Original Article

Do College Students At Majmaah University Meet the Weekly Recommended Physical Activity Guidelines? Cross-Sectional Analyses

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Abstract

Background and Aim: Regular engagement in physical activity (PA) has been known to associate with improved health and quality of life measures. Prior research reported that only 46 % of Saudi college students meet the weekly recommended PA volumes. However, these prior studies lack using standardized PA assessment methods, and therefore, this study examined PA levels and calculated the proportions meeting the weekly PA guidelines among college students currently enrolled in Majmaah university, Saudi Arabia.

Methods: Currently enrolled college students at Majmaah university were included. PA levels was evaluated using the International Physical Activity Questionnaire- Short Form. This questionnaire contains 7-items questions regarding the weekly time spent in vigorous- to-moderate PA (MVPA), walking, and sitting behavior. Additionally, proportions meeting the weekly recommended PA was calculated.

Results: One hundred and fifty-eight college students were enrolled (41.2% males, M age= 23. 32 ± 4.5 years, and M body mass index (BMI) = 24.1±5.0 kg/m2). Male college students spent more time in MVPA (p=0.001, d=0.50) and met the weekly recommended PA cutoffs at a higher proportion compared to female college students (p=0.023). There were no other significant differences in PA levels between male and female college students (all p values >0 .05).

Conclusions: Male college students spent more time in higher activity intensity and met the weekly recommended activity cutoffs at a higher proportion than female students at Majmaah university. Future research should examine factors associated with increased activity levels such as socioeconomic status and/or physical or mental status among college students.

Keywords: Activity, Saudi Arabia, Exercise, Students.

Introduction:

Physical activity (PA) is any type of body movements that are governed by the musculoskeletal system, including movements during leisure time and work-related movements. PA is considered a major element for healthy life and better physical function.[1] Reports from the Centers for Disease Control and Prevention (CDC) and from the physical activity guidelines advisory committee (Washington, DC: U.S. Department of Health and Human Service, 2018) suggest that being physically active is associated with improved health and quality of life measures.[2,3] On the other hand, physical inactivity is a prevalent activity behavior that impacts many individuals across the world and it has been linked to high mortality rate and chronic diseases.[4,3]

Currently, several tools are available to assess PA behavior and volumes, including self-reported measures6,[7] and device-measured approaches (e.g., accelerometers).[8] In Saudi Arabia, research on PA level is growing with few attempts to examine PA across various disease populations and healthy individuals.[9,10] However, most of the previous published studies lack specific PA outcomes, including PA behavior-related data among college students. Often, college students' schedule is very tight due to academic duties required to do in a daily basis that would render them to engage in regular sports, that would eventually lead to less activity engagement. Researchers found that only 46% of college students met the weekly recommended PA volumes (World Health Organization [WHO] PA recommendation) in Saudi Arabia.[9] Likewise, most of children through adulthoods are less active and few of them were able to meet the weekly recommended PA guidelines.[11] However, these studies lack using standardized PA assessment methods. Thus, more studies are needed to examine PA levels and whether adults meet the recommended PA levels suggested by public health guidelines.

The current study examined PA levels and calculated the proportions meeting the weekly PA guidelines among male and female college students currently enrolled in Majmaah university, Saudi Arabia. Additionally, we categorized college students into different activity categories based on IPAQjSF activity intensity. The hypothesize was that male college students will spend more time in activity and meet the weekly PA guidelines at a higher proportion compared to female college students. \

Materials and Methods:

Study Design and Participants:

This study used a cross-sectional study design and recruited college students at Majmaah University, Saudi Arabia. Participants who are currently enrolled during study data collection, aged 18 years or older, report negative history of orthopedic, neurological, or cardiovascular diseases, and ambulate freely in the community were invited to participate in this study. Data collection occurred from January to March 2024. The protocol of this study was approved by the institutional review board at Majmaah University (IRB#: MUREC- Sep.3 /COM -2023/26-3) prior to starting the data collection of this study.

Participants provided written informed consent prior to their participation in this study

Demographic and Physical Activity Assessment:

Collected demographic, anthropometric (self-reported), and other relevant data included age, sex, height and weight, study department/college, and study college major. The International Physical Activity Questionnaire-Short Form (IPAQjSF, Arabic version) was used to quantify PA levels. The IPAQjSF is a valid and reliable self-reported PA measure that has been widely used with healthy adults.[7] The IPAQ^SF contains 7 items that capture the recent PA weekly level and sedentary behavior in the last 7 days, including time (minutes/day) spent in vigorous, moderate, and walking as well as time (minutes/day) spent in sitting behavior. Recruitment strategies included distributing flayers around MU campus and word of mouth.

Data Processing and Statistical Analyses:

PA-related Data were collected and converted into minutes/day of time spent in vigorous, moderate, and walking PA intensities using the scoring criteria of IPAQjSF. Outcomes of interest were minutes/day of moderate-to-vigorous physical activity (MVPA), walking, and sitting behavior. Additionally, the cutoffs scores proposed by the American College of Sports Medicine (i.e., ≥21.4 minutes/day of MVPA) was used to determine the proportions of participants who met the weekly recommended PA levels.[3]

The Statistical Package for the Social Sciences guided the data analysis in this study. Descriptive statistics included means and standard deviations for continuous data and frequency and percentages for categorical data. Normality assumptions of the outcomes of interest involved histograms and p-p plots. Independent sample t-tests examined differences in activity levels (MVPA, walking, sitting) between males and females. Participants'proportions meeting the weekly recommended activity levels as well as distribution of participants based on the IPAQjSF activity intensity in both male and female college students were calculated. Additionally, we categorized participants based on IPAQ^SF activity intensity (i.e., high, moderate, vs. low). Cohen's d scores determined effect sizes and were interpreted as: 0.2, small effect size; 0.5, medium effect size; or 0.8, large effect size.

Results:

Adults (n= 158) participated in this study (41.2% males, M age= 23.32 ± 4.5 years, and M body mass index (BMI)= 24.1±5.0 kg/m2). There were no significant differences in age or BMI between males and females (all p>0.05), but there was a significant difference in sex distribution (males=67 vs. females=91; p=<0.001). A detailed demographic summary of the included sample is presented in **Table 1.**

Table 1: Demographic Data for the Sample:

Outcomes	Total Sample	Males	Females	*p* value
Age (M±SD)	23.3±4.5	23.9±4.9	22.9±4.2	0.095
Sex, n (%)	-	67 (43%)	91 (57%)	<0.001
BMI (M±SD)	24.1±5.0	24.9±5.2	23.5±4.7	0.081
Students in health colleges vs. students in non-health colleges, n (%)	Health colleges=106 (67%) Non-health colleges=52 (33%)	-	-	-

Note: M=mean; SD=standard deviation; all data presented as means and standard deviation.

Male students spent more time in MVPA compared to female students (p=0.001, d=0.50) and met the weekly recommended PA cutoffs at a higher proportion compared to female students (p=0.023). There were no other significant differences in PA levels between male and female college students (all p values >0.05). Summary of PA outcomes are shown in **Table 2.**

Table 2: Physical Activity Levels among Male and Female College Students at Majmaah University:

Outcomes	The Sample (n=158)	Males (n=67)	Females (n=91)	*p* value	Effect Size
Average time spent in MVPA (mins; M±SD)	18.8±19.7 minutes/day	24.6±26.6 minutes/day	14.5±10.9 minutes/day	0.001	0.50
Average time spent in walking (mins: M±SD)	12.4±16.3 minutes/day	12.8±15.9 minutes/day	12.1±16.7 minutes/day	0.797	0.04
Average time spent in sitting (mins; M±SD)	329.8±520.9 minutes/day	394.9±759.9 minutes/day	281.6±206.8 minutes/day	0.181	0.20
IPAQ Category, n (%)	High:60 (38%) Moderate: 62 (39%) Low: 36 (23%)	High: 30 (49%) Moderate: 19 (28%) Low: 18 (27%)	High: 30 (33%) Moderate: 43 (47%) Low: 18 (20%)	0.056	-
Proportions meeting recommended weekly PA cutoffs. n (%)	44(27.7)	25 (37 %)	19 (21%)	0.023	-

Note: M=mean; SD=standard deviation; all data presented as means and standard deviation.

Discussion:

In the current study, we examined PA levels in male and female college students at Majmaah University, Saudi Arabia. We found that male students spent more time (minutes) in MVPA, with a moderate effect size and met the weekly recommended PA cutoffs at higher proportions compared to female college students **(Table 2).** Both male and female students spent similar time (minutes/day) walking. Similar pattern was observed with sitting behavior. Lastly, there was no significant differences in participants' distribution based on the IPAQjSF categories (i.e., high, moderate, vs. low) between male and female college students (p values >0.05).

In line with previous studies, our study found that college students were physically inactive. Researchers reported that 58.0% of Saudi college students were physically inactive,[10] with no significant differences between males and female college students

regarding meeting the weekly recommended PA cutoffs levels. Another study reported that the overall inactivity rate among college students in Saudi Arabia is 45%, with female students being more inactive than male students (52% vs. 25%).[13] Moreover, a study conducted at Umm Al-Qura University showed that 54% of the students did not meet the weekly recommended PA levels based on the PA recommendations by the World Health Organization (WHO).

In our study, we found that 72.3 % of male and female college students at Majmaah University were physical inactive, with a significant difference in the proportions of meeting the weekly PA cutoffs levels between males and females. Sex difference in activity engagement has been discussed and reported in prior research. Specifically, as found in our study, a previous systematic review reported that males in Arab countries are more active than females.[14] Many factors could explain differences in amount of activity spent between males and females in the current study. For instance, prior research showed that males often face few barriers (time availability) to participate in activity/sports compared to females, which may explain the sex variation in activity engagement in the current study.

Importantly, we found that male students engaged more time in higher/intense activity behavior (~25 minutes/day of MVPA) compared to female students (~15 minutes/day of MVPA).This evidence was also supported when we further categorized our IPAQjSF data into activity-based intensity (METs) as: low, moderate, or high. We found that majority of male students were classified as high, whereas majority of female students were classified as moderate, but no significant differences were observed. Several reasons may justify this variation in our findings. First, the higher rate of inactivity behavior among Saudi college students is not surprising. According to previous reports announced by the Ministry of Health (2005) in Saudi Arabia showed that physical inactivity is 67% prevalent in adult age between 18 and 64 years (n =3,547).

Our study is not without limitations. First, the design of this study yielded a one-time point assessment, where we lack tracking PA activity and sedentary behavior overtime. Additionally, this study used a self-reported PA tool to quantify activity volume, which could lead to overestimation of activity behavior (on average, self-reported PA measures tend to overestimate activity by 84%).[17] A gold-standard PA assessment approach such as body-worn devices (e.g., hip/ankle/waist-worn accelerometers) should be implemented in future research work to accurately evaluate PA levels. Future studies should examine factors associated with higher PA levels such as socioeconomic status, mental health, and/or physical function that would enable researchers to design interventional studies with an overall goal of increasing activity levels among college students.

Conclusion:

In the current study, male college students spent more time in higher activity intensity and met the weekly recommended activity

cutoffs at a higher proportion than female students at Majmaah university. There were no differences in weekly time spent in walking or sitting between male and female college students at Majmaah University. Future research should examine factors associated with increased activity levels such as socio-economic status and/or physical or mental status among college students.

List of abbreviations in the order of appearance

PA - Physical activity, MVPA - Vigorous-to-moderate physical activity, BMI - Body Mass Index, IPAQ.- SF International Physical Activity Questionnaire - Short Form, SD - Standard Deviation

Conflict of Interest: Author declares that there is no conflict of interest.

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