

## Prevalence and patterns of physical activity among medical students in Bangalore, India

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### Abstract:

**Background:** Physical activity is one of the leading health indicators. The objective was to study the prevalence and patterns of physical activity among young adults.

**Methods:** 259 Medical students (Men: Women = 116:143) in the age group of 18-22 yrs were interviewed using the official English long version of the International Physical Activity Questionnaire (IPAQ). The total level of physical activity and activity in each of the 4 life domains – work, transport, domestic and gardening and leisure-time were estimated and was expressed as metabolic equivalent-hours per week (MET-hour/week).

**Results:** 41.3 % showed high levels of physical activity, 43.2% and 15.4 % of students showed moderate level and low level of physical activity respectively. 84.6 % (n=219) were engaged in work related activity and 80.7% (n=209) showed transport related activity. Domestic and gardening physical activity represented 63.7 % (n=165) of individuals total activity and 67.2% of students showed leisure time activity. The average time spent in sitting was 7.06 hrs/day. The median of the total physical activity for the whole sample was 39.13 MET/hour/week and 18.10 for work, 4.40 for transportation, 2.60 for domestic and gardening and 4 for leisure-time activity. There was significant gender difference observed with women having low physical activity.

**Conclusion:** This study provides baseline information about the physical activity levels and patterns including sitting hours among Indian young adults using IPAQ that can be used for comparison of data across different parts of world.

**Keywords:** Physical activity; Young adults; IPAQ

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## 1. Introduction

A decrease in the physical activity level has been associated with various chronic diseases (1). Adolescents and youth are not active on a regular basis and are reported to have low physical activity (2, 3). Studies reporting the pattern of PA and inactivity among Indian adults and adolescents are limited (4, 5, and 6) and there exist differences in the PA levels among various population (7). Therefore this study was undertaken to describe the prevalence and patterns of physical activity among young adults studying medical sciences.

## 2. Material and Methods

This study was conducted in a sample of 264 medical students in the age group of 18-22 years studying in I MBBS. Age (years), Height (meter), Weight (kg), BP (mmHg) were recorded using standardized methods. All participants had given their written consent for participating in the study before they were interviewed. For estimating the level of physical activity, the official long form English version of IPAQ was used (8). The questionnaire consists of 27 questions that cover 4 domains of physical activity (work, transport, domestic and garden, and leisure-time) and time

spent sitting. The items in IPAQ are structured to provide separate domain-specific scores for walking, moderate-intensity, and vigorous-intensity activity. All questions refer to the previous 7 days. The results were presented as the estimation of energy expenditure in metabolic equivalent-minutes per week (MET hours/week). According to IPAQ scoring protocol total physical activity score was calculated, as well as separate scores for each of the 4 physical activity domains. Based on standard scoring criteria the study sample was categorized into three levels of physical activity: "high" "moderate" and "low" [physically inactive], levels of physical activity. The standard scoring criteria is as follows: 1) High: Meets either of two criteria: (a) vigorous-intensity activity on > 3 days/week and accumulating at least 1500 MET-minutes/week; or (b) >5 days of any combination of walking, moderate-intensity, or vigorous-intensity activities achieving at least 3000 MET-minutes/week. 2) Moderate: Meets any of the following three criteria: (a) 3 days of vigorous activity of at least 20 minutes/day; (b) 5 days of moderate-intensity activity or walking of > 30 minutes/day for > 10 minutes at a time; or (c) 5 days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving at least 600 MET-minutes/weeks. 3) Low: Meets neither 'moderate' nor 'high' criteria

According to data cleaning rules 8 five participants were excluded from analyses, so the final sample included 259 participants. The prevalence of physical activity was calculated as the percentage of students involved in the activity. Normality of distributions of variables was tested. Median was calculated for each domain of physical activity separately as well as for total physical activity. Mean values are also reported for additional information. The analyses were performed on the total sample of participants and separately for men and women. Gender differences in physical activity were tested using Mann-Whitney Test. The level of significance for all analyses was set at  $P < 0.05$ . Statistical analyses were performed by SPSS software, version 12.0.1.

### 3. Results

According to categorical scoring 41.3 % (n=107) showed a high levels achieving a minimum of at least 3000 MET-min /week. 43.2% of students showed moderate level of physical activity achieving a minimum of at least 600MET-min /week. 15.4% (n=40) did not meet the above two criteria and considered to have low activity. Gender specific prevalence of IPAQ categories and for total sample is given in Table 1. It was noted that 84.6% (n=219) were engaged in work related activity, 91.1% of them showed transport related activity. Domestic and gardening physical activity represented (63.7 %) of total activity level. 67.2% of students were engaged in leisure time activity. The prevalence of students engaged in vigorous activity was 60.6% (n=157), in moderate intensity activity and walking was found to be 83.4% (n=261) and 91.9% (n=238) respectively. Table 2 provides data about percentage of students with different level of PA and with no physical activity. About one third of the students (32.8%) were not engaged in leisure time activity and 8.1% did not do walking.

**Table 1.** Prevalence of physical activity level (IPAQ categories)

IPAQ category	Total participants (n=259)	Men (n=116)	Women (n=143)
High	41.3(107)	51.7(60)	32.9(47)
moderate	43.2(112)	34.5(40)	50.3(72)
low	15.4(40)	13.8(16)	16.8(24)

**Table 2.** Prevalence of Level of physical activity and no physical activity in different domains and different type of activity by gender

	Activity level			Inactivity level		
	Total participants (n=259)	Men (n=116)	Women (n=143)	Total participants (n=259)	Men (n=116)	Women (n=143)
Work related	84.6(219)	82.8(96)	86.0(123)	15.4(40)	17.2(20)	14(20)
Transport	91.1(209)	78.4(91)	82.5(118)	19.3(50)	21.6(25)	17.5(25)
Domestic & gardening	63.7 (165)	56.9(66)	69.2(99)	36.3(94)	43.1(50)	30.8(44)
Leisure time activity	67.2(174)	75.9(88)	60.1(86)	32.8(85)	24.1(28)	39.9(57)
Vigorous	60.6(157)	71.6(83)	51.7(74)	39.4(102)	28.4(33)	48.3(69)
Moderate	83.4(216)	81.9(73)	84.6(121)	16.6(43)	18.1(21)	15.4(22)
Walking	91.1(238)	87.1(101)	95.8(137)	8.1(21)	12.9(15)	4.2(6)

Physical inactivity was more prevalent among women than men. Based on domain specific continuous scores, the median of the total physical activity for the whole sample was 39.13 MET/hour/week. Median physical activity for whole sample in MET-hour/week was 18.10 for work, 4.40 for transportation, 2.60 for domestic and gardening and 4 for leisure-time activity. The major contribution for total physical activity was from work related activity and the lowest was found in the domestic and gardening activities. Table 3 shows the total and gender specific physical activity level in MET /hr/week in different domains. Men had higher physical activity at work than women [25.64 MET-hour/week vs 12 MET-hour/week (P=0.002)]. In transport men had high activity but with no statistical significance. [4.95 MET-hour/week for men vs. 3.85 MET-hour/week for women]. In leisure-time domain, men were more active than women [6.6 MET-hour/week vs. 2.83 MET-hour/week (P= 0.002)]. On the other hand, women were more active than men in the domestic and garden domain [3.33 MET-hour/week vs. 1.50 MET-hour/week, (P=0.040)]. The time spent in sitting ranged from 00 to 17.71 hrs with average time of 7.06 hrs/day. The average time spent in sitting per day was 7.50 hrs  $\pm$  3.38 in men and 6.52  $\pm$  3.26 in women with a p value of 0.026.

**Table 3.** Physical activity level in MET /hr/week in different domains and in specific activity

	Mean	Median	Men (n=116)	Women (n=143)	P value*
Work related	35.29	18.10	25.64	12	0.002
Transport	7.59	4.40	4.95	3.85	0.301
Domestic& gardening	8.15	2.60	1.50	3.33	0.04
Leisure time activity	11.99	4.00	6.60	2.83	0.002
Total walking	19.07 $\pm$ 24.64	11.55	23.02	18.97	0.141
Total moderate	21.8	10.5	25.86	24.66	0.643
Total vigorous	21.8	5.5	32.72	23.68	0.000

\* p value between men& women

#### 4. Discussion

The present study reports the prevalence and patterns of physical activity among young students aged 18-22 years. In total 84.5% of young adults were involved in high to moderate levels of PA meeting the IPAQ high active and moderate active category. A significant proportion of men showed high PA where as women had moderate levels of activity (Table 1). The prevalence of activity level was higher than the levels reported for Indian adults in the IPS study and for Asian adolescents (4, 7). More than a half (61%) of American medical students reported to have similar activity level (9). The median PA score for the total sample was 39.13 MET/hour/week. The average score was different from activity scores in adult population of various age groups reported in studies from other European countries (10). The main source of physical activity energy expenditure in the present study was from work related activity and least was from domestic and gardening. In other studies the leisure time activity was the major component of total PA (11-13) where as in our study the PA done during domestic and leisure time was low indicating that students did not have enough time for these activities.

This difference could be due to less PA programs, recreational facilities and busy curriculum. Asian Indian Guadeloupean adolescents (7) and adults of Taiwan, china (14) reported lower weekly leisure time activity. In most of the previous studies women found to have lower rates of participation in physical activity than men (15). A similar gender difference observed in our study with men spending more time in leisure time activity and women in domestic and gardening. It has been confirmed in the study by Dong and colleagues that women are engaged in higher house hold activity than for men (16). Studies conducted in the United States have consistently shown walking to be the most common leisure-time physical activity among adults of all ages (17). In our study walking was the most frequent type of PA. 91% of the walking was from all the domains except domestic and gardening. The major contribution of walking was from transport related walking. The proportion of students who cycled was very less (3.5%).

The prevalence of physical inactivity reported was higher (15.4%) compared to Indian adults (9.4%) (18). But almost similar to inactivity reported in urban Indians (14%) (6). Many studies report in general, physical inactivity highest among youngest age group (16). In The HDSS survey the gender specific level of physical inactivity in different domains of activities were very high for Indian adults compared to young adults in this study because of inclusion of wide age group (15-64 years). In earlier studies total score physical activity and the leisure time activity have shown the different associations with Educational level (10, 19). But in the present study among students

studying MBBS the leisure time activity is very less in spite of them having high total PA. It is important to note that the above studies relate PA cross sectional with education level but not during the study course. Though IPAQ collects information on total sitting time, the data and observations are not discussed in other studies. A direct comparison of results could not be made with other Indian studies (4, 10) because of difference in the methodology, age group studied and the description of results in different domains and patterns of physical activity. The results of this study cannot be generalized as the sample is from the medical students and may not represent young adults in the general population. Physical activity has been related to socio demographic and environmental variables such as food consumption patterns, location of residence, monthly household income and number of household appliances which was not examined.

## 5. Conclusion

Physical activity being one of the leading health indicators, in the Healthy People 2010 one of the main objectives is to increase the proportion of adults who engage regularly preferably in moderate physical activity for at least 30 minutes/day. In the present study most of the subjects were already meeting the recommended physical activity levels. Therefore efforts should be taken to emphasize the benefits of physical activity to the students so that their activity is maintained in future. The low leisure time activity observed in the present study may demand recommendation and facilities for provision of physical education classes in the curriculum.

## Conflict of Interest:

There is no conflict of interest to be declared.

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