

# Physical Activity and Academic Performance among Medical Students of Bangladesh

Nargis S<sup>1</sup>, Roy HL<sup>2</sup>, Gosh E<sup>3</sup>, Shimi SH<sup>4</sup>

## Abstract

**Background:** Physical activity has many positive benefits not only in the physical state but also stimulates brain activity and influences cognitive function leading to better academic performance.

**Aims and Objectives:** To find out the relationship between physical activity and academic performance among medical students of Bangladesh in addition to BMI.

**Materials and Methods:** This cross-sectional study was conducted among 200 medical students from a selected medical college in Bangladesh, during a period of one year from February 2022 to January 2023. A semi-structured questionnaire, checklist, and International Physical Activity Questionnaire Short Form (IPAQ-SF) were used to collect the data.

**Results:** The majority of the respondents were between 22-24 years old (60%). Most participants (72.5%) had a healthy body weight, and a significant proportion of students reported moderate (61.5%) or low (28.5%) levels of physical activity. Overall present academic performance, the majority (95.5%) of respondents passed regularly significant association was found between physical activity and academic performance.

**Conclusion:** This study suggests that medical colleges in Bangladesh should incorporate physical activity promotion into their curricula and provide facilities to support increased physical activity among students.

**Keywords:** Academic performance, Physical activity, Body Mass Index (BMI), medical student.

## Introduction

The Academic Performance of students is immensely significant as the economic as well as the social development of any country are both attributable to the academic performance of the students. The better the students perform academically, the better are the prospects of the development of a fine manpower, who will contribute to the economic and social development of the nation<sup>1</sup>. Physical activity fosters normal growth and development and can make people feel better, function better, sleep better, and reduce the risk of a large number of chronic diseases. Health benefits start immediately after

exercising, and even short episodes of physical activity are beneficial<sup>2</sup>. Medical education is demanding and requires a significant amount of time and dedication. Medical students face a wide range of challenges, including long hours of study, high levels of stress, and a sedentary lifestyle. Studies have shown that medical students experience a high level of stress during their undergraduate course<sup>3</sup>. High levels of stress may have a negative effect on the cognitive functioning and learning of students in medical school<sup>4</sup>. According to the<sup>5</sup> of the Centre for Disease Control and Prevention (CDC), physical activity has an impact on cognitive skills such as concentration and attention, and it also enhances classroom attitudes and behaviors, all of which are important components of improved academic performance. The majority of the reviews have focused on the relationship between academic performance and physical fitness. More recently, reviews have attempted to describe the effects of an acute or single bout of physical activity, as a behavior, on academic performance. These reviews have focused on brain health in older adults<sup>6</sup>, as well as the effects of acute physical activity on cognition in adult<sup>7</sup>. In Bangladesh, the trend of getting medical education is increasing day by day in our society. The total number of public, private, and military medical collage is about 115. However, our tough and complex pattern of medical education is rendering medical students stressed and depressed. Regular physical activity not only reduces stress levels but also has a beneficial effect on the body and mind. This study aimed to explore the physical activity level among undergraduate medical students and to determine the relationship of this health status to their academic achievement.

1. Dr. Susmita Nargis  
Associate Professor, Department of Biochemistry  
Ad-din Sakina Womens' Medical College, Jashore.

2. Dr. Heera Lal Roy  
Associate Professor, Department of Biochemistry  
Khulna City Medical College, Khulna.

3. Dr. Emu Gosh  
Associate Professor, Department of Physiology  
Ad-din Sakina Womens' Medical College, Jashore.

4. Dr. Shaima Hafiz Shimi  
Associate Professor, Department of Forensic Medicine  
Ad-din Sakina Womens' Medical College, Jashore.

## Correspondence to:

Dr. Susmita Nargis  
Associate Professor, Department of Biochemistry  
Ad-din Sakina Womens' Medical College, Jashore.  
Email: susmita.47.sn@gmail.com.

## Materials & Methods

This was a descriptive type of cross-sectional study conducted to assess the relationship between physical activity and the academic performances of the medical students of Bangladesh. A total of 200 student respondents participated in this study from *Ad-din Sakina Women's Medical College Jashore* of Bangladesh from January 2022 to December 2022. The sampling technique employed for participant selection was a combination of stratified sampling and convenience sampling. Data were collected using a pretested semi-structured self-administered questionnaire, checklist, and with an International Physical Activity Questionnaire Short Form (IPAQ-SF). Informed written consent was taken before taking any interview. After collection of the questionnaires were checked for any inconsistency of data and corrected manually if possible. Then the data were entered into SPSS version 19. Descriptive analysis was performed to calculate mean, standard deviations, frequencies, and percentages using the SPSS software. A P-value of < 0.05 is considered as statistically significant. The data were presented by figures and tables with necessary descriptions and statistical analysis for easy understanding of the relationship of variables under investigation.

## Results

The cross-sectional study was conducted among 200 medical students to assess their physical activity. Regarding age, the majority of the respondents fell within the age range of 22-24 years old, accounting for 60% of the respondents, followed by 36.5% who were aged between 19-21 years old, and only 3.5% who were aged between 25-27 years old. Mean  $\pm$  SD age in years was  $22.04 \pm 1.37$ , as shown in Table 1.

**Table 1:** Distribution of the respondents by age (n=200)

Age (In years)	Age of the respondents	
	Frequency	Percent
19-21	73	36.5
22-24	120	60.0
25-27	7	3.5
Total	200	100.0
Statistics	Mean $\pm$ SD=22.04 $\pm$ 1.37, Minimum age=19 years, Maximum age=27 years	

**Table 2:** Distribution of the respondents according to Body Mass Index (BMI) (n=200)

Body Mass Index	Frequency	Percent
<18.5 (Underweight)	16	8.0
18.5 to 24.9 (Healthy weight)	145	72.5
25.0 to 29.9 (Overweight)	32	16.0
$\geq$ 30.0 (Obese)	7	3.5
Total	200	100.0

Table 2 shows the Body Mass Index (BMI) distribution of 200 participants. The majority of participants (145, 72.5%) had a healthy body weight with a BMI ranging from 18.5 to 24.9. A small percentage of participants (16, 8.0%) were classified as underweight with a BMI of less than 18.5, while 32 participants (16.0%) were categorized as overweight with a BMI between 25.0 to 29.9. Only seven participants (3.5%) were considered to be obese with a BMI of 30.0 or higher.

**Table 3:** Distribution of respondents by their academic performance and professional examinations (n=200)

Professional examinations	Frequencies and percentages of academic performance		
	Passed regularly	Passed irregularly	Total response
First MBBS Professional Examination	47 (98.5%)	3 (1.5%)	50 (100%)
Second MBBS Professional Examination	92 (92.1%)	7 (7.9%)	99 (100%)
Third MBBS Professional Examination	48 (94.1%)	3 (5.9%)	51 (100%)
Fourth MBBS Professional Examination	0 (0%)	0 (0%)	0 (100%)

Table 3 shows the distribution of the 200 medical students by their present academic performance. Out of 200 responses about the result of the first MBBS Professional examination, most of them (98.5%) passed regularly and 1.5% passed irregularly. Out of 99 responses about the result of the second MBBS Professional examination, most of them (92.1%) passed regularly and 7.9% passed irregularly. Out of 51 responses about the result of the third MBBS Professional examination, 94.1% passed regularly and 5.9% passed irregularly. In the fourth MBBS Professional examination, none of them appeared.

**Table 4:** Distribution of the respondents by the overall result in All professional examinations (n=200)

Result of All professional examination	Frequency	Percent
Average	23	11.5
Good	176	88.0
Excellent	1	0.5

Table 4 presents the distribution of respondents by their overall results in a professional examination. Out of the total 200 respondents, 23 (11.5%) scored an average result in the professional examination. The majority of the respondents, 176 (88%), achieved a good result. Only one respondent (0.5%) scored an excellent result in the examination.

**Table 5:** Distribution of respondents by Physical activity of level as per IPAQ-SF (n=200)

Physical activity level	Frequency	Percent
Low	57	28.5
Moderate	123	61.5
High	20	10.0
Total	200	100.0

Table 5 shows the distribution of physical activity levels based on the International Physical Activity Questionnaire Short form (IPAQ-SF) among the study participants. The majority of participants (61.5%) reported moderate physical activity levels, while 28.5% reported low levels, and only 10% reported high levels.

**Table 6:** Distribution of respondents by physical activity and academic performances (n=200)

Physical activity	Present academic results in professional examinations		Statistical Inference
	Regular <sup>y</sup>	Irregular <sup>z</sup>	
Low	52 (91.2%)	5 (8.8%)	Fisher's Exact Test=2.929 P value = 0.185
Moderate	11 (96.7%)	4 (3.3%)	
High	20 (100%)	0 (0%)	

Y= Was never irregular, Z = Was at least once or more times irregular

The results from Table 6 show the distribution of medical students based on their physical activity levels and present academic performances. Out of 52 students who had low physical activity, 52 (91.2%) of them had a regular academic performance, while 5 (8.8%) had an irregular performance. For 123 with moderate physical activity, 119 (96.7%) had a regular performance, while 4 (3.3%) had an irregular performance. All 20 (100%) students with high physical activity had a regular academic performance. A Fisher's Exact Test was performed and it was found that there is no significant ( $p>0.05$ ) association between physical activity levels and academic performance among the medical students in this study.

## Discussion

This study findings suggest that the majority of participants had a healthy body weight. However, a small percentage of participants were under weight, and a significant number were either overweight or obese. This finding corresponds with other study where 61.9% were healthy body weight<sup>8</sup>. Data from this study revealed that passing in different professional examinations were very good (For 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> professional exam were 98.5%, 92.1% and 94.1% respectively). It is important to note that the high percentage of students passing regularly in each of the

MBBS Professional examinations is a positive sign of their academic performance. However, the relatively small proportion of students passing irregularly suggests that there may be some students who are struggling with the academic demands of the program.

Study findings revealed that physical activity levels based on the IPAQ-SF, majority of participants (61.5%) reported moderate physical activity levels, while 28.5% reported low levels, and only 10% reported high levels. It is important that physical activity levels were self-reported using the IPAQ-SF, which may be subject to response bias and inaccuracies in self-reporting. In another study it was found that 47.2% were physically active. This finding was differ from the findings of this study<sup>8</sup>.

This study revealed that out of 52 students who had low physical activity, 91.2% of them had a regular academic performance, while 8.8% had an irregular performance. For 119 with moderate physical activity, 96.7% had a regular performance, while 3.3% had an irregular performance. About 100% students with high physical activity had a regular academic performance. But there is no significant ( $p>0.05$ ) association between physical activity levels and present academic performance among the medical students was found.

## Conclusion

It was found that a significant proportion of students reported low or sedentary physical activity levels. This calls for the implementation of interventions or programs aimed at promoting physical activity among medical students. This study did not find any significant relation between physical activity and academic performances of the medical students. Medical college in Bangladesh should incorporate physical activity promotion into their curricula and provide facilities to support increased physical activity among students. Further research should also be conducted to explore the factors that contribute to low physical activity levels among this population.

## References

1. Ali, N., Jusoff, K., Ali, S., Mokhtar, N., & Salamat, A. S. A. (2009). The Factors Influencing Students' Performance at Universiti Teknologi MARA Kedah, Malaysia. *Management Science and Engineering*, 3(4), 81-90.
2. U.S. Department of Health and Human Services. (2008). Physical activity guidelines for Americans. In *The Oklahoma nurse* (Vol. 53, Issue 4). <https://doi.org/10.1249/fit.0000000000000472>
3. Barrett, S. V, Hebert, J., Ockene, I. S., Ockene, J., Rosal, M. C., & Yunsheng, M. (1997). A Longitudinal study of Students Depression at one medical school. In *Academic Medicine* (Vol. 72, Issue 6, pp. 542-546). <https://europepmc.org/article/med/9200590>

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4. Dahlin, M., Joneborg, N., & Runeson, B. (2005). Stress and depression among medical students: A cross-sectional study. *Medical Education*, 39(6), 594-604. <https://doi.org/10.1111/j.1365-2929.2005.02176.x>
  5. U.S. Department of Health and Human Services. (2010). *The Association Between School-Based Physical Activity, Including Physical Education, and Academic Performance* (Issue April).
  6. Colcombe, S., & Kramer, A. F. (2003). Fitness effects on the cognitive function of older adults: A meta-analytic study. *Psychological Science*, 14(2), 125-130. <https://doi.org/10.1111/1467-9280.t01-1-01430>
  7. Tomporowski, P. D. (2003). Effects of acute bouts of exercise on cognition. *Acta Psychologica* 112, 112, 197-324. <https://doi.org/10.1109/MED.2013.6608698>
  8. Al-Drees, A., Abdulghani, H., Irshad, M., Baqays, A. A., Al-Zhrani, A. A., Alshammari, S. A., & Alturki, N. I. (2016). Physical activity and academic achievement among the medical students: A cross-sectional study. *Medical Teacher*, 38, S66-S72. <https://doi.org/10.3109/0142159X.2016.1142516>