

Evaluation of Lifestyle of Underweight, Normal Weight and Overweight Young Women

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ABSTRACT

The aim of this study was to compare eating and lifestyle habits between underweight, normal weight and overweight young women. Data obtained from a survey of 1129 students of the three higher education institutions in Kielce, Kraków and Opole (Southern Poland) were analysed. BMI was used to define underweight, overweight and obesity. Eating and lifestyle habits were assessed based on the information received from surveyed students. The study group consisted of women of childbearing-age and a special attention was paid to analyse habits correlated with the risk factor for pregnant women (low consumption of dairy products, meat, fish, fruits and vegetables, cigarette smoking, alcohol and caffeine intake). In the studied group, the prevalence of underweight was higher than the prevalence of overweight and obesity (11.1% vs. 7.0%). There were no significant differences in nutritional habits between the three weight groups. The responding students, regardless their weight status, presented numerous unhealthy eating habits. Underweight students more frequently took multivitamin supplements, less frequently followed an alternative diet, smoked cigarettes or drank larger amounts of coffee than normal weight and overweight women. Underweight and normal weight women more frequently participated in sports activities than overweight and obese women. However, 39.2 percent of the surveyed women declared that they seldom or never perform any sport activities. The results show that majority of young women present numerous unhealthy behaviours. Unhealthy habits occur with the same frequency among underweight students as among normal weight students or overweight ones

Key words: *underweight, overweight, nutritional habits, physical activity*

Introduction

There is no doubt that the incidence of many diseases is related to lifestyle. Unhealthy eating habits, physical inactivity, smoking, excessive alcohol and coffee consumption are positively related to several chronic diseases. Despite the campaigns promoting healthy lifestyle carried out for many years, the number of people with diseases resulting from unhealthy behaviours is constantly increasing¹.

Both consuming too little amount of food and eating excessive amounts increase the risk of diseases. Numerous reports have documented the association between eating habits and obesity or other diseases commonly related to it such as diabetes or cardiovascular diseases. Recently, more and more attention is paid to the results of malnutrition. Too low energy or macronutrient and micronutrient intake leads to osteoporosis, anaemia as

well as delaying the process of growing up and developing. Deficiencies in vitamins and minerals are particularly dangerous for pregnant women and women planning pregnancy in the nearest future, as they may result in neural tube defects and other fetal development disorders. It should also be emphasized that unhealthy eating habits are often combined with low physical activity, smoking and drinking alcohol which additionally increases the risk of diseases²⁻³.

Over the last years Poland has witnessed a significant change in the society's nutritional habits, caused mainly by changes in economic conditions and increased availability of diverse food in shops. A huge number of people travel abroad, often stay there for at least several months and get familiar with eating habits of other countries. Nevertheless, it seems that in Poland, similar to other

European countries, the pace of life and striving to reach the highest level of life results in the fact that the issue of our daily meals and ensuring the time for rest, in particular in form of physical recreation recedes into the background. Nowadays, the world trend is irregular meal consumption, often in a hurry, during short breaks at work. The following are among the most common nutritional mistakes committed by the Poles: irregular meals, too long intervals between them, skipping breakfasts, as well as monotonous meals and wrong quantitative and qualitative structure of nutritional portions⁴⁻⁶. Similar mistakes have been also reported in other industrialized countries^{7,8}. The researches carried out within recent years show that the role of nutrition in maintaining health is still underestimated.

So far, many studies compare lifestyle of overweight children or adults with all others, discounting possible differences between normal weight and underweight ones.

The objective of the presented study was to examine the differences in healthy eating and lifestyle behaviours among underweight, normal weight, overweight and obese young women.

Materials and Methods

The material was obtained from a cross-sectional survey carried out in 2009 among 1129 female university students in Kielce, Krakow and Opole. The surveyed students were aged 19–24.

Each person's height and weight was measured. BMI was used to define underweight, overweight and obesity, according to WHO guidelines.

A questionnaire was used to evaluate nutritional habits and leisure-time physical activities. The questionnaire contained additional questions regarding socio-economic

status (place of residence before studies, mother's and father's education, self-assessment of their financial situation).

Assessment of dietary habits

Nutrition habits were assessed using the questionnaire, created by the authors. The questionnaire was validated on a small group of university students from Kielce and has recently been used in several other studies. The questions posed in the questionnaire concerned the frequency of main meals (breakfast, lunch, dinner, supper) and typical food items according to categories: several times a day, once a day, 5–6 times a week, 3–4 times a week, once a week, very rarely and never. In the further analysis, some categories were combined and the frequency of consuming chosen products was determined as every day (at least once a day), sometimes (several times a week) and seldom (once a week or more seldom).

The questionnaire did not include questions related to the amount of consumed products. Only the questions concerning the number of daily consumption of cups of coffee, black and green tea, water and sweet/soft drinks as well as the number of smoked cigarettes were posed. Alcohol consumption was assessed on the basis of the question: How often do you have a drink containing alcohol?

Besides, the information concerning supplementation of the diet with vitamins and minerals was gained. Students were also asked if they follow any alternative diets or are on a special diet (because of some disease), or are vegetarian.

Considering the fact that the surveyed females were close to the average age of having their first child in Poland, in this paper particular attention was paid to such elements of lifestyle which are risk factors for pregnant

TABLE 1
THE FREQUENCY OF CONSUMING THE MAIN MEALS OF A DAY IN SURVEYED FEMALE STUDENTS IN RELATION TO THEIR BMI

		BMI <18.5		BMI =18.5–25		BMI ≥25		p values ^a
		N	%	N	%	N	%	
Breakfast	Every day	84	68.29	681	73.46	56	70.89	0.7662
	Sometimes	26	21.14	160	17.26	16	20.25	
	Seldom	13	10.57	86	9.28	7	8.86	
Dinner	Every day	72	58.54	480	51.78	30	37.97	0.0307
	Sometimes	44	35.77	361	38.94	43	54.43	
	Seldom	7	5.69	86	9.28	6	7.59	
Supper	Every day	80	65.04	570	61.49	38	48.10	0.0421
	Sometimes	34	27.64	242	26.11	25	31.65	
	Seldom	9	7.32	115	12.41	16	20.25	
Snack	Every day	88	70.40	525	56.82	30	37.97	0.0001
	Sometimes	23	18.40	191	20.67	23	29.11	
	Seldom	14	11.20	208	22.51	26	32.91	

^a based on χ^2 -tests; The frequency of consuming chosen products was determined as every day – at least once a day, sometimes – several times a week, seldom – once a week or more seldom

women (low intake of dairy products, meat, fish, fruit and vegetables, products which contain large amounts of folic acid, smoking, drinking alcohol or large amounts of coffee).

Statistical analysis

The significance of differences in the meal frequency, frequency of eating specified foods items and physical activity in leisure-time between underweight, normal weight and overweight women was estimated by using χ^2 -test. The differences in the number of daily consumption of cups of coffee, black and green tea, water and sweet/soft

drinks between groups were assessed with use of one-way analysis of variance. Logistic regression analysis was performed to assess the relationship between the students' weight status and unhealthy lifestyle and dietary habits. The level $p < 0.05$ was considered as the cut-off value for significance.

Results

An average BMI value in the surveyed group was 21.09, standard deviation 2.29, median 20.55, ranged from 16.70 to 33.22.

TABLE 2
THE FREQUENCY OF CONSUMING SPECIFIED FOODS IN SURVEYED FEMALE STUDENTS IN RELATION TO THEIR BMI

		BMI <18.5		BMI =18.5-25		BMI ≥25		p values ^a
		N	%	N	%	N	%	
Dairy products	Every day	51	40.80	392	42.38	28	34.44	0.8020
	Sometimes	59	47.20	429	46.38	40	50.63	
	Seldom	15	12.00	104	11.24	11	13.92	
Eggs	Every day	6	4.80	19	2.05	2	2.53	0.3239
	Sometimes	24	19.20	162	17.51	17	21.52	
	Seldom	95	76.00	744	80.43	60	75.95	
Whole-wheat bread	Every day	30	24.39	261	28.16	22	27.85	0.1390
	Sometimes	28	22.76	273	29.45	28	35.44	
	Seldom	65	52.85	393	42.39	29	36.71	
White bread	Every day	78	62.40	450	48.65	35	44.30	0.0128
	Sometimes	23	18.40	187	20.22	13	16.46	
	Seldom	24	19.20	288	31.14	31	39.24	
Rice, groats, pasta	Every day	4	3.20	22	2.38	2	2.53	0.1529
	Sometimes	40	32.00	294	31.82	36	45.57	
	Seldom	81	64.80	608	65.80	41	51.90	
Vegetable	Every day	13	10.57	79	8.52	9	11.39	0.7748
	Sometimes	17	13.82	147	15.86	14	17.72	
	Seldom	93	75.61	701	73.62	56	70.89	
Beans	Every day	18	14.63	108	11.65	11	13.92	0.4768
	Sometimes	29	23.58	186	20.02	12	15.19	
	Seldom	76	61.79	633	68.28	56	70.89	
Fruit	Every day	20	16.26	176	18.99	16	20.25	0.3199
	Sometimes	31	25.20	161	17.37	15	18.99	
	Seldom	72	58.54	590	63.65	48	60.76	
Fish	Every day	20	14.26	138	14.89	19	24.05	0.2055
	Sometimes	42	34.15	300	32.36	19	24.05	
	Seldom	61	49.59	489	52.75	41	51.90	
Meat	Every day	24	19.20	139	15.03	12	15.19	0.4722
	Sometimes	65	52.00	446	48.22	39	49.37	
	Seldom	36	28.00	340	36.76	28	35.44	
Sweets	Every day	44	35.20	270	29.19	8	10.13	0.0002
	Sometimes	36	28.80	343	37.08	28	35.44	
	Seldom	45	36.00	312	33.73	43	34.43	

^a based on χ^2 -tests; The frequency of consuming chosen products was determined as every day – at least once a day, sometimes – several times a week, seldom – once a week or more seldom

TABLE 3
THE LIFESTYLE OF SURVEYED FEMALE STUDENTS IN RELATION TO THEIR BMI

		BMI <18.5		BMI =18.5-25		BMI ≥25		p values ^a
		N	%	N	%	N	%	
Physical activity	Twice a week or frequently	24	19.20	226	24.43	14	17.72	0.1356
	Once a week	58	46.40	336	39.24	29	36.71	
	Seldom, never	43	34.40	363	36.33	36	45.57	
Vitamins supplements	No	76	60.80	551	59.87	59	74.68	0.0306
	Yes	49	39.20	374	40.43	20	25.32	
Smoking	No	110	88.00	764	82.59	62	78.48	0.1780
	Yes	15	12.00	161	17.41	17	21.52	
Alcohol	Every day	1	0.80	7	0.76	1	1.27	0.9020
	Once a week or frequently	28	22.40	323	25.08	17	21.53	
	Seldom, never	96	76.80	686	74.16	61	77.22	
Following a diet	Vegetarian	6	4.80	40	4.32	3	3.80	0.0324
	Slimming	1	0.80	53	5.73	7	8.86	
	Other	1	0.80	14	1.51	4	5.06	
	No	117	11.70	818	88.42	65	82.28	

^a based on χ^2 -tests

The improper body mass was determined among 18.1% of the students – 11.1% of these were underweight, 6.5% overweight and 0.5% obese. The prevalence of obesity was very low, whereas the prevalence of underweight was relatively high. No significant differences in the prevalence of underweight, overweight and obesity in relation to places of study and the socio-economic factors were found. In further analysis, a group of overweight women was combined with a group of obese women. The term »overweight« is used to describe both overweight and obese women.

Despite the fact that the majority of the surveyed students were slim, their lifestyle was not in accordance with recommendation. Table 1 presents the frequency of consuming the typical for Polish cuisine main meals of a day: breakfast, dinner and supper among underweight women, normal weight women as well as overweight women. Less underweight students than other ones reported skipping main meals during the day and more admitted eating snacks (Table 1). Significant differences between groups were observed in consuming dinners and suppers. Less overweight women compared to normal weight and underweight women regularly consumed dinners and suppers (Table 1). It should be emphasized, however, that in each group there was a high percentage of persons skipping meals or those who do not eat them at all. Regularly having breakfast has been declared by 72.72% of all surveyed students, dinner – only by 51.55% and supper – by 60.94%. The students compensated lack of main meals during the day with frequent eating of snacks. 56.95% of the surveyed students declared that they eat snacks between meals every day, 39.06% of these several times a day. There was a significant association between the frequency of snacking between meals and

weight status. The highest proportion of students who eat snacks every day was observed among underweight women, the lowest proportion among overweight women.

Unhealthy habits were also observed in the frequency of consuming specific food items. The analysis considered the products, recommended by doctors and dieticians to be consumed several times a day (vegetables, fruit), every day (dairy products) and several times a week. Statistically significant differences between the groups were found in consuming sweets and white bread. Paradoxically, these products were more frequently consumed by underweight students (Table 2). Similarly as in case of frequency of having main meals, among the surveyed women, regardless of their BMI, numerous unhealthy nutritional habits were noted: low intake of vegetables, fruit and fish (Table 2). The intake of products rich in folate and folic acid (vegetables, whole-wheat bread, groats, rice, pasta) was very low.

The underweight students rarely followed an alternative diet, only 5.8% were vegetarians. However, they took multivitamin and minerals supplements more often than normal weight women. Only 5.14% of the total number of surveyed women consumed folic acid supplements. Analysis found out that students with low BMI are less likely to smoke than others, yet the underweight smokers smoked on average more cigarettes a day than normal weight and overweight smokers (6.60 *vs.* 6.14 *vs.* 5.41).

The results of a one-way analysis of variance point to the difference between the groups in the amount of drinks consumed daily. On average, underweight students drank fewer cups of coffee, less water and more black tea a day than the students with a higher relative

body mass (Data not shown). There were no differences in the amount of daily consumption of green tea, juices and sweet/soft drinks. 5.6% of underweight students, 8% of normal weight women and 6.3% of overweight women drank more than two cups of coffee a day. 23.2% of underweight students drank alcohol once a week or more often. The remaining underweight students declared that they drink alcohol very rarely or never. Similar results were observed among normal weight and overweight students (Table 3). Underweight women and normal weight women undertook physical activity in leisure time more frequently than overweight women. However, as much as 37.47% of all surveyed women declare rare or no participation in sport activities (Table 3).

It has also been checked whether improper body mass is related to unhealthy habits. A method of logistic regression was applied. The following habits were recognized as being hazardous for health: rarer than recommended consumption of dairy products, vegetables, fruit, legumes, fish, whole-wheat bread, everyday consumption of sweets, skipping breakfasts and/or dinners, drinking alcohol more often than once week, consuming more than two cups of coffee a day, smoking and undertaking intensive physical activity rarer than once a week. The risk of habits adverse for health was independent from BMI. Except fish consumption, practically no statistically significant differences were noticed among the groups. Odds ratios (OR) among the underweight and overweight students was frequently slightly lower than among the women with normal body mass (Table 4).

TABLE 4
THE RISK (OR) OF UNHEALTHY BEHAVIOURS IN SURVEYED FEMALE STUDENTS IN RELATION TO THEIR BMI

Unhealthy habit	BMI <18.5	BMI ≥25	p values
Skipping breakfast	1.30	1.13	0.4095
Skipping dinner	0.76	1.75	0.0161
Low intake of dairy products	1.06	1.34	0.4698
Low intake of fruits	0.88	0.88	0.4815
Low intake of vegetables	0.97	0.81	0.7192
Low intake of beans	0.73	0.81	0.4627
Low intake of fish	0.92	0.55	0.1267
Low intake of whole-wheat bread	1.52	0.79	0.0435
High intake of sweets	0.91	0.43	0.0015
High intake of coffee	0.68	0.83	0.1933
High intake of alcohol	0.62	0.79	0.5387
Smoking	0.65	1.30	0.1659
Physical inactivity	0.81	1.30	0.2793

The results show that the lifestyle of young women is related to numerous unhealthy habits, which relate mainly to the nutrition way and physical inactivity. Unhealthy habits occur with the same frequency among underweight students as among normal weight students or overweight ones.

Discussion

The analysis of lifestyle of overweight and obese persons allows to identify the risk factors of excess body weight. Numerous studies have been devoted to interrelation between lifestyle and obesity, significantly less are focused on the association between lifestyle and underweight. In the presented paper the eating habits and physical activity were compared among the three groups: underweight women, normal weight women and overweight/obese women. All surveyed women were students. All of them were childless. The choice of a homogenous group for the research allowed to analyze the differences in lifestyles depending on weight status excluding other factors influencing lifestyle, such as type and time of performed work, education or family situation.

The observed differences related to e.g. eating habits. Underweight and normal weight students skipped dinners and suppers more rarely and ate snacks more often than the overweight students. Many researches reported that consuming a larger number of meals during the day reduces the risk of obesity⁹. The mechanism of this interrelation is not fully known. It is assumed to be related to greater thermogenesis after consuming more meals¹⁰ or insulin activity¹¹. It has been also noted that underweight students declared eating snacks more often than others. This is a surprising result, yet the research did not specify the type of snacks consumed. The problem is not the eating snacks habit itself, but the type of snacks. These can be high-calorie products such as crisps, candy bars or low-calorie ones such as vegetables, fruit or natural yoghurt. It is also possible that very slim students do not see a reason to avoid consumption of specific products. They are satisfied with their body mass and do not have to change it. Such a statement may be posed on the basis of the result showing that underweight students more often than other students consume the products commonly recognized as increasing the risk of obesity: white bread and sweets. Similarly, higher consumption of sweets and sweet/soft drinks among the underweight youth than among the overweight youth was reported in the research conducted in Germany¹². Commonly, only the occurrence of health problems, diabetes or obesity conduces to undertake healthy lifestyle.

Another explanation of frequent consumption of eating snacks and sweets by underweight women is related to their greater physical activity when compared to women with higher BMI. Underweight students more often participate in recreation sports activities thus they burn more calories. A positive finding is that underweight students frequently intake supplements of diet in form of multivitamin and/or minerals supplements. In this way, they partially make up for nutritional deficiencies.

There were noted slight differences between underweight, normal weight and overweight women in the frequency of consumption of particular products and drinks. The students provided information concerning their current lifestyle, which often changes after starting the course of study. Some researches suggest a significant

impact of peers, friends and flat-mates on healthy habits of youth, including eating habits¹³. The research covered students with at least one-year period of studying. However, we do not possess information related to their body mass and eating habits before this period.

Genetic factors as well as endocrinological and metabolic factors are responsible for inter-group differences in body mass among people having a similar way of nutrition. The signals coming from the digestive track (nutrients and intestinal signals) take part in regulating the energetic balance, which have a short-term effect. They initiate and finish the consumption of food and determine the amount of consumed portions of food. The long-term signals inform about the possessed resources of fatty tissue and take part in the adjustment of the amount of consumed food and energy expenditure – from the reserves of energetic substrates of the organism over a longer period. Synchronizing of both types of signals is necessary for the integration of taking food and energy expenditure in order to maintain the energetic balance on a permanent level¹⁴.

Considering the frequency of the consumption of particular products, the conclusion comes to mind that the differences between the BMI groups do not concern the type of consumed products, but probably their amount. The limitation of the paper is lack of information concerning the amount of consumed products. It is known, however, that long-lasting positive energetic balance leads to overweight and obesity, yet in numerous papers it has not been proven that overweight people consumed more calories in comparison to slim persons or that there were significant differences in terms of eating habits^{16,17}. Another explanation for the lack of association between the consumption of food and BMI is commonly described in subject literature risk of underreporting of food intake, particularly by obese people¹⁷.

Irrespectively of the relation between the underweight, overweight, obesity and lifestyle it should be remembered that both improper body mass and lifestyle increase the risk of occurring numerous diseases. In particular, people with improper body mass should follow the recommendations related to healthy lifestyle. Majority of the surveyed students, irrespectively of their BMI, do not follow the recommendations related to healthy lifestyle. Low consumption of vegetables, fruit or fish may result in macronutrient and micronutrient deficiency, even in the cases when BMI does not indicate malnutrition.

Lifestyle and the state of women's nutrition in their reproductive age influence not only their health, but also the health of their future progeny. It is very alarming that despite the fact that the examined women were close to an average age when women in Poland give birth to their first child, majority of them very rarely consumed products containing folic acid and they rarely declared multivitamin supplements containing folic acid intake. After discovering that they are pregnant, women usually change their lifestyle, yet the change often occurs too late. Weighing too much or too little can interfere with fertility and pregnancy. Obesity before pregnancy is

related to the risk of preeclampsia i.e. placental anoxia, premature birth and still birth¹⁸. Little body mass of women before the pregnancy increases the risk of premature delivery and low birth weight¹⁹. Also in the later period, these are mainly women who shape the lifestyle of the whole family and influence the health of their children and husband. Thus it is justified to examine the healthy habits of young women, recognize the most commonly committed mistakes and prevent their results.

Obtained results concerned a specific group – the students. Numerous data both from Poland and from other countries show that the students' lifestyle is characterized by numerous unhealthy habits. The students' wrong nutrition is probably connected with their lifestyle. Most of their time is devoted to university courses and preparing for them, thus there is not much time left for preparing meals or even doing the shopping. Underweight among female students is observed more frequently than in other groups. Their diet tends to include scarcely any vitamins or minerals, main meals during the day are frequently skipped and breakfast is replaced with coffee. They rarely consume home-made meals and often eat fast-foods^{6,7,20}. The presented research showed that almost 50% of the respondents declared they do not eat dinner on a regular basis. This result is much higher than the results obtained in other countries and probably follows from two reasons – lack of students' canteens near universities and high prices in bars and restaurants. In the countries where university facilities include students' canteens offering cheap meals (often subsidized) the students' nutrition and way of nutrition is much better. The situation is similar when it comes to physical activity, which is largely dependent on the availability of sport areas (pitches, courts, bicycle lanes, jogging tracks) in the neighbouring area, where sport can be safely practiced.

Nevertheless, the knowledge concerning healthy lifestyle is a key factor influencing the manner of nutrition and physical activity²⁰. During the course of study, many young people start living on their own and they start preparing their meals by themselves. It is a very important period for shaping nutritional habits and habits related to the lifestyle they are going to follow in the years to come.

Conclusions

There are many research papers analyzing the factors related to obesity, but there are few which focus on the factors correlated with underweight. The results of the presented paper, similarly to the data included in the scientific subject literature, reveal the fact that even if people with proper body weight are a majority in a specific group, this does not mean that they demonstrate healthy lifestyle. It has been determined that the habits wrongful for health are as common among women with normal body weight as among underweight or overweight women.

Due to the obesity epidemic, a lot of attention is paid to people with excessive body weight. People with proper body weight often do not see any reason to change their lifestyle. However, if their unhealthy habits continue for a longer period of time, this will have an adverse impact on both their body mass and their health condition. Thus, experts should strive not only to find methods of losing weight and maintaining proper body mass but also to promote healthy lifestyle and make young people aware that their future state of health depends on their

present actions. Young people are more prone to change than the elderly. It is also good to begin prophylactic activities at the young age before the diseases start to appear.

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PROCJENA ŽIVOTNOG STILA MLADIH ŽENA SMANJENE, NORMALNE I PREKOMJERNE TJELESNE TEŽINE

SAŽETAK

Cilj je ovog istraživanja usporediti navike u hranjenju i životnom stilu između mladih žena smanjene, normalne i prekomjerne tjelesne težine. Analizirani su podaci prikupljeni istraživanjem 1129 studentica u tri ustanove visokog obrazovanja u Kielce, Kraków i Opole (južna Poljska). BMI se rabio za definiciju smanjene, normalne te prekomjerne tjelesne težine te pretilosti. Navike u hranjenju i životnom stilu procijenjene su na temelju podataka dobivenih od istraživanih studentica. Posebna pažnja posvećena je navikama koje su povezane s faktorima rizika za trudne žene (smanjena konzumacija mliječnih proizvoda, mesa, ribe, voća i povrća, pušenje, konzumacija alkohola i kofeina). U istraživanoj skupini prevalencija smanjene težine bila je veća od povećane težine ili pretilosti (11.1% vs. 7.0%). Nije bilo značajnih razlika u navikama hranjenja između tri kategorije težine. Studentice su bez obzira na svoju težinu pokazale brojne nezdrave navike u hranjenju. Studentice smanjene težine češće su uzimale multivitaminske preparate, rjeđe su slijedile alternativnu dijetu, pušile ili pile velike količine kave nego one normalne ili prekomjerne težine. Žene smanjene i normalne težine češće su se bavile sportskim aktivnostima od pretelih ili onih s prekomjernom težinom. 39.2 % ispitanih žena izjavilo je da se rijetko ili nikad ne bave nikakvim sportskim aktivnostima. Rezultati pokazuju da većina žena pokazuje nezdrava ponašanja. Nezdrave navike jednako su učestale među studenticama sa smanjenom kao i u onih s normalnom i prekomjernom težinom.