SciencePG
Science Publishing Group

Correlation Between Eating Patterns and Nourish Status Among Medical Students of Sarajevo University

Amra Catovic[1, *], Amira Kurspahic-Mujcic[1], Ajdin Vatres[2], Ervin Nadarevic[1]

[1]Faculty of Medicine, University of Sarajevo, Sarajevo, Bosnia and Herzegovina

[2]Faculty of Mechanical Engineering, University of Sarajevo, Sarajevo, Bosnia and Herzegovina

Email address:

amra.catovic@mf.unsa.ba (A. Catovic)

[*]Corresponding author

Abstract: University students experience numerous health-related behavioral changes, including the adoption of unhealthy dietary habits. This study aimed to assess the nourish status in a sample of students from Faculty of Medicine of Sarajevo University and correlate it with students eating habits. A cross-sectional survey of 68 students was performed during February and March 2016, at the Sarajevo University. Verbal informed consent was obtained from all participants before completing the self-administered questionnaire that included questions on their eating habits and anthropometrics measures, weight and height. Body mass index was used to assess students nourish status. Statistical analyses were performed using the Statistical Package for Social Sciences software (version 13.0). This study showed that the majority of the students (69.12%) were of normal weight. Intakes of fruit and raw vegetables were more common among students with BMI$\leq$24.9 kg/m^2 than students with BMI$\geq$25 kg/m^2 (P=0.0004 and P=0.046 respectively). Consumption frequency of coca cola and beverages was less common (P=0.005) among students with BMI$\leq$24.9 kg/m^2. This study gives baseline information about weight status and eating habits among a sample of university students. Regulating the energy density of food could be used as an approach for successful body weight control.

Keywords: Studying Youth, Lifestyle, Diet, Promotion Program

1. Introduction

Diet is a key determinant of human health and wellbeing. It is an essential factor of human physical and mental development. Deterioration of health, caused by inadequate nutrition, has epidemic proportion. There is relationship between health and food consumption, dietary patterns, nutrition and lifestyles. [1] Underestimate health consequences of lifestyle factors is compromised dental conditions. [2] Studying youth have great demands for energy necessary to cover mind activity associated with learning processes. Energy drink consumption has been linked with risk-seeking behaviors. [3]

Intercountry comparable overweight estimates from 2016 show that 56.4% of the adult population (> 18 years old) in Bosnia and Herzegovina were overweight. The prevalence of overweight was higher among men (62.0%) than women (51.2%). [4]

The food consumption patterns of young adults have been limited explored in Bosnia and Herzegovina. Exploring this health-related factor is necessary to implement a nutrition and health promotion program. This study aimed to assess the nourish status in a sample of students from Faculty of Medicine of Sarajevo University and correlate it with student eating habits.

2. Methods

2.1. Design and Sample

A cross-sectional study was conducted during February and March 2016 at Faculty of Medicine of Sarajevo University. A sample of 68 students (27.94% male and

72.06% female), aged 26.01±2.72 years participated in this study. As participants had to be informed about questionnaire random selection of university students was not possible, and the sample was limited to student who were interested in diet issues.

The study was conducted according to the research ethics guidelines laid down in the Declaration of Helsinki. [5] Verbal informed consent was obtained from all participants before completing the self-administered questionnaire.

2.2. Data Collection

Students were handed a self-administered anonymous questionnaire that included questions related to anthropometric and dietary information.

The FFQ used in this study was adapted from the CDC Global School Health Survey. [6] The finally used items in the FFQ were fruits, raw vegetables, cooked vegetables, coca cola and beverages, sweets (ice cream, chocolate,...), chips, fried potatoes, cake, fast food (hamburger, hotdog, sausages) bread and derivatives, milk, coffee, red meat, white meat, fish.

The FFQ asked how often each food item, group, or beverage was usually consumed with five possible answers for each of the food categories: (1) never, (2) two to three times per month, (3) two to three times per week, (4) at least one time per day, and (5) several times per day. These five response categories were later merged into two categories for analysis purposes, namely: (1) never and once or twice per month – rear, (2) two to three times per week, and (3) consumption on weekly basis – often.

Self-reported height and weight were used to calculate BMI (kg/m^2). According to guidelines stated by the World Health Organization weight status was classified into four categories: under- weight (BMI ≤ 18.5), normal weight (BMI between 18.5 – 24.9), overweight (BMI between 25–29.9), and obese (BMI ≥ 30).

2.3. Data Analysis

Statistical analyses were performed using the Statistical Package for Social Sciences (version 13.0, SPSS, Inc) software.

Results were expressed as means ± SD (standard deviation). Parametric variables were analyzed using students' *t-test*, while Mann-Whitney test was used for non-parametric variables. To correlate nourish status and eating pattern chi-squared analyses were conducted. All reported P values were made on the basis of 2-sided tests; differences were considered statistically significant at P < 0.05.

3. Results

3.1. Age Characteristics of the Students' Sample

Mean age of a total of 68 students (19 males and 49

females) was 26.00±2.72 years. Maximum was 34 years, and minimum was 23 years. There was no significant difference in age structure between gender (students' *t-test*: P=0.406).

3.2. Anthropometric Characteristics of the Students' Sample

Anthropometric characteristics of the participated are presented by Table 1. The average weight and height of all participated students was 68.82± 14.77 kg and 173.49 ± 9.06 cm, respectively. Mean BMI was 22.87 ± 43.18 kg/m^2.

Table 1. *Anthropometric characteristics of the participants (means ± SD).*

Variable	Total (N=68)	Males (N=19)	Females (N=49)
Weight (kg)	68.82±14.77	86.68±12.99	63.29±9.23
Height (cm)	173.49±9.06	183.95±7.90	169.43±5.59
BMI (kg/m^2)	22.87±3.18	25.12±3.02	22.00±2.81

There were significant differences in weight, height and BMI between gender (students' *t-test*: P=0.0005 for all three measures).

3.3. Students' Nourish Status Based on BMI Categories

It is showed by Table 2 that the majority of the students (69.12%) were of normal weight (36.84% of the male students compared to 81.63% of the female students). The prevalence of overweight was more common among male students compared to females (63.16% vs. 14.29%).

Table 2. *Prevalence of obesity among students based on BMI by gender.*

Nourish status	Males		Females		Total	
	N	%	N	%	N	%
*Underweight**	-	-	1	2.04	1	1.47
*Normal***	7	36.84	40	81.63	47	69.12
*Overweight****	12	63.16	17	14.29	19	27.94
*Obese*****	-	-	1	2.04	1	1.47

Underweight (BMI ≤ 18.5 kg/m^2), ** Normal (BMI between 18.5 – 24.9 kg/m^2), *** Overweight (BMI between 25–29.9 kg/m^2), **** Obese (BMI ≥ 30 kg/m^2).

3.4. Students' Eating Habits

Frequency of food groups consumption was correlated with nourished status (Table 3). The majority of students with BMI≤24.9 kg/m^2 (80.85%), and 42.11% of students with BMI≥25 kg/m^2 reported taking fruits every day. The difference of frequency of fruit consumption was statistical significant (chi-squared test: P=0.0004). There were differences in consumption frequency of raw vegetables (chi-squared test: P=0.046) and coca cola and beverages (chi-squared test: P=0.005). Intake of raw vegetables was more common among students with BMI≤24.9 kg/m^2 than students with BMI≥25 kg/m^2 (43.48% vs. 15.79% respectively). Among students with BMI≤24.9 kg/m^2, 78.26% reported drinking coca cola and beverages monthly or never compared to 36.84% students with BMI≥25 kg/m^2. Consumption frequency of other food group had no differences regarding to nourish status.

Table 3. Correlation between frequency of food groups consumption and nourish status.

Food groups	Frequency of consumption *	BMI≤24.9		BMI≥25		p
		N	%	N	%	
fruits	daily	38	80.85	8	42.11	
	weekly	8	17.02	10	52.63	0.004
	monthly or never	1	2.13	1	5.26	
raw vegetables	daily	20	43.48	3	15.79	
	weekly	22	47.83	13	68.42	0.046
	monthly or never	4	8.69	3	15.79	
cooked vegetables	daily	16	34.78	7	36.84	
	weekly	21	45.65	6	31.58	0.631
	monthly or never	9	19.57	6	31.58	
coca cola and beverages	daily	4	8.70	4	21.05	
	weekly	6	13.04	8	42.11	0.005
	monthly or never	36	78.26	7	36.84	
sweets (ice cream, chocolate,...)	daily	28	60.87	7	36.84	
	weekly	13	28.26	9	47.37	0.132
	monthly or never	5	10.87	3	15.79	
cake	daily	11	23.91	4	21.05	
	weekly	21	45.65	10	52.63	0.949
	monthly or never	14	30.44	5	26.32	
chips	daily	2	4.35	-	-	
	weekly	8	17.39	4	21.05	0.713
	monthly or never	36	78.26	15	78.95	
fried potatoes	daily	3	6.52	-	-	
	weekly	2	4.35	3	15.79	0.904
	monthly or never	41	89.13	16	84.21	
fast food (hamburger, hotdog, sausages)	daily	-	-	1	5.26	
	weekly	5	10.87	4	21.05	0.069
	monthly or never	41	89.13	14	73.69	
bread and derivatives	daily	38	80.85	14	73.68	
	weekly	7	14.89	3	15.79	0.386
	monthly or never	2	4.26	2	10.53	
milk	daily	31	68.89	14	73.68	
	weekly	8	17.78	3	15.79	0.695
	monthly or never	6	13.33	2	10.53	
coffee	daily	34	73.92	12	63.16	
	weekly	6	13.04	3	15.79	0.359
	monthly or never	6	13.04	4	21.05	
red meat	daily	9	20.00	5	26.32	
	weekly	25	55.56	9	47.36	0.814
	monthly or never	11	24.44	5	26.32	
white meat	daily	12	26.67	7	36.84	
	weekly	25	55.56	9	47.37	0.512
	monthly or never	8	17.78	3	15.79	
fish	daily	3	6.67	2	10.53	
	weekly	13	28.89	4	21.05	0.995
	monthly or never	29	64.44	13	68.42	

* For some food items a few participants did not indicates consumption frequency.

Between gender there were significant differences in consumption frequencies of cooked vegetables (Mann-Whitney test: P=0.003), coca cola and beverages (Mann-Whitney test: P=0.011), sweets (ice cream, chocolate...) (Mann-Whitney test: P=0.03), fast food (hamburger, hotdog, sausages) (Mann-Whitney test: P=0.001). Only consumption frequencies of coca cola and beverages is statistical associated with nourish status in male (χ=4.099; P=0.049).

4. Discussion

Mean BMI for male was 25.12±3.02 kg/m^2 and for female 22.00±2.81 kg/m^2. There are some differences in anthropometric measures of students in sample of this study and anthropometric reference data for adults in general population: BMI for male 28.6 kg/m^2 and for male 28.7 kg/m^2. [7]

The prevalence of overweight was more common among male students compared to females (63.16% vs. 14.29%). Significant difference in nourish status between genders is common in student population. [8] Intakes of fruit and raw vegetables were more common among students with BMI≤24.9 kg/m^2 than students with BMI≥25 kg/m^2 (χ=9.644; P=0.0004 and χ=4.601; P=0.046 respectively), whereas consumption frequency of coca cola and beverages was less common (χ=10.428; P=0.005). There are conflicting results of randomized controlled trials on the effects of increased fruit

and vegetable consumption on changes in body weight. [9] Consumption frequencies of coca cola and beverages is statistical associated with nourish status in male (χ=4.099; P=0.049). Over the past several decades, as obesity rates increased sharply, consumption of added sugars in beverages is increased that coursed controversial scientific debate. [10]

5. Conclusion

The findings of this study are limited by the choose of a student's sample. Nevertheless, the present study gives baseline information about weight status and eating habits among a sample of university students. Regulating the energy density of food could be used as an approach for successful body weight control.

Conflict of Interests

The authors declare that they have no competing interests.

References

[1]   WHO: Diet, nutrition and the prevention of chronic diseases. Technical Report Series No. 916, WHO Geneva, 2003.

[2]   Nihtila A, West N, Lussi A, Bouchard P, Ottolenghi L, Senekola E, et all. Oral Health Behavior and Lifestyle Factors among Overweight and Non-Overweight Young Adults in Europe: A Cross-Sectional Questionnaire Study. Healthcare (Basel). 2016; 4 (2): 21.

[3]   Arria AM, Caldeira KM, Bugbee BA, Vincent KB, O'Grady KE. Trajectories of energy drink consumption and subsequent drug use during young adulthood. Drug Alcohol Depend. 2017; 179: 424-32.

[4]   WHO Global Health Observatory Data Repository [online database]. Geneva, World Health Organization (http://http://www.who.int/gho/en/, accessed 21 October 2017).

[5]   World Medical Association Declaration of Helsinki. Ethical Principles for Medical Research Involving Human Subjects, 2008.

[6]   Center for Disease Control. Global School Based Student Health Survey, 2010.

[7]   Fryar CD, Gu Q, Ogden CL. Anthropometric reference data for children and adults: United States, 2007–2010. National Center for Health Statistics. Vital Health Stat 11 (252). 2012.

[8]   Salameh P, Jomaa L, Issa C, Farhat G, Salamé J, Zeidan N, Baldi I. Assessment of dietary intake patterns and their correlates among university students in Lebanon. Front Public Health 2014; 2: 185.

[9]   Schwingshackl L, Hoffmann G, Kalle-Uhlmann T, Arregui M, Buijsse B, Boeing H. Fruit and Vegetable Consumption and Changes in Anthropometric Variables in Adult Populations: A Systematic Review and Meta-Analysis of Prospective Cohort Studies. PLoS One. 2015 Oct 16; 10 (10): e0140846.

[10]   Massougbodji J, Le Bodo Y, Fratu R, De Wals P. Reviews examining sugar-sweetened beverages and body weight: correlates of their quality and conclusions. Am J Clin Nutr May 1, 2014 99: 1096-104.