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Gender differences of physical activity in university students

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Abstract

Background: In the Indian context, there is very less literature available pertaining to the physical activity patterns. Therefore, the aim of this study is to assess the gender differences of physical activity in University students.

Methods: The sample size was 109 University students recruited conveniently, out of which 61 were males and 48 were females. Global Physical Activity Questionnaire (GPAQ) was administered to collect the data. Mann-Whitney U test was employed to analyze the data.

Results: Significant differences were observed in recreational domain, moderate intensity and overall physical activity ($p < .05$). Contrarily, no significant differences were found in work domain, transportation domain and in vigorous intensity activity.

Conclusions: Males were found to be more physically active than females in recreational domain, moderate intensity and overall physical activity.

Keywords: Physical activity, domain, gender, male, female

Introduction

The link between physical activity and health is well-evident. Research has revealed that active beings have a lesser probability of developing several chronic ailments, and exercise is also prescribed to treat of some diseases (World Health Organization 2004; U.S Department of Health and Human Services 1996) [6, 4]. Frightening rates of sedentary behaviour have been detected in developing and developed countries (Monteiro *et al.* 2003) [3], despite many initiatives meant at enhancing activity at population level (U.S. Department of Health and Human Services 2000; Ministério da Saude 2002) [5, 1]. Lately, Bucksch & Schlicht (2006) [2] revealed in their research that sedentary beings can reduce the risk of the entire continuum of diseases by following the recommendations of 30 minutes of moderate-intensity activities per day per week (Bucksch & Schlicht 2006) [2]. Moreover, existing studies revealed that physical activity is related with emotional intelligence, trait emotional intelligence, type A behaviour and health related quality of life (Singh, 2017; Singh *et al.*, 2017; Singh, 2018a; Singh, 2018b) [14, 17, 15, 16].

Earlier studies on gender differences have revealed that males are more active than females in leisure-time (Monteiro *et al.* 2003; Burton & Turrell 2000; Gomes *et al.* 2001; Martinez-Gonzalez *et al.* 2001; Steptoe *et al.* 2002) [3, 10, 12, 9, 11]. However, when compared in all domains of physical activity, no gender differences were seen (Hallal *et al.* 2003) [8]. Some studies have discovered the factors related with physical inactivity among males and females discretely, and majority of them were conducted in high-income nations, where PA patterns are diverse from those perceived within low to middle-income countries.

This study is aimed to find out the differences of physical activity between a sample of male and female students.

Methods

Selection of Subjects

A total of 109 students (males=61 and females=48) of Guru Nanak Dev University participated in the study. The participants were recruited from various departments of Guru Nanak Dev University, Amritsar. The age group of participants was 18 to 30 years.

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The convenience sampling method was used to approach the participants.

Variables of the Study

❖ **Physical activity**

- Domain specific physical activity
- Intensity specific physical activity
- Overall physical activity level

Study Instrument

WHO recommended Global physical activity questionnaire (GPAQ) was used to collect that data for physical activity. Data were processed and cleaned according to the guidelines of WHO STEPS Surveillance Manual (WHO, 2017).

Data processing of Physical activity

The Global Physical Activity Questionnaire is the part of WHO STEPS instrument for physical activity surveillance in countries. It collects information on physical activity participation in three settings (or domains) as well as sedentary behaviour, comprising 16 questions (P1-P16). The domains are:

- Activity at work (work domain)
- Travel to and from places (transportation domain)
- Recreational activities (recreation, leisure-time and sports domain)

It had been tested in large scale population-based surveys with the general adult population (WHO, 2017). METs (Metabolic Equivalents) were used to express the intensity of physical activities. MET is the ratio of a person's working metabolic rate relative to the resting metabolic rate. One MET is defined as the energy cost of sitting quietly, and is equivalent to a caloric consumption of 1 kcal/kg/hour. For the analysis of GPAQ data, existing guidelines have been adopted: It is estimated that, compared to sitting quietly, a person's caloric consumption is four times as high when being moderately active, and eight times as high when being vigorously active. Therefore, when calculating a person's overall energy expenditure using GPAQ data, 4 METs get assigned to the time spent in moderate activities, and 8 METs to the time spent in vigorous activities.

Statistical Analyses

SPSS version 21 software was used for statistical analyses. Data was tested on its normality by using Shapiro-Wilk test. Since the data was skewed, a non-parametric test Mann-Whitney U test was used to assess the gender differences. The level of significance was put at 0.05 value.

Results

Table 1: Gender differences of physical activity with regard to work domain

Variable	N	Median	MET (Min-Max)	Mean rank	p-value
Male	61	180	0-1680	55.43	.866
Female	48	220	0-1800	54.45	

Table 1 presents the results of Mann-Whitney u test between males and females on the variable work domain physical activity. The median value of male group was 180 METs and female group was 220. The mean rank (55.43) of male group was greater than female group (54.45). However, the differences between mean ranks were not statistically significant ($p > .05$).

Table 2: Gender differences of physical activity with regard to Transportation domain

Variable	N	Median	MET (Min-Max)	Mean rank	p-value
Male	61	240	0-1680	59.27	.083
Female	48	0	0-1680	49.57	

Table 2 shows the results of Mann-Whitney u test between males and females on the variable transportation domain physical activity. The median value of male group was 240 METs and female group was 0. The mean rank (59.27) of male group was greater than female group (49.57). However, the differences between mean ranks were not statistically significant ($p > .05$).

Table 3: Gender differences of physical activity with regard to Recreational domain

Variable	N	Median	MET (Min-Max)	Mean rank	p-value
Male	61	600	0-2080	61.60	.013*
Female	48	0	0-2800	46.86	

* indicates $p < .05$

Table 3 presents the results of Mann-Whitney u test between males and females on the variable recreational domain physical activity. The median value of male group was 600 METs and female group was 0 METs. The mean rank (61.60) of male group was greater than female group (46.86). The differences between mean ranks were found statistically significant ($p < .05$). Hence, it can be interpreted that males were more active than females in recreational domain.

Table 4: Gender differences of physical activity with regard to Vigorous intensity.

Variable	N	Median	MET (Min-Max)	Mean rank	p-value
Male	61	0	0-1440	59.01	.058
Female	48	0	0-1800	49.91	

Table 4 presents the results of Mann-Whitney u test between males and females on the variable vigorous intensity physical activity. The median value of male group was 0 METs and female group was 0 METs. The mean rank (59.01) of male group was greater than female group (49.91). However, the differences between mean ranks were not statistically significant ($p > .05$).

Table 5: Gender differences of physical activity with regard to Moderate intensity.

Variable	N	Median	MET (Min-Max)	Mean rank	p-value
Male	61	1000	0-3160	60.36	.045*
Female	48	710	0-4800	48.19	

* indicates $p < .05$

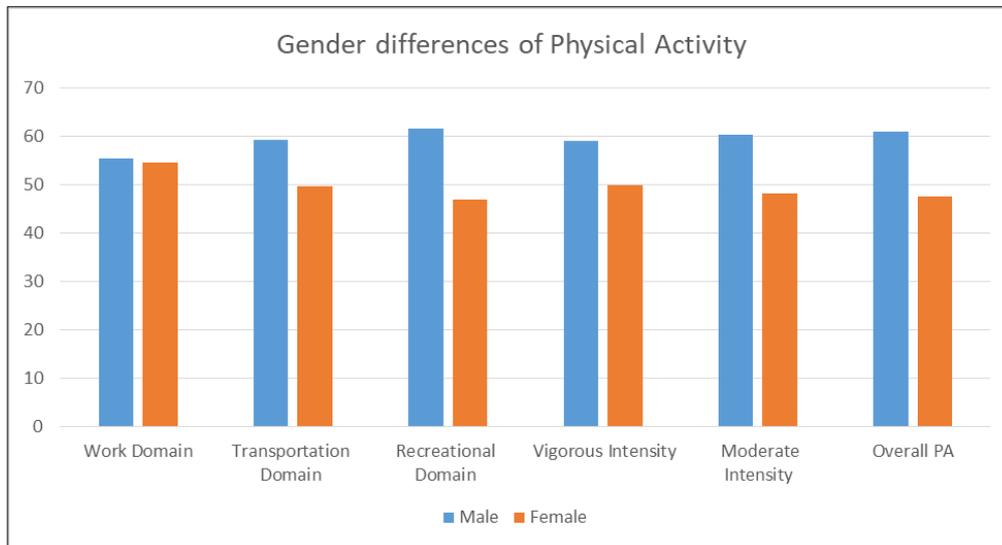
Table 5 presents the results of Mann-Whitney u test between males and females on the variable moderate intensity physical activity. The median value of male group was 1000 METs and female group was 710 METs. The mean rank (60.36) of male group was greater than female group (48.19). The differences between mean ranks were found statistically significant ($p < .05$).

Table 6: Gender differences of physical activity with regard to overall physical activity level

Variable	N	Median	MET (Min-Max)	Mean rank	p-value
Male	61	1500	0-4120	60.89	.028*
Female	48	820	0-4800	47.52	

* indicates $p < .05$

Table 6 presents the results of Mann-Whitney u test between males and females on the variable overall physical activity level. The median value of male group was 1500 METs and female group was 820 METs. The mean rank (60.89) of male group was greater than female group (47.52). The differences between mean ranks were found statistically significant ($p < .05$).

**Fig 1:** Graphical representation of mean rank differences of physical activity between males and females.

Discussion

The purpose of this study was to assess the gender differences with regard to the physical activity levels. Both groups were compared on three domains and intensity levels of physical activity. In work domain, females had more median MET value (220) as compared to their counterpart males (180), however, these differences were not found statistically significant. These median values also indicate the lower levels of physical activity in work domain in both the genders. The results were similar in transportation domain as no statistically significant differences were observed between both groups. The median value of energy expenditure in males (240) and females (0) revealed the extremely low activity in this domain. The recreational domain was the only domain in which both the groups differ significantly ($p < .05$) and males were found to be more active than females. In this domain, MET median value in males was 600 whereas in females, it was zero. With regard to the intensity of physical activity, males had more mean rank in vigorous intensity activity, however the differences were not significant. On the contrary, the differences were significant in moderate intensity activity where males were found to be more engaged in moderate activities than the females. When compared on overall physical activity levels, the differences were found significant and males emerged as more active than females. These results are in harmony with earlier research, which showed that males are more active than females in recreational domain (Monteiro *et al.* 2003; Burton & Turrell 2000; Gomes *et al.* 2001; Martinez-Gonzalez *et al.* 2001; Steptoe *et al.* 2002, Singh, 2017; Singh & Singh, 2017) [3, 10, 12, 9, 11, 14, 17].

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