

**A Cross-Sectional Study on Physical Activity among Medical Students and Interns in Southern India**Sindhu. B.M.<sup>1</sup>, Rashmi. B.M.<sup>2</sup>, Abhinandan.S.Kumbar<sup>3</sup><sup>1</sup>Assistant Professor, Department of Community Medicine, Basaveshwara Medical College & Hospital, Chitradurga, Karnataka<sup>2</sup>Associate Professor, Department of Community Medicine, Basaveshwara Medical College & Hospital, Chitradurga, Karnataka<sup>3</sup>Associate Professor, Department of Respiratory Medicine, Basaveshwara Medical College & Hospital, Chitradurga, Karnataka

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**Abstract:****Background:** India is facing increase in non-communicable diseases. Low physical activity is an important modifiable risk factor for the same. The doctors' own physical activity practices influence their clinical attitudes towards physical activity. Healthy lifestyle of medical students can facilitate the formation of healthy physicians who is more likely to give effective preventive health education to their patients.**Objectives:** To assess the prevalence and levels of physical activity among medical students and interns and its determinants.**Materials and Methods:** A cross-sectional study was conducted among undergraduate students and interns of Basaveshwara Medical College, Chitradurga. Proforma included GPAQ for physical activity measurement. Data was entered in Microsoft excel spreadsheets and analysed using SPSS.v.20.**Results:** 95 students participated in the study.63.2% belonged to normal BMI. 91.6% did walking, followed by moderate and vigorous physical activity (75.8% and 61.1% respectively). Median for walking was highest (60 min/week), followed by that for moderate (20 min/week) and last for vigorous activity (10 min/week).40% students spent < 450 METs physical activity per week.**Conclusion and Recommendations:** More than one third of the students had lesser levels of physical activity. Low physical activity being an important factor for non-communicable diseases, it has to be addressed at the earliest.**Keywords:** Physical Activity, Walking, Medical Students, Interns, METs, BMI.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Presently, non-communicable diseases (NCDs) are one of the major public health challenges. NCDs cause significant human sufferings.[1] They result in about 41 million deaths every year, i.e., nearly 3/4<sup>th</sup> of all deaths globally.[2] India is witnessing an epidemic of NCDs due to alarming increase in the prevalence of diabetes, hypertension, stroke, cancers, coronary heart disease, obesity, etc. [1] Deaths due to NCDs also have also increased in India. About 55.4% of the Disability Adjusted Life Years (DALYs) lost are because of NCDs.[3] Low physical activity is one of the major modifiable risk factors for NCDs.[4] Fit India Movement is one such initiative by the Government of India (GoI) to increase physically active lifestyle among its citizens.[5]

There are lesser number of studies on physical activity among future doctors in this geographical

area. So, this study was conducted to assess physical activity levels among medical students and interns and the determinants for the same.

**Methodology**

This was a cross-sectional study conducted in October 2022. Institutional ethics committee clearance was taken. The study proforma was administered to undergraduate medical students and interns of Basaveshwara Medical College and Hospital, Chitradurga. Considering the prevalence of physical activity as 71.1% with 9% margin of error at 90% confidence level, the required minimum sample size was calculated using Open Epi website. The required sample size was 69. [6-7] Universal sampling was done to achieve responses from the participants. The questionnaire included the following components. a) Participant information section describing purpose of conducting the present study

and seeking consent to participate. b) Questions eliciting information about socio-demographic profile of students. c) Details of physical activity in the last 7 days. d) self-reported height in centimeters and recent weight in kilograms.

#### Operational Definitions

**Physical Activity:** Any bodily movements produced by skeletal muscles that requires energy expenditure. [8]

**Walking:** This includes walking done at college and at home, walking to travel from place to place. This doesn't include brisk walking.[8]

'Vigorous-intensity activities': activities that require heavy physical effort and cause large increases in breathing or heart rate. [9]

'Moderate-intensity activities': activities that require moderate physical effort and cause small increases in breathing or heart rate.[9] This includes brisk walking [8].

#### Metabolic Equivalent of Task (MET)

The intensity of physical activity was measured using MET. One MET is the energy equivalent spent by an individual while seated at rest.[8] For calculation of MET for each activity,

Walking MET-minutes / week = 3.3 x walking time in minutes per week

Moderate intensity activity MET-minutes / week = 4.0 x moderate activity time in minutes per week

Vigorous intensity activity MET-minutes / week = 8.0 x vigorous activity time in minutes per week.

Total MET-minutes were calculated by adding up all the above three METs. Body mass index (BMI) was

calculated using the formula ' $weight \text{ (in kg)} / height \text{ (in meter)}^2$

BMI was classified as follows:

< 18.5 = Underweight

18.5 - 24.9 = Normal

25.0 - 29.9 = Pre obese

30.0 - 34.9 = Obese class 1

35.0 - 39.9 = Obese class 2

> 40.0 = Obese class 3 [10]

Data was compiled in Microsoft Excel spreadsheet and analysed using Statistical Package for the Social Sciences version 20 (SPSS Inc., SPSS for Windows, Chicago, USA). Incompletely filled forms were excluded from the analysis. Qualitative variables are presented as frequencies and percentages. Continuous variables were checked for Normality using the Shapiro–Wilk test and by visual inspection of normality plots. Nonparametric variables are tested by Mann Whitney U test, Kruskal Wallis test to estimate significance of difference in medians of physical activity durations and associations with p-value of less than 0.05 were considered to be statistically significant. Results are presented in tables.

#### Results

A total of 95 students participated in the study. 57.9% were females. More proportion of students hailed from urban areas (66.3%). Majority of them were from Karnataka (71.6%). 63.2% students belonged to normal BMI category.

**Table 1: Characteristics of participants**

Characteristics	Frequency (n)	Percentage (%)
<b>Sex</b>		
Female	55	57.9 %
Male	40	42.1%
<b>Place of origin</b>		
Rural	32	33.7%
Urban	63	66.3%
<b>State of origin</b>		
Karnataka	68	71.6%
Others	27	28.4%
<b>Year of studies</b>		
1st year	24	25.3%
2nd year	10	10.5%
3rd year	30	31.6%
4th year	16	16.8%
Internship	15	15.8%
<b>Body Mass Index (BMI)</b>		
Underweight	11	11.6%
Normal	60	63.2%
Pre-obese	18	18.9 %
Obese class 1	5	5.3%
Obese class 2	1	1.1%
Obese class 3	0	0
<b>Total</b>	<b>95</b>	<b>100.0%</b>

**Table 2: Types of physical activity done by students**

Response	Types of physical activity		
	Walking n (%)	Moderate physical activity n (%)	Vigorous physical activity n (%)
Yes	87 (91.6)	72 (75.8)	58 (61.1)
No	8 (8.4)	23 (24.2)	37 (38.9)

**Table 3: Physical activity level in MET /week**

METs	Frequency (n)	Percentage (%)
0	8	8.4
< 450	30	31.6
450 – 750	6	6.3
> 750	51	53.7

**Table 4: Distribution of Physical activity according to characteristics of participants**

Characteristics of participants	Vigorous activity Median (Q1, Q3)	Moderate activities Median (Q1, Q3)	Walking Median (Q1, Q3)
<b>Sex</b>			
Male	30.0 (1.0, 115)	20.0 (1.25, 97.5)	102.5 (31.3, 230.0)
Female	10.0 (1.0, 60.0)	20.0 (1.0, 100.0)	60.0 (30.0, 420.0)
p-value	Mann-Whitney U = 973.000, p > 0.05	Mann-Whitney U = 1064.0, p > 0.05	Mann-Whitney U = 1088.0, p > 0.05
<b>Place</b>			
Rural	5.0 (1.0, 59.0)	12.5 (1.0, 37.5)	30.0 (5.0, 120.0)
Urban	15.0 (1.0, 90.0)	30.0 (5.0, 105.0)	140.0 (45.0, 420.0)
p-value	Mann-Whitney U: 891.0, p > 0.05	Mann-Whitney U = 737.5, <b>p &lt; 0.05</b>	Mann-Whitney U = 580.0, <b>p &lt; 0.01</b>
<b>Year of studies</b>			
1st year	0.5 (0.1, 67.5)	10.0 (0.1, 85.0)	82.5 (22.5, 375.0)
2nd year	30.0 (3.75, 120.0)	45.0 (13.8, 120.0)	60.0 (30.0, 150.0)
3rd year	10.0 (1.5, 105.0)	25.0 (8.75, 210.0)	140.0 (30.0, 420.0)
4th year	0.1 (1.0, 15.0)	20.0 (7.5, 86.3)	110.0 (12.0, 420.0)
Internship	20.0 (1.2, 200.0)	20.0 (1.1, 60.0)	60.0 (30.0, 240.0)
p-value	Kruskal Wallis H = 5.395, df=4, p > 0.05	Kruskal Wallis H= 3.751, df=4, p > 0.05	Kruskal Wallis H = 1.041, df=4, p > 0.05
<b>Total</b>	<b>10.0 (1.1, 60.0)</b>	<b>20.0 (1.0, 100.0)</b>	<b>60.0 (30.0, 420.0)</b>

## Discussion

Low physical activity is an important modifiable risk factor for NCDs. The present study was done to assesses physical activity levels among medical students and interns in a Medical College in Southern India. In the present study, maximum students performed walking (91.6%), followed by moderate (75.8) and vigorous physical activity (61.1%). (Table 2). In the study among medical students in Kerala by Joy V et al, 71.1% were physically active. Among the physically active students, moderate physical activity (54.4%) was more than high levels of physical activity

(16.7%).[6] In the study by Schlickmann DW et al, 65.6% students practiced physical activity.[11] Rao CR et al reported 61.9% students as physically active in their study. [12]

In our study, 40% students spent < 450 METs per week physical activity and 60% students spent  $\geq$  450 METs per week physical activity (Table 3). In the study on medical students in Eastern India by Ganguly R et al, 40.8% students spent < 600 METs/week, 59.2% spent  $\geq$  600 METs physical activity. [13] In our study, time spent per week for walking, moderate and vigorous physical activity were less (median were 60, 20, 10 minutes

respectively).(Table 4) Higher duration was reported in the study on a University students in Tamil Nadu (median were 140, 90, 60 minutes for walking, moderate and vigorous physical activities respectively).[14]In the study among medical students in Saudi Arabia by Zain H et al, more number of students reportedly spent time daily for physical activity (37% did physical activity for more than 30 minutes daily). [15] For adults aged 18-64 years, WHO recommends at least 150–300 minutes of moderate-intensity aerobic physical activity; or at least 75–150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity throughout the week.[16]

Walking and vigorous activity durations were more among males compared to females. (Table 4) Peleias M et al also found out that higher grades of physical activity was more among males than female students. [17]Dikmen AU et al and Kumar PS et al found out that female sex was one of the significant factor for no physical activity. [14,18]

### Conclusion and Recommendations

More than one third of the students had lesser levels of physical activity. Low physical activity is one of the important modifiable risk factors for non-communicable diseases. Hence, measures have to be taken to improve physical activity levels among future doctors.

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