

# Knowledge, Attitude and Practice of Physical Activity Among Medical Students at University of Cyberjaya, Malaysia

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## ABSTRACT

**Background:** Physical activity plays a crucial role in maintaining and promoting good health. However, sedentary lifestyles have become increasingly prevalent, leading to various health complications. Medical students, as future healthcare professionals, should be well-informed about the benefits of physical activity and serve as role models for their patients. A comprehensive understanding of their behaviours and perceptions is essential for developing effective interventions to promote a healthy lifestyle within this population.

**Objectives:** This study aimed to investigate the knowledge, attitudes and practices towards physical activity among medical students.

**Materials and Methods:** A cross-sectional study was carried out among medical students using a validated self-administered questionnaire. The data was analysed with Jeffreys's Amazing Statistics Program.

**Results:** The study involved 270 medical students, the majority of whom were over 20 years old (57.0%), female (58.2%) and in their clinical years of medical school (54.1%). The results indicated the majority of the participants had high levels of knowledge (98.9%) and attitudes (92.2%) but low levels of physical activity practice (87.0%).

**Conclusion:** Despite the high levels of knowledge and positive attitudes the study participants had towards physical activity, it is important to encourage their practice. The findings highlighted the need for focused interventions to promote physical activity in medical educations.

**Keywords:** Physical Activity, Knowledge, Attitudes, Practice, Medical Students, Malaysia

## INTRODUCTION

Physical activity is an essential component of a healthy lifestyle and has numerous physical, mental and emotional benefits.<sup>[1]</sup> Physical activity is defined as any movement of the body produced by skeletal muscles that requires energy expenditure including during leisure time, transportation or even at work.<sup>[2]</sup> Physical activity can lower a person's risk for premature all-cause mortality and the incidence of many chronic diseases including hypertension and diabetes by up to 20% to 30%.<sup>[3]</sup> WHO recommends adults aged 18 to 64 to engage in at least 150 minutes of moderate-intensity physical activity or at least 75 minutes of vigorous-intensity physical activity throughout the week.<sup>[4]</sup>

Data from previous studies have highlighted that less than half of medical students were physically active at the recommended levels.<sup>[5-7]</sup> Medical students are future health care providers and they will play a central role in health promotion and the spread of healthy living information to patients and the general public.<sup>[8-9]</sup>

Currently, there is a lack of evidence regarding the knowledge, attitude and practices (KAP) towards physical activity among medical students in Malaysia. Thus, this study aims to determine physical

activity KAP levels and explore its correlates among medical students.

## MATERIALS AND METHODS

This cross-sectional study was conducted among medical students at University of Cyberjaya, Malaysia involving pre-clinical (Year 1 to 2) and clinical (Year 3 to 5) students from various socio-demographic backgrounds.

Stratified random sampling was used to collect the data. Data collection was done in an anonymous manner where participants were not required to include personal information such as names or phone numbers. Participants were required to provide consent prior to answering the survey. A self-administered questionnaire was distributed online via various social networking platforms.

A validated KAP questionnaire on physical activity was used in this study.<sup>[10]</sup> The scores for the knowledge, attitude and practice section ranged from zero to two, five to one and zero to two, respectively.

The maximum points obtainable for knowledge, attitude and practice are 36, 55 and 16, respectively. For knowledge and attitude, the levels were divided into high, medium and low categories and good and low for practice.

## RESULTS

A total of 270 respondents participated in this study.

**Table 1: KAP level of physical activity**

	Frequency, n	Percentage, %
<b>Knowledge Level</b>		
High	267	98.9
Medium	2	0.73
Low	1	0.37
<b>Attitude Level</b>		
High	249	92.2
Medium	20	7.4
Low	1	0.4
<b>Practice Level</b>		
Good	35	13.0
Low	235	87.0

Table 1 shows that the majority of the participants had high levels of knowledge (98.9%) and attitudes (92.2%) but low levels of physical activity practice (87.0%).

**Table 2: Knowledge of physical activity among medical students**

Statements	Correct, n (%)	I don't know, n (%)	Incorrect, n (%)
Physical activity is anybody activity that enhances and maintains physical fitness and overall health and wellness.	265 (98.1)	3 (1.1)	2 (0.8)
Physical activity is the best method to reduce weight.	247 (91.5)	20 (7.4)	3 (1.1)
Physical activity can decrease obesity and chances of developing Type II diabetes.	267 (98.9)	1 (0.4)	2 (0.7)
High blood pressure can be reduced by physical activity.	261 (96.6)	4 (1.5)	5 (1.9)
Performing physical activity only on weekends is not enough to achieve health benefits.	232 (85.9)	36 (13.3)	2 (0.8)
Is 4 – 5 days a week the minimum number a person must be physically active in order to receive any health benefit?	227 (84.0)	33 (12.2)	10 (3.8)
Is 30 minutes the minimum length of time one needs to be physically active throughout a typical day in order to achieve a health benefit?	235 (87.0)	18 (6.7)	17 (6.3)
Is “stretching” an example of aerobic exercise?	182 (67.4)	47 (17.4)	41 (15.2)
Benefits of regular physical activity are to reduce your risk of a heart attack and manage your weight better.	265 (98.1)	4 (1.5)	1 (0.4)
Increasing physical activity has the potential to improve health by significantly reducing the prevalence of chronic disease and lifestyle disease.	265 (98.1)	2 (0.8)	3 (1.1)
One cause of this NCD epidemic is the rapid increase in obesity, which is largely due to poor diets and low levels of physical activity.	261 (96.6)	4 (1.5)	5 (1.9)
The implementation of physical activity is a preventative measure for the prevention and control of NCDs.	263 (97.4)	3 (1.1)	4 (1.5)
Regular physical activity helps you to control your diabetes and reduce developing complications.	263 (97.4)	2 (0.7)	5 (1.9)
Your heart rate or breathing increases when you do physical activity.	264 (97.8)	4 (1.5)	2 (0.7)
A person should do physical activity every day to strengthen the heart and lungs.	249 (92.2)	15 (5.6)	6 (2.2)
30 minutes to 1 hour performing physical activity is needed on each occasion to strengthen the heart and lungs.	246 (91.1)	10 (3.7)	14 (5.2)
Endurance sports such as marathon running can sometimes cause fractures in bones and the body.	222 (82.2)	32 (11.9)	16 (5.9)
Physical activity performed regularly is beneficial for a long time.	261 (96.7)	7 (2.6)	2 (0.7)

Table 2 shows that almost all of the respondents (98.1%) knows that physical activity is anybody activity that enhances and maintains physical fitness and overall health and wellness and that 4-5 days a week is the minimum number a person must be physically active to achieve any benefit (84.0%). Most of the respondents believe

that physical activity can decrease obesity and chances of developing Type II diabetes (98.9%), high blood pressure (96.6%) and risk of a heart attack and manage weight (98.1%). Majority of the respondents (67.4%) knew that stretching is a part of aerobic exercise.

**Table 3: Attitude towards physical activity among medical students**

Items	Completely agree, n (%)	Agree, n (%)	No idea, n (%)	Disagree, n (%)	Completely disagree, n (%)
Being physically active is enjoyable.	70 (25.9)	176 (65.2)	8 (3.0)	15 (5.5)	1 (0.4)
It feels comfortable doing physical activities.	58 (21.5)	153 (56.7)	18 (6.7)	36 (13.3)	5 (1.8)
I believe that doing physical activity frequently is good for my health.	99 (36.7)	166 (61.5)	4 (1.4)	1 (0.4)	0 (0)
I love to give physical activity high priority among other activities.	42 (15.5)	147 (54.5)	35 (13.0)	40 (14.8)	6 (2.2)
I am very interested in doing exercise today and in the future.	55 (20.4)	168 (62.2)	21 (7.8)	24 (8.9)	2 (0.7)
Physical activity improves my physical health.	115 (42.6)	149 (55.2)	4 (1.4)	1 (0.4)	(0.4)
Physical activity provides good opportunities for developing social contacts.	105 (38.9)	127 (47.0)	28 (10.4)	8 (3.0)	2 (0.7)
Physical activity helps me to have more control over my eating behaviours.	95 (35.2)	128 (47.4)	15 (5.6)	30 (11.1)	2 (0.7)
I think physical activity needs to be included in the health care setting programme.	142 (52.5)	122 (45.2)	4 (1.5)	1 (0.4)	1 (0.4)
Obesity is not an indicator of good health.	123 (45.5)	98 (36.3)	7 (2.6)	18 (6.7)	24 (8.9)
Learning about the relationship between physical activity and health is important for my health	142 (52.6)	116 (43.0)	5 (1.8)	1 (0.4)	6 (2.2)

Table 3 shows that 65.2% of the respondents agree that being physically active is enjoyable while 5.5% disagree. Additionally, more than half of the respondents (52.5%) completely agree that

physical activity needs to be included in the healthcare setting programme however, only 15.5% completely agreed that they give high priority to physical activity compared to other activities.

**Table 4: Practice of physical activity among medical students**

Questions	Frequency, n	Percentage, %
How often do you do physical activity (for example: rugby, soccer, netball, dancing, swimming...)?		
Never	42	15.6
Sometimes	189	70.0
Always	39	14.4
How many hours do you practise physical activity (for example: rugby, soccer, netball, dancing, swimming...) in a week?		
Never	54	20.0
1 - 4 h/week	178	66.0
>4 h/week	38	14.0
How long do you do physical activity (for example: rugby, soccer, netball, dancing, swimming ...) in a day?		
< 5 min/day	66	24.4
6 - 30 min/day	143	53.0
> 30 min/day	61	22.6
What do you do during your free time?		
Sedentary activity (i.e., watching TV)	90	33.3
Mild activity (i.e., shopping/walking)	135	50.0
Intensive activity (practising a sport)	45	16.7
How many hours do you spend on the computer or watching TV per day (on weekdays)?		
< 3 hrs	151	56.0
3 - 6 hrs	98	36.2
> 6 hrs	21	7.8
How many hours do you watch TV or DVD movies at home per day?		
< 3 hrs	185	68.5
3 - 6 hrs	65	24.1
> 6 hrs	20	7.4
How many hours per day on weekends do you usually spend on the computer or laptop away from work?		
< 3 hrs	134	49.6

3 - 6 hrs	88	32.6
> 6 hrs	48	17.8
How many hours per day do you usually spend playing video games on mobile phones, tablets etc.?		
< 3 hrs/day	148	54.8
3 - 6 hrs/day	94	34.8
> 6 hrs/day	28	10.4

Table 4 shows that most of the respondents (70.0%) answered that they sometimes practiced physical activity and 66% said that they practiced physical activity for 1 to 4 hours a week. Half of the respondents (50.0%) admitted to having a sedentary

lifestyle while 24.4% of respondents reported that they practiced physical activity for less than 5 minutes a day. 68.5% and 56.0% of our respondents reported that they spent less than 3 hours watching TV per day and week, respectively.

**Table 5: Physical activity practice level by sociodemographic characteristics**

Sociodemographic characteristic	Practice level			Statistical test	
	Good, n (%)	Low, n (%)	Total, n (%)	Chi Square Value (df)	P-value
<b>Age group</b>					
≤ 20	16 (13.8)	100 (86.2)	116 (43.0)	0.124 (1)	0.725
> 20	135 (87.7)	19 (12.3)	154 (57.0%)		
<b>Gender</b>					
Male	26 (23.0)	87 (77.0)	113 (41.8%)	17.382 (1)	< 0.001*
Female	148 (94.3)	9 (5.7)	157 (58.2%)		
<b>Year of study</b>					
Pre-clinical (Years 1-2)	18 (14.5)	106 (85.5)	124 (45.9%)	0.490 (1)	0.484
Clinical (Years 3-5)	17 (11.6)	129 (88.4)	146 (54.1%)		
<b>Body mass index (BMI)</b>					
Underweight (<18.5 kg/m <sup>2</sup> )	4 (15.4)	22 (84.6)	26 (9.6%)	1.338 (3)	0.720
Normal (18.5 - 24.9 kg/m <sup>2</sup> )	25 (12.7)	172 (87.3)	197 (73.0%)		
Overweight (25.0 - 29.9 kg/m <sup>2</sup> )	6 (15.0)	34 (85.0)	40 (14.8%)		
Obese (>30 kg/m <sup>2</sup> )	0 (0)	7 (100.0)	7 (2.6%)		
<b>Smoking status</b>					
Current smoker	3 (23.1)	10 (76.9)	13 (4.8%)	2.391 (2)	0.303
Former smoker	6 (75.0)	2 (25.0)	8 (3.0%)		
Never smoked	30 (12.0)	219 (88.0)	249 (92.2%)		

\*Significant P-value (p<0.05)

Table 5 shows that only gender is significantly associated with physical activity practice levels of medical students.

Females had significantly higher (94.3%) physical activity practices than males (23.0%).

**Table 6: Knowledge, attitude and practices scores**

Variables	Frequency, n	Minimum	Maximum	Mode	Mean (SD)	95% CI
Knowledge	270	0	36	36	34.01 (3.274)	33.6, 34.4
Attitude	270	11	55	44	45.46 (5.488)	44.8, 46.1
Practice	270	0	16	4	5.89 (2.638)	5.5, 6.2

Table 6 shows the overall mean score of participants' knowledge, attitude and practices. The survey found that mean knowledge and attitude score was 34.01 (± 3.274) and 45.46 (± 5.488) respectively, which shows that most of our participants

have a high knowledge and attitude level. On the other hand, the mean practice score was 5.89 (± 2.638) revealing that the participants generally have low levels of physical activity practices.

**Table 7: Correlation between knowledge, attitudes and practices of physical activity**

Variables	Frequency, n	r Pearson	p-value
Knowledge vs Practices	270	0.039	0.528
Knowledge vs Attitude	270	0.407	< 0.001*
Attitude vs Practices	270	-0.083	0.176

\*Significant P-value (p<0.05)

Table 7 shows that there was a significant positive relationship between knowledge and attitude ( $r=0.407$ ,  $p<0.001$ ). However, there was a non-significant positive relationship between knowledge and practices ( $r=0.039$ ,  $p=0.528$ ) and a non-significant negative relationship between attitude and practices ( $r=-0.083$ ,  $p=0.176$ ).

## DISCUSSION

This study aimed to shed light on the current state of physical activity engagement within this specific population and provides valuable insights for designing interventions and educational programmes to promote a healthy lifestyle among future healthcare professionals. The findings revealed that the majority of participants demonstrated a high level of knowledge regarding physical activity (98.9%). Similarly, a significant proportion of students displayed positive attitudes toward physical activity, acknowledging its importance in maintaining good health (92.9%). However, when it came to actual practice, the results were strikingly different, with only a small percentage of students engaging in regular physical activity as recommended by guidelines (13.0%). Our findings concur with that of similar studies done in Semnan and Delhi. [7,11]

The results of this study indicated that overall, medical students possess a reasonable level of knowledge about the importance of physical activity for maintaining good health. This is an encouraging finding, as medical students are expected to be well-informed about health benefits of physical activity due to their academic background. [12]

The mean knowledge score was 34.01 (SD  $\pm 3.274$ ) indicating that the respondents had very high levels of knowledge regarding PA. The majority of the participants were aware of the advantages of regular PA as well as the necessity of PA as a preventive and control measure of non-communicable diseases which were consistent with a previous study. [13] The respondents did, however, show a lack of understanding

when questioned whether stretching is considered an aerobic exercise, whether 4-5 days per week of PA is the minimum requirement for receiving health benefits or whether prolonged participation in endurance sports might lead to fractures in bones and the body. A comparable study among American medical students showed they lacked knowledge of the specifics of exercise. [14] It demonstrates that it is essential to raise medical students' awareness and specific knowledge of the current physical activity recommendations to be better prepared to serve as future healthcare professionals. [15]

The attitudes of medical students towards physical activity were found to be generally positive, with the majority acknowledging its importance in maintaining good health, preventing chronic diseases and improving well-being. [16-17] These positive attitudes may be attributed to the knowledge acquired during their medical education, which emphasises the benefits of exercise in disease prevention and management. It is encouraging to observe this as it reflects an understanding of the potential benefits of regular exercise and a willingness to endorse its inclusion as part of a healthy lifestyle. [18-19]

More than half of the participants reported that participating in PA is enjoyable as well as helps maintain good health and that they do, in fact, prioritise it over other activities. This is consistent with research conducted among Polish medical students who stated that physical activity constituted a significant part of their everyday lives. [20]

Physical activity was also cited by survey participants as a way of fostering social connections. According to research on effects of physical activity on social interactions, when individuals engaged in physical activity, they showed more prosocial and trusting behaviours. [21] Furthermore, exercise has been shown to enhance mental health by reducing anxiety, depression and negative mood as well as by improving self-esteem and cognitive function. [22-23]

However, despite these positive attitudes, there remains a significant gap between intention and action among medical students when it comes to engaging in regular physical activity. The study found that while the participants had good knowledge and attitude towards physical activity, this did not necessarily translate into effective behaviour change.<sup>[24]</sup>

Less than one quarter of the respondents were found to be physically active with a mean score of 5.89 (SD  $\pm$  2.638). This proportion is significantly lower than studies conducted among medical students at University Malaya, Kasturba Medical College and King Saud University.<sup>[25-27]</sup>

The study found no statistically significant association between knowledge and practices. However, this is inconsistent with earlier studies done in China that discovered a significant association between knowledge and practice of physical activity.<sup>[28-29]</sup> This idea is especially true when it comes to the likelihood that someone will use their knowledge of a subject effectively in practice if they have a thorough understanding of it.<sup>[30]</sup>

On the other hand, there are gender related differences in physical activity levels as established by previous studies.<sup>[6-7,25]</sup> However, the study found that female participants were more physically active than their male counterparts, indicating an opposite trend to prior research. Self-efficacy, social support and motivation have been demonstrated through research to have distinct effects on women's physical exercise engagement than they do on men.<sup>[31]</sup>

It is worth highlighting that the findings of this study are consistent with previous research conducted among various populations, indicating that the challenges faced by medical students regarding physical activity are not unique to this group.<sup>[32-34]</sup> However, given their future role as healthcare providers, addressing the physical activity habits of medical students becomes particularly important. Medical students are expected to serve as role

models for their patients and advocate for a healthy lifestyle.<sup>[35]</sup> Therefore, efforts should be made to create a supportive environment within medical schools that fosters and promotes physical activity. One possible explanation for the suboptimal physical activity levels among medical students could be the demanding nature of their academic curriculum. Medical education is often characterised by rigorous schedules and heavy workloads, leaving little time for extracurricular activities such as exercise.<sup>[36]</sup> Moreover, the high levels of stress associated with medical training might also contribute to a sedentary lifestyle among medical students.<sup>[37]</sup> It is important to recognize these challenges and address them effectively through targeted interventions.

This study inherently has some limitations that should be acknowledged. Firstly, our research is a cross-sectional study which focuses on observing data at one specific point in time and does not take into consideration the dynamics of the relationship between the variables evaluated. Secondly, the study relied on self-reported data, which is subject to recall bias and social desirability bias. Respondents might have provided answers not reflective of their actual attitude and practices to appear socially desirable, which may contribute to reporting bias.<sup>[38]</sup> The study was conducted at a single institution, which may limit the generalisability of the findings to other medical schools. Further multi-centre studies involving diverse medical student populations would provide a more comprehensive understanding of the knowledge, attitudes, and practices towards physical activity among medical students. Considering all the limitations, the findings of our study may not be representative of the average medical student.

## **CONCLUSION**

The current study highlights the paradoxical situation where high levels of knowledge and positive attitudes toward physical activity are not translating into regular

exercise practices. The observed disparity among medical students is a matter of concern. This poses significant challenges not only for the students' own health but also for their future roles as healthcare providers and advocates for healthy lifestyle.

By addressing the barriers and challenges faced by medical students in incorporating physical activity into their lives, we can foster a culture of wellness within the medical community and empower future healthcare professionals to lead by example. Efforts to bridge this gap must be multifaceted and comprehensive. Medical education programmes should prioritize integrating physical activity education, emphasizing the importance of personal well-being and the role of physicians in promoting healthy lifestyles.

Ultimately, closing the gap between awareness and action in physical activity among medical students will not only benefit their own health but also contribute to their ability to effectively promote and advocate for physical activity among their patients, thus making a positive impact on public health outcomes.

#### **Declaration by Authors**

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