[9]</sup>

Sedentary Life style combined with increased energy intake, impairs both physical and mental capabilities and increases the risk of disease.<sup>[10]</sup> It was also found in an meta-analytic study that low physical activity is associated with a greater risk of depression.<sup>[11]</sup>

Student behaviour is considered a temporary part of college life and any unhealthy behaviour at this phase generally persists in adult life.<sup>[12]</sup> Therefore, it is important for medical students to adopt physical activity which in turn promotes mental health and prevents distress, anxiety and depression. Hence, this study was conducted to assess the level of physical activity and mental health status among undergraduate medical students and to find the association between them.

#### **Method:**

Cross-sectional study was conducted among undergraduate medical students for a period of six months from August 2021 to January 2022 in one of the medical college in Karnataka after obtaining approval from the Institutional Ethics Committee.

A convenient sampling was done and a total of 214 medical students from all professional years were considered for the study, of which 145 students

accepted to get enrolled in the study on voluntary basis and the remaining 69 students who did not agree to participate in the study were excluded from the study. Data was collected using the proforma after taking a written informed consent from the students.

The questionnaire consisted of two sections - Part I and Part II. Part I consisted of socio-demographic details of the participants such as age, gender, year of study, height, weight, habits. Part II consisted of International Physical Activity Questionnaire - short form (IPAQ-SF) to assess the level of physical activity and General Health Questionnaire-12 (GHQ-12) to assess the mental health status of the students.

**IPAQ-SF<sup>[13]</sup>:** It consisted of seven questions with pre-defined options which is widely used to measure the level of physical activity. A minimum time of 10 minutes of physical activity was required to be included in the analysis. The short version of the questionnaire is related to the physical activities at high or moderate level, walking, and time spent sitting. The level of physical activity used in the questionnaire is presented in the corresponding Metabolic Equivalent of Task units (MET) (1 MET=a resting energy expenditure assuming oxygen consumption of 3.5 mL-min/kg). As per the requirements of the questionnaire, the following scores of intensities of physical activity were used in the analysis: walking = 3.3 METs, moderate physical activity = 4.0 METs, and vigorous physical activity = 8.0 METs. Total physical activity level was defined in MET-minutes/week.

#### **Level of physical activity was assessed using the following formula:**

Level of physical activity = MET level x minutes of activity/day x days per week.

After calculating the level of physical activity, the participants were divided into various categories namely,

**Low level:** < 600 MET-minutes/week

**Moderate level:** ≥ 600 to < 3000 MET-minutes/week

**High level:** ≥3000 MET-minutes/week.

**General Health Questionnaire-12 (GHQ-12)<sup>[14]</sup>:**

Developed by Goldberg, has been adopted by WHO as a screening tool for psychological disturbances and disorders. Scoring is done on the Likert Scale giving 0, 1, 2, 3 scores. Score 0-14 indicates normal mental health status, 15-20 indicates evidence of distress, whereas score >20 suggests severe problems and psychological distress.

**Statistical analysis:** Data collected was analysed using SPSS software version 27.0. Descriptive statistics was done and Chi-square ( $\chi^2$ ) test was applied to determine association between two categorical variables. Odds ratio with 95% confidence interval was calculated. Statistical significance was set at 5% ( $p < 0.05$ ).

**Results:**

Total of 145 medical students participated voluntarily in the study. Majority were females 74 (51.03%) and males were 71 (48.97%). Mean age of the study participants was  $20.34 \pm 2.34$  years.

Of the 145 study participants, it was found that 60.00% were doing moderate level of physical activity. 30.98% males were doing high level physical activity as compare to that of 20.27% females who were doing low level of physical activity. When mental health status was assessed, it was found that 49.66% of study participants were having normal mental health status. It was also found that 29.73% and 25.68% of females were distressed and psychologically distressed respectively as compared

to males who were less distressed as shown in Table 1.

When the Mental Health Status was compared in relation to the level of Physical Activity it was found that 30.00% and 24.24% study participants who were doing low level of physical activity were distressed and psychologically distressed respectively, whereas 68.05% and 26.39% of the participants who were doing moderate and high levels of physical activities respectively were not having any type of distress. This association was statistically significant ( $\chi^2=10.826$ ,  $df=4$ ,  $p=0.028$ ) as mentioned in Table 2.

When the BMI was compared in relation to Mental Health Status, it was found that 36.67% had obesity and 11.11% underweight were suffering from psychological distress as compared to 55.56% underweight and 49.30% having normal BMI were having better mental health status as mentioned in Table 3.

When the BMI was compared in relation to level of Physical Activity it was found that 54.93% had normal BMI and 77.78% were underweight who were doing moderate physical activity. It was also found that 27.27% were obese were performing low level of physical activity as compared to 11.11% underweight were performing high level of physical activity as mentioned in Table 4.

**Table 1: Gender-wise distribution of participants in relation to their level of Physical Activity and Mental Health Status(n=145)**

Physical Activity MET/Week	Male		Female		Total	
	No.	%	No.	%	No.	%
Low(<600)	9	12.68	15	20.27	24	16.55
Moderate( $\geq 600$ to <3000)	40	56.34	47	63.51	87	60.00
High( $\geq 3000$ )	22	30.98	12	16.22	34	23.45
<b>Total</b>	71	48.97	74	51.03	145	100.00
Mental Health Status	Male		Female		Total	
	No.	%	No.	%	No.	%
Normal	39	54.93	33	44.59	72	49.66
Distress	18	25.35	22	29.73	40	27.59
Psychological Distress	14	19.72	19	25.68	33	22.75
<b>Total</b>	71	48.97	74	51.03	145	100.00

Table 2: Comparison of Mental Health Status in relation to level of Physical Activity (n=145)

Physical Activity MET/Week	Mental Health Status							
	Normal		Distress		Psychological distress		Total	
	No.	%	No.	%	No.	%	No.	%
Low(< 600)	4	5.56	12	30.00	8	24.24	24	16.55
Moderate ( $\geq 600$ to < 3000)	49	68.05	19	47.50	19	57.58	87	60.00
High( $\geq 3000$ )	19	26.39	9	22.50	6	18.18	34	23.45
<b>Total</b>	72	49.66	40	27.59	33	22.76	145	100.00
<b>Chi square = 10.826, df = 4, p = 0.028 (significant)</b>								
<b>Odds Ratio* = 0.1559 (95% CI: 0.0503 to 0.4835)</b>								

(\* Distress and psychological distress are combined and Moderate and high levels of physical activity are combined to calculate odds ratio)

Table 3: Comparison of Body Mass Index in relation to Mental Health Status

Mental Health Status	Body Mass Index (BMI)									
	Normal		Overweight		Obese		Underweight		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Normal	35	49.30	22	48.89	05	45.45	10	55.56	72	49.66
Distress	17	23.94	15	33.33	02	18.18	06	33.33	40	27.59
Psychological Distress	19	26.76	08	17.78	04	36.37	02	11.11	33	22.75
<b>Total</b>	71	48.97	45	31.04	11	07.58	18	12.41	145	100.00
<b>Chi square = 4.5787, df = 6, p = 0.5989 (Not Significant)</b>										

Table 4: Comparison of Body Mass Index in relation to Physical Activity

Physical Activity MET/Week	Body Mass Index (BMI)									
	Normal		Overweight		Obese		Underweight		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Low (< 600)	14	19.72	05	11.11	03	27.27	02	11.11	24	16.55
Moderate ( $\geq 600$ to <3000)	39	54.93	28	62.22	06	54.55	14	77.78	87	60.00
High ( $\geq 3000$ )	18	25.35	12	26.67	02	18.18	02	11.11	34	23.45
<b>Total</b>	71	48.97	45	31.04	11	07.58	18	12.41	145	100.00
<b>Chi square = 5.2717, df = 6, p = 0.5095 (Not Significant)</b>										

## **Discussion:**

Medical students always face a unique set of stressors during their medical education training that is associated with increased incidence and prevalence of mental health disorders, such as depression, anxiety, and suicidal ideation.

In this study a total of 145 medical students participated, of which 16.55% were performing low level of physical activity whereas 60.00% and 23.45% were performing moderate and high level of physical activity respectively. This finding is contrary to the findings of study done in one of medical college in Pune, Maharashtra among medical students by Ashok P et al which revealed that 40%, 47% and 13% medical students were performing low, moderate and high levels of physical activity respectively.<sup>[15]</sup>

Present study found that 20.27% female students were physically inactive compared to male students (12.68%). Similar finding was found in studies done among medical students in Davangere, Karnataka by Patil VV et al and in Thrissur, Kerala by Jose J et al which found that female students were physically inactive compared to male students.<sup>[12, 16]</sup> This can be due to the reason that male students are more engaged in exercises, going to gym and sports on daily basis compared to female students.

The present study revealed that 83.45% medical students were physically active, of which 60% and 23.45% had moderate and high levels of physical activity and 16.55 were physically inactive. The findings are in line with the study done among medical students in Thrissur, Kerala by Joy V et al where the study findings showed that 71.1% were found as physically active and 28.9% as physically inactive. Among the physically active students, 54.44% and 16.66% showed moderate and high levels of physical activity, respectively.<sup>[17]</sup>

Present study found that 50.34% of medical students were distressed. Similar findings were found in the study done by Khan H et al where 49.10% of students were distressed.<sup>[18]</sup>

The present study revealed that medical students, who were performing low levels of physical activity were suffering from distress. Similar results were also obtained from the previous study done in Thrissur, Kerala by Jose J et al which found that medical students who were physically inactive suffered from anxiety and depression.<sup>[16]</sup>

When the BMI was compared in relation to Mental Health Status, it was found that 36.67% had obesity and 11.11% underweight were suffering from psychological distress, this shows that as the BMI increases the level of distress also increases. When the BMI was compared in relation to level of Physical Activity it was found that 54.93% had normal BMI and 77.78% were underweight who were doing moderate physical activity, this shows that optimal level of physical activity plays a major role in maintaining BMI. Irrespective of the mental status of the study participants all of them practiced adequate physical activity, as there were regular yoga sessions for students, sports facility at the institute level and students were consistent in performing physical activity on a daily basis.

## **Conclusion:**

This study concludes that male students were doing high level of physical activity compared to female students. Female participants being physically inactive were distressed compared to male participants who were less distressed. Study found statistically significant association between Mental health status and physical activity as the study participants who were doing low level of physical activity were distressed and psychologically distressed, whereas the students with moderate and high levels of physical activity were not distressed. Hence, Physical activity and mental health are related proportionally. Further research is warranted to develop better understanding of various predictors of physical inactivity and distress. The awareness about mental health and need for physical activity among medical students need to be considered.



**Recommendations:**

Lack of Physical activity will lead to negative impact on the mental status of the medical students, which increases as they enter higher level of academics, indirectly affecting their health and leading to early development of non-communicable diseases. Counselling sessions should be conducted to all medical graduates at the entry level, on periodical basis, at the time of completion of the college and should be continued thereafter during their professional life. Counselling regarding coping daily stress with time management for studies and physical activity and also de-stressing sessions like yoga, meditation, cultural and sports activities should be made compulsory from the beginning of the first year as their part of their curriculum, so that they can overcome and face untoward events in their lives for their better future.

**Declaration:**

Funding: Nil

Conflict of Interest: Nil

**References:**

1. Physical activity-WHO fact sheet; 2020. Available at: <https://www.who.int/news-room/fact-sheets/detail/physical-activity> (Accessed on Feb 2<sup>nd</sup>, 2022)
2. World Health Organization. Global action plan on physical activity 2018-2030: more active people for healthier world. Available at: <https://www.who.int/publications/i/item/9789241514187> (Accessed on Dec 5<sup>th</sup>, 2022)
3. Launch of new global estimates on levels of physical activity in adults. World Health Organization. Available at <https://www.who.int/news/item/05-09-2018-launch-of-new-global-estimates-on-levels-of-physical-activity-in-adults> (Accessed on June 9<sup>th</sup>, 2023).
4. Physical activity in low and middle income countries. Available at (Accessed on June 9<sup>th</sup>, 2023).
5. Physical activity. National Health Portal. Ministry Of Health and Family Welfare 2018. Available at <https://www.nhp.gov.in/healthyliving/physical-activity> (Accessed on Feb 3<sup>rd</sup>, 2022)
6. Physical activity and non-communicable diseases. Available at: [https://www.physio-pedia.com/Physical\\_Activity\\_and\\_Non-Communicable\\_Diseases](https://www.physio-pedia.com/Physical_Activity_and_Non-Communicable_Diseases) (Accessed on June 10<sup>th</sup>, 2023).
7. Mental Health: Strengthening our response. WHO Fact sheet 2018. Available at <https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response> (Accessed on Mar 10<sup>th</sup>, 2022)
8. Mental Health. Centres for Disease Control and Prevention. Available at <https://www.cdc.gov/mentalhealth/learn/index.htm> (Accessed on Mar 1<sup>st</sup>, 2022)
9. Thuma T, Lawandy M, Lotfalla A, et al. Mental Health Matters: Mental Health and Overall Well-Being Among First- and Second-Year Medical Students. *Health Professions Education*. 2020;6(1):516-21.
10. Malm C, Jakobsson J, Isaksson A. Physical Activity and Sports-Real Health Benefits: A Review with Insight into the Public Health of Sweden. *Sports*. 2019;7(5):1-28.
11. Schuch F, Vancampfort D, Firth J, et al. Physical activity and sedentary behavior in people with major depressive disorder: A systematic review and meta-analysis. *Journal of Affective Disorders*. 2017;210(1):139-50.
12. Patil VV, Basavaraju V. Patterns and Barriers of Physical Activity among Medical Students in Davangere, Karnataka. *Natl J Community Med*. 2020;11(8):371-5.
13. International Physical Activity Questionnaire-Short form (IPAQ-SF). Available at [www.ipaq.ki.se](http://www.ipaq.ki.se). (Accessed on May 8<sup>th</sup>, 2021)
14. Qin M, Vlachantoni A, Evandrou M, et al. General Health Questionnaire-12 reliability, factor structure, and external validity among older adults in India. *Indian J Psychiatry*. 2018;60(1):56-9.