



An Assessment and Correlation of Physical Activity and Mental Health Status of Medical Students

Huma Khan¹, Shashi Saxena², Ujjwal Khullar³, Saurabh Mishra²

Financial Support: None declared

Conflict of Interest: None declared

Copy Right: The Journal retains the copyrights of this article. However, reproduction is permissible with due acknowledgement of the source.

How to cite this article:

Khan H, Saxena S, Khullar U, Mishra S. An Assessment and Correlation of Physical Activity and Mental Health Status of Medical Students. Natl J Community Med 2019; 10(6): 370 - 374.

Author's Affiliation:

¹Assistant Professor; ²Statistician & Assistant Professor, Department of Community & Medicine, SRMS Institute of Medical Sciences, Bareilly; ³PG student, Department of Obs & Gy, People's College of Medical Sciences and Research, Bhopal

Correspondence

Dr. Shashi Saxena
humakgupta@gmail.com

Date of Submission: 07-12-18

Date of Acceptance: 26-06-19

Date of Publication: 30-06-19

ABSTRACT

Background: As during the student life a doctor is usually young and somehow manages to cope with the stress of a becoming or being a doctor and ignores the importance of being physically active. But many times this casual approach towards their health comes in the form of various physical illnesses and psychological disorders. Globally, one in three adults is not active enough. For adults (18+): WHO recommends 150 minutes of moderate intensity activity per week.

Objectives: 1. To assess the level of physical activity among medical students 2. To assess the mental health status of medical students. 3. To assess the correlation between physical activity and the mental Health of medical students

Sample size: The sample size was calculated by the formula: $N = Z^2PQ / d^2$, the final sample size calculated was 105 including both undergraduate and postgraduate students.

Results: Out of 108 participants 101 (93.5%) were involved in an overall moderate intensity physical activity of more than 150 minutes per week. The mean MET score found by our study is 76.3 MET/week. Overall 53 (49.1%) students were having psychological distress.

Conclusion: A statistically significant association was found between sitting or reclining for more than 8 hours and psychological distress.

Key Words: Physical activity, mental health status, medical students, MET Score

INTRODUCTION

Doctors are said to be The God on earth. They are considered to be having great physical and mental health. As during student life, a doctor is usually young and somehow manages to cope up with the stress of becoming or being a doctor and ignores the importance of being physically active. But many times this casual approach towards their health comes in the form of various physical illnesses and psychological disorders. Worldwide, one third among adults are not living actively enough. Regular and adequate levels of physical activity reduce the risk of hypertension, coronary heart disease, stroke, diabetes, breast and colon

cancer and depression (WHO). As per WHO definition physical activity has been defined as any bodily movement produced by skeletal muscles that require energy expenditure including activities undertaken while working, playing, carrying out household chores, traveling, and engaging in recreational pursuits. For adults, WHO recommends 150 minutes of moderate intensity activity per week¹.

Medicos suffer very high levels of psychiatric illness, depression, and suicide, dependence on alcohol and drug abuse². People with sedentary behavior are at higher risk of suffering from symptoms of depression and anxiety. Mood disorders

are also found to be associated with physical inactivity and increased physical activity helps in improving the mood disturbances. There is an inverse relationship between physical activity and depression³. Medical education all over the world is considered very stressful. Studies on psychological problems such as stress, depression, and anxiety among medical students have found that these disorders are under-diagnosed as well as under treated⁴. Research shows that exercise can also help to decrease long-term depression⁵. There is a need to find out whether there is a correlation between physical activity and mental health.

OBJECTIVES

The study was conducted to assess the level of physical activity and the mental health status among the medical students. The study has also tried to assess the correlation between physical activity and the mental health of medical students.

METHODS

This was a descriptive cross-sectional study using stratified random sampling. The Study population consisted of all undergraduate (above 18 years of age), and postgraduate students of SRMS Institute of Medical Sciences, Bareilly.

Sample size: The sample size was calculated by the formula: $N = \frac{Z^2PQ}{d^2}$, $N =$ Sample size $P =$ estimated prevalence $Q = (1-P)$ $d =$ precision $Z = 1.96$ Prevalence of recommended physical activity among medical students was taken as 50%. (So as to yield the maximum sample size at a defined confidence interval and precision.). Absolute Precision $d = 10\%$. $N = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.1)^2} = 96$, 10 per cent more subjects were taken for non-respondents. The final sample size calculated was 108.

Sampling technique: Stratified random sampling technique was used and 3 strata of undergraduate students (separate strata for male and female students) from each professional year of MBBS curriculum) and 3 strata of postgraduate students, (separate strata of male and female of First year, second year and third year Postgraduate students of all subjects) so a total of 6 strata were formed and from each strata 18 students (9 males and 9 females). Students from each stratum were randomly selected by lottery method.

Selection criteria: Any Under Graduate or Post Graduate student (above 18 years of age) studying in SRMS Institute of Medical Sciences, Bareilly, who gave consent to be a part of the study was included. Interns and any student already diagnosed

and under treatment for psychiatric disorders were excluded from the study.

Data collection procedure: Data collection instruments included Global Physical Activity Questionnaire (GPAQ)⁶, WHO and General Health Questionnaire -12 (GHQ-12)⁷ developed by Goldberg which 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 from left to right. For 12 items, 0 to 3 each item Score range 0 to 36. Score 15-20 indicates evidence of distress whereas score >20 suggests severe problems and psychological distress. MET is the ratio of a person's working metabolic rate relative to the resting metabolic rate. One MET is defined as the energy cost of sitting quietly and is equivalent to a caloric consumption of 1 kcal/kg/hour. For the analysis of GPAQ data, It is estimated that, compared to sitting quietly, a person's caloric consumption is four times as high when being moderately active, and eight times as high when being vigorously active. GPAQ Generic Show Cards⁸ were used to take the details about various type of physical activities.

Quality control was ascertained by maintaining complete anonymity and confidentiality of the study participants.

Study procedure: Before collecting the data from the respondents, informed consent was taken. The respondent has explained the purpose of the study clearly. None of the respondents was forced to participate in the study. The students were interviewed regarding their physical activity under work-related, transportation-related and recreation-related vigorous and moderate intensity physical activity. Besides physical activity, the time spent in sitting or reclining (does not include sleeping) on a typical day was also enquired and the correlation between the duration of physical activity and GHQ score was sought for.

Ethical considerations: The study was done after taking ethical clearance from the college ethical review committee.

RESULTS

A total of 108 students were included in the study (54 males and 54 females). The mean age was 25.1 with a standard deviation of 5.1 years. The mean age for undergraduate students was 20.88 years with a standard deviation of 1.7 years and for the postgraduate students, the mean age was 29.4 years with a standard deviation of 3.5 years. Out of 108 participants 101 (93.5%) were involved in overall moderate intensity physical activity of more than 150 minutes per week whereas only 7 (6.5%) stu-

dents were having moderate-intensity physical activity for less than 150 minutes per week. 26.9% were engaged in more than 150 min/week of work-related moderate physical activity, 32.4% were involved in a vigorous type of recreational physical activity and 35.2 % were involved in moderate intensity of recreational physical activity for more than 150 minutes/week.

Overall 53 (49.1%) students were having psychological distress. Out of 54 male students 50.0% were having evidence of psychological distress out

of which 11 (20.4%) were having severe psychological problems. Among female students, 48.1% were having evidence of psychological distress out of which 6 (11.1%) were having severe psychological problems. The relationship between gender and evidence of distress was not found to be statistically significant. ($p > 0.05$) (Table 1).

The prevalence of distress increased with the age of participants but the association was not found to be statistically significant. ($p > 0.05$) (Table 2)

Table 1: Distribution of participants on the basis of Gender and mental distress

Gender	No. of students	Evidence of distress	No evidence of distress	Severe problems	P value
Male	54	16 (29.6%)	27 (50.0%)	11 (20.4%)	0.380
Female	54	20 (37.0%)	28 (51.9%)	06 (11.1%)	

Table 2: Distribution of participants on the basis of age and mental distress

Age group	N	Evidence of distress	No evidence of distress	Severe Problems	P value
18-25	55	15 (27.3%)	27 (49.1%)	13 (23.6%)	0.104
26-33	47	16 (34.0%)	27 (57.4%)	04 (8.5%)	
34 & above	6	05 (83.3%)	01 (16.7%)	00 (0.0%)	

*Values after Yates' correction

Table 3: Odds ratios of different categories of physical activity (PA) and mental distress

Variable	Category	n=108	Distress present	Distress absent	Odds Ratio	95% CI	p-value
Work related PA (moderate)	≤150 min/week	79	41 (51.9)	38 (48.1)	Ref	0.6-3.6	0.388
	>150 min/week	29	12 (41.4)	17 (58.6)	1.5		
Transport Related moderate PA	≤150 min/week	31	12	19	Ref	0.2-1.3	0.204
	>150 min/week	77	41	36	0.56		
Recreational PA (moderate)	≤150 min/week	70	37	33	Ref	0.7-3.4	0.318
	>150 min/week	38	16	22	1.5		
Recreational PA (vigorous)	≤150 min/week	73	37	36	Ref	0.5-2.7	0.683
	>150 min/week	35	16	19	1.2		

Table 4: Odds ratio of the duration of sitting/reclining and mental distress

Sitting or reclining	N (108)	Distress present n=53 (49.1%)	Distress absent n=55 (50.9%)	Odds Ratio	95% CI	p-value
≤8 hours/day	43	9	34	Ref	0.051-0.31	0.000
>8 hours/day	65	44	21	0.13		

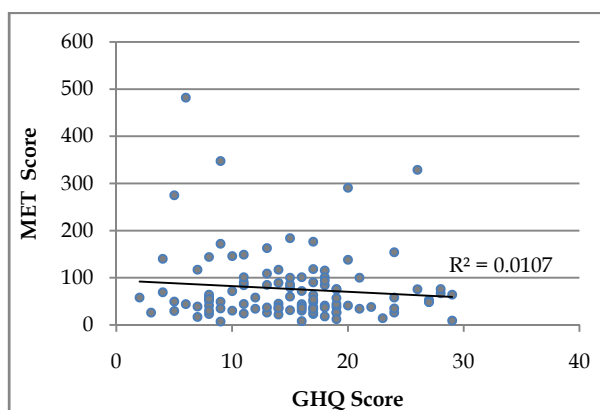


Fig 1: Correlation between MET Score and GHQ Score

Participants involved in ≤150 min/week of work-related moderate PA were more likely to have mental distress than those with >150 min/week (OR 1.5285; CI 0.6463-3.6148) Whereas participants involved in >150 min/week of transport-related moderate PA were more likely to have mental distress than those with ≤150 min/week (OR 0.5546; CI 0.237-1.2976) & participants involved in ≤150 min/week of **Recreational moderate PA** were more likely to have mental distress than those with >150 min/week (OR 1.5417; CI 0.6949-3.4202) and similarly participants involved in ≤150 min/week of **Recreational vigorous PA** were more likely to have mental distress than those with >150 min/week (OR 1.2205; CI 0.544-2.738). But the associa-

tion was not found to be statistically significant. ($p > 0.05$) (Table 3)

A statistically significant association was found between hours of sitting/reclining and mental distress ($p = 0.000$). Participants who were involved sitting or reclining for ≤ 8 hours/day were less likely to have mental distress than those > 8 hours/day (OR 0.1263; CI 0.0514-0.3108). (Table 4)

Our study has found a very poor correlation between the total MET Score and GHQ score ($R^2 = 0.0108$)

DISCUSSION

Physical activity In our study, out of 108 participants 101 (93.5%) were involved in overall moderate intensity physical activity of more than 150 minutes per week. Findings from our study are of the same order as found in the study done by Tanu Anand et al.⁹ Though the study done by Chythra R Rao et al.¹⁰ have reported the recreational activity of 55% that is more than that reported by our study. This difference could be due to the availability and promotion of sports facilities. The mean duration of sitting or reclining on a typical day has been found by our study to be 8.7 hours with a standard deviation of 2.4 hours which is slightly more than 7.06 hours per day reported by Krishna Kumar Padmapriya et al.¹¹. This difference could be due to the difference in the sample size. Mental health In our study the mean GHQ score was 15.0 with a standard deviation of 6.3. About half that is 50.9% of students were having GHQ score within normal limit. The Mean GHQ score reported by Jamshid Ahmadi et al.¹² is 16.46. In their study, the prevalence of severe distress was 22.3%. Our study reports the prevalence of severe distress as 15.7%. This difference could be due to the fact that we have included the postgraduate students in our study and mean age of our study participants is 25.1 years (sd 5.1 years) in comparison to mean age of 18.85 yrs in their study. Our study has reported the prevalence of distress in 49.1% of the participants which is of the same order of that reported by Rael d Strous et al.¹³ and BibiKulsum and NasirAli Asgar¹⁴ Correlation between Physical activity and mental health Our study has found a statistically significant association between the duration of sitting or reclining per day and the presence of psychological distress. Our findings are supported by the study done by Mark Hamer et al.¹⁵ Our study has found a very poor correlation between the total MET score and GHQ score ($R^2 = 0.0108$). Though studies done by Xiaoyan Wu et al.¹⁶, Ajit Singh et al.¹⁷ and Aldana et al.¹⁸ have reported a strong negative correlation between physical activity and mental health, A systematic

review on the effect of stress on physical activity done by Matthew A et al.¹⁹ have concluded that psychological stress predicts less physical activity and more sedentary behavior. Some individuals utilize exercise to cope with stress, habitually active individuals exercise more in the face of stress and those in the beginning stages exercise less. Paluska SA et al.²⁰ in their study on the current concepts on physical activity and mental health have reported that excessive physical activity may lead to overtraining and generate psychological symptoms that mimic depression. The poor correlation found in our study may be due to small sample size and self-reported exercise practices, not the observed practices.

In the study conducted by Robert A Sloan et al.²¹ the sedentary behavior was positively associated with increased odds (OR = 1.29, 1.04-1.59) for psychological distress, whereas the category of active was inversely associated with lower odds (OR = 0.73, 0.62-0.86) for psychological distress.

A H Y Chu et al.²² have reported that Higher levels of leisure-time physical activity and lower levels sedentary behavior were associated with lower psychological distress.

CONCLUSION

Our study concludes a high prevalence of psychological distress which was present in approximately half of the study participants. A very poor correlation has been found between the level of physical activity and the psychological stress among medical students. Further study with large sample size is needed to reveal the effects of lifestyle factors on the mental health of young population including medical students.

Acknowledgment: This study was selected and approved for ICMR-STIS-2015. The student got a stipend of 5000/- for two months and a certificate after completion and acceptance of the report. We hereby acknowledge the contribution of ICMR for this study.

REFERENCES

1. <https://www.who.int/en/news-room/fact-sheets/detail/physical-activity> accessed March 26, 2019.
2. Kaistha M, Raina SK, Bhardwaj AK, et al. A Screening for Presence of Psychological Distress among Undergraduate Medical Students of a Medical College in Rural North-West India, International Journal of Clinical Psychiatry, 2013; 1 (1):20-3.
3. Eisa EA, Buragadda S, Melam GR. Association between physical activity and psychological status among Saudi female students. BMC Psychiatry, 2014;14:238.

4. Kittu D, Patil R. Study of Association of Psychological Stress and Depression among Undergraduate Medical Students in Pondicherry. *Natl J Community Med* 2013; 4 (4): 555-8.
5. <https://www.apa.org/monitor/2011/12/exercise> accessed March 26, 2019.
6. https://www.who.int/ncds/surveillance/steps/resources/GPAQ_Analysis_Guide.pdf accessed March 26, 2019.
7. <https://www.scribd.com/doc/249050418/Practicum-08-GHQ-2007>, accessed March 26, 2019.
8. https://www.who.int/chp/steps/GPAQ_GenericShowCards.pdf
9. Anand T, Tanwar S, Kumar Ret al. Knowledge, attitude, and level of physical activity among medical undergraduate students in Delhi, India. *Indian Journal of Medical Sciences*,2011; 65 (4),133-42.
10. Rao CR, Darshan B, Das N et al. Practice of Physical Activity among Future Doctors: A Cross-Sectional Analysis. *Int J Prev Med.* 2012;3 (5):365-9.
11. Padmapriya K, Krishna P, Rasu T. Prevalence and patterns of physical activity among medical students in Bangalore, India. *Electron Physician.* 2013;5 (1):606-10.
12. Ahmadi J, Ahmed GM, Bayoumi AF, et al. Mental Health of Dubai Medical College Students. *Iran J Psychiatry Behave Sci.* 2012; 6 (2): 79-83.
13. Strous RD, Shoenfeld N, Lehman A, et al. Medical students' self-report of mental health conditions. *Int J Med Educ.* 2012;3:1-5.
14. Kulsum B and Afsar NA. Stress, anxiety, and depression among medical students in a multiethnic setting. *Neuropsychiatric Disease and Treatment.* 2015; (11):1713-1722.
15. Hamer M, Coombs N, Stamatakis E. Associations between objectively assessed and self-reported sedentary time with mental health in adults: an analysis of data from the Health Survey for England. *BMJ Open* 2014;4
16. Wu X, Tao S, Zhang Y et al. Low Physical Activity and High Screen Time Can Increase the Risks of Mental Health Problems and Poor Sleep Quality among Chinese College Students. *PLOS ONE.* 2015;10 (3).
17. Singh A, Lal A, Shekhar. Prevalence of Depression Among Medical Students of a Private Medical College in India. *Online J Health Allied Scs.* 2010;9 (4):8.
18. Aldana SG, Sutton LD, Jacobson BH et al. Relationships between Leisure Time Physical Activity and Perceived Stress. *Perceptual and Motor Skills.* 1996; 82 (1), 315-321.
19. Stults-Kolehmainen MA, Sinha R. The effects of stress on physical activity and exercise. *Sports Med.* 2014;44 (1):81-121.
20. Paluska SA, Schwenk TL. Physical activity and mental health: current concepts. *Sports Med.* 2000;29 (3):167-80.
21. Sloan RA, Sawada SS, Girdano D, et al. Associations of sedentary behavior and physical activity with psychological distress: a cross-sectional study from Singapore. *BMC Public Health* 2013 (13)885.
22. Chu AHY, Dam RMV, Biddle SJH et al. Self-reported domain-specific and accelerometer-based physical activity and sedentary behaviour in relation to psychological distress among an urban Asian population. *International Journal of Behavioral Nutrition and Physical Activity.*2018; (15):36