

# Physical activity profile of students in Mansoura University, Egypt

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مرتسم النشاط البدني لطلبة جامعة المنصورة في مصر  
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**الخلاصة:** أجرى الباحثون دراسة مستعرضة لألف وسبع مئة وثمانية من طلبة جامعة المنصورة في مصر لتوصيف نمط النشاط البدني لديهم، والمنبئات بالحمول البدني، وعوائق ومزايا النشاط البدني في رأيهم. وقد استخدم الباحثون الاستبيان الدولي للنشاط البدني IPAQ لقياس النشاط البدني. وقاموا بتحليل المعطيات وفقاً للدلائل الإرشادية للتعامل مع المعطيات وتحليلها في الاستبيان الدولي للنشاط البدني. كما قاموا بسؤال الطلبة عن العوائق والمزايا المتوقعة للنشاط البدني. وتبين أن أكثر من 11% من الطلبة لم يكونوا يمارسون نشاطاً بدنياً. وتحليل التحوُّف اللوجستي، كانت المنبئات المستقلة بانعدام النشاط البدني هي المعايير الاقتصادية والاجتماعية للأسرة (OR = 2.1)، والجنس الأنثوي (OR = 1.8)، والتعليم الطبي (OR = 1.8)، وعدم الاشتراك في عضوية الأندية الرياضية (OR = 1.6). وكانت أكثر عوائق النشاط البدني تَوَارِدًا هي الوقت، ونقص الأماكن الرياضية الملائمة التي يسهل الوصول إليها. وقد ذكّر أكثر من 70% من المشاركين أن النشاط البدني يعزّز الصحة ويحافظ عليها.

**ABSTRACT** A cross-sectional study was carried out on 1708 students from Mansoura University, Egypt, to describe the pattern of physical activity, predictors of physical inactivity and perceived barriers to and benefits of physical activity. The International Physical Activity Questionnaire (IPAQ) was used to measure physical activity. Data were analysed according to the guidelines for data processing and analysis of the IPAQ. Perceived barriers to and potential benefits of physical activity were asked for. More than 11% of students were physically inactive. On logistic regression analysis, the independent predictors of physical inactivity were high socioeconomic standard of the family (OR 2.1), female sex (OR 1.8), medical education (OR 1.8) and non-membership in sports clubs (OR 1.6). The most frequent barriers to physical activity were time limitation and lack of accessible and suitable sporting places. More than 70% of the participants stated that physical activity promotes and maintains health.

## Profil de l'activité physique des étudiants de l'Université de Mansoura (Égypte)

**RÉSUMÉ** Une étude transversale a été conduite auprès de 1708 étudiants de l'Université de Mansoura (Égypte) pour décrire les caractéristiques de leur pratique sportive, les obstacles et les avantages perçus en la matière et les facteurs prédictifs de l'inactivité physique. Le questionnaire international sur l'activité physique (IPAQ) a été utilisé, et les informations ont été analysées conformément aux directives sur le traitement et l'analyse des données de ce questionnaire. Les étudiants ont été interrogés sur leur perception des obstacles et avantages potentiels de la pratique d'une activité physique. Plus de 11 % des étudiants étaient physiquement inactifs. Selon une analyse de régression logistique, les facteurs prédictifs indépendants de l'inactivité physique étaient les suivants : statut socioéconomique familial élevé (O.R. 2,1), sexe féminin (O.R. 1,8), formation médicale (O.R. 1,8) et absence d'inscription dans un club de sport (O.R. 1,6). Les obstacles les plus fréquents à l'activité physique étaient les contraintes de temps et l'absence de lieux accessibles et adéquats pour la pratique d'un sport. Plus de 70 % des participants ont affirmé que l'activité physique favorisait durablement une bonne santé.

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Received: 15/11/09; accepted: 25/02/10

## Introduction

Health-enhancing physical activity is that which benefits health and functional capacities without harm or risk. This term includes the full range of human movement, such as competitive sports and exercise, active hobbies, cycling or the physical activities of daily living [1–3]. Physical activity is the key strategy for reducing the risk of chronic diseases. Regular physical activity helps build and maintain healthy bone and muscle, reduces the risk of developing obesity, reduces feelings of depression and anxiety and promotes psychological well-being [4–8].

In his systematic review on the prevalence of university students' participation in physical activity of 19 studies from 27 countries, not including Egypt, Irwin concluded that more than half the university students in the United States of America (USA) and Canada were not active enough to gain health benefit [9]. Internationally the same was true, with Australian students having the highest level of sufficient activity. Other international studies concluded that the majority of university students were insufficiently physically active [10,11].

Physical activity habits during adolescence and youth are likely to be important influences on habitual physical activity throughout adult life [12]. Opportunities for physical activity are largely determined by social, economic, and cultural factors as well as physical environments that influence access, availability and utilization [13].

To the best of authors' knowledge, no studies have been done to assess physical activity pattern among the Egyptian population in general and specifically among university students. The objectives of this study were to assess the levels of physical activity, study predictors of physical inactivity, and perceived barriers to and benefits of physical activity among students at Mansoura University, Egypt. Such studies could

pave the way for planning a programme for physical activity promotion among university students.

## Methods

The study was carried out in Mansoura University, Egypt, 1 month before examinations during the academic year 2007–08. Mansoura University is one of the biggest public universities in Egypt and has specialized medical centres which provide both medical and academic services. The main campus in Mansoura comprises 13 faculties; 4 faculties are located off campus. A total of 124 386 students were enrolled in all faculties in 2007–08.

Students of Mansoura University were the target population. Colleges outside the city were not included for logistic reasons. Only a few (3) students with chronic disease or disability were also excluded. This was determined as self-reported by students.

Verbal approval was obtained from the authorities of each college to conduct the survey in the setting as there is no research ethics committee at the moment in the university. After obtaining approval for data collection, the researchers introduced themselves to the students in each cluster and informed them about the aim of the study and about guarantees of anonymity and confidentiality. Students were allowed to respond in their own time and in private. Participation was entirely on voluntary basis after giving verbal consent.

## Study tool

An anonymous, self-administered questionnaire was used to collect data on sociodemographic characteristics, membership in sports clubs, and physical activity using an Arabic language translation of the long form of the International Physical Activity Questionnaire (IPAQ) [14].

A list of potential barriers to physical activity/sports participation was prepared and students required answering whether these are not barriers, permanent barriers or temporary barriers. Opinions about the potential benefits of physical activity and suggestions to promote physical activity among university students were also included in the questionnaire.

The long form of IPAQ is used to collect data on physical activity levels among young and middle age adults (15–69 years) over the previous 7 days. This version provides detailed information for evaluation purposes. The reliability and validity of the questionnaire were tested across 12 countries (14 sites) in 2000. The findings suggest that it has acceptable properties for use in many settings and in different languages, and is suitable for national population-based prevalence studies of participation in physical activity [15,16].

The long form of the IPAQ questionnaire was translated into Arabic separately by 2 bilingual translators (first 2 authors). The 2 versions were combined and revised and then back translated into English by the last 2 authors. The translation was refined after back translation until agreement was obtained among the 4 translators. Seven bilingual experts (staff members of Department of Public Health, College of Medicine, Mansoura University) examined the Arabic version of the questionnaire for content and construct validity and agreed upon it. A list of possible barriers to physical activity was developed by the authors and approved by the staff members. The questionnaire was then piloted for comprehension and ease of administration.

## Pilot study

A pilot study was done on 50 university students attending the University Students' Hospital for inconsequential conditions e.g. acne, blood donation. During this pilot study the Arabic version of the IPAQ and the list of barriers

were tested and the level of physical inactivity was used to calculate the sample size for the full scale study. The Arabic version was retested on 41 of the same students who attended for follow-up after 1 week. The test–retest correlation coefficients ranged from 0.73 to 0.87 for the total physical activity score and the domain-specific score and activity specific scores.

### Study variables

The outcome variables are the total physical activity score, domain-specific scores, activity-specific scores and physical activity levels.

The predictor variables were age in years, sex, college, residence (urban or rural), education and work of father and mother, and membership of sports club or participating in university sports activities. Social score and socioeconomic status were calculated according to Fahmy and El-Sherbini [17], which incorporates parent's education and work, family income and number of persons per room within the home.

Students were asked to think about all the vigorous and moderate activities that they had done in the previous 7 days. Vigorous physical activities are those that take hard physical effort and make a person breathe much harder than normal. Moderate activities refer to activities that take moderate physical effort and make a person breathe somewhat harder than normal [14].

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 [18].

### Sampling

Sample size was calculated using *Epi-Info*, version 6.02. According to the student affairs administration, the total number of registered students on the

main campus was 109 067. The pilot study showed that about 10% of students were physically inactive. With the worst acceptable level 8.5%, the sample needed for the study was estimated to be about 1515 students at a study power of 80% and 95% confidence level. To overcome the attrition due to cluster sampling, 10% was added to the sample size giving a final sample size of 1667.

A multistage, stratified, cluster sampling technique was adopted. In the first stage the university colleges were stratified into medical (medicine, pharmacy, dentistry, veterinary and nursing), other practical (engineering, agriculture, physical education) and non-practical/theoretical (education, commerce, law, arts). The sample size was distributed proportionally between these 3 categories. In the second stage, 1 college or more was selected from each group. Lastly, in each college students were stratified into the different academic years. From each year a section or group (cluster) was randomly chosen. All students in the chosen clusters were included. A total of 1885 students were registered in 47 chosen clusters (40–50 students in each cluster). The response rate was 90.6% (1708 out of 1885). Reasons for non-participation were absence during the study period (3.8%), incomplete questionnaires (3.3%) and lack of interest in the study (2.2%).

### Data analysis

Using the Ainsworth et al. compendium of the average MET score for each type of activity [18], 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 [16].

Data were analysed using *SPSS*, version 16. Descriptive statistics were presented as mean and standard deviation (SD), first, second (median) and third quartiles (Q1, Q2 and Q3) of total physical activity score, domain-specific scores and activity-specific scores as

proposed by IPAQ Research Committee [16]. Physical activity scores and levels were calculated according to the guidelines for data processing and analysis of the IPAQ. Continuous scores were expressed as MET-minutes per week (MET level × minutes of activity/day × days per week) [16].

In categorical data, the Chi-squared test was used for comparison between groups. Significant factors predicting of physical inactivity on bivariate analysis were entered into multivariate logistic regression analysis to find out the independent predictors of physical inactivity. Odds ratio and 95% confidence interval was calculated.  $P < 0.05$  was considered statistically significant.

## Results

Age of participating students ranged from 17 to 25 years, with a mean of 19.6 (SD 1.6) years. About half (49.9%) were males and 54.9% were rural residents.

### Pattern of physical activity

Total physical activity score, domain-specific scores and activity-specific scores were non-parametric (skewed) in distribution. The total physical activity score ranged from 0 to 32928.0 (mean 3133.0; median 2256.0) MET-min/week. The highest median score was observed in the walking domain, while domestic and gardening activities had the lowest median score. Regarding the activity levels, 11.3% of students were physically inactive, 52.0% had moderate and 36.7% had high physical activity levels (Table 1).

### Predictors of physical inactivity

In bivariate analysis, sex, grade, college, residence, participation in university sports activities, membership of sports clubs, father's and mother's education level, family income and socioeconomic standards were significant predictors of physical inactivity. The non-significant

**Table 1** Descriptive statistics of physical activity scores and levels among Mansoura University students (n =1708)

Physical activity & domain	Min-max	Median (IQR)	Skewness
<b>Total physical activity score (MET-min/wk)</b>	0-32928	2256 (91-4111)	2.77
<b>Domain-specific score (Total MET-min/wk)</b>			
At work	0-24906	594 (120.0-1491)	3.94
For transportation	0-13104	346 (132.0-738)	3.71
From domestic & gardening activities	0-6600	60 (0-488)	3.27
In leisure time	0-11016	264 (0-982)	3.1
<b>Activity specific score (total MET-min/wk)</b>			
Walking	0-13068	1023 (0-1848)	2.45
Moderate	0-16980	405 (0-1260)	3.53
Vigorous	0-23520	0 (0-840)	4.42
<b>Physical activity level</b>	<b>No.</b>		<b>%</b>
Low	193		11.3
Moderate	889		52.0
High	626		36.7

IQR = inter quartile range (first-third quartiles).

MET-min/wk = metabolic equivalent-minute/week.

independent variables were age, parent's work and family size (Table 2). The independent predictors of physical inactivity as revealed by logistic regression analysis are presented in Table 3. Females were about 2 times more likely to be physically inactive than males, also students of the college of medicine were more likely to be physically inactive (OR = 1.8), while students of physical education were the least likely to be physically inactive (OR = 0.1). Non-membership of sports clubs was associated with greater physical inactivity (OR = 1.6). Students of high social class families were about 2 times more likely to be physically inactive compared to those with low/very low social class.

### Barriers to physical activity

No barriers to physical activity were reported by 63 (3.7%) students. The perceived barriers reported are listed in Table 4. The commonest permanent barriers were time limitation, lack of accessible and suitable sporting places and lack of support and encouragement from others. The commonest temporary barriers were not being interested in sports, time limitation, unsuitable (hot or cold) weather and feeling tired on physical activity.

### Benefits of and suggestions for promoting physical activity

The commonest perceived benefits of physical activity were promotion and maintenance of health, improving body image and shape, improving muscle power, spending free time, weight control and psychological wellbeing (Table 5). More than two-thirds of the students suggested the provision of free playgrounds in each college to practice sports during free time to promote physical activity in the university.

### Discussion

This study showed that 11.3% of participants were physically inactive, much lower than the 45.8% of college students in a Saudi Arabian study [19]. Only 26.4% of university students in a Lebanese study were engaged in physical exercise [20]. About one-third of Chinese and Brazilian university students were physically inactive [21,22]. Makrides et al. [23] reported that fewer than half of university students in Canada participated in exercise 3 or more times per week. A previous study in the USA [24] found that only 39% of students exercised 3 or more times

per week. Another American study reported that 47% of college students did not engage in vigorous physical activity and 17% were physically inactive [25]. The National College Health Risk Behavior Survey (NCHRBS) in the USA reported that 42% of college students participated in vigorous activity at least 3 times a week, while an additional 20% participated in moderate activity [26]. Staten et al. reported that 39% and 41% of university students were vigorously and moderately physically active [27]. National statistics also show that in many countries at least one-quarter of all young people are deemed physically inactive [28]. Among university students of 23 countries the prevalence of inactivity in leisure time varied with cultural and economic development factors, averaging 23% (northwestern Europe and USA), 30% (central and eastern Europe), 39% (Mediterranean), 42% (Pacific Asia), and 44% (developing countries) [11]. This variation in the level of physical inactivity between different countries is a reflection of socioeconomic development, technology and urbanization.

Analysis of the risk factors of physical inactivity using regression analysis



**Table 2** Bivariate analysis of predictors of physical inactivity among Mansoura University students (*n* = 1708)

Predictor	Total	Physically inactive No. (%)	OR (95% CI)
<b>Overall</b>	1708	193 (11.3)	
<b>Age (years)</b>			
< 20	768	93 (12.1)	1.2 (0.9–1.6)
20+	940	100 (10.6)	Ref
<b>Sex</b>			
Female	856	123 (14.4)	1.1 (1.4–2.6)
Male	852	70 (8.2)	Ref
<b>Grade</b>			
<b>Preparatory and first</b>	319	53 (16.6)	1.0 (0.5–1.8)
2nd	714	83(11.6)	0.6 (0.4–1.1)
3rd	307	23(7.5)	0.4 (0.2–0.8)
4th	264	16(6.1)	0.3 (0.1–0.7)
5th & 6th	104	18(17.3)	Ref
<b>College</b>			
Medicine	331	64 (19.3)	1.5 (0.9–2.5)
Engineering	282	37 (13.1)	1.0 (0.6–1.7)
Physical education	247	2 (0.8)	0.1 (0.01–0.2)
Education	229	11 (4.8)	0.3 (0.2–0.7)
Law	211	23 (10.9)	0.8 (0.4–1.4)
Arts	196	27 (13.8)	1.1 (0.6–1.9)
Commerce	212	29 (13.7)	Ref
<b>Residence</b>			
Urban	771	111 (14.4)	1.8 (1.3–2.4)
Rural	937	82 (8.8)	Ref
<b>University sports activity</b>			
No	1415	171 (12.1)	1.7 (1.0–2.8)
Yes	293	22 (7.5)	Ref
<b>Membership of sports clubs</b>			
No	1223	162 (13.2)	2.2 (1.5–3.4)
Yes	485	31 (6.4)	Ref
<b>Father's work</b>			
Professional/employee	1131	132 (11.7)	1.0 (0.6–1.5)
Farmer/manual worker	295	27 (9.2)	0.7 (0.4–1.3)
Other	282	34 (12.1)	Ref
<b>Father's education</b>			
< Secondary	952	134 (14.1)	1.7 (1.1–2.8)
Secondary	456	33 (7.2)	0.8 (0.5–1.5)
> Secondary	300	26 (8.7)	Ref
<b>Mother's work</b>			
Housewife	871	101 (11.6)	1.1 (0.8–1.5)
Working outside the home	837	92 (11.0)	Ref
<b>Mother's education</b>			
< Secondary	736	112 (15.2)	1.6 (1.1–2.4)
Secondary	598	43 (7.2)	0.7 (0.4–1.1)
> Secondary	374	38 (10.2)	Ref
<b>Family size</b>			
< 6 persons	906	113 (12.5)	1.3 (0.9–1.8)
6+ persons	802	80 (10.0)	r
<b>Family income</b>			
Able to save	732	104 (14.2)	2.3 (1.2–4.7)
Enough	811	78 (9.6)	1.5 (0.8–3.0)
Not enough	165	11 (6.7)	Ref
<b>Socioeconomic standard</b>			
High	599	98 (16.4)	2.3 (1.6–3.2)
Middle	396	38 (9.6)	1.2 (0.8–1.9)
Low & very low	713	57 ( 8.0)	Ref

OR = odds ratio; CI = confidence interval; Ref = reference group.

**Table 3 Logistic regression analysis of independent predictors of physical inactivity among Mansoura University students (n =1708)**

Predictor	$\beta$	P	OR (95%CI)
<b>Sex</b>			
Female	0.6	$\leq 0.001$	1.8 (1.3–2.5)
Male	–		Ref
<b>College</b>			
Medicine	0.6	0.04	1.8 (1.02–3.3)
Engineering	0.1	0.8	1.1 (0.6–2.1)
Physical education	–2.5	0.001	0.1 (0.0–0.4)
Education	–0.7	0.07	0.5 (0.2–1.1)
Law	0.2	0.6	1.2 (0.6–2.3)
Arts	0.4	0.2	1.5 (0.8–3.0)
Commerce	–		Ref
<b>Membership of sports clubs</b>			
No	0.5	0.04	1.6 (1.0–2.5)
Yes	–		Ref
<b>Socioeconomic standards</b>			
High	0.7	$\leq 0.001$	2.1 (1.4–3.1)
Middle	0.2	0.4	1.2 (0.8–1.9)
Low/very low	–		Ref
Constant		–2.7	
Model $\chi^2$		125.3; $P \leq 0.001$	
Correctly predicted (%)		88.7	

OR = odds ratio; CI = confidence interval; Ref = reference group.

revealed that females were about 2 times more likely to be physically inactive than males. The same finding has been reported by many studies in different cultures and different age groups [9,11,21,29–32]. In traditional communities, females face social pressures that have historically linked physical power and athleticism to maleness: femininity is not consistent with vigorous activity and sport play. Cultural norms and values in Egypt are more permissive for boys and restrict females to the domestic domain [33].

Membership in sports clubs and coming from a family of high socioeconomic status were significant independent predictors of the high likelihood of physical inactivity. Similar findings have been reported in the USA and Hong Kong, where daily participation of adolescents in school physical education classes, use of recreation centres, high maternal education, and high family income were all associated with high level

of physical activity [22,34]. In contrast to our findings, low socioeconomic standard was related to sedentary behaviour and low levels of physical activity [35].

In the present study, medical students were about 2 times more likely to be physically inactive while students of physical education were less likely to be physically inactive compared to students of commerce. This is a direct reflection of the physical education practical curricula implemented in this college.

There are 2 cognitive variables, which account for physical activity levels: perceived benefits and perceived barriers. Perceived benefits can positively improve participation in physical activity while, barriers can negatively influence it [36]. Only a minority of the students in our study reported no barriers. Time limitation (permanent or temporary) was by far the most important barrier to physical activity. The

most cited temporary barriers were lack of interest in physical activity, having other important priorities and unsuitable weather. These were more or less similar to findings reported by other studies where lack of time due to busy lesson schedule, parents giving academic success priority over exercise, lack of time due to responsibilities related to family and social environment, lack of available /convenient facilities, injuries, health condition, perceived lack of support from parents and peers who were concerned more about students' academic performance than their participation in physical activity were the most cited items for physical activity barriers [30,35–37]. It seem that parents and caregivers play a key role in creating a culture in the home and community that is supportive of participation in physical activity by children and young people [31].

People are more active when they can easily access key destinations such

**Table 4 Barriers to physical activity and sporting among Mansoura University students (n =1708)**

Barrier	Permanent		Temporary	
	No.	%	No.	%
Time limitation	703	41.2	606	35.5
Lack of accessible and suitable sports place	606	35.5	400	23.4
Lack of safe sporting places	545	31.9	379	22.2
Lack of support and encourage from others	534	31.3	415	24.3
Lack of friends to encourage me	493	28.9	407	23.8
Have other important priorities	475	27.8	578	33.8
Lack of sports programme that suits my physical fitness	442	25.9	435	25.5
Not interested in sports	429	25.1	694	40.6
Lack of motivation	418	24.5	469	27.5
High cost	378	22.1	411	24.1
Lack of sports skills	344	20.1	388	22.7
Fear of failure in sports competition	319	18.7	462	27.0
Fear of injury	286	16.7	379	22.2
Fear of deterioration of physical illness	282	16.5	189	11.1
No person caring for my family	264	15.5	242	14.2
Feeling tired on physical activity	244	14.3	514	30.1
Ignorance about benefits of sports	241	14.1	345	20.2
Prefer to not attend to sports places	240	14.1	244	14.3
Lack or low physical power	238	13.9	481	28.2
Feeling of inability to practice sports adequately	235	13.8	486	28.5
Objection of parents	228	13.3	347	20.3
Body cannot tolerate physical activity	216	12.6	270	15.8
Previous failure in sports competition	187	10.9	427	25.0
Unsuitable (hot or cold) weather	178	10.4	525	30.7
Previous bad experience with physical sports activity	150	6.1	446	26.1

Categories are not mutually exclusive.

No barriers was reported by 63 (3.7%) of students.

as parks, green spaces, work places and shops. Other barriers to active living include fear of crime, road safety, transport emissions and pollution; problems with access and/or lack of recreation and sports facilities; and negative attitude to physical activity and public transport [32].

In this study, the majority of students reported 1 or more benefits of physical activity, especially the promotion and maintenance of health. In contrast, Haase et al [11] reported that knowledge about activity and health was disappointing, with only 40%–60% being aware that physical activity was relevant to risk of heart disease. Physical activity is consistently associated with fewer symptoms of

anxiety and depression, fewer self-reported sleep problems, improved sleep quality and improved social well-being [31,38–40].

This study has 2 important features. First our findings may shed light on interventions that would promote physical activity in university students. Second, it highlights levels, barriers to and perceived benefits of physical activity in Egyptian youth for the first time. However it has some limitations. The study was carried out in students of single university during the academic year. The levels of physical activity may differ in other youth groups and may vary during vacations and the time of examinations. University students are better educated and

may be more aware about benefits of physical activity than other young people. Only simple health beliefs were measured in this study, but many cognitive and attitudinal factors are known to correlate with physical activity, and examining a broader range of psychosocial variables may help to explain the motives behind the practice of physical activity.

Taking into account the significance of the college years as a transition from adolescence to adulthood, physical activity at the university should be encouraged as a preventive measure against chronic diseases and to improve quality of life through adult and elderly life. There is a need for clear, practical guidelines for practising physical

**Table 5 Perceived benefits of and suggestions to promote physical activity among Mansoura University students (n =1708)**

Benefit/suggestion	No.	%
<b>Perceived benefit</b>		
No benefits	119	7.0
Promote and maintain health	1202	70.4
Improve body image and shape	953	55.8
Improve muscle power	950	55.6
Spent free times	905	53.0
Weight control/obesity prevention	898	52.6
Psychological wellbeing	864	50.8
Recreation	786	46.0
Prevent diseases <sup>a</sup>	861	50.4
Improve mentality and intellectuality	772	45.2
Companionship with others	719	42.1
Socializing	588	34.4
Other <sup>b</sup>	88	6.2
<b>Suggestions to promote physical activity</b>		
No suggestions	135	7.9
Free playgrounds in each college to practice sports during free time	1143	66.9
Educating students about benefits of physical activity	742	43.4
Include sports education in curricula	551	32.3
Other <sup>c</sup>	207	12.1

Categories not mutually exclusive.

<sup>a</sup>e.g. diabetes mellitus, cardiac diseases and hypertension.

<sup>b</sup>Fun and enjoyment (59), improve sleeping (14), self-dependence (10), relieve tension (5).

<sup>c</sup>Low fees for membership in youth and university sports clubs (114), separate playground for males and females (61), sports training (10), organizing monthly sports day (6), care for sports injuries (9), more incentives for sports participation (7).

activity in university students. Factors identified as predictors of physical inactivity should be taken into account in the design of interventions. University curricula should include the opportunity for all students to participate in physical activity. More research on effective strategies to promote all forms

of physical activity is needed. Provision of free playgrounds in each college to practise sports during free times would promote physical activity among university students.

In conclusion the majority of students of Mansoura University are either moderately or highly physically

active and perceive the benefits of physical activity. Despite these findings, there are many barriers to physical activity. Overcoming these barriers together with consideration of students' suggestions may contribute to a further increase in their level of physical activity.

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