

Barriers to Exercise for Overweight/Obese Physiotherapy Students in Egypt. A Cross-Sectional Study

Ahmad Mahdi Ahmad^{*,†,1}, Faten Eltohamy Megahed², Magda Ramadan Zahran Mahgoub³, Heba Mohammed Ali⁴, Wafaa Mohammad Kamal⁵

¹Department of Physical Therapy for Cardiovascular and Respiratory Disorders, Faculty of Physical Therapy, Cairo University, Giza, Egypt.

²Department of Physical Therapy for Internal Medicine and Geriatrics, Faculty of Physical Therapy, Delta University of Science and Technology, Dakahlia, Egypt

³Basic Science Department, Faculty of Physical Therapy, Cairo University, Giza, Egypt.

⁴Department of Physical Therapy for Internal Medicine, Faculty of Physical Therapy, Beni-Suef University, Egypt

⁵Department of Physical Therapy for Women Health, Faculty of Physical Therapy, Cairo University, Giza, Egypt

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ABSTRACT

Background and Purpose: The prevalence of overweight and/or obesity due to lack of exercise practice is higher among college students in Egypt, which can increase the risk for cardiovascular and metabolic diseases in this young-aged population. Therefore, the main aim of this study was to assess the barriers to exercise that could face the overweight and obese physiotherapy students in Egypt.

Methods: A cross-sectional study was conducted and included 703 physiotherapy college students recruited from three Egyptian uni-versities: Cairo University, Beni Suef University, and Delta University. The inclusion criteria were male and female undergraduate students; overweight/obese and normal weight students; their mean age was 20.5 ± 1.45 years. The assessment tool for the study was an Arabic modified version of an original English self-report survey consisting of 14 items representing potential barriers to exercise/physical activity.

Results: The majority of perceived barriers to exercise/physical activity showed a significant difference between college students with different BMI, residence, and/or geographic location. Moreover, this study showed that, the most important barrier for normal weight and overweight students was lack of time (51.4% & 46.8%), while, the somewhat important exercise barriers perceived by the highest percentage of both normal weight and overweight students were lack of motivation (36% & 47%), lack of skills (43%&41%), and lack of friends' support (38.5 % &43.9%). Furthermore, for obese students, the somewhat important barriers to exercise perceived by the highest percentage of them were lack of motivation (46.7%), lack of enjoyment (40%), inaccessibility to convenient physical activity places (42.7%), and lack of time (46.1%).

Conclusions: BMI, residence and its geographic location have made a difference in perceiving barriers to exercise/physical activity. Common denominator barriers to exercise/physical among all physiotherapy students, regardless of body weight status, were lack of time and lack of motivation. This study can aid authorities in Egyptian universities to better recognize the barriers to exercise between college students, so that properly designed policies and strategies are implemented.

Keywords: Barriers, Exercise/physical activity, Overweight/obese, Physiotherapy students, Egypt

1 INTRODUCTION

In Egypt, the prevalence of overweight and obesity among samples of university students was about 25.3%–59.4% [1].

A decline in regular exercises and/or physical activity has been reported in college students in Egypt, with a prevalence of physical inactivity by 32% [2–4]. This can put this population at considerably greater risk of sedentary consequences such as metabolic syndrome and increased cardiovascular problems [5]. The World Health Organization (WHO) has launched a global plan of action to promote

* Corresponding author.

† Email: Ahmed.Mahdy(at)pt.cu.edu.eg

physical activity worldwide in June 2018 [6]. Based on the above, understanding various obstacles to exercise/physical activity practice facing college students seems to be the first step towards encouraging these students to adopt a more active lifestyle, which comes in accordance with WHO policies to increase physical activity worldwide.

The topic of exercise/physical activity barriers among college students has attracted many researchers in many countries and several studies have been conducted on this topic worldwide with the use of multiple assessment tools [7–27]. However, in Egypt, only two studies have been conducted in this regard [2, 28], in two Egyptian universities. Therefore, the purpose of the present study is to further assess the barriers to exercise in other three Egyptian universities recruiting students coming from different geographic locations of residence. The results of this study may add helpful observations to the earlier literature in this regard, and may help Egyptian universities to better address the barriers to exercise practice among college students; so that, well designed policies and strategies can be implemented to overcome those barriers and promote a more active lifestyle for college students.

2 METHODS

2.1. Study design

A cross-sectional study was conducted in Egypt in 2018, on physiotherapy college students at Cairo University, Beni Suif University and Delta University.

2.2. Ethical considerations

The protocol of this study was approved by the Ethics Committee of Scientific Research of Faculty of Physical Therapy in Cairo University. Filling out the questionnaire was considered as a written consent from each student to participate in the study.

2.3. Participants

Physiotherapy college students ($n=703$; males=150, females=553) were enrolled in this study from three Egyptian universities: Cairo University, Beni Suf University, and Delta University of Science and Technology. They were recruited by convenience sampling as the chosen students were those who were available and willing to participate in the study. The mean value of age of the participants was 20.5 ± 1.45 years and their body mass index ranged from 18.5-39.9 Kg/m². The inclusion criteria were: undergraduate physiotherapy students, both male and female students; normal weight, overweight, and obese students; students from all country's governorates; students from urban and rural areas; and apparently healthy students. Students were excluded if they, as reported by them, had health problems, were underweight or morbidly obese, were smokers or married, and/or incompletely or incorrectly filled in their data.

2.4. Assessment Procedures

2.4.1. Study assessment tool

Two papers on self reported questions were administered to the physical therapy students in the three universities.

The first page included an introductory statement which explained the purpose of collecting data and comprised demographic questions about student's age, gender, academic level, marital status, and geographic location of residence. Other questions were about body weight and height, smoking status, and/or presence of any health problems. The questionnaire was anonymous as a guarantee of the confidentiality of the information obtained. The second paper included the Arabic version of a validated questionnaire about barriers to physical activity/exercise which has been transformed from the original English version [29], to the Arabic version by Musaiger *et al.* [21]. The questionnaire was self-reported with a closed-response format consisting of 14 items questioning barriers or obstacles to physical activity/exercise among college students. The items were categorized into three categories: personal, environmental, and social barriers. Each category has different subcategories as shown in the tables. Students were instructed to judge each item which represents a potential barrier to exercising and report a response option from "very important", "somewhat important", or "not important" in front of each barrier.

2.4.2. Body mass index (BMI)

Body weight and height were reported by the students and Body mass index was calculated as (BMI = weight in kg/height in m²) [30]. The students were divided into: (a) normal weight students with a BMI of 18.5-24.9 Kg/m²(b) overweight students with a BMI of 25-29.9 Kg/m²(c) and obese students with a BMI of ≥ 30 Kg/m² [31].

2.5. Statistical analysis

First, the observed frequencies of students' responses to each item of the questionnaire were classified according to students' body weight status, rural or urban residency, and geographic locations of habitation; and were introduced to a contingency table. Then the Chi-squared test was used to assess the statistically significant difference among the categorical variables in the rows and columns of the contingency tables [32], and the data were displayed as percentage frequency distributions. Online Social Science Statistics software was used to analyze the data. Values of $p < 0.05$ were considered as statistically significant.

3 RESULTS

As shown in Table 1, the most important barriers to exercise perceived by the highest percentage of normal weight students were not having access to convenient exercise places (36%) and lack of time (51.4%), while the somewhat important exercise barriers were lack of motivation (36%), lack of skills (43%), lack of friends' support (38.5%), and lack of information (39%). For overweight students, the most important barrier to exercise perceived by the highest percentage of these students was a lack of time (46.8%), and the somewhat important barriers to exercise were lack of motivation (47%), lack of enjoyment (39.7%), lack of skills (41%), lack of friends' support (43.9%), not having access to the proper exercise places (45%). For obese students, the somewhat important barriers to exercise perceived by the

Table 1. Perceived barriers to exercise/physical activity among physical therapy students by BMI

Barriers	Normal weight (n=348)			Overweight (n=280)			Obese (n=75)			p value
	Very Import. (%)	Somewhat Import. (%)	Not Import. (%)	Very Import. (%)	Somewhat Import. (%)	Not Import. (%)	Very Import. (%)	Somewhat Import. (%)	Not Import. (%)	
A- Personal barriers										
1-Do not have motivation to do physical activity/ exercise	30.4	35.9	33.6	20.8	47.1	31.1	22.6	46.7	30.7	0.020*
2-Not enjoying physical activity/ exercise	23.3	31.3	44.3	20	39.7	39	24	40	36	0.199
3-Do not have the skills to do physical activity/ exercise	23.3	43.1	32.5	21	41	36	22.6	33.4	44	0.383
B. Social barriers										
4. No parent's support to be physically active	22.8	33.9	42.5	23.2	30.4	45.7	10.7	26.7	62.6	0.022*
5-No friend's support to be physically active	26.4	38.5	34.4	24.7	43.9	30.7	18.6	36	45.3	0.150
6-No faculty staff support to be physically active	20.7	33.4	44.5	18.2	27.5	51.8	14.7	20	64	0.027*
C. Environmental barriers										
7-Do not have enough information about how to increase physical activity	29.9	39.1	13.9	19	37.9	42.2	24	30.7	45.3	0.002*
8-Not having access to places to do physical activity, exercise and sport	35.9	31.6	31.3	28.6	45	25.7	29.3	42.7	28	0.015*
9-Not being able to find physical activity facilities that are inexpensive	30.4	32.5	36.5	24	32.5	43.6	22.6	21.4	56	0.018*
10-Not having time to be physically active	51.4	34.2	14.3	46.8	39.3	13.6	42.6	46.1	9.4	0.247
11-Feeling shy when practicing exercise outdoors	31.3	24.7	53.7	16	28.2	55.7	21.4	17.4	61.3	0.207
12-The climate is not suitable for practicing exercise	17.5	35.9	46	13.2	37.5	48.2	13.3	38.7	48	0.652
13-Not being able to practice physical activity due to cultural factors	31	21.8	46.2	22.5	28.2	48.6	18.7	18.7	62.7	0.010*
14-Do not have enough money to enroll with physical activity club	18.7	31.1	49.5	13.5	23.2	62.8	13.4	18.7	68	0.004*
* Significant p value from Chi Square test (<i>i.e.</i> <0.05)										

Table 2. Perceived barriers to exercise/physical activity among physical therapy students by residence

Barriers	Residence	Normal weight (Urban=239; Rural=107)				Overweight (Urban =229; rural n= 47)				Obese (Urban=65; Rural=10)			
		Very Import. (%)	Somewhat Import. (%)	Not Import (%)	P value	Very Import (%)	Somewhat Import. (%)	Not Import (%)	P Value	Very Import. (%)	Somewhat Import. (%)	Not Import (%)	P value
A- Personal barriers													
1-Do not have motivation to do physical activity/ exercise	Urban	29.7	35.5	34.7	0.75	19	49	31.8	0.13	21.53	47.69	30.76	0.82
	Rural	32.7	36.4	30.8		31.9	38.3	29.7		30	40	30	
2-Not enjoying physical activity/ exercise	Urban	23.30	31.7	44.91	0.96	19.46	41.15	39.3	0.54	24.6	38.46	36.9	0.78
	Rural	24.52	31.1	44.3		26.08	34.78	39.13		20	50	30	
3-Do not have the skills to do physical activity/ exercise	Urban	22.03	42.8	35.16	0.37	18.85	40.78	40.35	0.00*	21.53	30.76	47.69	0.25
	Rural	27.35	44.3	28.30		37.20	44.18	18.60		30	50	20	
B. Social barriers													
4. No parent's support to be physically active	Urban	21.09	35.4	43.45	0.42	22.36	32.89	44.73	0.26	10.76	27.69	61.53	0.86
	Rural	27.35	31.1	41.50		30.43	21.73	47.82		10	20	70	
5-No friend's support to be physically active	Urban	23.84	39.7	36.40	0.17	24.66	46.69	28.63	0.20	16.92	35.38	47.69	0.48
	Rural	33.33	36.2	30.47		25.53	34.04	40.42		30	40	30	
6-No faculty staff support to be physically active	Urban	17.7	34.2	48.10	0.05	16.96	25.89	57.14	0.00*	13.84	16.92	69.23	0.08
	Rural	28.8	32.7	38.46		28.26	41.30	30.43		22.22	44.44	33.33	
C. Environmental barriers													
7-Do not have enough information about increasing physical activity	Urban	28.69	39.7	31.64	0.69	16.66	35.08	48.24	0.00*	18.46	33.84	47.69	0.01*
	Rural	32.38	40	27.61		33.33	51.11	15.55		60	10	30	
8-Not having access to places to do physical activity, exercise and sport	Urban	34.17	32.9	32.91	0.47	26.31	46.92	26.75	0.06	26.15	43.07	30.76	0.21
	Rural	40.95	30.5	28.57		43.47	34.78	21.73		50	40	10	
9-Not being able to find physical activity facilities that are Inexpensive	Urban	27.73	31.9	40.33	0.10	20.08	31.44	48.47	0.00*	15.38	21.53	63.07	0.00*
	Rural	36.79	33.9	29.24		42.55	34.04	23.40		70	20	10	
10-Not having time to be physically active	Urban	52.71	35.1	12.13	0.18	48.24	38.59	13.15	0.89	43.75	45.31	10.93	0.85
	Rural	47.66	32.7	19.62		44.68	40.42	14.89		40	60	0	
11-Feeling shy when practicing exercise outdoors	Urban	21.00	22.3	56.72	0.16	14.41	26.63	58.95	0.01*	18.46	15.38	66.15	0.09
	Rural	22.42	30.9	46.72		25.53	38.29	36.17		40	30	30	
12-The climate is not suitable for practicing exercise	Urban	15.61	35.0	49.36	0.15	10.61	40.26	49.11	0.01*	12.30	35.38	52.30	0.16
	Rural	22.42	38.3	39.25		25.53	29.78	44.68		20	60	20	
13-Not being able to practice physical activity due to cultural factors	Urban	23.62	21.9	54.43	0.00*	17.18	29.95	52.86	0.00*	12.30	18.46	69.23	0.00*
	Rural	49.05	21.7	29.24		48.93	23.40	27.65		60	20	20	
14-Do not have enough money to enroll with physical activity club	Urban	15.18	27.4	57.38	0.00*	10.04	20.96	68.99	0.00*	7.69	15.38	76.92	0.00*
	Rural	27.35	40.6	32		31.91	36.17	31.91		50	40	10	

* Significant p value from Chi Square test (i.e.<0.05)

Table 3. Perceived barriers to exercise/physical activity among physical therapy students by geographic locations

Barriers	Egyptian Regions	Normal weight (n=348)				Overweight (n=280)				Obese (n=75)			
		Very Import (%)	Somewhat Import. (%)	Not Import (%)	p value	Very Import (%)	Somewhat Import. (%)	Not Import (%)	p value	Very Import (%)	Somewhat Import. (%)	Not Import (%)	p value
A- Personal: Barrier 1	1#	29.47	36.41	34.1	0.08	20.22	47.19	32.58	0.91	14.28	50	35.71	0.06
	2#	31.94	44.44	23.6		21.70	47.28	31.00		23.52	50	26.47	
	3#	37.5	21.42	41		14.81	55.55	29.62		83.33	16.66	0	
	4#	20	37.5	42.5		13.63	45.45	40.90		0	42.85	57.14	
Barrier 2	1#	21.63	29.82	48.53	0.00*	11.23	34.83	53.93	0.01*	17.85	32.14	50	0.11
	2#	26.76	46.47	26.76		27.13	41.08	31.78		26.47	55.88	17.64	
	3#	26.78	26.78	46.42		25.92	37.03	37.03		33.33	0	66.66	
	4#	17.5	20	62.5		18.18	54.54	27.27		28.57	28.57	42.85	
Barrier 3	1#	26.01	40.46	33.52	0.02*	29.21	43.82	26.96	0.00*	32.14	39.28	28.57	
	2#	21.12	38.02	40.84		12.59	37.00	50.39		8.82	32.35	58.82	0.02*
	3#	25.92	57.40	16.66		21.42	50	28.57		66.66	33.33	0	
	4#	12.82	48.71	38.46		40.90	40.90	18.18		14.28	14.28	71.42	
B. Social barriers Barrier 4	1#	24.41	33.72	41.86	0.93	25.55	31.11	43.33	0.21	21.42	21.42	57.14	
	2#	25.35	33.80	40.84		17.18	33.59	49.21		5.88	32.35	61.76	0.65
	3#	16.36	36.36	47.27		32.14	28.57	39.28		0	16.66	83.33	
	4#	25	35	40		40.90	18.18	40.90		0	28.57	71.42	
Barrier 5	1#	26.58	31.79	41.61	0.03*	23.86	42.04	34.09	0.35	28.57	21.42	50	0.14
	2#	25	52.77	22.22		20.15	50.38	29.45		14.70	52.94	32.35	
	3#	23.63	41.81	34.54		34.48	44.82	20.68		16.66	16.66	66.66	
	4#	35.89	35.89	28.20		36.36	31.81	31.81		0	28.57	71.42	
Barrier 6	1#	21.76	34.70	43.52	0.38	29.88	32.18	37.93	0.00*	25	21.42	53.57	0.55
	2#	15.27	30.55	54.16		7.75	27.13	65.11		5.88	23.52	70.58	
	3#	23.63	30.90	45.45		25.92	18.51	55.55		16.66	0	83.33	
	4#	25.64	43.58	30.76		22.72	31.81	45.45		16.66	16.66	66.66	
C. Environmental Barrier 7	1#	35.88	35.88	28.23	0.03*	25.84	49.43	24.71	0.00*	32.14	32.14	35.71	
	2#	18.05	38.88	43.05		7.81	27.34	64.84		8.82	29.41	61.76	0.04*
	3#	27.27	50.90	21.81		28.57	50	21.42		33.33	50	16.66	
	4#	27.5	45	27.5		36.36	36.36	27.27		57.14	14.28	28.57	
Barrier 8	1#	34.31	31.36	34.31	0.00*	35.95	33.70	30.33	0.00*	42.85	42.85	14.28	0.07
	2#	20.83	45.83	33.33		19.37	55.03	25.58		11.76	50	38.23	
	3#	46.42	26.78	26.78		34.48	41.37	24.13		50	16.66	33.33	
	4#	55	20	25		50	36.36	13.63		42.85	28.57	28.57	
Barrier 9	1#	30.81	34.88	34.30	0.00*	32.22	38.88	28.88	0.00*	39.28	25	35.71	0.02*
	2#	21.12	19.71	59.15		11.62	20.93	67.44		8.82	14.70	76.47	
	3#	33.92	41.07	25		48.27	44.82	6.89		33.33	16.66	50	
	4#	40	30	30		18.18	50	31.81		14.28	42.85	42.85	
Barrier 10	1#	52.60	32.36	15.02	0.90	47.19	32.58	20.22	0.00*	39.28	50	10.71	0.95
	2#	52.77	34.72	12.5		49.61	45.73	4.65		44.11	47.05	8.82	
	3#	50	37.5	12.5		34.48	37.93	27.58		33.33	50	16.66	
	4#	42.5	42.5	15		50	27.27	22.72		66.66	33.33	0	
Barrier 11	1#	18.49	24.85	56.64	0.60	18.88	26.66	54.44	0.00*	32.14	17.85	50	0.02*
	2#	22.53	26.76	50.70		9.30	24.03	66.66		2.94	17.64	79.41	
	3#	21.42	23.21	55.35		34.48	41.37	24.13		50	0	50	
	4#	32.5	25	42.5		27.27	36.36	36.36		42.85	28.57	28.57	
Barrier 12	1#	19.76	34.30	45.93	0.49	17.04	39.77	43.18	0.06	21.42	57.14	21.42	0.00*
	2#	9.72	41.66	48.61		7.03	36.71	56.25		2.94	23.52	73.52	
	3#	17.54	35.08	47.36		17.24	44.82	37.93		16.66	16.66	66.66	
	4#	25	35	40		27.27	36.36	36.36		28.57	57.14	14.28	
Barrier 13	1#	29.23	18.71	52.04	0.00*	32.95	22.72	44.31	0.00*	28.57	17.85	53.57	0.04*
	2#	22.22	25	52.77		12.40	27.13	60.46		5.88	17.64	76.47	
	3#	37.5	33.92	28.57		34.48	44.82	20.68		16.66	16.66	66.66	
	4#	51.28	10.25	38.46		31.81	36.36	31.81		41.17	29.41	29.41	
Barrier 14	1#	19.76	33.13	47.09	0.11	16.66	23.33	60	0.00*	25	14.28	60.71	0.21
	2#	11.26	23.94	64.78		3.87	22.48	73.64		2.94	17.64	79.41	
	3#	26.78	28.57	44.64		37.93	31.03	31.03		16.66	33.33	50	
	4#	17.94	38.46	43.58		22.72	22.72	54.54		14.28	28.57	57.14	

* Significant p value from Chi Square test (i.e.<0.05)

1# : Greater Cairo region; 2# : Delta region; 3# : Suez canal region, 4# : Upper Egypt region

highest percentage of these students were lack of motivation (46.7%), lack of enjoyment (40%), not having access to the proper exercise places (42.7%), and lack of time (46.1%). In addition, Table 1 also shows that, the perception of eight barriers to exercise/physical activity was significantly different among students with different BMI. Moreover, as shown in Table 2, the perception of several barriers to exercise was significantly different between urban and rural students either these students were normal weight, overweight, or obese. Furthermore, as shown in Table 3, the perception of several barriers to exercise was also significantly different between students coming from various country's locations.

4 DISCUSSION

This study has investigated the barriers to exercise/physical activity practice among physical therapy college students who have different BMI and residence and who come from different geographic locations in Egypt. The first finding in this study is that, several barriers to exercise/physical activity were significantly different among physiotherapy students with different BMI. This finding can be supported by similar findings from earlier studies [33–37]. Higher BMI was found to be associated with more personal and social perceived barriers to exercise [33], and even more fear of injury [34]. Ball et al. [35], considered fatness as an important barrier to exercise in the overweight subjects, and subject's perception of being an overweight or obese was considered as a cognitive barrier to physical activity [36]. Furthermore, fat persons may receive cruelly sarcastic comments while exercising at the gym or outdoors, this can be devastating for their self-confidence and would stop them from keeping exercising [37].

The secondly important finding is that, the subjective perception of barriers to exercise in our students was significantly affected by residency status (*i.e.*, whether urban or rural). This finding may be consistent with earlier studies done by Humpel et al. [38, 39], which have shown that physical activity behavior is influenced by physical environments, and that attributes of the local environment can influence physical activity patterns. Thus, because the physical environments in urban and rural places are quite different, environmental barriers to exercise in both environments are not the same, and college students in these environments have various perceptions about these barriers. In addition, socioeconomic status and culture differ between urban and rural areas. It has been shown that subjects residing in areas of low socio-economic level have decreased overall physical activity [40]. Accordingly, since rural areas tend to have lower socio-economic status than urban areas, rural students may also face financial and social barriers to exercise which is not the case as for urban students. In line of the above, the present study showed that, the highest percentages of overweight (48.5%) and obese (63%) students from urban places perceived the barriers of "Not being able to find physical activity facilities that are inexpensive" and the barrier of "Not being able to practice physical activity due to cultural factors" as not important; while on the

other hand, the highest percentages of overweight (42.5%) and obese (70%) students from rural places perceived the same barriers as very important. This means that college students in these environments have various perspectives about exercise/physical activity influenced by environmental barriers. Moreover, a previous study has observed that exercise habits of students living in campus and those living out of campus differ, and concluded that the place where college students live can have an impact on their exercise habits [41]. Although the living places of students in the previously mentioned study [41], (*i.e.* in or out of campus) are not the same as the urban or rural living places of students in our study, the notion of observing an effect of the residing place on exercise habits or barriers could be the same in both studies.

The thirdly important finding is that, the barriers to exercise/physical activity subjectively perceived by students showed a significant difference among students who come from various geographic locations of residency. This finding can be supported by Bauman *et al.* [42] who have found a significant association between geographic locations of residence and participation in physical activity, that is, subjects who lived in inland locations were likely to be classified as being more sedentary than subjects who lived in coastal locations. They concluded that geographical location may be linked to cultural norms about exercise practice/physical activity and may have a consequent impact upon physical activity behaviors [42]. Hence, the perceived barriers to exercise practice for college students in Egypt were influenced by various geographical locations in the country with different customs, cultures and traditions.

Finally, this study has observed that "not having time for exercise practice or physical activity" was an important barrier to exercise reported by all college students. Of interest, this barrier was independent of either students' BMI or residence. Lack of time has been the most frequently reported barrier to exercise/physical activity across gender, age, living arrangement and socioeconomic status in many studies [2, 7, 9, 11, 13, 19, 23, 24].

Limitations of this study include the inability to deduce causal inferences among study variables, which is due to the cross-sectional nature of the study. Moreover, BMI was calculated from self-reported data about body weight and height, which might have affected the accuracy of calculation. Furthermore, the method of sampling used in this study has led to unequal representation of students with different academic levels in our target sample. Recommendations of the present study include reinforcing enablers to exercise for college students in the form of setting academic benefits for sports participation in the University. In addition, organizing regular symposiums about the health benefits of regular exercises is recommended to expand the culture of an active lifestyle among college students. These feedbacks and suggestions may need to be considered by the authorities of the Egyptian Universities, and may aid efforts directed to promote a healthy lifestyle for this young-aged population.

5 CONCLUSION

The perceived barriers to exercise for physiotherapy college students in Egypt could significantly differ according to the BMI of these students, students' residence (i.e. whether urban or rural) and geographic locations of residency. Moreover, the most frequently perceived barriers to exercise reported by the overweight and obese physiotherapy students in Egypt were: lack of time, lack of motivation for exercise, lack of enjoyment during exercise, lack of skills to practice exercises, lack of friends' support towards exercising, and lack of accessibility to convenient exercise places.

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AUTHOR BIOGRAPHY

Ahmad Mahdi Ahmad Department of Physical Therapy for Cardiovascular and Respiratory Disorders, Faculty of Physical Therapy, Cairo University, Giza, Egypt.

Faten Eltohamy Megahed Department of Physical Therapy for Internal Medicine and Geriatrics, Faculty of Physical Therapy, Delta University of Science and Technology, Dakahlia, Egypt

Magda Ramadan Zahran Mahgoub Basic Science Department, Faculty of Physical Therapy, Cairo University, Giza, Egypt.

Heba Mohammed Ali Department of Physical Therapy for Internal Medicine, Faculty of Physical Therapy, Beni-Suef University, Egypt

Wafaa Mohammad Kamal Department of Physical Therapy for Women Health, Faculty of Physical Therapy, Cairo University, Giza, Egypt