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Association overweight and obesity with dietary habits and some socio-demographic variables among students in Southern Technical University

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***Abstract*---**Overweight/obesity is a health problem that many young people suffer from, as a result of their unhealthy eating habits and changing their lifestyles, especially when they move to university life and makes them responsible for preparing their food meals. This study aims to find out the relationship between the dietary habits of university students and body mass index. A cross-sectional study was conducted on 384 randomly selected students (simple random sample) from Southern Technical University (College of Health and Medical Technology, Administrative Technical College, Technical College of Engineering, and Basrah Technical Institute). Data collection lasted for .6 months that started on November 2021 and ended on April 2022. Data were collected by direct interview with students by the researcher, using a detailed self-report questionnaire form .Use the height and weight scale to determine the body mass index .Regarding of food habits, use a questionnaire containing items related to the food habits and lifestyle that followed by the student. The results of our study showed that the lifestyle and dietary habits of Southern Technical University students, in addition to some demographic variables, had a significant effect on body mass index. Where it appears from the results that the largest number of students

184, with a percentage of (47.91 percent) of the total students were in the categories of overweight and obesity, because of their unhealthy eating habits and as a result of the change that occurred in their lifestyle when they moved from high school to university. While the students with normal weight were 172 with a percentage of 44.8% and the students with low weight were 28 students with a percentage of7.29.%. We conclude from our study that the dietary habits and lifestyle of university students had a significant effect on body mass index, as the largest number of students was 212 students with a percentage of (55.21 %) who were in the overweight or obese in addition an underweight category, this is due to their unhealthy eating habits and lifestyle. We recommends of developing a health education plan to educate college students about healthy lifestyles and healthy food choices.

***Keywords*---**obesity, overweight, students, dietary habits.

Introduction

Overweight and obesity represent one of the important risk factors for the development of cardiovascular diseases, insulin resistance, glucose intolerance, high blood pressure, and different types of cancers (Ji *et al.*, 2020; Garcia-Hermoso *et al.*, 2019). There are many reasons of overweight and obesity; among them, unhealthy dietary practices with low consumption of fruits, vegetables, whole grains, and nuts and high consumption of foods with high caloric density (Branch *et al.*, 2020; Saintila *et al.*, 2021). It is obvious that what a person eats has a serious effect on his/her health, maintaining a healthy weight is a crucial way to make sure that the person will stay in good health and decrease the possibilities of acquired a number of long terms health problems (Mahfouz *et al.* 2016). The prevalence of overweight and obesity has doubled dramatically in recent years and became affects almost a third of the world's population, becoming a public health problem and, especially among university students in developing countries (Chen *et al.* 2020). Studies conducted on university students in developing countries show high prevalence of overweight and obesity.

For example, in Africa (Nigeria: 10%; Egypt: 25.3%–59.4%, South Africa: 10.8%–24%. In Asia (Bangladesh: 20.8%; China: 2.9%–14.3%; Malaysia: 20%–30.1%, Thailand: 31%, Pakistan: 13%–52.6%, and India: 11%–37.5%. In Latin America (Colombia: 12.4%–16.7%; Mexico: 31.6%, the Middle and Near East (Saudi females: 47.9%, Oman: 28.2%; Kuwait: 42%, Iran 12.4%, and Turkey: 10% 47.4%) (Peltzer *et al.* 2014). A healthy lifestyle consists of a series of actions, habits and patterns of behavior acquired at an early age and persisting, in the most of cases, into adulthood contributing to good health. However, university students often have a poor diet, because of the change in their lifestyle and they are away from home for a long period of the day (Sánchez-Ojeda 2015). Furthermore, the lifestyle of young university students often includes the consumption of drugs, and, in particular alcoholic beverages, where consumption of alcoholic in this group of population is very high and it is currently considered

a social and a public health problem (Mekonen *et al.* 2017). So. This study aimed to investigate the relationship between overweight/obesity and eating habits and lifestyle.

Materials and Methods

This study was conducted in Iraq / Basra City, Southern Technical University, for the period from November 2021 to April 2022. It is a cross-sectional descriptive study conducted on 384 students who were randomly selected (simple random sample) from Southern Technical University students, from three colleges and one institute (College of Health and Medical Technologies, Administrative Technical College, Technical College of Engineering, Basrah Technical Institute).

Sampling technique

The number of students chosen at random from the Southern Technical University was 384 students, distributed among three faculties and one institute. Ninety-six students were randomly selected by simple random sampling technique from each college or institute.

The study tools

The Data were collected by direct interview with the students by the researcher, by using a detailed self-reporting questionnaire form. The study questionnaire was divided into two sections; the first section includes Socio-demographic variables (age, gender, marital status, residence, family monthly income, study stage, and College), and also this section include anthropometric measures such as height (meter), and weight (kg),. While section two includes students' lifestyles and eating habits. Use the height and weight scale to determine the body mass index

Statistical analysis

The data through the questionnaire, the information for each question was transferred to code sheets, the data was entered into the personal computer, and then the data was analyzed by the statistical package available from SPSS version 25. Data were showed in simple measures of frequency, percentage, mean, standard deviation, and range (minimum and maximum values). The significance of the difference for different percentages (qualitative data) was tested using the Pearson Chi-square test (χ2-test). Statistical significance was taken into account when the P-value was equal to or less than 0.05. Univariate Logistic regression analysis to identify some variables independently associated with obesity/ overweight.

Results

Table 1 shows the distribution of University Students according to Socio-demographic characteristics. The mean ± SD of their ages was 21.09±1.683 years, the age range at the time of study was between 18-26 years, The highest percentage (44.5%) were in the age group (18-20) years and the lowest percentage

(11.5%), was in the age group 24-26 years. Regarding gender, the study shows that half of the students (50.0%) were males and the other half were females. A high percentage of 325 (84.6%) of the students were single in this study. Concerning residence, the study shows that the highest percentage (43.5%) of the participants were living in the city. The highest percentage (51.8%) of students have a high income, while the lowest percentage (16.4%) of them have low income.

Table 1
Distribution of University Students according to Socio-demographic Characteristics

Socio-demographic		No.	Percent (%)
Age group	18 - 20 years	171	44.5
	21 - 23 years	169	44.0
	24 - 26 years	44	11.5
	Mean± SD (Min-Max)	21.09±1.683 (18-26)	
Gender	Male	192	50.0
	Female	192	50.0
Marital	Single	325	84.6
	Married	43	11.2
	Engaged	16	4.2
Residency	City	167	43.5
	Village	131	34.1
	student dorm	86	22.4
Income	Low	63	16.4
	Moderate	122	31.8
	High	199	51.8
college	Health	96	25.0
	Administrative	96	25.0
	Engineering	96	25.0
	Institute of Basra	96	25.0
class	first stage	120	31.3
	second stage	120	31.3
	third stage	72	18.8
	fourth stage	72	18.8

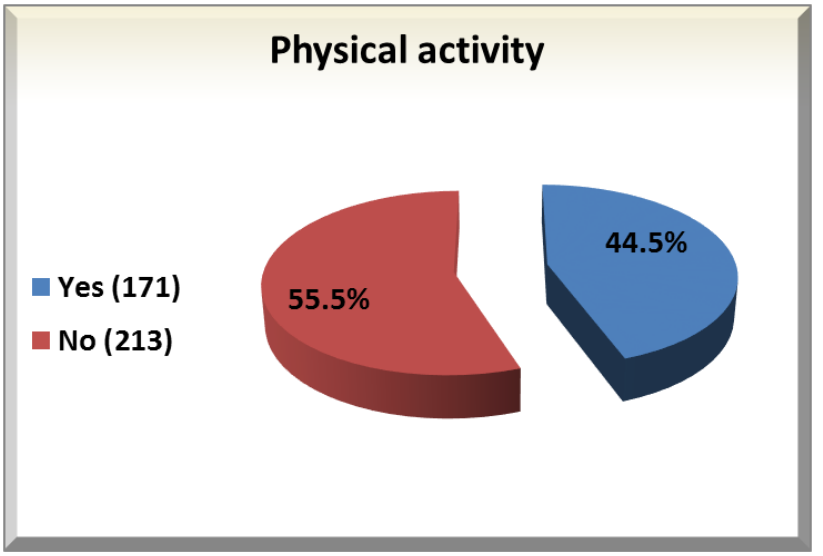

Figure 1. Represented distribution of students according to Physical activity

Figure (1) The present study reveals that the highest percentage 213 (55.5%) of the students were physically inactive, while the lowest percentage 171 (44.5%) of them were physically active.

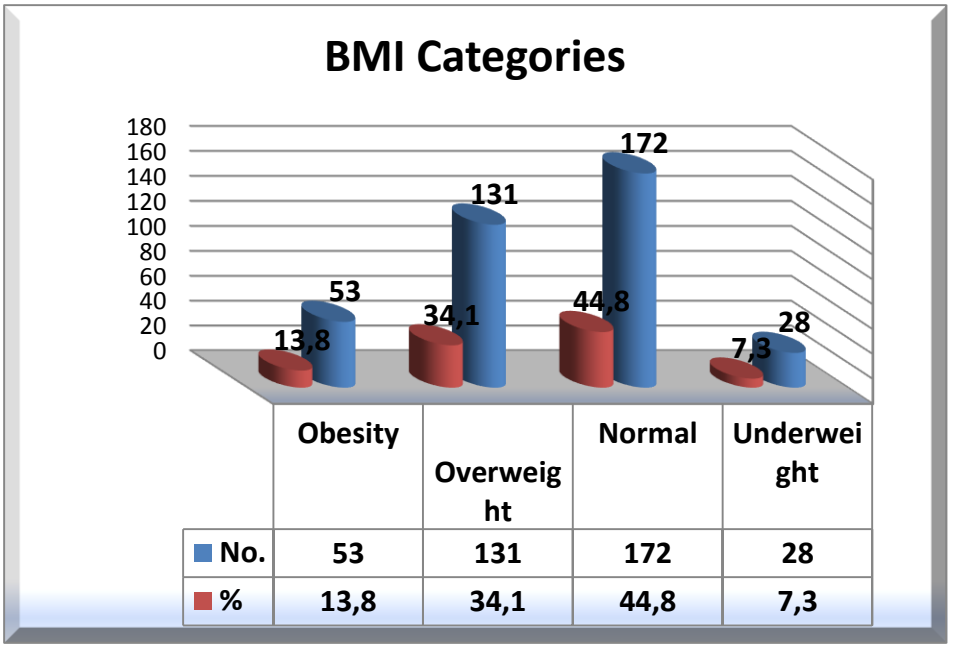

Figure 2. Represented distribution of students according to BMI categories

Figure 2 reveals that the 172 students with percentage (44.8%) of total students were normal weight, followed by 131 students by (34.1%) of them were

overweight, 53with percentage by (13.8%) of students were obese, finally, the lowest number 28 by (7.3%) of them were underweight.

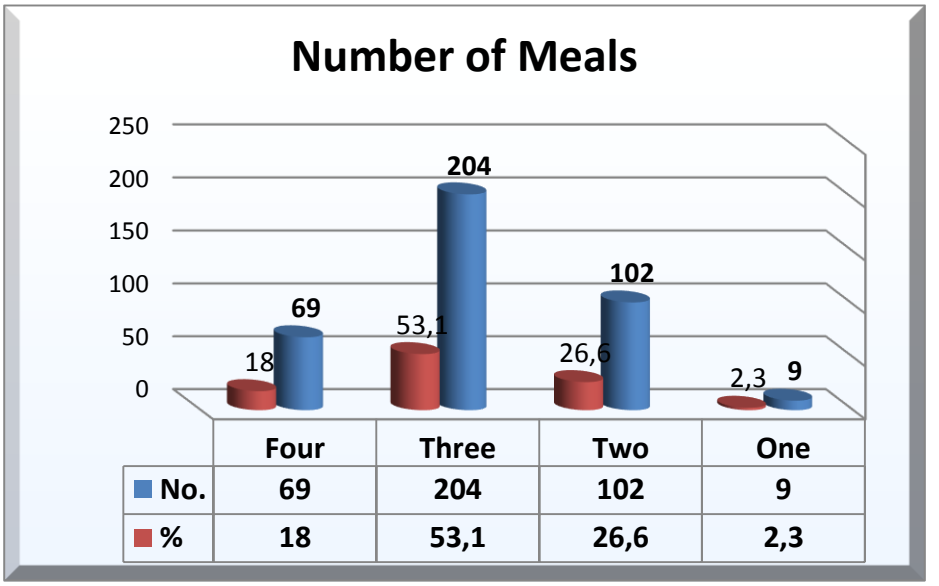

Figure 3. Represented distribution of students according to number of meals

Figure 3 reveals that the highest percentage 204 (53.1%) of students were eating three meals daily, while the lowest percentage 9 (2.3%) of them were eating one meal daily. Table 2 represents the distribution of University students according to their dietary habits, the current study found the following percentages (52.6%, 44.0%, 35.4%, 82.6%, 59.9%, and 92.4%) of students eating vegetables, fruits, sweets, bread, tea, and rice daily respectively. The highest percentage (40.6%, and 31.5%) of students eating meat, and drinking soft drink for once or twice per week respectively. Also the results of this study indicated that the highest percentages (59.4%, 34.6%, and 57.8%) of students daily consuming coffee, fast food, and margarine respectively.

Table 2
Distribution of University Students according to their dietary habits

Habits		No.	Percent
Vegetables	Rarely	46	12.0
	Once or twice per week	86	22.4
	Three or four time/day	50	13.0
	Daily	202	52.6
Fruits	Rarely	51	13.3
	Once or twice per week	106	27.6
	Three or four time/day	58	15.1
	Daily	169	44.0
Meat	Rarely	58	15.1
	Once or twice per week	156	40.6

	Three or four time/day	93	24.2
	Daily	77	20.1
Sweets	Daily	136	35.4
	Three or Three	60	15.6
	Once or Twice	92	24.0
	Rarely	96	25.0
Bread	Daily	317	82.6
	Three or Four	25	6.5
	Once or Twice	24	6.3
	Rarely	18	4.7
Soft drink	Daily	108	28.1
	Three or Four	60	15.6
	Once or Twice	121	31.5
	Rarely	95	24.7
Milk	Rarely	215	56.0
	Once or twice per week	80	20.8
	Three or four time/day	22	5.7
	Daily	67	17.4
Tea	Daily	230	59.9
	Three or Four	18	4.7
	Once or Twice	32	8.3
	Rarely	104	27.1
	Total	384	100.0
Coffee	Daily	57	14.8
	Three or Four	19	4.9
	Once or Twice	80	20.8
	Rarely	228	59.4
Fast food	Daily	73	19.0
	Three or Four	70	18.2
	Once or Twice	108	28.1
	Rarely	133	34.6
Margarine	Daily	89	23.2
	Three or Four	27	7.0
	Once or Twice	46	12.0
	Rarely	222	57.8
Rice	Daily	355	92.4
	Three or Four	14	3.6
	Once or Twice	11	2.9
	Rarely	4	1.0

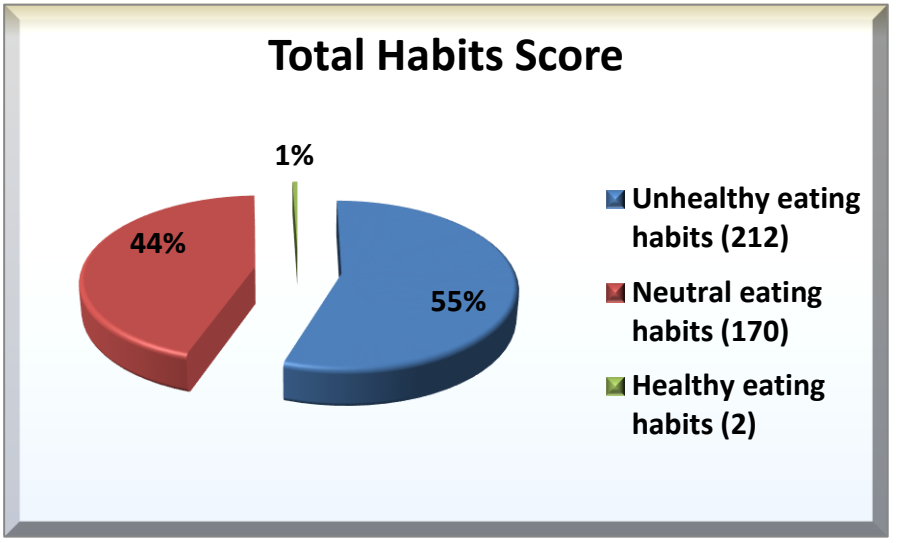

Figure 4. Represented distribution of students according to total habits score

Figure 4 reveals that the highest percentage 112 (55.0%) of students have unhealthy habits score, while the lowest percentage 2 (1.0%) of them have a healthy habits score. Table 3 shows a Univariate Logistic regression analysis to identify some variables independently associated with obesity/ overweight. The current study found that there is no a significant association between socio-demographic items of the studied sample and body mass index (P. value >0.05). The results of this study indicate the participants who physical inactivity were likely at higher risk of obesity/overweight than those physical activity (B= 0.422; P. value=0.041; OR=1.552; 95% C. I =1.016-2.287).

Table 3
Univariate Logistic regression analysis to identify some variables independently associated with obesity/ overweight

		B	P. value	OR	95% C.I. for OR	
					Lower	Upper
Age group per years	18 - 20 years	Reference				
	21 - 23 years	0.211	0.332	1.235	0.806	1.893
	24 - 26 years	0.615	0.073	1.849	0.944	3.623
Income	Low	Reference				
	moderate	0.057	0.855	1.059	0.573	1.956
	High	0.358	0.219	1.431	0.808	2.533
Marital	Single	Reference				
	Married	0.604	0.068	1.829	0.956	3.501
	engaged	0.690	0.192	1.993	0.708	5.613
Residency	City	Reference				
	village	0.459	0.051	1.582	0.998	2.507
	student dorm	-0.052-	0.845	0.949	0.561	1.604

Gender	Male	Reference				
	Female	-0.083-	0.683	0.920	0.616	1.373
Physical activity	Yes	Reference				
	No	0.422	0.041	1.525	1.016	2.287

It is clear from the results presented in Table 4 that there is a statistically significant correlation between the habit of drinking soft drinks and the body mass index of the sample of students under study, where the significance value was less than 0.001 (P < 0.001). The current study also found a statistically significant relationship between drinking tea, eating fast food, and eating margarine with body mass index, where the significance value for the habit of drinking tea was (P-value = 0.044), and the significance value for the habit of eating fast food (P-value = 0.05).) and the significance value for the habit of eating margarine was (P value = 0.048),

Table 4
Association between the dietary habits of the studied sample and Non-overweight/ Obesity, and Overweight / Obesity

Type of food and eating pattern			BMI status		X^2	P. value
			Non-overweight/ Obesity	Overweight/ Obesity		
Vegetables	Rarely	No	21	25	2.099[a]	0.552
		%	45.7%	54.3%		
	Once or twice per week	No	49	37		
		%	57.0%	43.0%		
	Three or four time/day	No	28	22		
		%	56.0%	44.0%		
	Daily	No	102	100		
		%	50.5%	49.5%		
Fruits	Rarely	No	22	29	2.571[a]	0.463
		%	43.1%	56.9%		
	Once or twice per week	No	60	46		
		%	56.6%	43.4%		
	Three or four time/day	No	31	27		
		%	53.4%	46.6%		
	Daily	No	87	82		
		%	51.5%	48.5%		
Meat	Rarely	No	29	29	0.284[a]	0.963
		%	50.0%	50.0%		
	Once or twice per week	No	82	74		
		%	52.6%	47.4%		
	Three or four time/day	No	50	43		
		%	53.8%	46.2%		
	Daily	No	39	38		

		%	50.6%	49.4%		
Sweets	Daily	No	65	71	2.798[a]	0.424
		%	47.8%	52.2%		
	Three or Three	No	29	31		
		%	48.3%	51.7%		
	Once or Twice	No	51	41		
		%	55.4%	44.6%		
	Rarely	No	55	41		
		%	57.3%	42.7%		
Bread	Daily	No	166	151	1.141[a]	0.767
		%	52.4%	47.6%		
	Three or Four	No	12	13		
		%	48.0%	52.0%		
	Once or Twice	No	11	13		
		%	45.8%	54.2%		
	Rarely	No	11	7		
		%	61.1%	38.9%		
Soft drink	Daily	No	53	55	22.336[a]	<0.001*
		%	49.1%	50.9%		
	Three or Four	No	31	29		
		%	51.7%	48.3%		
	Once or Twice	No	48	73		
		%	39.7%	60.3%		
	Rarely	No	68	27		
		%	71.6%	28.4%		
Milk	Rarely	No	115	100	2.204[a]	0.531
		%	53.5%	46.5%		
	Once or twice per week	No	39	41		
		%	48.8%	51.3%		
	Three or four time/day	No	14	8		
		%	63.6%	36.4%		
	Daily	No	32	35		
		%	47.8%	52.2%		
Tea	Daily	No	107	123	8.124[a]	0.044*
		%	46.5%	53.5%		
	Three or Four	No	12	6		
		%	66.7%	33.3%		
	Once or Twice	No	17	15		
		%	53.1%	46.9%		
	Rarely	No	64	40		
		%	61.5%	38.5%		
Coffee	Daily	No	23	34	7.041[a]	0.071
		%	40.4%	59.6%		
	Three or Four	No	9	10		

		%	47.4%	52.6%		
	Once or Twice	No	37	43		
		%	46.3%	53.8%		
	Rarely	No	131	97		
		%	57.5%	42.5%		
Fast food	Daily	No	30	43	7.420[a]	0.050*
		%	41.1%	58.9%		
	Three or Four	No	34	36		
		%	48.6%	51.4%		
	Once or Twice	No	66	42		
		%	61.1%	38.9%		
	Rarely	No	70	63		
		%	52.6%	47.4%		
Margarine	Daily	No	36	53	7.925[a]	0.048*
		%	40.4%	59.6%		
	Three or Four	No	14	13		
		%	51.9%	48.1%		
	Once or Twice	No	22	24		
		%	47.8%	52.2%		
	Rarely	No	128	94		
		%	57.7%	42.3%		
Rice	Daily	No	182	173	4.023[a]	0.259
		%	51.3%	48.7%		
	Three or Four	No	7	7		
		%	50.0%	50.0%		
	Once or Twice	No	9	2		
		%	81.8%	18.2%		
	Rarely	No	2	2		
		%	50.0%	50.0%		

Discussion

The current study found that the highest percentage (44.5%) were in the age group (18-20) years and the lowest percentage (11.5%), was in the age group 24-26 years. these results agreed with the study conducted at the University of Gujrat, Pakistan (Irfan *et al.*, 2019), which found that 229 (53.0%) of the students were between (18-21) years. Also, these results are agreement with the previous study findings done by Ahmad *et al.*, (2019), who found same the results. The highest percentage (43.5%) of the participants were living in the city. This result is consistent with the study findings conducted at the University of Gujrat, Pakistan (Irfan *et al.*, 2019), which revealed that 58.8% of the students were living in the urban. The possible explanation for this result may be due to two reasons, the first is the increased population density in urban areas, and the second reason may be due to the fact that most of the study participants choose universities located in cities close to their regions.

In this study, found that the 172 students by (44.8%) of students were normal weight, followed by 131 students by (34.1%) of them were overweight, 53 students by (13.8%) of students were obese, finally, the lowest number 28 students by (7.3%) of them were underweight. Thus, the largest percentage of students, 47.9, are in the categories of overweight and obesity. . Results of our current study is consistent with the study findings conducted in Lebanon, the prevalence of overweight and obesity among male college students was 37.5% and 12.5%, respectively (Yahia *et al.*, 2008). A possible explanation for students' weight gain may be due to changing behaviors in university life. Ganasegeran *et al.*, (2012), reported that University students also undergo a critical period when their behaviors are conducive to change often resulting in weight gain.

The results of this study reveals that the highest percentage 213 (55.5%) of the students were physically inactive , while the lowest percentage 171 (44.5%) of them were physically active. These results agree with study results of (Al-Hazzaa, 2002) revealed that the majority of Saudi adolescents (71%) were physically inactive . Omer *et al.*, (2013) reported much higher rates of physical inactivity (91.7%). Keating *et al.*, (2005) which revealed that approximately 40-59% of university students were physically inactive. The transition period from high school to university appears to be associated with decreased physical activity and increased sedentary activities, resulting in students gaining weight (Crombie *et al.*, 2009).

The highest percentage 204 (53.1%) of students were eating three meals daily, while the lowest percentage 9 (2.3%) of them were eating one meal daily in this study. These results agreed with the study findings conducted in Najran University, Najran, Saudi Arabia (Al-Shehri *et al.*, 2017), which found that 50.0% of students were eating three meals per day. As the results study agreed with the study findings conducted at University students in Alexandria, Egypt (Genena and Salama, 2017), which found that a high percentage (37.4%) of students eating daily and fruits. Also, these results agreed with (Ahmad *et al.*, 2019), which found that 65.0% of students drinking tea daily. Ahmed *et al.*, (2019) revealed that 35.0% of participants drinking soft drink once a week. Another study by Olatona *et al.*, (2018) found that 29.0% of students drinking soft drink for once or twice per week. The results of this study indicated that the highest percentage (59.4%, 34.6%, and 57.8%) of students daily consuming coffee, fast food, and margarine respectively. These results agreed with the study findings at Najran University, Najran, Saudi Arabia (Al-Shehri *et al.*, 2017). A possible explanation for the increase in the unhealthy eating habits of most students may be due to the division of university residents into two categories, those who continue to live with their parents and those who study at universities away from their usual place of residence who are forced to. Living away from home. Al-Qahtani, (2016), and Al-Rethaiaa *et al.*, (2010) reported College students represent the young category of society, and they are prone to eating habits and unhealthy foods during their college years which may affect their health, and increase the risk of obesity, diabetes and coronary heart disease; Such as consumption of fast food with lack of physical activity and increased hours of computer and television viewing.

The current our study found that there was a significant association between certain dietary habits and BMI categories including intake of soft drinks, tea, fast food and margarine, were the percentage of obese people who consume soft drinks, tea, fast food and margarine a daily (55%, 53.5%, 58.9% and 59.6%) respectively with significant values (P-value <0.001 , P-value= 0.044 , P-value= 0.05 , and P-value = 0.048) respectively. These results agreement with result of Neta *et al.* , (2021) who they reported that tea, butter, and ghee have a significant relationship with Z-BMI over time. A possible explanation for the relationship between certain dietary habits and overweight and obesity may be that the majority of students have unhealthy eating habits because most of them live in college dorms. If several studies indicate that those specific periods of students' lives may influence the student's lifestyle and thus nutritional habits, and this leads to changes in BMI (Perusse-Lachance *et al.*, 2010).
In this study, there is no significant relationship between the socio-demographic elements of the studied sample and body mass index with a significant value (P value > 0.05), except for physical activity, as we found a statistically significant relationship between exercise and body mass index with a significant value (P value = 0.041) .These results are in agreement with that of Abdelhakim *et al* (2015), who found that there was no significant association between economic status and BMI with a significant value (X2 = 6.253, P = 0.395). The results of our study are also in agreement with the result of the study conducted at Sultan Zine El Abidine University by (Rusli & Harith, 2020) which found that there is no significant association between residence and gender with a significant BMI value (P = 0.769 and P = 0.694). Straight. While these results are not in agreement with the results of the study conducted at the University of Belgrade, Serbia (Gazibara *et al.*, 2013), which revealed a significant association of gender with BMI with a significance value (P = 0.001).

Conclusions

- We conclude from this study that more than half of the students are overweight and obese because of their unhealthy eating habits and because of the change in their lifestyle.
- We also conclude from this study that there is no statistically significant association between demographic characteristics and BMI except for exercise. We found a statistically significant relationship between exercise and BMI.

Recommendations

This study recommends developing a health awareness plan to educate university students about healthy lifestyles and healthy food choices. It also recommends a health education program to address the high rates of overweight and obesity.

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