

Relationship between eating patterns and body composition among young females in Qatar.

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ABSTRACT

The prevalence of obesity has been increased in Qatar, with the transition from healthy to unhealthy dietary habits. Behavioral factors that are associated with obesity are, long-term imbalanced energy intake, high screen time, skipping breakfast and physical inactivity. Changes in body composition and percent body fat (PBF) increase the risk of non-communicable disease. This study is the first study conducted in Qatar to investigate the relationship between dietary patterns and body composition among young females at Qatar University. This cross-sectional study consisted of 766 healthy female students Qatari and non-Qatari aged from 18-26 years randomly selected from different colleges at Qatar University. A validate questionnaire was used in order to collect data about healthy and unhealthy dietary patterns. Anthropometric measurements involved body weight, height, waist-to-height ratio (WHtR), waist circumference (WC), body mass index (BMI) and body composition using "Seca285", "Seca203" and "InbodyBiospace 720". Dietary patterns were identified by using factor loading. Linear regression was used to estimate confidence intervals and regression coefficient. More than half of the participants had a normal weight (65.1%), whereas 22.8% and 12.0% were overweight and obese, respectively. Fat mass, BMI and PBF were slightly increased with age, but there was no significant difference. Factor analysis identified two dietary patterns: unhealthy patterns and healthy patterns. The frequent intake of vegetables and fruits was significant among high PBF female students ($p=0.045$ and $p=0.001$, respectively). The frequent intake of fast food was higher for overweight female students but there was no significant difference ($p=0.289$), whereas, the frequent intake of sweetened beverages was associated with higher significant rate of normal weight among female students ($p = 0.009$). No significant relation was found between dietary patterns, BMI and PBF. In conclusion, body composition is not significantly associated with healthy and unhealthy eating patterns among young females.

INTRODUCTION

The prevalence of obesity increased dramatically in the last three decades in the Middle East and North Africa. In 2016, more than 30% of women in this region were obese, whereas the prevalence of obesity in Qatar was 42% for women aged 18 years old and above [1,2]. Obesity is considered a multifactorial condition influenced by genetic and behavioral variables [3]. Long-term energy intake imbalance, sedentary behavior related to high screen time, skipping breakfast and physical inactivity are among the behavioral factors that are associated with obesity [3]. Many studies have shown that a higher intake of fruits, vegetables, and whole grains were associated with lower BMI [4,5]. In contrast, high intake of refined grains, white bread, meat, sweets, and desserts seemed to promote weight gain and increase in waist circumference [6].

OBJECTIVES

This cross-sectional study aims to identify the eating patterns among young females (between 18-26 years) at Qatar University and to highlight the association between eating patterns and body composition.

METHODOLOGY

Study population and sample selection:

The study design is cross sectional study. The sample was randomly selected from different colleges at Qatar University. This study was conducted between November and October of 2014 and 766 students aged between 18-26 years accepted to participate in the study. The study protocol has been approved by Qatar university IRB each participant assigned a consent form.

Inclusion and exclusion criteria:

The inclusion criteria in this study was healthy young females with absence of disease.

The exclusion criteria was involving pregnant, lactating women and females who were on medical treatment.

Anthropometric data:

Anthropometric data were determined using standard methods. Weight and body composition were measure using Inbody Biospace 720. Height measured using a stadiometer Seca 285, Waist Circumference was measured by Seca 203.WHtR was calculated by dividing the waist to the height and BMI was calculated by dividing the weight in kilograms to the height in meter squared.

Dietary habits assessments:

Dietary habit were assessed using validated questionnaire (ATLS). Food frequency Questionnaire was used to collect intake frequency of the target population. Questionnaire included 10 specific questions about participant's intake frequency of certain dietary habits during a regular week and it covered healthy and unhealthy dietary habits. The frequency of food consumption was classified in the answer choices into eight levels, ranging from zero intake (noun) to more than seven times per week.

Statistical analysis:

We conducted an exploratory factor analysis using 10 food items. The number of dietary patterns was determined by the following criteria: First, eigenvalue > 1, then scree plot, finally the interpretation based on food culture. Factor loadings were to identify dietary patterns. Regarding this study, food groups with absolute factor loading ≥ 0.3 were included, as it considered a significant factor in the pattern. The Kaiser-Meyer-Olkin value for the FFQ was 0.84, and Bartlett's sphericity test had a $p < .001$ value, indicating that factor analysis was appropriate for the data. Data were collected from the questionnaire and analyzed by using STATA (statistical analysis software package version 16). One-Way between group analysis of variance (ANOVA) and t-test were performed for normally distributed data to test the mean frequency of different food intake according to the body fat % tertile between three groups, T1 (low BFP), T2 (medium BFP), and T3 (high BFP). In addition to the analysis of anthropometric measurements between different age groups. P -value < 0.05 was considered as statistically significant. Multiple regression was used to study the association between obesity indicators and food consumption patterns.

RESULTS

Table 1 . Anthropometric characteristics of participants (means \pm standard deviations)

Variables	Mean \pm standard deviations (X \pm SD)	
Age (years)	21.23 \pm 1.94	
Anthropometric Measures		
Weight (kg)	60.79 \pm 13.80	
Height (cm)	161.12 \pm 51.12	
Waist Circumference (cm)	83.32 \pm 10.98	
Body mass index (BMI) (kg/m ²)	23.98 \pm 5.07	
Free fat mass (FFM) (kg)	20.54 \pm 3.53	
Total Body water (TBW) (kg)	28.31 \pm 8.41	
Fat mass (FM) (kg)	22.82 \pm 9.72	
% Fat mass (FM%)	36.52 \pm 16.86	
BMI class (%)	Normal	65.1%
	Overweight	22.8%
	Obese	12.0%
Central obesity (%)	Normal WC	72.4%
	High WC	27.6%

*The result was expressed as Mean \pm standard deviations.

Table 2. Factor loading matrix of food groups consumed by the study population.

Variables	Unhealthy	Healthy
French fries' intake	0.7502	0.1363
Fast food intake	0.7127	-0.1476
Cake, biscuits and donuts intake	0.7055	0.1409
Breakfast intake	0.1897	-0.1122
Fruits intake	-0.0299	0.7506
Vegetables intake	-0.0826	0.6020
Sweetened beverages intake	0.3028	0.5933
Pastries and chocolate intake	0.3685	-0.3836
Dairy milk products intake	0.2415	-0.2559

RESULTS CONT.

Table 3 . Multiple linear regression Coefficient and respective confidence intervals for testing the association between dietary patterns, BMI and percentage body fat

Variables	β (coefficient)	95% Confidence Interval	P-value
BMI			
Unhealthy	-0.274	-0.632-0.085	0.134
Healthy	0.132	-0.226-0.490	0.468
Percentage body fat (PBF)			
Unhealthy	-0.299	-0.866-0.268	0.301
Healthy	-0.284	-0.850-0.282	0.324

*The model used was adjusted for age and physical activity.

CONCLUSION

The present study indicated a slight positive association between healthy diet and BMI, and an inverse association with percentage body fat. Our results show that there is no significant impact of both healthy and unhealthy eating patterns on body composition among young females.

REFERENCES

- Azizi, F., et al., Metabolic health in the Middle East and north Africa. The Lancet Diabetes & Endocrinology.
- Organization, W.H., Noncommunicable diseases country profiles 2018. 2018. p. 223.
- Narciso, J., et al., Behavioral, contextual and biological factors associated with obesity during adolescence: A systematic review. PLOS ONE, 2019. 14(4): p. e0214941.
- Denova-Gutiérrez, E., et al., Dietary Patterns Are Associated with Different Indexes of Adiposity and Obesity in an Urban Mexican Population. The Journal of Nutrition, 2011. 141(5): p. 921-927.
- Drenowatz, C., et al., The independent association between diet quality and body composition. Scientific reports, 2014. 4: p. 4928-4928.
- Fogelholm, M., et al., Dietary macronutrients and food consumption as determinants of long-term weight change in adult populations: a systematic literature review. Food & nutrition research, 2012. 56: p. 10.3402/fnr.v56i0.19103.

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