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Effect of dietary pattern and lifestyle on the body composition of Umm Al-Qura University females' students in Kingdom of Saudi Arabia

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A lifestyle behavior is associated with eating and intentional weight control behaviors. Recent research highlights the importance of considering unique relationships between behavioral practices and multiple aspects of weight change. Increasingly sedentary leisure activities are considered one of the main reasons for the obesity epidemic especially during quarantine. To assess the effect of dietary pattern and lifestyle on the body composition of Umm Al-Qura University (UQU) females' students. Cross-sectional study was applied on 450 female students from Applied Medical Sciences in Umm Al-Qura University. Data were collected by using close ended question questionnaire. Body composition data were obtained by using composition monitor scale. The obtained data were statically analysis by SPSS version 26 using Chi square and all data were performed at significant level of 95% (P. value \leq 0.05). The obtained data showed that 78.7% of subjects eat fast foods, 55.3% and 45.3 % of them did not eat at least one serving of fruit and vegetables daily. Eating fast foods; performing physical exercise and hours spend on electronic devices show a great effect on body fats. The present study suggested that healthcare professionals should make efforts to educate students about the risk of sedentary and encourage them be physically active and to improve dietary habits.

Keywords: Obesity, dietary pattern, life style, and body composition.

INTRODUCTION

Nutrition is considered as a physiological and psychosocial status and differs according to many factors. Food choices eating style depend on many factors such as: Individual Preferences which influenced by personal experience, Cultural, social, economic and Religious Influences. Also, environmental influences are an important factor that effect on eating style (Lallukka et al. 2004). For example, eating style is highly depend on type of work and the condition of individuals at work and these affect their health status and risk factor for some disease. In addition, factors like working environment, work stress and working time etc. have an impact on the development of food

choices and eating pattern (Yemişçi and Pekcan, 2012). When people do not consume right type and amount of food and do not eat balanced diet, they become weaker and their bodies cannot defense against disease probably, they loss focus and attention, so their productivity on work, school and their live will decrease and become slower than should it be (Sözen et al. 2009). A study was conducted for adults and adolescents in the Middle East to confirm that changing environmental-feature negatively effect on their food habits. The result was that they were affected by the surrounding environment and found that many of them tended to fast food and generally unhealthy eating, which led to the

spread of diseases, such as obesity, diabetes and stress significantly (Alsheikh-Ali et al. 2014).

In the recent years, Saudi Arabia has great dramatic changes in their habits as a results of economic growth Al-Nakeeb et al. (2012). The main effect on this change are the appearing of new technologies that used by population which resulting in usage of electronic devices based activity by children also for communication and E-learning (Owen , 2018).

Limited research on this topic has been documented in Saudi Arabia, so the aim of this cross-sectional study is to examine the effect of dietary pattern and lifestyle on the body composition of Umm Al-Qura University (UQU) females' students

MATERIALS AND METHODS

Subjects:

Across sectional data was collected during six months. 450 random female students from undergraduate and masters from Umm Al-Qura University were shared of the present research. Their ages were 19 to 27 years old. Electronic questionnaire was used for obtaining the data during the academic year 1441-1442 (2019-2020), data about anthropometric measurements were collected during return study in the university.

Methods:

Study design:

Subjects were randomly chosen from UQU female students

Data collection:

Data were collected by electronic questionnaire found in (appendix 1) that include general questions about dietary related habits.

Anthropometric measurements:

Height:

The students height was measured in cm. participant was asked to stood without shoes (yalcin et al 2004) and to stand straight with the head as the Frankfurt horizontal plane, feet together, knee straight, buttocks, heels, and shoulder blades in content with the vertical surface of the stadiometer and wall (Gibson, 2005).

Body weight:

Weight of participant was measured in kilograms using Bioelectrical Impedance Analysis , **Omron Body** Composition Monitor and Scale (HBF-514C)

Body Mass Index (BMI)

BMI was calculated automatically (kg/m^2) throughout **Omron Body** Composition Monitor and Scale (HBF-514C), and the result classified as following: BMI <18.5 was underweight, normal weight BMI ranged between 18.5 and 24.9, BMI between 25 and 29.9 was considered overweight, BMI between 30 and 39.9 was considered obese and these classifications is agree with WHO, (1995) classification.

Body composition:

Body composition was measured by using the Bodystat 1500 MDD device (Bodystat Ltd, Isle of Man, British Isles). This device measures the impedance value of the body, providing quick and effective analysis of body composition.

Statically analysis:

The obtained data were statically analysis by SPSS version 26 using Chi square and all data were performed at significant level of 95% (P. value ≤ 0.05)

RESULTS

Table (1) illustrates frequency distribution of subject according to demographic, social and economic data. It is clearly noticed that 92.67% of subjects are single. The highest percent of subjects have 5-7 family members whereas the lowest percent have more than 9 family members represented (58.7% and 8.6%) respectively. In the same table 98.7 % of subjects have university as educational level and 1.3% were in master as educational level. 57.3% of subjects reported that their family income level were more than 10,000RS and 28% their income less than 3000RS to 5000RS. Table (2) illustrates frequency distribution of subject according to practice of physical activity. It is clearly noticed that 54.7% of subjects doing physical activity. The highest percent of subjects walking whereas the lowest percent running represented (73.1 vs. 3.6%). 46.7% of subjects reported that they have no barrier for doing physical activity, 39.3 of them were lazy and 12% of them reported that the barrier of doing physical activity was not suitable environment.

Table 1: Frequency distribution of subject according to demographic, social and economic data

Parameters	No.	%	
Social status	Single	417	92.67
	Married	31	6.89
	Divorced	2	0.44
	Total	450	100
Family members	3-4	57	12.7
	5-7	264	58.7
	7-9	90	20
	>9	39	8.6
	Total	450	100
Educational level	Undergraduate	444	98.7
	Masters	6	1.3
	Total	450	100
Income level/month	≤ 3000 SR	42	9.3
	3000-5000 SR	42	9.3
	6000-9000 SR	108	24
	>10000	258	57.3
	Total	450	100

Table 2: Frequency distribution of subjects according to practice of physical activity

Parameters	Answers	NO.	%	P. value
Are you doing exercise?	Yes	246	54.7	0.054
	No	204	45.3	
	Total	450	100	
What type of exercise you do?	Walking	180	73.1	0.036
	Running	9	3.6	
	Aerobic	39	15.8	
	Resistance	18	7.3	
	Total	246	100	
What are the barriers for doing exercise?	No time	210	46.7	0.046
	Laziness	177	39.3	
	No suitable environment	54	12	
	Other	9	2	
	Total	450	100	
What is the average of using electronic devices daily?	1:00-2:00 hours	39	8.7	0.047
	3:00-4:00 hours	153	34	
	>4 hours	258	57.3	
	Total	450	100	
How many hours do you sleep?	4:00-5:00 hours	93	20.7	0.039
	6:00-8:00 hours	291	64.7	
	9 hours or more	66	14.7	
	Total	450	100	

Table 3: Frequency distribution of subjects according to fast food consumption

Parameters	Answers	NO.	%	P. value
Are you eating fast foods?	Yes	354	78.7	0.028
	No	96	21.3	
	Total	450	100	
How many times you eat fast food per week?	Once	153	43.2	0.047
	2 - 3 times	171	48.3	
	Every day	30	8.5	
	Total	354	100	
Are you eating semi-prepared foods?	Yes	351	78	0.027
	No	99	22	
	Total	450	100	
Does advertising affect your buying foods behavior?	Yes	177	39.3	0.046
	No	273	60.7	
	Total	450	100	

Table 4: Frequency distribution of subjects according to consuming coffee, meats, fruits, and vegetables

Parameters	Answers	NO.	%	P. value
Are you drinking coffee or tea after meal directly?	Yes	123	27.3	0.048
	No	327	72.7	
	Total	450	100	
Are you eating meat or fish or chickens at least twice weekly?	Yes	186	41.3	0.035
	No	264	58.7	
	Total	450	100	
Do you eat at least one serving of fruit daily?	Yes	201	44.7	0.056
	No	249	55.3	
	Total	450	100	
Do you eat at least one serving of vegetable daily?	Yes	246	54.7	0.046
	No	204	45.3	
	Total	450	100	
Do you prefer eating fruits as a snake between meals?	Yes	141	31.3	0.038
	No	309	68.7	
	Total	450	100	
Are you trying to eat a healthy diet?	Yes	324	72	0.039
	No	126	28	
	Total	450	100	
Are you eating fast foods because it's cheaper than other foods?	Yes	78	17.3	0.029
	No	372	82.7	
	Total	450	100	
Do you prefer fast food than other food because it's tasty?	Yes	198	44	0.047
	No	252	56	
	Total	450	100	

Table 5: Mean \pm SD of height, weight, BMI, % of body fats, and % of body muscles of the subjects.

Height	Weight	BMI	Fat Percent	Muscle Percent
156.80 \pm 5.17	54.08 \pm 12.11	22.01 \pm 4.39	33.24 \pm 9.33	24.69 \pm 2.91

Table 6: The effect of consuming fast foods, fruits, vegetables, performing exercise, and time spending using electronic devices on the Subject's BMI Categories

Variables		BMI Categories					Total	P. value
		Under-weight	Normal	Over-weight	Obesity I	Obesity II		
Are you eating fast foods?	Yes	12	81	189	63	9	354	0.017
	No	3	3	57	18	15	96	
Do you eat at least one serving of fruit daily?	Yes	6	36	108	45	6	201	0.300
	No	9	48	138	36	36	249	
Do you eat at least one serving of vegetable daily?	Yes	12	51	126	45	12	246	0.348
	No	3	33	120	36	12	204	
Are you doing exercise?	Yes	6	60	102	24	12	204	0.048
	No	9	24	144	57	12	246	
What is the average of using electronic devices daily?	1-2 hours	0	0	21	9	9	39	0.047
	3-4 hours	3	24	96	21	21	153	
	More than 4 hours	12	60	129	51	6	258	

Table 7: The effect of consuming fast foods, fruits, vegetables, performing exercise, and time spending using electronic devices on the Subject's body fat percentage categories

Variables		Body Fat Percentage Categories				Total	P. value
		Low	Normal	High	Very high		
Are you eating fast foods?	Yes	33	132	75	114	354	0.048
	No	18	39	12	27	96	
Do you eat at least one serving of fruit daily?	Yes	30	72	36	63	201	0.290
	No	21	99	51	78	249	
Do you eat at least one serving of vegetable daily?	Yes	21	99	48	78	246	0.518
	No	30	72	39	63	204	
Are you doing exercise?	yes	30	90	36	48	204	0.166
	No	21	81	51	93	246	
What is the average of using electronic devices daily?	1-2 hours	0	12	12	15	39	0.043
	3-4 hours	9	63	30	51	153	
	More than 4 hours	42	96	45	75	258	

Table (3) illustrates frequency distribution of subject according to fast food consumption. It is clearly noticed that 78.7% of subjects consume fast food. 48.3% of subject report that they consume fast food 2-3 times per week, 43.2% of them consumed fast food once a week and 8.5% of them consumed fast food every day. In the same table 78% of subjects consumed semi-prepared products. 52.9% of subjects consumed semi-prepared products 2 to 3 times per week, 32.4% of subjects consumed semi-prepared products once a week and 14.5% of them consumed semi-prepared products daily. As shown in table (4) 27.3% of subjects drinking

coffee or tea after meal directly, 44.7% eat at least one serving of fruit a day, 54.7% eat at least one serving of vegetable a day. Table (5) illustrates Mean \pm SD of Height, Weight, BMI, % of body fats, and % of body muscles of the subjects. Table (6) illustrates the effect of consuming fast foods, fruits and vegetables, performing exercise, and time spending using electronic devices on the subjects BMI categories. It is clearly noticed that students eat fast have a highest levels of overweight, obesity grade 1 and obesity grade 2 than others who did not eat fast foods with a significant ($P \leq 0.05$) difference between them. The same trends were observed with students who did not perform physical activity. Students eat fruits

and vegetables daily show insignificant effects on BMI categories. Concerning time spending using electronic devices there is a significant ($P \leq 0.05$) effect on BMI categories. It is clearly noticed that students spend 2-3 hours and who spend more than 4h have highest levels of overweight, obesity grade 1 and 2 than others who spend 1-2 hours. Concerning the effect of consuming fast foods, fruits, vegetables, performing exercise, and time spending using electronic devices on the subjects body fat percentage categories table (7) show that students eat fast foods and spending more time using electronic devices have a highest levels of body fat percentage categories than others with a significant ($P \leq 0.05$) differences while students consuming fruits, vegetables and performing exercise show insignificant effects on their body fat percentage categories.

DISCUSSION

In recent decades society of Saudi Arabian has been undergoing great changes in lifestyle specially in college student and using electronic devices and E-learning became necessary specially during current due to spread of Covid-19.

A lifestyle behavior is accompanied by eating and behaviors of weight control. Recent research highlights the importance of considering unique relationships between behavioral practices and multiple aspects of weight change. Increasingly sedentary leisure activities are considered one of the main reasons for the obesity epidemic (Sciamanna et al. 2011). In the past few decades, Saudi Arabia has become one of the highest obesity and overweight prevalence rates. Previous studies related to prevalence of obesity in the Kingdom of Saudi Arabia (KSA) indicate an increasing trend in obesity and overweight, which are major sources of a number of other diseases, including hypertension, diabetes and hyperlipidemia. The study indicated that life style and motionless affected obesity in KSA (Sabra, 2014).

Obtained data in the present study shows that students eat fast foods and spending more time using electronic devices have a highest levels of body fat percentage categories than others with a significant differences while students consuming fruits, vegetables and performing exercise show insignificant effects on body fat percentage categories. The same results were found by Jari et al. (2020) they found a high significant correlation (P -value = 0.017) between frequency of eating fast food weekly and increasing BMI of

their study subjects than others who eating more fruits and vegetables, also they found increasing in BMI between subjects eating more fast food than others who spend more time watching television. Hmidan et al. (2020) in their study on children between 9 to 12 years old found that spending more time using and watching electronic devices are accompanied with obesity and over weight in Saudi schools. Also in agreement with our results Mishra et al. (2010) they found that eating behaviors as skipping meals, eating out, and snacking were common among adolescent girls and affect their body fat percentage. Also they reported that female have enough awareness toward nutritional deficiency, but they did not follow healthy dietary behaviors. Their diets deficient with protein, iron, and fiber. Nutritional problems among other groups of females in Delhi showed that subjects of both higher and lower socioeconomic groups suffered from iron deficiency anemia. Allison et al. (1996) reported that the amount of daily physical activity clearly contributes to the maintenance of body. Obese people are less active than lean people and spending more time using electronic devices Pereira et al. (2005).

Successful weight reduction requires long-term lifestyle changes to decrease energy intake and increase physical activity. By contrast, freely available diet remedies are advertised as quick solutions which promise to induce weight loss with little or no effort (Pillitteri et al. 2012).

The present study show that 78.7% of subjects eat fast foods, 55.3% and 45.3 % of them did not eat at least one serving of fruit and vegetables daily. In agreement with these results Washi and Ageib, (2010) they found that high percent of the adult girls in Jeddah, Saudi Arabia, enjoy eating outside-of-home. Results of their study indicated that more than 80% of the participants preferred fast food rather than foods prepared in home. 73% of them eat fast foods in restaurants. Adamson et al. (1996) make a survey conducted on 379 UK adolescents (11 years to 12 years of age) revealed that eating outside the home accounted for about 30% of daily energy intake. The study also revealed that meals taken during tiffin hours at collage are rich in fats and salt contained less protein, non-starch polysaccharide, iron, and retinol equivalents. According to Finkelstein et al. (2009) 30.0% of adults reported having consumed fruits at the recommended level of 2 or more times per day. 27.2% of adults reported having consumed vegetables at the recommended level of 3 or more

times per day. Baker et al. (2003) examined eating behaviors in a sample of 279 adolescents from a midsized catholic girls' school and a large public school of US and showed that adolescents were less likely to have a positive attitude or intention about healthy eating and activity if their parents and peer group do not perceive these behaviors as important in life. Another study carried out among Costa Rican adolescents demonstrated direct impact of peer influence on intake of foods containing saturated fat (Monge-Rojas et al. 2002).

CONCLUSION

This study provides important data about the effect of dietary pattern and life style on the body composition. Eating fast foods; performing physical exercise and hours spend on electronic devices show a great effect on body fats percentage and BMI category. The present study suggested that healthcare professionals should make efforts to educate students about the risk of sedentary and encourage them be physically active and improving dietary habits.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

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AUTHOR CONTRIBUTIONS

Aminah Kassim Alajmi, Nadiah Hamed Majdali, Fayza Mustafa Jastaniah, Shoug Naif Almogaty, Abeer Abdullah Hamdi collect data from their peer students. Doaa Rafat Negm designed questionnaire and also wrote the manuscript also and make data analysis by SPSS and reviewed the manuscript. All authors read and approved the final version.

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