

Physical Inactivity Prevalence and Determinants among Assiut University Students, Egypt

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Abstract:

Background: Physical inactivity (PI) became an alarming epidemic. University students are considered an interesting group for studying the prevalence and determinants of PI. Interventions for promotion of healthy lifestyle, including physical activity in this group is a way of ensuring a good physical and mental health not only as young adults but also later in life. **Objectives:** This study was conducted to estimate the prevalence of physical inactivity and its determinants among Assiut university students. **Method:** A multistage stratified cluster sampling was used to conduct a cross-sectional study among a representative sample of Assiut University student (850 students). A self-administered Global Physical Activity Questionnaire (GPAQ) was used to collect the data. **Results:** Total respondents were 805 (95%). The mean age was 20.2 ± 1.8 years old. Males represent 53.4% and the sample includes 56.5% of theoretical faculties students, 29.0% of practical faculties and 14.5% of medical faculties. The prevalence of physical inactivity was 14.3% (9.3% among males and 20.0% among females). The odds of physical inactivity are nearly 3 times more in females (CI= 1.707 – 4.719, $p < 0.001$). Also, the chance of physical inactivity increased by 2.4 times among student of medical faculties (CI= 1.330 – 4.251, $p = 0.003$) and nearly two times among students of practical faculties (CI= 1.170 – 3.129, $p = 0.019$). **Conclusion:** Most of Assiut University students either moderately or highly active and only 14.3% were physically inactive. Predictors of physical inactivity among Assiut University students are being a female and student of medical or practical faculty.

Key Words: *Physical Inactivity, Assiut University, Prevalence, Egypt*

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Introduction:

Physical inactivity (PI) was identified as the fourth leading risk factor for non-communicable diseases (NCDs), preceded only by tobacco use, hypertension, and high blood glucose levels, causing about 3.2 million deaths each year.¹ Regular physical activity reduces the risk of ischemic heart disease, stroke, diabetes and breast and colon cancer. Additionally, regular physical activity is a key determinant of energy expenditure and is therefore fundamental to energy balance, weight control and prevention of obesity.^{2,3}

Physical activity (PA) is defined by WHO as any body movement produced by skeletal muscles that require energy expenditure. Physical activity occurs across different domains, including work, transport, domestic duties and during leisure.⁴ Worldwide, 31.1% of adults are physically inactive. Women are more inactive 33.9% than men 27.9%.⁵ The prevalence of inactivity varied greatly between WHO regions; 43.3% of people are inactive in the Americas, 43.2% in the Eastern Mediterranean, 34.8% in Europe, 33.7% in the western Pacific,

27.5% in Africa and 17.0% in southeast Asia.⁵

The estimated prevalence of physical inactivity in Arab countries was 43.7%; higher in women (49.2%) than men (37.6%).⁶ In Egypt according to results of Stepwise survey conducted in 2011-2012; the prevalence of physical inactivity among adults aged 25-64 years was 32.1%; higher in women (42%) than men (23.3%).⁷

Diverse studies have shown that physical activity decreases significantly through passing youth years (15-24 years according to UNFPA), and this may be explained by the fact that physical activity practice becomes a voluntary activity when individuals leave school and start to work or to study at university.^{8,9} In a study among a random sample of university students from 22 universities in low, middle income countries including Egypt, the prevalence was 20.7%.¹⁰ A cross-sectional study conducted among university students in 23 low-, middle- and high-income countries the prevalence of physical inactivity was 41.4 %, ranging from 21.9 % in Kyrgyzstan to 80.6 % in Pakistan.¹¹ Another study among university students from 23 countries reported that prevalence of leisure time physical inactivity varied according to the region, it was 23% in North-Western Europe and the United States, 30% in Central and Eastern Europe, 39% in Mediterranean, 42% in Pacific Asia, and 44% in developing countries.¹²

In Egypt, a cross-sectional study was conducted in Al-Mansoura University and revealed that 11.3% of students were physically inactive, among which females were more inactive (14.4%) than males (8.2%).¹³

The university venue is an ideal environment for the promotion of physical activity and other health lifestyle practices. So, conducting such study is important to determine the current situation and to develop a set of

recommendations for interventions to ensure the good level of physical activity in the university life.

Objectives: The main objectives of this study were to estimate the prevalence of physical inactivity among Assiut University students and to identify its determinants among them.

Method

This was a cross-sectional study conducted on Assiut University. Assiut University was established in October 1957 as the first university in Upper Egypt. Now in 2018 the university includes 18 faculties inside Assiut city.

Egyptian Students in Assiut University was the target population. Students enrolled in faculties outside the Assiut city, Faculty of Physical Education and non-Egyptian students were excluded.

Sample design: Target students were selected randomly by using a multistage stratified cluster sampling technique.

At the first stage, Faculties within Assiut University was stratified into 3 strata; Theoretical, Practical, and Medical (then faculties were chosen randomly from each stratum and ended up with 4 faculties; two theoretical "Faculty of Law and Faculty of Social Service", one practical "Faculty of Engineering", and one medical "Faculty of Medicine".

In the second stage, students within each faculty was stratified into 2 strata (first & fourth scholastic year) to represent early and late stages of university life.

In the third stage a cluster sample was chosen from each scholastic year within each faculty (practical sections or small classes). The clusters were chosen through simple random sample.

Sample size: Sample size was calculated using Epi- Info, version 7. Based on previous study conducted in Egyptian university the prevalence of physically inactive university students was 11%.¹³

With a confidence level of 95%,

acceptable margin of error 2.5 % and design effect 1.2 the sample needed for the study was estimated to be about 710 students. To compensate the drop outs / incomplete questionnaires, 15% was added giving a final sample size of about 850 students. The sample was distributed proportionally between faculties.

Data collection tool and technique: Data of the present study were collected through self-administered questionnaire; the questionnaire was consisted from two parts: a. Sociodemographic characteristics, this part includes social and demographic factors related to student which may affect or determine his/her physical activity. b. Global Physical Activity Questionnaire (GPAQ), it is a questionnaire designed by WHO for surveillance of physical activity for adults. It has been designed to identify the level of physical activity in different domains "Work, Transport and Recreation time". It was validated to be used in Arabic language and through self-administration technique.^{14,15}

Data were collected at the middle of first semester of the academic year 2016-2017 away from exam times.

Data management and statistical analysis: Data management including data entry, cleaning and statistical analysis were done by using IBM SPSS software, version 20.

Physical activity time and levels were calculated as following: Total weekly time spent in physical activity, time spent in each domain were calculated by multiplying the number of days/week in each category by the duration on an average day (Days/week X average duration/day) and Minutes per week in each category then multiplied with metabolic equivalents [MET; which reflect multiples of resting energy expenditure specific to moderate (4 METs) and vigorous (8 METs) intensity activities to divide the students' physical activity levels into three categories

Table (1): Time spent in physical activity (minutes/ week) by gender of Assiut University

according to GPAQ analysis guide (Low "Inactive"; if < 600 MET-minutes/Week, Moderate; If 600- 1500 MET- minutes/Week, High; If > 1500 MET- minutes/Week).

Descriptive statistics in the form of frequencies, mean and SD were used to describe the sample characteristics and to find the prevalence of physical inactivity. Then, to test the relationship between physical inactivity and studied variables, bivariate analysis was done by proper statistical test (Students' T-test, Mann Whitney-test, Chi-square (X^2) and Fisher's exact tests). After that, Multivariable analysis by binary logistic regression analysis was applied. Variables included in the model were those suspected to determine the physical activity level from literature and those significant at the bivariate level. Odds ratio was calculated as a measure of association at 95% confidence limit.

In all statistical tests used, statistical difference considered significant when P-value was less than 0.05.

Ethical consideration:

The proposal was approved via the Ethical Review Committee of Assiut Faculty of Medicine before starting data collection. Written informed consent was obtained from participating students (at front page of the questionnaire). Administrative permission was obtained from the higher authorities of the University and selected faculties.

Results

From 850 students the respondents were 805, with 5% incomplete questionnaires and dropouts.

Characteristics of the sample and socio-demographics (Tables 2 &3): The mean of age of sampled students was 20.2±1.8 years old with nearly equal percentage of students enrolled in the first year and fourth year of university. Males represent

students (2016/2017)

Physical activity (PA) time (Mean ± SD)	Males (n= 430) (53.4%)	Females (n= 375) (46.6%)	P-value *
Total PA time	349.8 ± 201.2	304.2 ± 192.3	0.002
Domain-specific time:			
Work/Domestic activities	101.1 ± 108.5	104.1 ± 107.1	0.446
Transport	133.1 ± 106.3	110.9 ± 91.9	0.002
Recreational activities	115.7 ± 118.4	89.1 ± 116.3	< 0.001
Type-specific time:			
Vigorous	83.1 ± 91.3	58.7 ± 84.4	< 0.001
Moderate	133.7 ± 128.7	134.5 ± 126.0	0.710

* Mann-Whitney test was used.

53.4% of the sample and the sample include 56.5% of theoretical faculties students, 29.0% of practical faculties and 14.5% of medical faculties.

Another characteristic studied was the residency of students during the academic year; about 33% of students were resident with their families inside Assiut city and 17% with their families but outside the Assiut city so they should travel to their college daily or according to their schedule. On the other hand, about 49% of students was accommodated away from their families; in university dormitory (26.3%), apartment alone or with colleagues (8.6%) or private students' hostels (14%). Student who have job mainly works during vacations only and represent 16.8% of sampled student. Among studied students there was 26.0% of males have a membership for sport club compared to 9.4% of females.

The study also investigated the socio-demographics of students. As regards parents' education and work, 74.3% of students' fathers completed secondary and above levels of educations compared to 59.6% of students' mothers. Most of students' fathers working in professional work or as employee (31.8% and 25.3%

respectively) while most of mothers were house wives 55.6%. The mean of students' family size was 6.2±1.8 member including parents. The main residency of students' family was also investigated, and nearly equal percent of student were from urban and rural areas. Family income in the most of cases were enough and able to save (44.1% and 43.6% respectively).

Prevalence of physical inactivity and physical activity levels:

Among Assiut university students the prevalence of physical inactivity was 14.3%. Physical inactivity among males was 9.3% compared to 20.0% among females. As regard active students, 41.6% were moderately active and 44.1% were highly active. Males showing more activity levels than females (Figure 1).

Table (1) shows the differences between students as regard the time spent in PA as minutes per week. Generally, males spent more time in doing PA than females.

Predictors of physical inactivity:

Bivariate analysis to compare between physically active and inactive students revealed that, females were more physically inactive, with percentage of

Table (2): Relationship between students' characteristics and physical inactivity among Assiut university students (2016/2017)

Characteristics	Physically active (n= 690) (85.7%)		Physically inactive (n= 115) (14.3%)		Total (n= 805) (100%)		P- value*
	No.	R%	No.	R%	No.	C%	
Age:							
< 20	325	84.2	61	15.8	386	48.0	0.238
≥ 20	365	87.1	54	12.9	419	52.0	
Gender:							
Male	390	90.7	40	9.3	430	53.4	< 0.001
Female	300	80.0	75	20.0	375	46.6	
Faculty:							
Theoretical	402	88.4	53	11.6	455	56.5	0.020
Practical	196	84.1	37	15.9	233	29.0	
Medical	92	78.6	25	21.4	117	14.5	
Academic year:							
First year	340	84.6	62	15.4	402	49.9	0.357
Fourth year	350	86.8	53	13.2	403	50.1	
Residency during Study: ^a							
Inside Assiut city with family	223	85.1	39	14.9	262	32.7	0.856 #
Assiut Governorate with family ^b (Daily traveling)	119	86.2	19	13.8	138	17.2	
University Dormitory	178	84.4	33	15.6	211	26.3	
Assiut city (Apartment alone or with colleagues)	60	87.0	9	13.0	69	8.6	
Assiut city (Students' hostel)	100	89.3	12	10.7	112	14.0	
Other (not specified)	8	80.0	2	20.0	10	1.2	
Working: ^a							
Yes	168	90.8	17	9.2	185	23.0	0.024
No	522	84.2	98	15.8	620	77.0	
Membership of Sport Club							
Yes	129	87.8	18	12.2	147	18.3	0.427#
No	559	85.2	97	14.8	656	81.7	

* Chi-square test was used, # Fisher exact test was used, ^a Missing values were present (ranged from 1-7) & valid percent was used. ^b Assiut Governorate but outside the Assiut city.

20.0% compared to 9.3% of males and there is a significant statistical difference between them ($p < 0.001$). Students who enrolled in medical and practical faculties were more inactive than those of theoretical faculties (15.9% & 21.4% respectively versus 11.6%) this difference is statistically significant ($p = 0.020$). Also, students who works in a paid job either during vacation only or

during study and vacations shows less percent of physical inactivity (9.2%) compared to those who didn't work (15.8%) and there was a significant statistical difference ($p = 0.024$). Students' age, year of study, residency during the study, membership in sport club didn't show difference in activity level (Table 2). As regards family socio-demographics as family size, residency

Table (3): Relationship between students' family socio-demographics and physical inactivity among Assiut university students (2016/2017)

Socio-demographics	Physically active (n= 690) (85.7%)		Physically inactive (n= 115) (14.3%)		Total (n=805) (100%)		P-value *
	No.	R%	No.	R%	No.	C%	
Family size							
< 6	241	85.2	42	14.8	283	35.2	0.740
≥ 6	449	86.0	73	14.0	522	64.8	
Family Residency ^							
Urban	331	83.8	64	16.2	395	49.5	0.154
Rural	352	87.3	51	12.7	403	50.5	
Family Income							
Able to save	292	83.7	57	16.3	349	43.6	0.145 #
Enough	304	86.4	48	13.6	352	44.1	
Not enough	78	92.9	6	7.1	84	10.5	
Other	11	78.6	3	21.4	14	1.8	
Father's Education ^							
Illiterate/ Read & write	78	90.7	8	9.3	86	10.7	0.595 #
Completed Primary / Preparatory	82	83.7	16	16.3	98	12.2	
Completed Secondary / Intermediate	236	86.4	37	13.9	273	33.9	
University graduate	272	84.2	51	15.8	323	40.1	
Other ^a	18	85.7	3	14.3	21	2.6	
Mother's Education ^							
Illiterate/ Read & write	147	89.1	18	10.9	165	20.6	0.462 #
Completed Primary / Preparatory	120	84.5	22	15.5	142	17.6	
Completed Secondary / Intermediate	220	86.6	34	13.4	254	31.5	
University graduate	186	82.7	39	17.3	225	28.0	
Other ^a	14	87.5	2	12.5	16	2.0	
Father's Work ^							
Farmer / Unskilled & Skilled worker	160	89.4	19	10.6	179	22.2	0.072 #
Professional Work / Employee	383	83.6	75	16.4	458	56.9	
Retired / Not working	104	84.6	19	15.4	123	15.3	
Other ^b	41	95.3	2	4.7	43	5.3	
Mother's Work							
Unskilled & Skilled worker	10	90.9	1	9.1	11	1.4	0.488 #
Professional Work / Employee	195	83.3	39	16.7	234	29.1	
Retired / House Wife	480	86.5	75	13.5	555	68.4	
Other ^b	5	100	0	0.0	5	0.6	

*Chi-square test was used. #Fisher exact test was used. ^ Missing values were present (ranged from 1-7) & valid percent was used. ^a postgraduates / not specified ^b Died / not specified

Table (4): Logistic regression analysis for predictors of physical inactivity among Assiut University students (2016/2017)

Physical Inactivity predictors	P-value	OR	95% C.I.	
			Lower	Upper
Gender (Ref.= Male)				
Female	<0.001	2.839	1.707	4.719
Faculty (Ref. = Theoretical)				
Practical	0.019	1.861	1.107	3.129
Medical	0.003	2.378	1.330	4.251
Academic year (Ref.= Fourth)				
First	0.202	1.321	0.862	2.025
Residence (Ref. = Rural)				
Urban	0.728	0.925	0.596	1.436
Working (Ref.= Yes)				
No	0.866	0.948	0.508	1.768
Membership of Sport Club (Ref.= Yes)				
No	0.870	0.950	0.516	1.751
Constant	< 0.001			

and income and parents' education and work, also didn't show difference in activity level (Table 3).

By multivariable logistic regression for predictors of physical inactivity. The odds of physical inactivity are nearly 3 times more in females (OR= 2.839, CI= 1.707 – 4.719, $p < 0.001$). Also, the chance of physical inactivity increased by 2.4 times among student of medical faculties (OR= 2.378, CI= 1.330 – 4.251, $p = 0.003$) and nearly two times among students of practical faculties (OR= 1.861, CI= 1.170 – 3.129, $p = 0.019$) (Table 4).

Discussion:

The prevalence of physical inactivity in the current study was 14.3%. This percent is slightly higher than that reported by study conducted among Egyptian students at 2011 in Al-

Mansoura university in which 11.3% of students were physically inactive.¹³ Both studies are similar in that, the theoretical, practical, and medical students were included in the sample and PA has been measured by self-administered questionnaires either international physical activity questionnaire (IPAQ) or global physical activity questionnaire (GPAQ). However, in Al-Mansoura study physical education faculty was involved in the sample and it was excluded from the present study as in physical education study programs includes obligatory exercises and their students doing more physical activity. The low percentage of physically inactive students in both universities may reflect the nature of university campus policy, which recently applied as gates didn't allow private cars and taxis to enter so

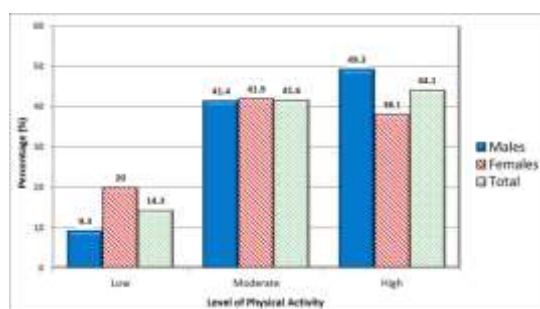


Figure (1) Levels of physical activity among Assiut University students (2016/2017)

students walk to their faculties. Another study among Egyptian university students have been conducted at 2007 in Alexandria University in which 34% of students were inactive.¹⁶ Although it is a higher percent when compared to Assiut and Al-Mansoura but in fact, the mentioned study was conducted among students at university dormitory aimed to assess health related lifestyle; and PA was investigated by asking if student exercising regularly and not by assessment of PA at different domains by standardized comparable questionnaire. Studies conducted in Arab countries reported higher percent of PI among university students. In south-western Saudi Arabia the percent was 58% and among Kuwaiti University students was 45%.^{17,18} In fact, Saudi Arabia and Kuwait are among gulf countries and hot weather is a barrier for PA and sport practice. Moreover, availability of private cars and sedentary lifestyle are high among those countries.^{18,19}

There were two cross-sectional studies conducted cross-countries to estimate the prevalence of PI among university students by using self-administered International Physical Activity Questionnaire (IPAQ). First, is a study among a random sample of university students from 22 universities in low, middle income countries including Egypt the prevalence was 20.7%.¹⁰ The second study conducted among university students in 23 low-, middle- and high-income countries -Egypt not included- the

prevalence of physical inactivity was 41.4%.¹¹ Both studies found a large variation of PI across different countries as development of a country was associated with physical activity level. It is possible that university students from developing countries may have low percentage of PI and this because their increased activity in work and transport domains. On the other hand, students from developed countries engage in higher physical activity levels in recreation / leisure time activities domain than students from developing countries because of having better access to physical activity or sports facilities, have better access to health promotion information and have a higher motivation to participate in physical activity and sports.¹¹

The predictors of physical inactivity in this study are, female gender, medical and practical faculties students.

Among Assiut university students, females were about 3 times more likely to be physically inactive than males. This result is comparable with the study conducted among Egyptian students at Al-Mansoura university as being a female increasing the chance of physical inactivity for 2 times.¹³ Moreover, the same finding has been reported by many studies in different cultures and different age groups.^{12,16,20-22} Also, it is observed that males spent more time in active transport, recreational and vagarous activities than females. This gender deference reflects the community norms and presence of barriers either internal or external among females more than males. Previous studies in both developed²³⁻²⁵ and developing^{12,17} countries revealed that this variation is usual in most of the countries. Cultural practices and habits from children can be associated with the difference in pattern of activity per gender as recreational sports and vigorous activities usually related to maleness and their facilities and training programs

available for males more than females especially in countries like us.^{24,26}

Another predictor of physical inactivity in our study was related to type of faculty as medical faculties students was 2.5 times and practical faculties students 2 times more likely to be physically inactive than theoretical faculties students. Many studies have been conducted among medical students and revealed a high level of physical inactivity among them although of their perception and knowledge about the benefits of physical activity is high^(19,21,27). This may due to the fact of that, medical faculties usually have busy schedules and need a lot of time for study which increase the sitting time and sedentary behaviors among those students. As regard the practical faculties, there was no studies investigated this group specifically but at Al-Mansoura university students of practical faculties were 1.1 time more likely to be physically inactive.¹³ In the present study the sampled practical faculty was an engineering faculty in which students have a lot of obligations and study and this may explain the high physical inactivity among them.

In this study, physical inactivity was higher among students didn't work (in a paid job) either during study or vacation although in a regression model it was not significant predictor. Different studies revealed the same result, students whom work in a paid job usually more active than those did not work.^{9,28} This result can be explained by that PA include different domains one of that was PA at work so when the student works the level in this domain will be increased.

The present study investigated the effect of residency place during academic year on PA of student; as some studies suggested that students whom resident in university dormitories or with their colleagues tend to be more physically active due to peer interpersonal influences.^{9,29} However, this study didn't reveal such difference. Moreover,

membership in sports clubs may influence the level of PA. In this study there was no association between those variables and physical inactivity. On contrast of this finding, many studies reported that membership in sports clubs was predictors of physical inactivity as student who didn't have a membership were more physically inactive.^{13,19,21,30}

Among sociodemographic characteristics the effect of family residency has been studied. In this study, students belong urban areas shows more level of physical inactivity than rural (16% vs. 13%) but it was not statistically different. Previous studied showed that urban inhabitants usually more inactive than rural ones due to modern lifestyle and more sedentary activities belong them.^{13,19,29,31}

Socioeconomic level usually acts as a determinant for physical inactivity as high socioeconomic status associated with physical inactivity.^{11,13,19,21} In this study family size, family monthly income and parents' education and jobs may reflect the socioeconomic status of students and all those variables show no difference between active and inactive student.

Conclusion and Recommendations:

Most of Assiut University students either moderately or highly active and only 14.3% were physically inactive. Males are more active than females and spent more time in active transport, recreational and vagarous activities. Predictors of physical inactivity among Assiut University students are being a female and student of medical or practical faculty. Further studies are needed to determine the barriers of physical activity and to measure the role of university in promotion of healthy life style included physical activity.

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Conflicts of interest: The authors declare that there are no conflicts of interest.

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