

Evaluation of the Physical Activity Level among Undergraduate Students of Faculty of Allied Health Sciences, University of Peradeniya

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ABSTRACT

Objectives: This current study was carried out to evaluate the level of physical activity (PA) among undergraduate students of faculty of Allied Health Sciences, University of Peradeniya. **Materials and methods:** This was a cross sectional study which was conducted at Faculty of Allied Health Sciences, University of Peradeniya, Sri Lanka. Data was collected through a self-administered questionnaire [International Physical Activity Questionnaire – Short Form (IPAQ-SF)] and total of 231 students responded. Prior to the data collection, informed written consent was taken from the students. **Main outcome measures:** MET value (Metabolic Equivalent) **Results:** The mean total MET of the population indicated that of 'moderate physical activity level'. Comparing four study years (4th year to 1st year), total MET level was gradually declining from 1st year to 4th year though there were no statistically significant relationship found. PA level was moderate in all the degree programs but the values were different. In relation to sex, males were predominant in all the MET categories. According to the BMI category, normal weighted students were presented with higher values for MET categories compared with others. **Conclusion:** All the students of Faculty of Allied Health Sciences, University of Peradeniya were moderately physically active with higher percentages of walking MET minutes/ week in all the variables. PA score is gradually declined from first year to final year. RAD students were more physically active among all five degree programs. Male students and normal weighted students had higher PA scores respectively for sex category and BMI category.

KEYWORDS: Physical activity level, University undergraduates, Study year, Degree Program, Gender, BMI Category

INTRODUCTION

Physical activity (PA) is defined as 'Any bodily movement produced by skeletal muscles that result in caloric expenditure' [1] and it is divided into three categories: vigorous (high), moderate and mild [2]. Increasing physical activity is a key component of recommendations to decrease morbidity and mortality [3].

It is estimated that nearly one-fifth of the world's population is physically inactive [4]. Promoting physical activity amongst adolescents and young adults is a sensible strategy likely to help reduce physical inactivity levels and the associated disease burden in future generations. Health behaviors developed during adolescence and young adulthood tend to persist into adulthood [5]. However, previous studies have shown a decline in physical activity levels among young adults [6]. The decline was evident during young adults' transition into early adulthood with the steepest decline occurring at the time of entering a university [7, 8]. A previous study stated that one third of active students in high school became insufficiently active upon transitioning to university life [9].

There were many studies found which were conducted among university population on physical activity from USA,

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UK, Canada and other countries. However, the situation in developing countries, including in the South Asian region, is less known. Therefore, the development of effective interventions for the promotion of physical activity among young adults has become a recent priority in public health research [10].

Promoting physical activity among university students may be an important strategy to ensure that they develop regular physical activity habits which they can continue throughout their adult life. Determining the prevalence of physical activity in university settings may help conceptualize, plan, and implement programs towards improving students' health.

There was one previous study on physical activity level among Physiotherapy undergraduates done in Sri Lanka [11] and no other published articles were found. For this current study, Faculty of Allied Health Sciences (FAHS), University of Peradeniya was selected as the study site. Six different health care professional degrees are offered by the faculty and produce future health care providers. Therefore, FAHS was selected to carry out the study as the students of this faculty have a variety of activities during their

undergraduate life such as lectures, practical, clinical placement, field visits, extracurricular activities etc. and it may have a correlation with their physical activity level.

Materials and methods

For this questionnaire based cross-sectional study, Six hundred and fifty three (653) registered students were taken as the study population and calculated study sample was 243. Students who were presented with recent fractures, any injuries, long-term illnesses like asthma etc. were excluded. Study year (Batch - 4th year, 3rd year, 2nd year, 1st year), degree program (Medical Laboratory Sciences-MLS, Pharmacy-PCY, Physiotherapy-PHY, Radiography/Radiotherapy-RAD, Nursing-NUR), sex (male, female) and body mass index – BMI category (underweight, normal weight, pre-obesity, obesity class I, obesity class II, obesity class III) were taken as the independent variables.

The International Physical Activity Questionnaire – short form (IPAQ - SF) was taken as the study instrument. It consisted of seven items, asking participants to report on the duration of time they have spent doing the following activities over last week: walking, moderate activity, vigorous activity and sitting. The reliability and validity of the questionnaire were first tested across 12 countries (14 sites) in 2000. The findings suggest that it has acceptable properties for use in many settings and in different languages, and is suitable for national population-based prevalence studies of participation in physical activity [12, 13]. Computation of the total score required summation of the duration (in minutes) and frequency (days) of walking, moderate-intensity and vigorous-intensity activities. IPAQ scoring features categorical and continuous scoring. All continuous scores were expressed in MET (Metabolic Equivalent) – minutes/ week. [14]. In this current study, MET-minutes/week values were calculated according to the independent variables and used to categorize the physical activity level as mild, moderate and high.

Informed written consent was obtained from the students who were willing to participate in this study. Only 231 answered questionnaires were collected giving a rate of participation of 95%. Students were in the age range of 21 to 35 years and consisted of both girls and boys (83 males-35.9%, 148 females-64.1%). Study sample consisted of 57-4th (final) year, 54-3rd year, 55-2nd year and 65-1st year students. They were; 37-MLS, 37-PCY, 46-PHY, 54-RAD, 57-NUR students. Among the total sample of the students according to BMI categories, it was identified that 43-underweight, 151-normal weight, 19-pre-obese, 2-obesity class I and 2-obesity class II students. In the analysis, confidence level was set to 95% in all the tests. Therefore, statistical significant level was taken as 5% ($p < 0.05$) to identify statistically significant difference between means/proportions of the variables.

Mean value for different MET categories (total MET, vigorous MET, moderate MET and walking MET) were calculated. Analysis of variance (ANOVA) and post – hoc tests were used to determine whether there were any statistically significant differences between the means strata for the independent variables of study level, degree program and BMI category as they had more than two variables in each group. Independent sample t-test was used for independent variable of sex as it has two variables, male and female.

Results

According to the analysis of the total sample of students, the means of the MET minutes/ week values reported as

vigorous MET of 347.9, moderate MET of 143.6, walking MET of 1186.8 and total MET of 1678.3 MET minutes/ week. The walking MET was comparably higher than the vigorous and moderate MET among all independent variables. As the total MET value was in-between the range of 600 – 3000 MET minutes/ week, it can be stated as the students of Faculty of Allied Health Sciences were '**Moderate physically active students**'.

Study year

Among the mean MET values, the highest vigorous MET of 566.7 minutes/ week showed by 3rd year students and highest moderate MET of 178.9 minutes/ week was recorded by 2nd year students. The highest walking MET of 1895.9 minutes/ week and the highest total MET of 2201.8 minutes/ week was observed among 1st year students. According to the statistical analysis by SPSS 22.0 software conducted with ANOVA and post-hoc test, there was no statistically significant difference found between group means of MET minute/ week values in different study years (Table 1).

Degree program

Physiotherapy undergraduates have shown the highest vigorous MET of 681.7 minutes/ week and the highest moderate MET of 221.3 minutes/ week. Radiography/ Radiotherapy undergraduate students have presented with the highest walking MET of 2232.4 minutes/ week and highest total MET of 2667.2 minutes/ week. According to the statistical analysis that was conducted with ANOVA and post-hoc test, there was no statistically significant difference found between group means of MET minute/ week values in different degree programs (Table 2).

Sex

Among all three MET minutes/ week categories and total MET, males were identified with all highest values of MET categories (vigorous, moderate, walking and total MET) compared with females. Independent sample t-test was used to find any statistically significant difference between sex and different MET categories, but there was no any difference has found (Table 3).

BMI category

Among mean MET values, highest vigorous MET of 401.9 minutes/ week, highest walking MET of 1345.4 minutes/ week and highest total MET of 1868.0 minutes/ week has shown by normal weighted students. Students of obesity class II has identified with the highest moderate MET of 720.0 minutes/ week. According to the statistical analysis that was conducted with ANOVA and post-hoc test, there was no statistically significant difference found between group means of MET minute/ week values in different BMI categories (Table 4).

Discussion

In this study, the means of the MET minutes/ week values were consisted as vigorous MET of 347.9, moderate MET of 143.6, walking MET of 1186.8 and total MET of 1678.3 MET minutes/ week. The total MET minutes/ week value was taken for the calculation of the physical activity level. As the total MET value of this study lies in between 600-3000 MET minutes/ week, the students of the Faculty of Allied Health Sciences were identified as '**Moderate physically active students**' according to the results obtained. There were previous studies found with the same results among university students from India in 2017 [15] and Malaysia in 2015 [16]. Opposing the results of the current study, some

previous studies concluded that the university students were highly physically active [17-19] in some researches and having low physical activity level in some other studies [20, 11].

Comparing four study years (4th year to 1st year), total MET level was gradually declining from 1st year to 4th year though there were no statistically significant relationship found. First year students were presented with high PA compared with final year students; may be because final year students have tight clinical schedule with less extracurricular activities and first year students have more opportunities to engage with more sports and extracurricular activities. A similar cross sectional study conducted among nursing students has shown that both the freshman and seniors were identified as irregular active and were considered as risk groups. But it also stated that seniors were more active compared with freshmen. [21]

Five Allied Health degree programs were included in this study; Medical Laboratory Sciences (MLS), Pharmacy (PCY), Physiotherapy (PHY), Radiography/ Radiotherapy (RAD) and Nursing (NUR). In the current study, Physical activity level was moderate in all the degree programs but the values were different. RAD students had the highest value in moderate physical activity level as 2667.2 MET minutes/ week. Next was PHY students presented with 1641.6 MET value, almost 1000 MET minutes/ week less than RAD students. It was expected to have highest value of PA level with PHY students, because they have more knowledge on physical activities, physical fitness, sedentary life styles and nutrition. But RAD students had the highest score among all of them, may be due to their engagement with other extracurricular activities compared with other students. PCY students had 1591.4 and MLS and NUR students were presented with almost same values, respectively 1173.7 and 1154.9 MET minutes/ week. It may be due to more laboratory work and practical work, they may have to stand for long time along the day, therefore they may not find enough time for other extracurricular activities due to the tiredness felt at the end of the day. Nevertheless, there was no statistically significant relationship found in this study.

There were no previously conducted studies were found for MLS or RAD degree programs. A study conducted among nursing undergraduates concluded that both seniors and juniors were physically inactive [21] which was not supporting the results of this study. There were numerous research articles found based on physiotherapy students. Most of those studies concluded that the physiotherapy students were highly physically active compared with other students [16, 22-24] which is not supporting the current study results. Another previous Sri Lankan study which was done in 2016 among physiotherapy students, concluded that they had low physical activity level [11] which also not supporting the current results. Another similar study was found in the health and biology fields including pharmacy students. It was reported that biology and physical education students were more active compared to biochemistry students and pharmacy students were moderately physically active; supporting the current study results [14].

In relation to sex, males were predominant in all the MET categories and have a total MET of 2093.3 minutes/ week. A study done in 2018 with undergraduate students of the University of Tuzla [90] has illustrated total MET of 4619.4

and 6013.5 MET minutes/ week for males which was comparably higher than females. They were identified as 'highly physically active students' while the current study identified their students as 'moderately physically active students'. Almost all the previous studies were concluded that males were more physically active compared with females irrespective of their physical activity level, whether it is mild, moderate or high. It may be because their body composition, physical fitness level, endurance level and strength levels were comparably higher in males than females. In the current study, normal weighted students were presented with higher values for MET categories compared with others and this result was supported by a study done in Malaysia in 2015 among university students [16].

A study conducted among medical students found that if the students had social support from friends and families they were tend to be more physically active [25]. There were few barriers were identified to achieve recommended physical activity level by previous studies; time limitation, lack of accessible and lack of suitable sporting places [19], social influence and lack of willpower [26], study related activities and overtime shifts of medical students [25], low family income, mental health and self-efficacy [27]. Another study found that students were more active during weekdays compared with weekend days [28]. The residence of the students may have an influence on their physical activity level, a study concluded that hostel resident students have low PA levels [15]. Students who were more physically active or with high physical activity level shown high levels of academic performances [29] and decreased sedentary behaviors [30]. Even though students had high level knowledge on physical activity they were not physically active highly, presenting there were no correlation between the knowledge of PA and students' PA level [18]. In the current study, there were no statistically significant difference found in any variable; study year, degree program, sex and BMI category.

Conclusion

As the conclusion, all the students of Faculty of Allied Health Sciences, University of Peradeniya were moderately physically active with higher percentages of walking MET minutes/ week in all the variables. PA score is gradually declined from first year to final year. RAD students were more physically active among all five degree programs. Male students and normal weighted students had higher PA scores respectively for sex category and BMI category.

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Tables

Table 1: Mean and significance probability of different study years from ANOVA and post-hoc tests for PA

		ANOVA	Post hoc tests	4th year	3rd year	2nd year	1st year	Mean
p-values of MET minutes/ week	Vigorous MET	0.464	4 th year	-	0.786	0.996	0.921	231.4
			3 rd year	0.786	-	0.894	0.387	566.7
			2 nd year	0.996	0.894	-	0.827	379.6
			1 st year	0.921	0.387	0.827	-	162.5
	Total mean							347.9
	Moderate MET	0.606	4 th year	-	0.692	0.998	0.989	166.7
			3 rd year	0.692	-	0.598	0.847	85.3
			2 nd year	0.998	0.598	-	0.962	178.9
			1 st year	0.989	0.847	0.962	-	143.4
	Total mean							143.6
	Walking MET	0.257	4 th year	-	0.984	0.903	0.236	678.5
			3 rd year	0.984	-	0.989	0.445	920.2
			2 nd year	0.903	0.989	-	0.650	1137.3
			1 st year	0.236	0.445	0.650	-	1895.8
	Total mean							1186.8
	Total MET	0.571	4 th year	-	0.954	0.902	0.500	1166.6
3 rd year			0.954	-	0.999	0.834	1570.4	
2 nd year			0.902	0.999	-	0.905	1695.8	
1 st year			0.500	0.834	0.905	-	2201.8	
Total mean							1678.3	

Table 2: Mean and significance probability of different degree programs from ANOVA and post-hoc tests for PA

		ANOVA	Post hoc tests	MLS	PCY	PHY	RAD	NUR	Mean
p-values of MET minutes/ week	Vigorous MET	0.349	MLS	-	0.943	0.499	0.995	1.000	194.6
			PCY	0.943	-	0.929	0.993	0.868	436.8
			PHY	0.499	0.929	-	0.670	0.304	681.7
			RAD	0.995	0.993	0.670	-	0.974	312.6
			NUR	1.000	0.868	0.304	0.974	-	153.8
	Total mean							347.9	
	Moderate MET	0.308	MLS	-	0.552	0.225	0.855	0.679	37.3
			PCY	0.552	-	0.987	0.966	0.997	177.6
			PHY	0.225	0.987	-	0.727	0.886	221.3
			RAD	0.855	0.966	0.727	-	0.997	122.2
			NUR	0.679	0.997	0.886	0.997	-	148.1
	Total mean							143.6	
	Walking MET	0.185	MLS	-	1.000	.999	.432	1.000	941.8
			PCY	1.00	-	.998	.461	1.000	977.1
			PHY	.999	.998	-	.223	1.000	738.5
			RAD	.432	.461	.223	-	.246	2232.4
			NUR	1.000	1.000	1.000	.246	-	853.0
	Total mean							1186.8	
	Total MET	0.318	MLS	-	0.992	0.985	0.421	1.000	1173.7
			PCY	0.992	-	1.000	0.727	0.986	1591.4
PHY			0.985	1.000	-	0.716	0.974	1641.6	
RAD			0.421	0.727	0.716	-	0.288	2667.2	
NUR			1.000	0.986	0.974	0.288	-	1154.9	
Total mean							1678.3		

Table 3: Mean and significance probability of sex from independent sample t-test for PA

		Mean value			Levene's test	Independent sample t-test (2-tailed)	
		Male	Female	Total			
P - values of MET minutes/ week	Vigorous MET	615.9	197.6	347.9	Equal variances assumed	0.000	0.027
					Equal variances not assumed		0.078
	Moderate MET	198.4	112.9	143.6	Equal variances assumed	0.004	0.117
					Equal variances not assumed		0.182
	Walking MET	1278.9	1135.1	1186.8	Equal variances assumed	0.539	0.769
					Equal variances not assumed		0.797
	Total MET	2093.3	1445.5	1678.3	Equal variances assumed	0.132	0.246
					Equal variances not assumed		0.306

Table 4: Mean and significance probability of different BMI categories from ANOVA and post-hoc tests for PA

		ANOVA	Post hoc tests	Under weight	Normal weight	Pre-obesity	Obesity class I	Obesity class II	Mean	
p-values of MET minutes/ week	Vigorous MET	0.955	Under weight	-	0.959	0.994	1.000	0.999	232.6	
			Normal weight	0.959	-	1.000	0.999	0.995	401.9	
			Pre-obesity	0.994	1.000	-	0.999	0.996	395.8	
			Obesity class I	1.000	0.999	0.999	-	1.000	120.0	
			Obesity class II	0.999	0.995	0.996	1.000	-	0.0	
				Total mean						361.5
	Moderate MET	0.193	Under weight	-	.700	1.000	1.000	.419	211.1	
			Normal weight	.700	-	.890	.998	.238	120.6	
			Pre-obesity	1.000	.890	-	1.000	.449	211.6	
			Obesity class I	1.000	.998	1.000	-	.721	210.0	
			Obesity class II	.419	.238	.449	.721	-	720.0	
				Total mean						152.9
	Walking MET	0.940	Under weight	-	0.983	0.997	1.000	1.000	1002.1	
			Normal weight	0.983	-	0.937	1.000	1.000	1345.4	
			Pre-obesity	0.997	0.937	-	1.000	1.000	649.1	
			Obesity class I	1.000	1.000	1.000	1.000	1.000	1039.5	
			Obesity class II	1.000	1.000	1.000	1.000	1.000	1138.5	
				Total mean						1211.7
	Total MET	0.961	Under weight	-	0.978	1.000	1.000	1.000	1445.8	
			Normal weight	0.978	-	0.976	1.000	1.000	1868.0	
Pre-obesity			1.000	0.976	-	1.000	1.000	1256.5		
Obesity class I			1.000	1.000	1.000	1.000	1.000	1369.5		
Obesity class II			1.000	1.000	1.000	1.000	1.000	1858.5		
			Total mean						1726.1	

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