Practice of Physical Activity among Femal Medical Students in Saudi Arabia

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Abstract— Background: Collage students face stressors and lack of time that prevent their adoption of healthy practices. Medical students have certain privileges and responsibilities different from others students.

Objectives: To estimate the prevalence rate of practicing physical activity and to determine motivating factors and barriers to physical activity among female medical students.

Subjects and Methods: A cross-sectional study was done on a 177 female medical students of Taif University. The International Physical Activity Questionnaire (IPAQ) short form was used chosen to assess physical activity and the Metabolic equivalent (MET) was used to estimate the metabolic cost (oxygen consumption) of physical activity.

Results: the mean age of the participants was (21.3±1.3 years). Underweight, overweight and obesity were observed in 18.1% , 2.3% and 4.5% of students respectively. About 80% of them low physical activity (≤600 MET min/week), 14.1% reported moderate level (601-3000 MET min/week), and high level (≥3001 MET min/week) was reported in 4.5%. Barriers to physical activities were exhaustion from academic activities (50.8%), lack of time (44.3%) and laziness (42.4%)..

Conclusion: The majority of the participants reported low level of physical activity, and they expressed variability in perceiving the benefits of physical activity. Overcoming the barriers to physical activity will contribute to a further increase in their level of physical activity.

Index Terms— Femal, lack of time, laziness, medical student, over weight, physical activity, under weight.

1. INTRODUCTION

1.1 Background:

Non-communicable diseases are rapidly emerging to replace communicable disease in developing countries.1 These disease include cardiovascular problem, cancer, and diabetes are now among the most prevalent, costly, and preventable of all health problem which strongly associated with unhealthy lifestyle habits including inappropriate nutrition, lack of exercise, smoking, alcohol consumption, caffeine overuse, and improper sleeping habits.2

The physical activity show benefits for both individuals and society in many ways, for example, by increasing productivity, improving morale, decreasing absenteeism, and reducing health-care costs. Other benefits include improved psychological well-being, self-esteem and ability to cope with stress.3 Physical activity is defined as any bodily movement produced by skeletal muscles which result in energy expenditure that can be categorized in to occupational, sports, conditioning, household, or other active daily life activities.4

The behaviors of the students are parts of college life, however unhealthy habits picked up at this level generally persist in adult life.2 Collage life is a period during which the students exposed to stress and lack of time, posing a barrier to adoption of healthy practices.2 The university and collage arenas represent an important opportunity for health and nutritional education. Medical students have more knowledge about health lifestyle and dietary habits. Also they have certain privileges and responsibilities different from others students. So, they must aware that they are often acting in the position of a qualified doctors and that their fitness will affect patients. Medical student should aware that their behavior outside the clinical environment including their physical activity, may have an impact on their fitness to practice medicine.5 The stress involved in meeting responsibilities of becoming a physician may adversely affect the exercise habits of students.6

The Kingdom of Saudi Arabia (KSA) has experienced a rapid progress in improving the health and well-being of its people during the past few decades.7 One of the more significant consequences of the socioeconomic development in KSA has been lifestyle changes with subsequent adverse effects on health. In particular, an increase in obesity and physical inactivity has been evidenced. 7-9 The prevalence of physical inactivity in the Saudi society ranged from 43% to as high as 99% in certain segments of the population.9 While women in KSA by traditional frequently engage in moderately intensive PA due to engagement in housekeeping tasks, 9 they have among the lowest reported prevalence of moderate and vigorously intensive PA (2%) worldwide.10 Furthermore, males reported more frequent participation in high intensity PA than their female counterparts, 11a finding that is consistent with global PA statistics.12

In KSA, empirical studies have in recent decades started to focus on the healthy female population of KSA, 13, 14 reporting an alarming increase in physical inactivity and thus obesity and non-communicable diseases.15 Similar studies have not been conducted on female university students in the southwestern part of KSA, despite the huge importance of studying the current situation of the females' PA. Furthermore, the main determinants for physical inactivity among males and females in KSA was found to be marital status and education level, i.e., spouses and people with lower levels of education were more likely to adopt an inactive lifestyle. 7, 8 The presence of several considerable health threats concomitant with low levels of PA suggest that physical inactivity should be one of the primary targets of obesity prevention in all age groups.

Despite the widely recognized benefits of PA 16-18 and the diversity of global recommendations published on PA, 17, 18 researches on PA levels in female Saudi college students has been sparse, especially with respect to possible correlations with socio-cultural and environmental factors. 19

1.2 Rationale:

- To the knowledge of the researcher, no previous researches were done to study the practices of Saudi female medical students regarding the physical activity in Taif University.
- Many studies showed that there is high prevalence of physical inactivity among Saudi female. Also health benefits of participation in regular exercise are to higher the levels of self esteem and self-concept and lower the level of anxiety and stress.
- Healthy habits among medical students are even more important as they are future physicians and the

STUDENTS WHO PERSONALLY IGNORE ADOPTING HEALTHY LIFESTYLE ARE MORE LIKELY TO FAIL TO ESTABLISH HEALTH PROMOTION OPPORTUNITIES FOR THEIR PATIENTS.

- ☐ THE MEDICAL STUDENTS HAVE BEEN SHOWN TO EXHIBIT EARLY RISK FACTOR FOR CHRONIC DISEASE. ACCORDING TO THIS THE STUDY DESIGNED TO ASSESS PRACTICES AND MOTIVATING AND HINDERING FACTORS OF PHYSICAL ACTIVITY ON FEMALE MEDICAL STUDENTS.

1.3 AIM OF THE STUDY:

TO EVALUATE THE PRACTICES OF PHYSICAL ACTIVITY AMONG UNDERGRADUATE FEMALE MEDICAL STUDENTS.

1.4 SPECIFIC OBJECTIVES:

- ☐ TO ESTIMATE THE PREVALENCE RATE OF PRACTICING DIFFERENT FORMS OF PHYSICAL ACTIVITY AMONG FEMALE MEDICAL STUDENTS.
- ☐ TO DETERMINE THE MOTIVATING AND HINDERING FACTORS FOR THE PRACTICE OF PHYSICAL ACTIVITY.
- ☐ TO IDENTIFY THE ASSOCIATION OF PRACTICING PHYSICAL ACTIVITY WITH AGE, ACADEMIC LEVEL, AND BMI.

2 LITERATURE REVIEW

Rao et al (2012) conducted a study about practice of physical activity among future doctor concluded that 38% of female medical students are physically active and 66% of them though the increase stamina one of the important cause to exercise. Regarding the hindering factors, 60.5% though those lack of time whoever 61.8%, laziness and 42% are exhaustion from academic activities. Also the same study recommend that the encourage of physical activity among medical school need to able them as future doctors to advice patients regarding health lifestyle practices. 6

Another study conducted among Saudi medical students at Taibah University, Madinah, Kingdom of Saudi Arabiaby Allamet al in 2012 concluded that the prevalence of physical inactivity among medical student was high and this indicated the need to improve health promotion among them. 20

EL-Gilany et al, 2011 in their study showed taht 41.1% of Saudi medical student were physical inactive and 10.7% of them showed that there were no barriers to physical activity. They concluded that the commonest barrier was time limitation and 72.4% of Saudi medical student thought that the commonest perceived benefits of physical activity were rank as promotion and maintenance of health. 5

Khalaf et al, 2013 conducted a study to examine the prevalence of physical activity (PA) and associated factors among female university students. This cross-sectional study involved 663 randomly selected female university students who completed the Arab Teens Life Style questionnaire. Data included measurements of anthropometric, socioeconomic and environmental factors, as well as self-reported PA. Ordinal regression was used to identify associated factors with low, moderate and high PA levels. The mean age of participants was 20.4 years (SD 1.5). Mean BMI of the students in relation to PA were 23.0, 22.9 and 22.1 for high, moderate and low levels of activity, respectively. The analysis revealed significantly higher PA levels among married students, those with high educated mothers, and those who lived far from parks, and lower activity levels among underweight students. This study raised four important determinants for female university students' PA levels. These factors could be of great importance in the endeavor to prevent the health-threatening increase in physical inactivity patterns and thus non-communicable diseases and obesity where the focus should be on the specific situation and needs of women in Saudi Arabia.21

Gawwad 2008 conclude that physical inactivity common among KSU students and recommend that the encourage active living within the context of Islamic rules and Saudi culture very necessary. 22

El-Gilany and El-Masry, 2011 conducted a study to describe the pattern of physical activity, predictors of physical inactivity and perceived barriers to and benefits of physical activity among a sample of Egyptian and Saudi medical students. A cross-sectional comparative study was carried out on 319 Egyptian and 297 Saudi medical students. The long form of the international physical activity questionnaire (IPAQ) was used to measure physical activity. Data was analyzed according to the guidelines for data processing and analysis of the IPAQ. Perceived barriers to and potential benefits of physical activity were reported. Physical inactivity was significantly higher among Saudi than Egyptian medical students (41.1% versus 15.4%, respectively). Logistic regression analysis revealed that the independent predictors of physical inactivity were non-membership in sports clubs (OR=4.8) and use of private cars for transportation (OR=2.3), . The most frequent barriers to physical activity are time limitation due to busy study schedule and lack of accessible and suitable sporting places. More than 70% of students perceived that physical activity promotes and maintains health. 23

In Iran, a study conducted by Baradaran-Rezaei et al showed that 39.8% of medical students reported physical activity status and only 6.5% reported appropriate physical activity sta-

tus.24 A study in Thailand found that only 26.8% of medical students had sufficient physical activity.25

With this background in mind the current study done to assess the practices of physical activity among future female doctors and to identify the reasons for exercise and important hindering factors for practices of regular physical activity.

3 METHODOLOGY

3.1 Study Setting:

This study was conducted at female medical college, Taif University. Taif City is located at the West of Saudi Arabia. It is located in the Mecca Province of Saudi Arabia at an elevation of 1700 meters on the slopes of the Al-Sarawat mountains. It has a population of 885,477 (2004 census). Taif University consists of six colleges; the collage of medicine at the Taif University is one of the most recent medical schools in Saudi Arabia. It started on 1425 AH (2005AB). The female part started at 2010AB. In 2010, the number of student was around 700 students (male and female).The female form around 35%of college students.25

3.2 Study design:

It was a cross sectional study.

3.3 Study population:

The study population consists of Saudi female medical students in Taif University enrolled during the academic year 2013-2014. The estimated number of eligible female medical students is 202 students. This figure was obtained from Admission and Registration Deanship. They were distributed as follows; 2nd year (72 students), 3rd yeas (64) and 4th year (66) students. Students of the fifth year were not available at the time of study conduction due to their hospital rotation.

3.4 Inclusion criteria:

The inclusion criteria are:

- 2nd, 3rd and 4th year's female medical students.
- Regular attendees in the University.

3.5 Exclusion criteria:

Students who were absent at the time of study conduction or those who refused to participate in the study.

3.6 Sampling method and sample size :

All female medical students (2nd-4th) years eligible to include were invited to participate in the study.

3.7 Data collection method:

- The International Physical Activity Questionnaire (IPAQ) short form chosen to assess physical activity of the students.

3.7.1 Questionnaire:

The IPAQ short version estimates how much health enhancing physical activity, including daily life activities and exercise, the person has undertaken over the previous 7 days. The questionnaires were distributed to all eligible female students at their college during free times. The reliability and validity of the questionnaire were tested across 12 countries (14 sites) in 2000.27 The findings suggested that it has acceptable tool for use in many settings and in different languages, and is suitable for use in regional, national and international monitoring and surveillance system and for use in research projects and public health program planning and evaluation.28

The IPAQ included questions about physical activity of 3 intensities (vigorous physical activity, moderate physical activity, and walking). The physicians had to estimate how many days (frequency) he/she was physically active and the average time (duration) that he/she spent being physically active on these days. We calculated the total physical activity, MET or metabolic equivalent (MET min/week), as suggested in the Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire for the sum of walking, and moderate, and vigorous physical activity.29 IPAQ classify the subjects to three categorical (ordinal) level based on intensity, duration and the frequency of the physical activity.27

The tool asks for times that individual spent in walking, moderate- and vigorous-intensity physical activities. The volume of activity can be computed by weighting each type of activity by its energy requirements (METs). METs are multiples of resting metabolic rate and a MET- minute is computed by multiplying the MET score of activity by the minutes performed.30

Metabolic equivalent (MET) is a unit used to estimate the metabolic cost (oxygen consumption) of physical activity. One MET equals the resting metabolic rate of approximately 1 kcal/kg/h. MET-minutes is the rate of energy expenditure expressed as METs per minute multiplied by minutes of a specific activity. 31 Using the Ainsworth et al. compendium of the average MET score for each type of activity,30 the following values were used for the analysis of IPAQ data: walking at work = 3.3 METs, cycling for transportation = 6.0 METs, moderate yard work = 4.0 METs and vigorous intensity in leisure = 8.0 METs.29

Body mass index (BMI) assesses the body weight relative to height. It was calculated as weight in kilograms divided by height in meters squared, rounded to one decimal place. Obesity in adults is defined as BMI greater than or equal to 30 kg/m², while BMI from 25-29.9 kg/m² is considered overweight, BMI from 18.5- 24.9 is considered normal while BMI < 18.5 is considered underweight.

3.8 Ethical considerations:

- The study proposal was approved by the Regional Research and Ethics team in Taif Armed Hospitals.
- consent was obtained from Taif University Administration before start the study. The aim of the study was explained to them. Feedback about the results will be sent to them. The investigator helped to construct an educational program, about the importance of physical activity.
- Verbal consent was obtained from each participant to

voluntary participate in the study.

- Data were treated confidentially and will be used only for the purpose of research.

3.9 Data analysis:

Collected data were coded, verified and analyzed using SPSS program version 20. Descriptive statistics was applied in the form of frequency and percentage for categorical variables while mean and standard deviation were utilized for description of continuous variables. Chi-square test was applied to test for the association and/or difference between categorical variables. A p-valus of less than 0.05 was considered as statistically significant.

3.10 Budget:

It is self-funded.

4 RESULTS

The study included 177 female medical students out of 202 invited to participate in the study giving a response rate of 87.6%.

Table 1 summarizes their age and academic level. Their age ranged between 19 and 24 years with a mean of 21.3 years and standard deviation of 1.3 years. More than a third of them (35.0%) were recruited from the second academic level where slightly less than a third were recruited from the third academic level (32.8%) and fourth academic year (32.2%).

As obvious from figure 1, the majority of them (95.5%) were singles whereas only 4.5% were married

Table 1: Age and academic level distribution of female medical students, Taif University (n=177)

	Frequency	Percentage
Age in years		
≤21	**90**	**50.8**
>21	**87**	**49.2**
Range	**19-24**	
Mean±SD	**21.3±1.3**	
Academic level		

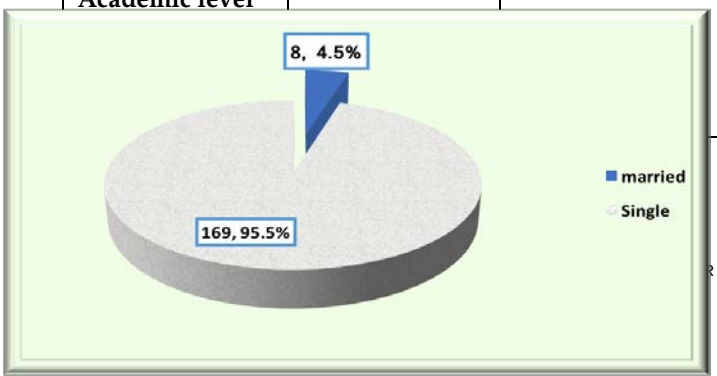

Figure 1: Marital status of female medical students (grades 2nd-4th), Taif University.

Body mass index:

Regarding their body mass index, almost three-quarters of the students (75.1%) were normal. Overweight and obesity were identified among 18.1% and 2.3% of them, respectively whereas underweight was reported among 4.5% of the participants.

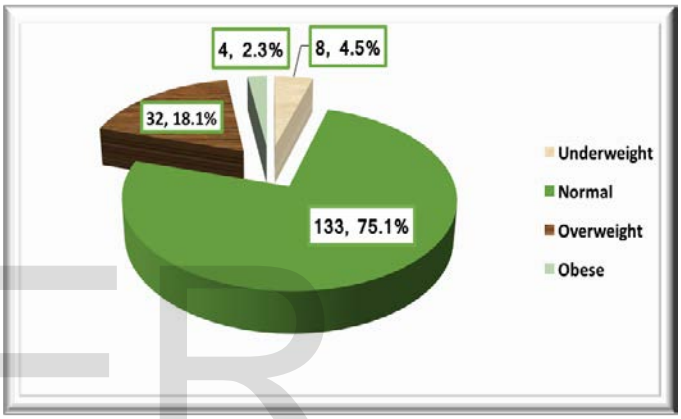

Figure 2: Distribution of the body mass index among female medical students (gragdes 2nd-4th), Taif university.

Physical activity:

As demonstrated in figure 3, most of the students (81.4%) reported low level of physical activity (≤600 MET min/week) whereas 14.1% of them reported moderate level of physical activity (601-3000 MET min/week). High level of physical activity (≥3001 MET min/week) was reported among only eight students representing 4.5% of them.

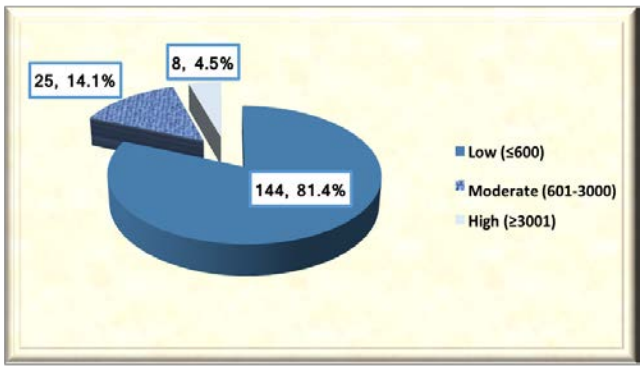

Figure 3: Level of physical activity (MET min/week) among female medical students (gragdes 2nd-4th), Taif University.

As shown in figure 4, vigorous physical activities (heavy lifting, digging, aerobics) were practiced by only 4.3% of students whereas moderate physical activities (carrying light loads, bicycling at a regular pace) were practiced by only 3.3% of them/ Walking was practiced by 45.7% of the students.

Figure 4: Types of physical activities practiced by female medical students (grades 2nd-4th), Taif University.

Regarding duration of sitting (minutes/day), figure 5 shows that 42.4% of the female medical students reported sitting period more than 360 minutes/day.

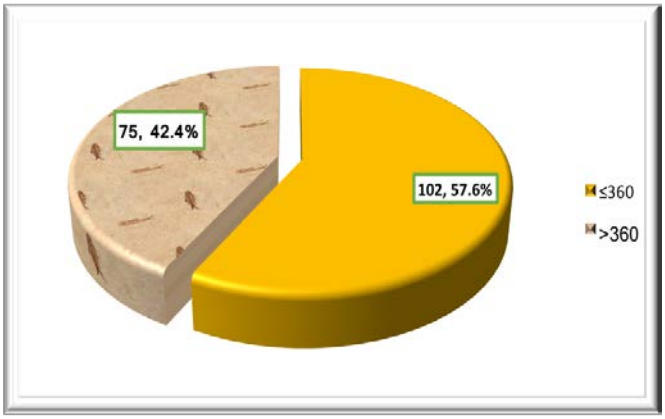

Figure 5: Duration of sitting in minutes/day among female medical students (grades 2nd-4th), Taif University.

Factors associated with physical activity:

Age: Although high physical activity level was more reported among younger students (≤21 years) compared to older students (>21 years) (6.7% versus 2.3%). However, the difference was not statistically significant, p=0.125. Table 2

Marital status	Level of physical activity			χ^2- value (p-value)
	Low N=144 N (%)	Moderate N=25 N (%)	High N=8 N (%)	
Single (n=169)	138 (81.7)	24 (14.2)	7 (4.1)	1.24 (0.539)
Married (n=8)	6 (75.0)	1 (12.5)	1 (12.5)	

Table 2: Association between age and physical activity among female medical students (grades 2nd-4th), Taif University

Age (years)	Level of physical activity			χ^2- value (p-value)
	Low N=144 N (%)	Moderate N=25 N (%)	High N=8 N (%)	
≤21 (n=90)	75 (83.3)	9 (10.0)	6 (6.7)	4.16 (0.125)
>21 (n=87)	69 (79.3)	16 (18.4)	2 (2.3)	

Academic level: Although high physical activity level was more reported among students of fourth academic level compared to those of lower academic levels. However, the difference was not statistically significant, p=0.488. Table 3

Table 3: Association between academic level and physical activity among female medical students (grades 2nd-4th), Taif University

Academic level	Level of physical activity			χ^2- value (p-value)
	Low N=144 N (%)	Moderate N=25 N (%)	High N=8 N (%)	
2nd (n=62)	53 (85.5)	6 (9.7)	3 (4.8)	3.44 (0.488)
3rd (n=58)	47 (81.0)	10 (17.2)	1 (1.7)	
4th (n=57)	44 (77.2)	9 (15.8)	4 (7.0)	

Marital status: As shown in table 4, marital status of the students was not significantly associated with their physical activity level, p=0.539.

Table 4: Association between marital status and physical activity among female medical students (grades 2nd-4th), Taif University

Body mass index: As demonstrated in table 5, body mass index of the students was not significantly associated with their physical activity level, p=0.437.

Table 5: Association between body mass index and physical activity among female medical students (grades 2nd-4th), Taif University

BMI	Level of physical activity			χ^2-value (p-value)
	Low N=144 N (%)	Moderate N=25 N (%)	High N=8 N (%)	
Underweight (n=8)	6 (75.0)	2 (25.0)	0 (0.0)	5.87 (0.437)
Normal (n=133)	109 (82.0)	18 (13.5)	6 (4.5)	
Overweight (n=32)	27 (84.4)	4 (12.5)	1 (3.1)	
Obese (n=4)	2 (50.0)	1 (25.0)	1 (25.0)	

Benefits of practicing physical activities:

As demonstrated in table 6, the commonest benefits of practicing physical activities as reported by the participated female medical students were promote and maintain health (62.7%), improve body image and shape (57.1%), lose weight (40.1%) and psychological wellbeing (41.2%).

Table 6: Benefits of practicing physical activity among female medical students (grades 2nd-4th), Taif University

Benefits	Frequency	Percentage
Promote and maintain health	111	62.7
Improve body image and shape	101	57.1
Lose weight	71	40.1
Spent free times	20	11.3
Psychological well-being	73	41.2
Others	4	2.4

Barriers of practicing physical activities:

As evident from table 7, the commonest barrier of practicing physical activities as reported by the participated female medical students was exhaustion from academic activities (50.8%), followed by lack of safe sorting places (44.3%) and laziness (42.4%). Lack of safe time, lack of support or encouragement from others and having other important priorities were mentioned by 40.1%, 33.9%, and 25.4% of the participants, respectively as barriers for practicing physical activities.

Table 7: Barriers of practicing physical activity among female medical students (grades 2nd-4th), Taif University

Barriers	Frequency	Percentage
Lack of time	71	40.1
Laziness	75	42.4
Have other important priorities	45	25.4
Lack of safe sporting places	71	44.3
Lack of support or encouragement from others	60	33.9
Exhaustion from academic activities	90	50.8
Others	6	3.4

5 DISCUSSION

The process of medical study and training seems to have a negative impact on students' lifestyle such as deterioration in PA level.32 There is compelling evidence that doctor's own PA practices influence their clinical attitudes towards PA.33

Although the well known health benefits of PA, the majority of female medical students were not physically active. The present study revealed that most of our students were of low level regarding PA (81.4%).

This finding with regard to PA levels among females are consistent with studies conducted in similar environments and cultures in other countries.34-37 Al-Hazzaa, 200438 showed a

prevalence of physical inactivity levels that ranged between 43% and 99% among Saudi children and adults alike, in comparison to study conducted by Khalf el al 21that showed a high prevalence of students not meeting the WHO recommendations for PA at a vigorous-intensity level (85%). Results from other international studies conducted in different cultures with similar lifestyle patterns to that of the Kingdom of Saudi Arabia (KSA) 8, 39 also indicated high inactivity levels among female students.40 Reasons for the observed similarities may be explained in terms of a trend towards replacement of an active lifestyle with an increasing frequency of sedentary routines in daily life and a growing trend towards unhealthy weight gain. In addition, global physical inactivity patterns were reported to be more prevalent in affluent societies and among women.12, 41 This trend was also recently reported in KSA.42

In the present study, body mass index was not significantly associated with the physical activity level. However, underweight females were found to be less active than their obese or overweight peers. We do not have complementary data on the health status of the students who participated in the study and suggest further research in this area. The same has been reported by Khalf et al in a study conducted among female University students in Southwestern Saudi Arabia.21 Several explanations may be given for this discrepancy: underweight persons may display a lower level of PA relative to peers with greater BMI due to poor energy levels and/or a greater disposition to fatigue. 43Another reason may be a wish from this group to increase their weight by being physically inactive. 44 Yet, this phenomenon has not been sufficiently studied earlier, and more research on the underweight females' PA patterns is crucial. Previous studies have reported a considerable decline in PA levels, especially among adolescent females in some of the major cities in KSA. 38 International studies, including that of Kimm et al., 41 have shown a significant age-specific decline in PA seemingly correlated with adolescence and the female sex. A recently published review study reported significant correlations between increased BMI and decline in PA levels.45 Contrary to this, a study conducted on American university students of Arabic origin found that the overweight students were more PA than their underweight counterparts.46 Levin et al., 47 also reported that underweight adolescents were less active than what previous studies had indicated.

A number of evidence-based studies indicate that individuals who engage in PA at an adequate level are considered healthier than their physically inactive counterparts.10-12, 16, 48 While recent indications that a large proportion of overweight/obese females are physically active may be a sign that public health efforts and information in KSA have been effective, it may be too early to draw any conclusions of this nature. Messages from public health authorities with regard to the importance of PA are reaching the intended audience and seem to be affecting behavior patterns, but results have not yet been reported on any significant scale. Another possible reason for the reported high PA levels among overweight/obese females could be the self-reported questionnaire that presents a risk for reporting the ideal levels of PA as reported in previous studies, according to Dumith et al.,49 instead of actual levels. Furthermore, a person's perception of the 'amount of effort required to perform an activity' is also involved in her assessment of whether an activity should be characterized as being of low, moderate or high intensity. In the WHO definition of METs, intensity is the rate at which an activity is performed, or the effort required to perform the activity.1 This may provide a partial explanation to why students with a high BMI showed relatively high levels of moderate-high PA. An activity that requires little effort for (some) students with low BMI may require a considerably greater effort on a subjective level for a "larger or heavier" student.

Regarding barriers for practicing physical activity, the study showed that 50.8% of participants reported that exhaustion from academic activities was the most important barrier of being physically active. Lack of time, laziness and lack of safe sporting places were mentioned by 40% to 44% of them as barriers for practicing physical activities. Likewise a study by Rao et.al revealed lack of time and lack of motivation or will as the most significant barrier for practicing regular physical activity by over 50% of the medical professionals.6 Other studies revealed lack of suitable places, time, financial limits and lack of facilities as a barrier to physical activity.50-52

Another important barrier for physical activity although mentioned by a third of female medical students was the lack of support or encouragement from others. This an observation may be at least in part be explained by the propensity of females to engage in household activities.53 The extent to which parental influence impacts the PA patterns of young women has been examined in several studies and shown some or a considerable degree of correlation.54 The students' PA behaviors in relation to indicated effects of parental support of regular exercise can partially be explained by the socioecological model of Sallis and Owen.55 In consistency with the socioecological model, the interpersonal factors seem to have an important role in shaping the students' behavior with regard to PA levels.

This study included 177 female medical students with a response rate of 87.6%. This relatively high response rate can probably be ascribed to the researcher himself in personal contact with the college dean as well as to the explanation of the purpose of the study, scientific importance and value of the study to students. According to Rosnow and Rosenthal (1999).56 these techniques (e.g. personal contact, using reminders and explaining the scientific importance and value of the study, ensuring the participants confidentiality) are linked to increase participation in surveys.

The study also has some limitations, one being limitation is the sample. First, is the possible risk of overestimation or underestimation where physical activity is self-reported. The self-reported total physical activity scores alone do not yield a complete pattern of physical activity. On the other hand, the

questionnaire is the most widely used method in epidemiological studies, while laboratory methods are more expensive and mainly employed for validation purposes. 57 Hence it is evident that validated self-reported questionnaires like the IPAQ are suitable for everyday practice. 58 The cross-sectional design of the survey makes it difficult to sort out the causal relationships among variables studied. Finally, subjects included in the study represented female medical students (grades 2nd-4th), thus the findings cannot be generalized beyond those in other areas in KSA. Despite these limitations, findings from this study have tentative implications for public health policies and programs.

6 CONCLUSION

The majority of female medical students of Taif University reported low level of physical activity. They expressed variability in perceiving the benefits of physical activity. There are many barriers to physical activity including exhaustion from academic activities, lack of time, laziness, lack of safe sporting places, lack of support or encouragement from others and having other important priorities. Overcoming these barriers together with consideration of students' suggestions may contribute to a further increase in their level of physical activity.

7 RECOMMENDATIONS

1. The importance of applied interventions that could help to decrease the perceived barriers by provision of playgrounds in each medical college and modifying medical school curriculum. So an integrated and comprehensive intervention could increase the likelihood of engagement in PA.
2. Medical students will be the future health care providers, so they should have an important role in promoting PA and fitness among all people.
3. Efforts to improve the educational system, including the implementation of physical education classes for females should be made, and a larger number of public facilities for sports and exercise should be established specifically for women and adolescent girls.
4. Supporting programs to increase self-efficacy in order that future physicians will develop increased confidence to participate despite perceived and actual barriers to physical activity.
5. The study should be replicated with additional samples of female medical students from other universities in the kingdom

6. Finally, national studies addressing PA patterns of medical students for Saudi population are urgently needed. Such surveillance will provide precious information for public health authorities and policy-makers.

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