

## University Student Health Survey

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**Objective:** To evaluate the lifestyle of students at the University of Bahrain and to determine the prevalence of diseases and behavioral risk factors.

**Design:** A Cross-Sectional Study.

**Setting:** University of Bahrain, Bahrain.

**Method:** Nine hundred sixty-six students enrolled in the academic year 2011/2012 from all educational levels seeking bachelor degree at the University of Bahrain were included in the study.

**Result:** Two hundred and thirty-eight (24.6%) males and 728 (75.4%) females were included in the study. The participants' age ranged between 18 and 21 years. Five hundred and twenty-four (54.2%) students had normal weight, 192 (19.9%) were overweight and 133 (13.8%) were obese. Eight hundred two (83%) presented with normal waist/hip ratio (WHR). Eighty-three (34.9%) males and 81 (11.1%) females presented with central obesity. Seven (0.7%) students had high blood sugar level. Nine (3.8%) males presented with systolic blood pressure (SBP) >140 mmHg and 5 (0.7%) females presented with SBP >140 mmHg. Three hundred twenty-six (44.8%) females had anemia compared to 78 (32.8%) males. Four (1.7%) males were diabetic compared to 7 (1%) females. Five hundred and fifty-four (57.3%) students reported physical activity for thirty or more minutes/day. One hundred six (44.5%) males and 36 (4.9%) females were smokers. Two hundred twenty-nine (31.5%) females have checked their blood sugar level during the past 12 months and only 47 (19.7%) males did.

**Conclusion:** The study emphasizes the importance of providing periodic measurements of diabetes as well as the importance of early detection of diseases and health risks. In addition, the importance of participating in regular physical activities as a prevention measure from diseases associated with a sedentary lifestyle.

*Bahrain Med Bull 2019; 41(1): 33 - 36*

One of the challenges among youths worldwide is to have a healthy lifestyle in the face of numerous temptations<sup>1,2</sup>. Various unhealthy habits have been adopted by students, such as physical inactivity, irregular daily fast meals and daily intake of fried food as well as snacks<sup>3,4</sup>.

A study showed that there is a nutrition transition due to the urbanization and economic development leading westernized diet with high energy and saturated fat diet. In addition, it showed that there is another transition from manual to office

work leading to sedentary lifestyle, obesity and metabolic syndromes<sup>5</sup>. Another study showed that maintaining healthy lifestyle habits can reduce metabolic syndrome incidence<sup>6</sup>.

A study in Saudi Arabia among students found that the most frequent unhealthy eating habits occur when with the family, eating fried food with less consumption of fruits and vegetables; in addition, 21.8% were overweight and 15.7% were obese<sup>7</sup>. Only 1.9% of university students in Germany eat fast foods frequently<sup>8</sup>.

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In Bahrain, a cross-sectional study revealed that 62.8% of adolescent females skipped breakfast compared to 37.2% males; it showed that females consumed less fruits compared to males and they exercise less<sup>9</sup>. Another study concluded that 10.8% of medical students were current smokers, the majority of them were males; the highest rate was seen in the final years<sup>10</sup>. In 2016, a study showed that 57% of students among Bahrain schools consume energy drinks as part of socializing activity<sup>11</sup>. Another study among Bahraini physicians found that 29.6% exercise for >30 minutes in a week and 72% are either overweight or obese<sup>12</sup>.

The aim of this study is to evaluate the lifestyle of students at the University of Bahrain and to determine the prevalence of diseases and behavioral risk factors among them.

**METHOD**

A cross-sectional study was conducted from 6 May 2012 to 14 May 2012 at the University of Bahrain. The data was obtained through a questionnaire, and informed consent was taken from participants before their enrollment.

A pilot study was performed on 20 students from the College of Physical Education and Physiotherapy. Stability was calculated by finding the value of the coefficient Alpha Cronbach 0.86 which is considered as an acceptable percentage.

The following anthropometric measurements were obtained: weight, height, waist and hip circumference. Biometric measurements were obtained: blood sugar level, blood pressure, hemoglobin and personal characteristic data. Other data obtained were diabetes, smoking and sports activity.

Nine hundred sixty-six students (238 males and 728 females) were included in the study. The inclusion criteria were as follows: students age 18 and above in the academic year 2011/2012.

Measurement of length to the nearest 0.5 cm was obtained by a balance (Seca brand) connected to a digital column; the same balance was used to measure the weight to the nearest 0.1 kg. Furthermore, the waist and hip circumference were measured to the nearest 0.5 cm.

Waist to hip ratio was calculated by the waist circumference divided by the hip circumference. Blood sugar level was measured not fasting or two hours after meal and any reading  $\geq 8.7$  mill moles (140 mg/dL) was considered high (WHO). In addition, systolic and diastolic blood pressure was measured by a manual blood pressure device and any reading  $\geq 140/90$  was considered high (WHO). Hemoglobin level was also measured and any value between 13.5-18g/100ml was considered normal for males and any value between 12-16g/100ml was considered normal for females (WHO).

BMI was calculated by dividing the body weight (in kilograms) by height (in meters squared); 18-24.9 was normal, 25-29.9 overweight and  $\geq 30$  indicates obesity (WHO). Data analyses were done using SPSS.

**RESULT**

Nine hundred sixty-six students were included in the study, 238 (24.6%) males and 728 (75.4%) females. The participants' age range was between 18-21 years; 798 (82.6%) were single, 163 (16.9%) were married and only 5 (0.5%) were widowed/divorced, see table 1.

**Table 1: Students Personal Characteristics**

Variable	Number	Percent
<b>Gender</b>		
Males	238	24.6 %
Females	728	75.4 %
Total	966	100%
<b>Marital Status</b>		
Single	798	82.6%
Married	163	16.9%
Divorced or widowed	5	0.5%
Total	966	100%

BMI ranged between 18.5 and 24.9, indicating that approximately half of the students 524 (54.2%) were normal. One hundred seventeen (12.1%) students were classified as underweight. One hundred five (10.9%) females were underweight which is considered high compared to the international standards for females. One hundred ninety-two (19.9%) students were overweight and 133 (13.8%) were obese, see table 2.

**Table 2: BMI and Obesity**

	Males (238)		Females (728)		Total (966)	
	N	%	N	%	N	%
Underweight	12	5	105	14.4	117	12.1
Normal	135	56.7	389	53.4	524	54.2
Overweight	60	25.5	132	18.8	192	19.9
Obese	31	13	102	14.0	133	13.8
Total	238	100	728	100	966	100

Eight hundred two (83%) had normal waist/hip ratio (WHR) and 164 (17%) had central obesity. Eight-three (34.9%) males had central obesity compared to 81 (11.1%) females, see table 3.

**Table 3: Waist-to-Hip Ratio**

Variable	Males (238)		Females (728)			
	Number	Percent	Number	Percent	Number	Percent
<b>With central obesity</b>	83	34.9%	81	11.1%	164	17%
<b>Without central obesity</b>	155	65.1%	647	88.9%	802	83%
<b>Total</b>	238	100%	728	100%	966	100%

The blood sugar level was normal except in 7 (0.7%) students. Nine (3.8%) male students had systolic blood pressure >140mmHg compared to female students. Diastolic blood pressure >90mmHg was obtained in 6 (2.5%) males and 3 (0.4%) females, see tables 4 and 5.

**Table 4: Students and Diastolic Blood Pressure (DBP)**

Variables	Males (238)		Females (728)		Total	
	Number	Percent	Number	Percent	Number	Percent
(High) $\geq 140$ mmHg	9	3.8%	5	0.7%	14	1.4%
(Normal) 91-139 mmHg	228	95.8%	712	97.8%	940	97.3%
(Low) $\leq 90$ mmHg	1	0.4%	11	1.5%	12	1.2%
<b>Total</b>	<b>238</b>	<b>100%</b>	<b>728</b>	<b>100%</b>	<b>966</b>	<b>100%</b>

**Table 5: Students and Systolic Blood Pressure (SBP)**

Variables	Males		Females		Total	
	Number	Percent	Number	Percent	Number	Percent
(High) $\geq 90$ mmHg	6	2.5%	3	0.4%	9	0.9%
(Normal) 61-89 mmHg	202	84.9%	402	55.2%	604	62.5%
(Low) $\leq 60$ mmHg	30	12.6%	323	44.4%	353	36.5%
<b>Total</b>	<b>238</b>	<b>100%</b>	<b>728</b>	<b>100%</b>	<b>966</b>	<b>100%</b>

Females were more likely to have anemia than males at a rate of 41.8% and 24.4%, respectively. Only 4 out of 238 (1.7%) males were confirmed as diabetic compared to 7 out of 728 (1%) females, which reflects that men had slightly higher prevalence of diabetes.

Two hundred thirty-five (98.7%) males and 718 (98.6%) females did not suffer from any cardiovascular disease. One hundred ninety-three (20%) students had Glucose-6-phosphate dehydrogenase (G6PD) deficiency, 99 (10.2%) were SCD carriers, 27 (2.8%) were carriers of thalassemia, 23 (2.4%) had sickle cell disease (SCD) and 14 (1.4%) have thalassemia. Only 38 (3.9%) participants had asthma, see table 6.

**Table 6: Both Genders Regarding the Study Variables**

Variable	Males		Females		Value of X	Significance of X	The direction of the difference
	Mean	Standard deviation	Mean	Standard deviation			
Height (cm)	172.89	6.68	158.17	5.82	30.427	***0.000	More in men
Weight (Kg)	73.74	16.13	59.76	15.01	12.240	***0.000	More in men
BMI (kg/m <sup>2</sup> )	24.63	4.99	23.86	5.73	1.981	*0.048	More in men
Waist (cm)	85.47	14.08	72.28	16.63	11.021	***0.000	More in men
Hip (cm)	100.19	13.84	94.64	17.49	4.457	***0.000	More in men
WHR	0.85	0.08	0.76	0.08	15.638	***0.000	More in men
Blood sugar	5.61	0.88	5.42	0.81	2.960	**0.003	More in men
Systolic blood pressure	115.69	9.23	109.9	8.13	9.856	***0.000	More in men
Diastolic blood pressure	72.64	7.47	66.34	7.69	11.059	***0.000	More in men
Hemoglobin	14.41	1.43	12.14	1.43	21.157	***0.000	More in men

\*\*\*function at 0.001 \*\*function at 0.01 \*function at 0.05

Five hundred fifty-four (57.3%) students were physically exercising for  $\geq 30$  minutes/day. The predominant physical activity was walking. Two hundred twenty-nine (23.7%) were exercising one to two days per week and 87 (9%) daily. One hundred six (44.5%) males were smokers compared to 36 (4.9%) females. Fifty-four (22.7%) males tried to quit smoking, compared to 10 (1.4%) females.

Two hundred twenty-nine (31.5%) females have checked their blood sugar level during the past 12 months while 47 (19.7%) males did.

Four (1.7%) males and 13 (1.8%) females were diagnosed as diabetic. One (0.4%) male and 1 (0.1%) female were taking insulin.

## DISCUSSION

The percentage of students from both genders who had BMI  $\geq 25$  was lower than the global percentage reported by WHO. However, certain regions (South East Asia, Western Europe, and Africa) had reported a lower percentage of overweight and obese citizens compared to our study findings<sup>13,14</sup>. This could be attributed to the difference in lifestyle and diet habits in different regions. It is also worth noting that the WHO figures cover all citizens above the age of 18, while our study was limited to college students who might have had a more active lifestyle than the rest of our community and thus their BMI could be lower than the rest of the community who had a more sedentary life and higher BMI.

The WHR findings of this study were similar to other studies, which showed high percentage of normal WHR in both genders and a large gap between males and females, as males had higher percentage of central obesity<sup>15</sup>. A few students had diabetes mellitus or an elevated blood sugar level, which is similar to a study from China; because the onset of diabetes mellitus is usually around the age of 45-64 years<sup>16,17</sup>. In addition, blood pressure findings were similar to other studies<sup>18</sup>.

In our study, there was a high prevalence of anemia compared to the global prevalence measured in 2010. However, some studies showed a similar trend with a greater prevalence in females compared to males<sup>19</sup>.

The high prevalence of anemia in both genders could be due to the prevalence of hereditary blood disorders in the region, such as G6PD, sickle cell disease, sickle cell trait, thalassemia disease and thalassemia carriers particularly thalassemia alpha.

In this study, more than half of the students were physically active for thirty minutes or more every day, with a greater exercise frequency in males, which is similar to other studies<sup>20</sup>. The difference between the genders could be due to gender's view because females' view is centered on having a lean body which could be maintained by concentrating on their diet without exercising<sup>21</sup>.

In this study, more females have checked their blood sugar levels in the last year, and this could be related to what has been described in the literature with regards to females being more likely to seek health care advice than males do<sup>22</sup>. In

addition, more than half of the study sample had relatives who suffer from diabetes mellitus; but only a minor percentage was diagnosed with diabetes or on insulin. The above finding could be related to the young age of the study sample or due to the increased health awareness.

## CONCLUSION

**It is important to provide periodic measurements of diabetes among youths as well as to increase the awareness of the importance of early detection of diseases and health risks. Regular physical activities should be encouraged as a preventive measure from diseases associated with a sedentary lifestyle.**

**We recommend a larger sample with equal gender distribution to evaluate the association between parental smoking and the risk of initiating smoking among youth.**

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**Author Contribution:** All authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes.

**Potential Conflicts of Interest:** None.

**Competing Interest:** None.

**Sponsorship:** None.

**Acceptance Date:** 20 January 2019.

**Ethical Approval:** The study was approved by the University Council in accordance with its decision number (2012/261).

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