International Journal of Physical Education
DOI : 10.15740/HAS/IJPE/10.1and2/1-6
e ISSN-0976-7924 ■ Visit us : *www.researchjournal.co.in*
Research Paper
Volume **10** | Issue 1&2 | April & October, 2017 | 1-6

Physical activity patterns of college students in Kerala

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Received : 26.06.2017; **Revised :** 11.09.2017; **Accepted :** 21.09.2017

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■ **ABSTRACT**

This study examines physical activity (PA) patterns in the context of international physical activity questionnaire (IPAQ) short form, which include 27 questions used for the study of undergraduate students in Kerala State, India. The sample represent proportionately the various districts of Kerala state with 1096 male (mean age = 19.44 years) and 1841 female (mean age = 19.35 years) in the year 2015. These following values used for the analysis of IPAQ data: Walking = 3.3 METs, Moderate PA = 4.0 METs and Vigorous PA = 8.0 METs. The results indicate that 30.02 per cent of male and 36.5 per cent of female students found "inactive" with MET/week score below 600. At same time 57.76 per cent (n=633) and 48.67 per cent (n=896) male and female found in "minimally active" group, respectively with MET/week score between 600 to 1499. Only 12, 23 per cent (n=134) male and 14.83 per cent (n=273) found belonging to HEPA (Health-enhancing physical activity) category with MET score above 1500/ week. There is no significant difference found between genders at the same time category wise difference were found significant. The average of inactive group was MET /week was 116.49, minimally active with 995.58 MET's week and HEPA group showed PA equalling to 2148.68 MET/week. More important, health and physical education professionals in higher education have not been able to effectively increase students' PA behaviours. Interventions to promote students' PA are still at an early stage and have only produced moderate effects. The data from the study suggest more effective interventions should be implemented to promote PA among college students.

■ **KEY WORDS :** Physical activity patterns, IPAQ

■ **HOW TO CITE THIS PAPER :** Manoj, T.I. and Ajith, K.R. Mohan (2017). Physical activity patterns of college students in Kerala. *Internat. J. Phy. Edu.*, **10** (1&2) : 1-6, **DOI : 10.15740/HAS/IJPE/10.1and2/1-6.**

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Young people form treasured human wealth in every country. The National Youth Policy of India (2003) defines the youth population as those in the age group of 15-35 yr. It is hard to imagine life without the wide variety of multimedia devices that have become so common over the last few decades. This technology has become essential in almost every educational, business, community, and recreational environment. Access to electronic information and communication technology is widely available to both high school and college level students, and mastering elegant information technology is one key to success in adult life (Lawrence *et al.*, 2012). Unfortunately, this new technology phenomenon may be having a negative impact on physical activity patterns in an increasingly sedentary population (Rashad and Grossman, 2004). Scientific guidelines issued by various international bodies, national centres and institutes and professional organisations have

documented that regular physical activity protects against coronary heart disease, type 2 diabetes, some cancers, hypertension, obesity, clinical depression and other chronic disorders (Gregory *et al.*, 2013). According to the United States Department of Health and Human Service Healthy People 2010 report, only 22 per cent of adults engage in moderate physical activity for 30 minutes five or more times a week and nearly 25 per cent of the population is completely sedentary. In addition, only about 25 per cent of young people (aged 12-21) participate in light to moderate activity nearly every day (Troiano and Flegal, 1998). Lack of physical activity continues to contribute to the high prevalence of overweight individuals and obesity within the United States. Keating *et al.* (2005) reviewed studies on college students' physical activity (PA) behaviours and found that previous research on this topic focused on describing college students'PA patterns and their determinants. Researchers reported that about 40 per cent to 50 per cent of college students are physically inactive. More important, Health and PA professionals in higher education have not been able to effectively increase students' PA behaviours. Interventions to promote students' PA are still at an early stage and have only produced moderate effects.

In the State of Kerala, no previous data available regarding the physical activity pattern of college students, general observation that many young adults in college campuses are not meeting current physical activity recommendations and therefore may not be performing beneficial activities like aerobic exercise and resistance training. As on date, very few reliable instruments exist to quickly assess the leisure activity and physical activity patterns of young, college level adults. The IPAQ (International Physical Activity Questionnaire) is one instrument that has been validated (Craig *et al.*, 2003) for use with this population, but the long version of the instrument is complicated and arduous to use in a collegiate setting. This may partially explain the paucity of research in this area. For example, it still remains unanswered what types of physical activities (PA) college students engage in and whether changes occur with PA patterns during the duration of their enrolment in a college. As suggested by Rhodes *et al.* (2009), professionals in the fields of fitness, health education, and physical education have not paid great attention to specific characteristics of student PA such as frequency, intensity, duration, and PA types. This lack of information inventory hinders efforts for promoting PA in college campuses, as different types of PA generate different health benefits. This PA data could provide guidance for the development of various meaningful programming interventions to better influence college students regarding PA. Therefore, the purpose of this study is to examine PA patterns among students of various types of colleges in Kerala.

■ METHODOLOGY

A survey was conducted in order to assess the leisure and physical activity patterns within a young adult demographic group. The study is intended to provide reliable data describing the characteristics of undergraduate college students of 18 to 23 years of both sexes. The sample represent proportionately the various districts of Kerala state with 1153 male (Mean Age = 19.44 years) and 1794 female (Mean Age = 19.35 years).

International physical activity questionnaire (IPAQ) (Short form) includes 27 questions. IPAQ is an instrument designed primarily for population surveillance of adults. It has been developed and tested for use in adults (age range of 15-69 years) and until further development and testing is undertaken the use of IPAQ with older and younger age groups is not recommended.

Characteristics of the IPAQ short-form instrument:

IPAQ assesses physical activity undertaken across a comprehensive set of domains including leisure time, domestic and gardening (yard) activities, work-related and transport-related activity.

The IPAQ short form asks about three specific types of activity undertaken in the three domains introduced above and sitting. The specific types of activity that are assessed are walking, moderate-intensity activities and vigorous intensity activities; frequency (measured in days per week) and duration (time per day) are collected separately for each specific type of activity.

The items were structured to provide separate scores on walking; moderate-intensity; and vigorous-intensity activity as well as a combined total score to describe overall level of activity. Computation of the total score requires summation of the duration (in minutes) and frequency (days) of walking, moderate-intensity and vigorous-intensity activity.

Another measure of volume of activity can be

computed by weighting each type of activity by its energy requirements defined in METS (METs are multiples of the resting metabolic rate) to yield a score in MET - minutes.

A MET-minute is computed by multiplying the MET score by the minutes performed. MET-minute scores are equivalent to kilocalories for a 60 kilogram person. Kilocalories may be computed from MET-minutes using the following equation: MET-min x (weight in kilograms/ 60 kilograms). The selected MET values were derived from work undertaken during the IPAQ reliability study undertaken in 2000-2001. Using the average MET score was derived for each type of activity (Ainsworth *et al.*, 2000). For example; all types of walking were included and an average MET value for walking was created. The same procedure was undertaken for moderate-intensity activities and vigorous-intensity activities. These following values continue to be used for the analysis of IPAQ data: Walking = 3.3 METs, Moderate PA = 4.0 METs and Vigorous PA = 8.0 METs.

There are three levels of physical activity suggested for classifying populations; these are the new proposed levels, which take account of the concept of total physical activity of all domains. The proposed levels are: [i] 'inactive'- MET less than 600 [ii] 'minimally active'- MET 600 to 1500 [iii] 'HEPA active' (health enhancing physical activity; a high active category) = MET above 1500. The MET values used in the above formula were derived from the IPAQ validity and reliability study undertaken in 2000-2001(Craig *et al.*, 2003).

■ OBSERVATIONS AND DISCUSSION

A Chi-square test of goodness-of-fit was performed to determine whether the three category scores were equal. The results shows that, the category score was not equally distributed in the population, X^2 (2, N = 2947) = 23.638, p = .000, Contingency co-efficient =.089, p= .000. Among the male college students of Kerala 42.84 per cent (n=494) were found inactive, 23.16 per cent (n=267) found minimally active and 34 per cent found HEPA active. In the case of female students, 50.11 per cent were found inactive, 16.61 per cent found minimally active and 33.28 per cent found HEPA active category.

Adequate levels of physical activity (PA) positively influ- ence health (Bacevicien*et al.*, 2013). Globalisation and urbanisation have created an environment that

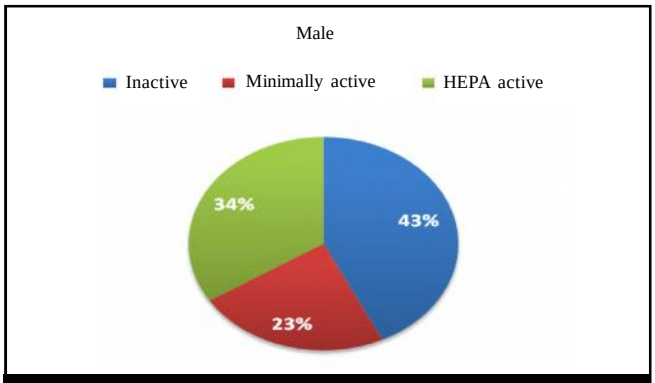

Fig. 1 : Physical activity categories of male students

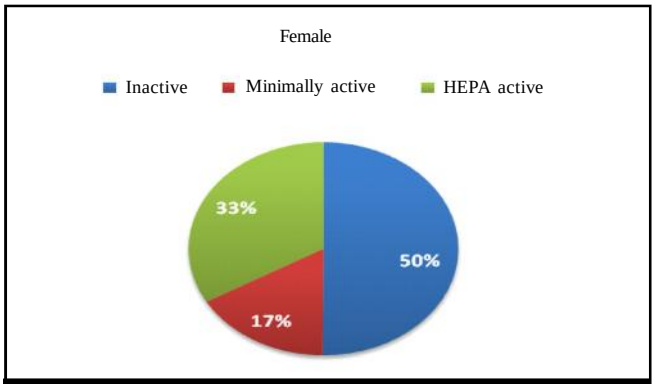

Fig. 2 : Physical activity categories of female students

Table 1 : Gender wise physical activity category scores of college students

			Category score			Total
			Inactive (MET 0 ≤ 599)	Minimally active (MET 600≤ 1499)	HEPA active (MET ≤ 1500)	
Gender	Male	Count	494	267	392	1153
		Expected count	545.0	221.1	386.9	1153.0
	Female	Count	899	298	597	1794
		Expected count	848.0	343.9	602.1	1794.0
	Total	Count	1393	565	989	2947
		Expected count	1393.0	565.0	989.0	2947.0

enhances negative changes in the population's diet and reduces PA, which results in positive energy balances (Malik *et al.*, 2013). Overall, these changes have brought greater risks of weight gain, overweight and obesity (Cunha *et al.*, 2010). Insufficient PA is also associated with frequent occurrence of hypertension and other cardiovascular diseases, type 2 diabetes, breast cancer, bowel cancer and death (Lee *et al.*, 2012). The occurrence of these non-infectious diseases is also reflected in increased health care costs (Janssen, 2012). In the present study found among the college students of Kerala, 43 per cent of male and 50 per cent female found "inactive" with their MET score below 600, "minimally active" male were 23 per cent and 17 per cent female with their MET score between 600 to 1499 and students in "HEPA (health-enhancing physical activity)" category 34 per cent male and 33 per cent female college students found with their MET score above 1500. Hallal *et al.* (2012) in a recent review showed that the prevalence of physical inactivity varied widely between regions of the world: 27.5 per cent in Africa, 43.3 per cent in the Americas, 43.2 per cent in the Eastern Mediterranean, 34.8 per cent in Europe, 17 per cent in South East Asia and 33.7 per cent in the Western Pacific. The current rate of physical inactivity among the college students of Kerala, 43 per cent of male and 50 per cent female seems to be not much varied with other countries. A positive finding of the present study is that more than one third of adult individuals achieve a high PA level. The study found that there was a significant difference among males and females with respect to physical activity, with males being more active. This is in agreement with earlier studies, most of which have reported higher levels of activity in males compared to females (Bergman *et al.*, 2008; Sjostrom *et al.*, 2006; Shah, 2005 and Hallal *et al.*, 2014).

Ranjit *et al.* (2014) found that, in India, of the 14227 individuals studied, 54.4 per cent were inactive (male: 41.7%), while 31.9 per cent were active (male: 58.3%) and 13.7 per cent were highly active (male: 61.3%). The results show that approximately overall 392 million individuals are inactive in India. This is a staggering figure and implies a huge population at risk for developing diabetes and other non-communicable diseases. This underscores the urgent need to improve overall physical activity levels with specific reference to recreational physical activity. This could go a long way in curtailing the twin epidemics of diabetes and obesity in India.

The WHO recommends that individuals should perform at least 150 minutes of moderate to vigorous physical activity per week for the maintenance of health. In India at the present time, more than half of the population does not meet these recommendations. Moreover, individuals appear to derive most of their physical activity from the occupational domain. This is similar to the situation in China and Vietnam, where most of time spent in physical activity is in the work domain (Trinh *et al.*, 2008 and Jurj *et al.*, 2007). As physical activity levels in the occupational domain decline, individuals will have to obtain much of their physical activity requirements through their leisure time pursuits. This assumes significance in view of our findings that over 90 per cent of the population do no recreational physical activity at all.

The world needs to get serious about physical activity. And that means money required for capacity building in public health departments to undertake adequate surveillance, cross sector partnerships, interventions, policy monitoring, and research, especially the cost-effectiveness of interventions. There is extensive evidence about the need for action to improve physical activity, what actions are most promising, and who needs to be involved. But capacity and funding remains insufficient because physical activity is not taken seriously enough to rise to the top of the funding priorities (Das and Horton, 2016). The global pandemic of physical inactivity requires a multisectoral, multi-disciplinary public-health response. Scaling up interventions that are capable of increasing levels of physical activity in populations across the varying cultural, geographic, social and economic contexts worldwide is challenging, but feasible. Policies to support active living across society are needed, particularly outside the health-care sector, as demonstrated by some of the successful examples of scale up identified. Researchers, research funders and practitioners and policymakers in culture, education, health, leisure, planning, and transport and civil society as a whole, all have a role. We should embrace the challenge of taking action to a higher level, aligning physical activity and health objectives with broader social, environmental and sustainable development goals (Rodrigo *et al.*, 2016). The results of the study will encourage policy makers to take physical activity more seriously and for people to take it regularly. We must

continue to strive towards the longer term goal: the integration of physical activity into our daily lives.

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