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### ORIGINAL RESEARCH ARTICLE

## LEVELS AND BARRIERS OF PHYSICAL ACTIVITY AMONG UNDERGRADUATE MEDICAL STUDENTS IN QASSIM, SAUDI ARABIA

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### ABSTRACT

**Background:** Physical inactivity is a known risk factor for a number of non-communicable diseases. This paper reports levels and barriers of physical activity among medical students in Unayzah, Qassim.

**Methods:** A cross sectional study was conducted among 174 undergraduate students in Unayzah College of Medicine using an online questionnaire. Physical activity was measured using Short form-International Physical Activity Questionnaire (IPAQ). Level of physical activity was classified into three categories; Low, moderate and high according to standard scoring.

**Results:** About 45% (79) of the respondents were male and 75% (130) belonged to basic academic years. Forty percent (70) participants had high physical activity, 32% (55) had moderate and 28% (49) had low physical activity levels. We found no significant difference in the levels of physical activity with respect to gender and academic performance. Significantly higher physical activity was observed among clinical years. Commonly reported barriers to physical activity were, study pressure, lack of time and laziness. Significantly higher proportion of females 43% reported lack of place as barrier compared to male 30%.

**Conclusion:** This study found that more than quarter of the students was physically inactive. There is need for creating conducive and gender sensitive environment for encouraging physical activities.

**KEY WORDS:** Exercise, Intensity, Obstacles, Medical College

## INTRODUCTION

Evidence suggests that physical activity (PA) has effects on normal growth and development, reduces risk of chronic diseases and affects body functions [1]. Physical inactivity is associated with cardiovascular diseases, type II diabetes mellitus, stroke and mental illnesses [2-4]. There is also evidence of positive effect of physical activity among patients of osteoarthritis, osteoporosis, diabetes, breast cancer and inflammatory bowel diseases [2,5,6]. Physical inactivity is estimated to be the main cause for approximately 21–25% of breast and colon cancers, 27% of diabetes and approximately 30% of ischemic heart disease burden [7]. Physical inactivity (lack of physical activity) is the fourth leading risk factor for global mortality (6% of deaths globally) [8].

Globally it is estimated that about 23% of adults were not active enough in 2010 (men 20% and women 27%). This burden is higher in high income countries where 26% of men and 35% of women were insufficiently physically active, as compared to low income countries where, 12% of men and 24% of women were inactive [9].

A recent systematic review reported prevalence of physical inactivity among Saudis to range from 26% to 85% in males and from 43% to 91% in females [10]. An analysis of household national survey on physical activity reported about 67% of the participants were physically inactive (60.1% male and 72.9% female) [11]. There were wide regional variations in the prevalence of physical inactivity across the Kingdom. One national survey found physical inactivity to be highest in northern and central northern regions [11] while another reported inactivity to be highest in central region and lowest in southern region [12]. These differences could be due to instruments used to measure physical activity, criteria used for the physical inactivity, age, gender and population included in the studies [10]. Commonly associated factors with physical inactivity include; gender, age, marital status, education, employment status, income [12,13].

Today's medical students will be physicians tomorrow. A study has reported a positive correlation between students' physical activity behaviors and their counselling about PA to patients [14]. However, there are few studies published about physical activity among medical students. A study among medical students of Jazan University, Kingdom of Saudi Arabia (KSA) found a high prevalence of inactivity among study participants 88% [15]. This prevalence was significantly higher among females 91.7% compared to males 83.8%. Commonly reported barriers to physical activity were; academic work and lack of appropriate place for physical activity [15]. Another study among medical students in Riyadh found prevalence of physical inactivity to be 53%. They also found a positive association between physical activity and students' academic performance [16].

This study aimed to measure levels and barriers of physical activity and its association with academic performance among medical students in Unayzah College of Medicine.

## METHODS

Ethical approval for the study was obtained from institutional review board of Qassim University (Letter No: 190305). Informed consent was obtained from all the participants.

This was institution based cross sectional study conducted in Unayzah College of medicine, Qassim, KSA between January and April 2018. The participants in this study were medical 1st to 5th academic year students enrolled in Unayzah college of Medicine at the time of data collection.

The sample size was calculated using OpenEpi online sample size calculator and applying finite population formula [17]. Expected prevalence of physical activity was assumed to be 12% from a previous study from Jazan, KSA [15]. At 95% confidence level and a bound on error of 4% the required sample size was 174. The questionnaire was sent to the participants through college students' social media group.

Information about physical activity was obtained using International Physical Activity Questionnaire (IPAQ) short version [18]. This version of IPAQ contains question about number of days and duration of vigorous exercise (lifting heavy objects, running, playing football, or swimming) and moderate physical activity lifting light objects, or sweeping the house, walk for at least 10 minutes at a time and time spent sitting. All the information was collected for last seven days. We also inquired about the perceived barriers to physical activity.

Data was entered on excel sheet. METs and level of physical activity were calculated by preformed excel program [19]. This program calculated METs and levels of physical activity as Low, Moderate and High according to IPAQ short form categorical scoring. Low: If not moderate or vigorous. Moderate: a) 3 or more days of vigorous-intensity activity of at least 20 minutes per day, OR b) 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day, OR c) 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum T=total physical activity of at least 600 MET-minutes/week. Vigorous: a) Vigorous-intensity activity on at least 3 days (20min minimum, achieving a minimum total physical activity of at least 1500 MET-minutes/week OR b) 7 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum Total physical activity of at least 3000 MET-minutes/week. Academic years were classified into basic (1st year pre-medical, MD1 and MD2) and clinical (MD3 and MD4). Further analysis was carried out in Statistical Package for Social Sciences (SPSS Version 21.0). Frequencies and proportions were calculated. Chi-square test was used to assess the differences in proportion among gender, Grade Point Average (GPA) and academic year categories. Mann-Whitney U test was used to compare the means between groups as data was skewed. P-value less than 0.05 was considered significant for inferential statistics. Informed consent was obtained from the participants.

## RESULTS

A total of 174 participants completed the survey questionnaire of which about of 45% (79) were male. Majority belonged to basic academic years 75% (130) and about 37% (64) had GPA less than 4. Prevalence of high physical was found to be 40% (70) while moderate was 32% (55). A little more than quarter 28% (49) had low physical activity levels (Figure 1).

No significant difference was found in physical activity levels of male and female p-value 0.257. Similarly no association was observed with academic performance (GPA) of participants and levels of physical activity p-value 0.378. There was significant association of academic years and level of physical activity p-value 0.01. (Table 1)

Table 2 is representing comparison of mean METs minutes per week from walk, moderate and vigorous activities and total between gender, GPA categories and academic year. There was no significant difference in total MET minutes per week among both the genders (p-value 0.194), however male had significantly higher MET minutes per week from vigorous activities compared to female, p-value 0.001. There was no significant difference in METs minutes per week with respect to GPA, p-values >0.05. Those in the clinical years had significantly higher total METs minutes per week (3798), compared to those in basic years (2861) p-value 0.025. Similarly there were significantly higher METs minutes per week from vigorous activities among clinical year students (1472) compared to basic year students (760) p-value 0.004.

Overall the most common reported barrier to physical activity was study pressure 76%. Higher proportion of female 80% compared to makes 71% reported study pressure as barrier to physical activity; however this difference was not statistically significant. Second most common reported barrier was lack of time 72%. A significantly higher proportion of female 79% compared to male 65% reported lack of time as barrier to physical activity p-value 0.034. Lack of place was reported by about 30% of the respondents as barrier. This was significantly higher among female 43% compared to male 14% p-

value  $<0.001$ . Preoccupation with family tasks was reported by about 24% of the participants. Significantly higher proportion of male 34% compared to female 14.7 % reported preoccupation with family tasks as barrier to physical activity. Other commonly reported barriers were laziness 50%, physical fatigue 31%, harsh weather 17% and high cost of gym 14% and these were similar across both the genders. (Table 3)

## DISCUSSION

In this study we assessed the physical activity levels of male and female medical students at Unayzah College of medicine. We found that prevalence of high, moderate and low physical activity was 40%, 32% and 28% respectively. The level of physical activity in our study is higher than reported in a study from Jizan university, where about 88% of the students were inactive [15]. The level of high physical activity is similar to that found in a study among medical student in India, 41.3%. However levels of moderate and low physical activity 43.2% and 15.4 % respectively were different from our study [20].

We found no significant difference in physical activity levels of male and female p-value 0.257, which contradicts findings from another study from Jizan, Saudi Arabia where they found overall male were more physically active than female [15]. However in the same study there was no gender difference in physical activity among medicine, dentistry and pharmacy students. Other studies have also found higher physical activity among male compared to female medical and other university students [21,22]. There are mixed findings in the literature about physical activity and gender in Arab countries. International prevalence study on physical activity reported higher physical activity levels among females in Saudi Arabia [23]. A recent systematic review however reported a higher prevalence of physical activity among males [24]. These variations in the findings are possibly due to differences in the definitions, measurements and methodology. Similarly there was no significant difference in total MET minutes per week among both the genders (p-value 0.194), however male had significantly higher MET minutes per week from vigorous activities compared to female, p-value 0.001, this is similar to findings from a study on medical students in Casablanca, Morocco [25] in which boys had practiced more vigorous activity during the last week compared to girls (p-value  $<0.0001$ )

Regarding GPA this study showed no association observed with academic performance (GPA) of participants and levels of physical activity p-value 0.378 which is similar to reported previously [26,27].

We found that those in the clinical years had significantly higher total METs minutes per week (3798), compared to those in basic years (2861) which is in contrast to findings of study from Thailand where they found students in preclinical years had higher METs minutes per week [21]. This difference in the findings may be due to the differences in study and clinical burden between the two settings. Moreover, lower physical activity among students in basic years in our study could be due to large amount of reading material in basic years which the students have to read and also some students find difficulties in managing their time especially in early years of medical college.

Overall the most common reported barrier to physical activity was study pressure 76%. This was also the main factor (89%) affecting the level of physical activity in a study conducted in medical students of Jazan University [15]. Second most common reported barrier was lack of time 72%, which was reported to be the main reason that contribute to inactivity [28]. Lack of place was reported by about 30% of the respondents as barrier. This was significantly higher among female 43% compared to male 14% p-value  $<0.001$ . This is also reported in previous study where significantly higher proportions of female reported lack of place as barrier to physical activity [15]. This gives a clear indication about need to increase the facilities such as gyms and walkways to facilitate physical activity among women in Saudi Arabia.

This is among the few studies to assess the physical activity levels of Medical students in Saudi Arabia using a validated tool. However certain limitations should be considered while interpreting the findings of this study. The data of this study was collected during the active academic session that could

influence the result as there could be variations in the physical activity levels with study burdens among students. Furthermore, study was not powered for differences between groups and association with academic performance; therefore these results should be interpreted cautiously.

A little more than quarter of the students was inactive in our study, which can results in poor health outcomes in the future. Study pressure, lack of time and laziness were most common barriers to physical activity. Institutions should encourage physical activity among students by creating conducive environment for physical activity such as teaching time management, encouraging sports and establishing gyms and walk ways. No significant association between physical activity and academic performance was observed which could be due to inadequate sample size. We therefore, also recommend further large scale studies for in-depth analyses of factors affecting physical activity and its association with academic performance among university students.

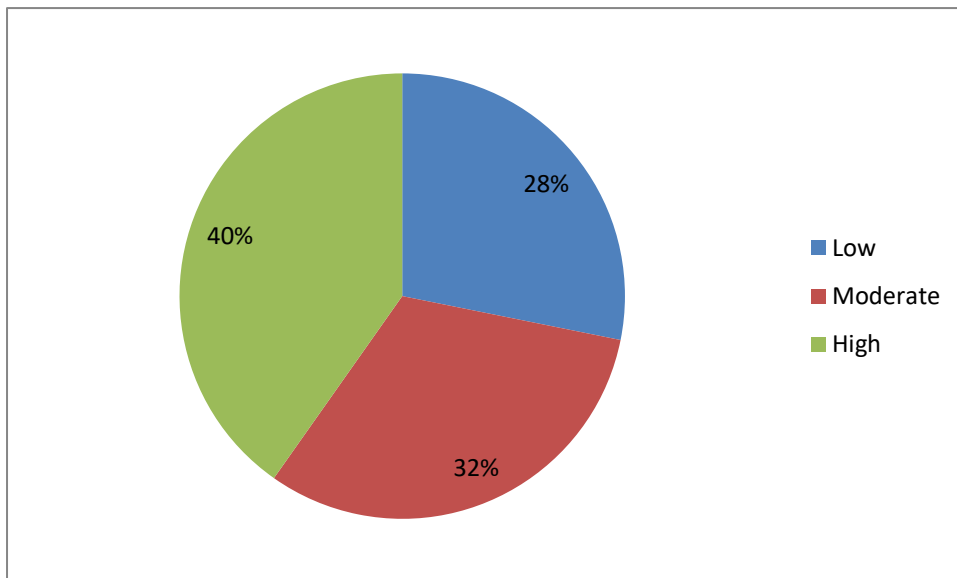
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**Figure 1 Level of Physical activity among students (n = 174)**



**Table 1: Association of level of physical activity with gender and GPA**

Characteristics	Level of Physical Activity			p-value
	Low % (n)	Moderate % (n)	High % (n)	
<b>Gender</b>				
Male	31.6 (25)	25.3(20)	43.0 (34)	0.257
Female	25.3 (24)	36.8 (35)	37.9(36)	
<b>GPA</b>				
<4	23.4 (15)	37.5 (24)	39.1 (25)	0.378
≥4	30.9 (34)	28.2 (31)	40.9 (45)	
<b>Academic Years</b>				
Basic	26.9(35)	37.7 (49)	35.4 (46)	<b>0.01</b>
Clinical	31.8 (14)	13.6 (6)	54.5 (24)	



**Table 2: Physical activity levels in METs minutes per week**

Characteristics	METs minutes per week			
	Total Mean (SD)	Walk Mean (SD)	Moderate Mean (SD)	Vigorous Mean (SD)
<b>Gender</b>				
Male	3407 (2767)	1110 (1118)	936 (1098)	1361 (1788)
Female	2841 (2613)	1278 (1088)	972 (1109)	591 (1303)
<b>P-value</b>	0.194	0.171	0.751	<b>0.001</b>
<b>GPA</b>				
<4	3165 (2840)	1203 (1112)	994 (1078)	967 (1670)
≥4	3059 (2613)	1201 (1101)	934 (1119)	925 (1541)
<b>P-value</b>	0.798	0.931	0.469	0.326
<b>Academic Years</b>				
Basic	2861 (2641)	1201 (1090)	899 (1083)	760 (1502)
Clinical	3798 (2745)	1201 (1148)	1123 (1149)	1472 (1718)
<b>P-value</b>	<b>0.025</b>	0.726	0.240	<b>0.004</b>

**Table 3: Barriers to physical activity**

Barriers	Overall % (n)	Males % (n)	Female % (n)	P-value
Study Pressure	75.9 (132)	70.9 (56)	80.0 (76)	0.162
Lack of time	72.4 (126)	64.6 (51)	78.9 (75)	<b>0.034*</b>
Laziness	50.0 (87)	55.7 (4)	45.3 (43)	0.171
Physical Fatigue	31.0 (54)	26.6 (21)	34.7 (33)	0.247
Lack of place	29.9 (52)	13.9 (11)	43.2 (41)	<b>&lt;0.001*</b>
Family Tasks	23.6 (41)	34.2 (27)	14.7 (14)	<b>0.003*</b>
Weather	16.7 (29)	12.7 (10)	20.0 (19)	0.196
High cost of gym	14.4 (25)	19.0 (15)	10.5 (10)	0.113
Health issues	1.7 (3)	2.5 (2)	1.1 (1)	0.456