



DOI: 10.18427/iri-2018-0065

## **Are young Z generation members really in danger? Nutrition habits of Hungarian students**

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As risk factor for several chronic diseases and a major health concern obesity is a current problem, which affects more and more young adults nowadays. Fighting against obesity, consuming large amounts of alcohol and caffeine, smoking, eating fast food versus eating fruits and vegetables, exercising, leading a healthy lifestyle. These are issues, actions with strong effect on our quality of life after years. The aim of the study is to investigate the eating habits and current health state of Hungarian students and to find the main explanatory variables. Our study uses data based on a questionnaire filled in by bachelor students of Corvinus University of Budapest (total 150 respondents). Based on the results the authors examine (conducting descriptive analysis) the nutrition habits of a special age group, namely young adults of "Z generation". We also aimed to discover the factors that might have a strong effect on the student's nutritional habits, general health and fitness level. We analyzed whether different behaviors and lifestyle choices could result in overweight or obesity being more common in certain groups of students. Regarding the food consumption of the respondents we wanted to find out, what influences their habits and what patterns can be observed in their choices. We also made an outlook to students' mind set about primary producers. Our goal was to examine whether Hungarian students are open for activities in short supply chains. Based on the results, authors can draw several conclusions. Most of the students in our sample were either underweight or healthy weight based on their BMI scores, and only a minority of the students were overweight or obese. The majority of the students reported that they believe they were not overweight at the moment and they have never been overweight before. Our preliminary results suggested that the students' BMI does not show notable differences based on living conditions, whether the students work or not or the grade students are currently enrolled in. Regarding their eating habits, most of the students reported that they only choose to eat fast food once or twice a week, consume fruits or vegetables at least once daily. Our results suggested that Hungarian students in our

sample lead a healthier lifestyle and suffer for fewer weight problems than what can usually be observed in the general population.

## *Introduction*

In our study we focus on a special generation, namely the young adults of Z generation. These juveniles of Z generation have just began or are beginning their academic studies, and differ from all previous generations in many aspects (Shatto & Erwin, 2017). They grew up in a different world with more stimuli, in a rapidly changing environment, embedded in the information and consumer society (Tari, 2011), who are already on the job market. Our aim is to observe the main health and lifestyle related characteristics of students studying at Corvinus University of Budapest as the first wave of Z generation employees on the job market.

To access the weight problems of the students in our sample, we used the Body Mass Index (BMI) classification provided by the World Health Organization (WHO). BMI is a measure that is commonly used to analyze the nutritional situation of adults and it is calculated as a person's weight in kilograms divided by the square of the person's height in metres (kg/m<sup>2</sup>). The WHO classifies a person underweight if their BMI score is below 18.5. Normal weight is associated with a BMI score between 18.5 and 24.9. Any higher BMI score indicates pre-obesity (overweight) or obesity (WHO, 2017).

The concept of supply chain is defined as a vertical sequence of economic activities overarching the companies' borders in order to fulfil customer's needs (Chikán, 2008:179). In case of food industry (which is usually called 'food chain') the length of the chain is a relevant issue because of the ecological impact, it is key as a control element in the community structure and as an ecosystem function (Post, 2002; Post & Takimoto, 2007). We can distinguish long and short food chains, and as short food chain options 3 categories can be identified: organic farming, quality production and direct selling (Renting et al., 2003). In this study our aim is to check whether health conscious students prefer short food chains (especially organic farming goods) or not in their daily purchasing habits.

Eating habits can majorly influence the health status of young adults. Several health problems and risk factors that affect the whole population begin during young adulthood. Fazzino et al. found that heavy alcohol consumption increases the risk of becoming overweight or obesity in young adults (2017). In another study, Yahia et al. found that the majority of the students they surveyed were normal weight and regarding their eating habits, mainly eating meals regularly (61.4%), while 30.5% reported daily intake of colored vegetables. In this study male and female students proved to be different regarding their weight related problems and eating habits (Yahia et al., 2008).

Our study structures as follows. After the short introduction and literature review of the topic, the methodology of the research is presented including

all the key elements of the survey conducted by the authors. In the next section the results of the survey and the analysis of the sample is presented. Finally, we drawn the conclusions, give the limitations of the research and identify potential future researches.

## *Methodology*

The study is based on the questionnaire created by the authors, the survey was filled in by BSc student of Corvinus University of Budapest. For the creation of the questionnaire we have used Qualtrics Survey software (Qualtrics, Provo, UT) and the analysis of results was conducted in IBM SPSS Statistics (IBM SPSS, Version 21.0. Armonk, NY: IBM Corp., 2012). We have asked total 151 students, 74 students were in the 1<sup>st</sup> year, 31 students in the 2<sup>nd</sup> year and 45 students in the 3<sup>rd</sup> year, total 12 specializations were present in the survey. From the 151 respondents, answers of one respondent student have been excluded due to the fact the student was a guest student, and the authors could not identify its class and the main goal was to examine the main health related characteristics of BSc students. Excluding this questionnaire, total 150 answers were available, therefore the sample size can be considered as statistically high sample size.

The structure of the questionnaire is the following. Total 36 questions have been asked from the students, the questions have been organized around 5 different topics: obesity, studies, health status, eating habits and demography. Related to obesity questions about sport, drinking alcohol and smoking habits have been asked, regarding studies questions about class, GPA and working habits have been asked. In the next 2 sections questions related to health status were asked like height, weight, chronic illness, frequency of sickness and overweight. Authors asked respondents about their eating habits, like holding any special diet, consumption of fast food and/or home-made dishes, consumption of fruits and/or vegetables. Also questions about daily life have been asked like breakfast consumption and meal frequency. Authors were also curious whether respondents drank large amount of caffeine content drinks (coffee, tea, cola or energy drinks). Eating habit section is also containing questions about shopping habits, which store the students preferred (supermarket, hypermarket, market, small shops, etc.). In the last section of the questionnaire a few demographic questions were collected about age, living place and flat mates.

The questionnaire was created as a multiple choice questionnaire, categories, answers were formed previously by the authors, and respondents had only to mark their adequate answer. In the certain questions (basically in case of the most sensible questions like income, or status of income comparing to others) there was also a choice for N/A (with the meaning of "I do not prefer to answer/ I cannot answer"). Analyzing the samples, the main results will be presented in the following section.

## *Results, analysis*

In this section the analysis of the sample is presented. In the first part of the section, the general characteristics of the sample is introduced including the main characteristics of the students, the BMI index and the working effects. After this part health consciousness and eating habits of the participants is presented with the confrontation of health consciousness with exercise routine, fast food consumption, living place, alcohol consumption, smoking, unhealthy food price and income.

### *Characteristics of the students*

Altogether 150 students were included in our sample. Out of the 151 students, who filled out the questionnaire 1 was not the student of Corvinus University of Budapest and was excluded from our sample. The mean age in our sample was 20.15 years (SD=1.54 years), with the students' age ranging from 18 to 29 years. In total 52.7% of the students were female. 74 students were in their 1st year, 31 students in the 2nd year and 45 students in the 3rd year. In total 12 specializations were represented in our survey.

### *BMI index of the students*

The mean of the BMI score in our study was 21.69 (SD=3.44). Based on the BMI score classification 20 students (13.3%) were underweight (BMI score lower than 18.5), the majority of the students (n=112, 74,7%) were normal weight, 12 students (8.0%) were overweight, 4 (2.7%) were obese and only 2 students (1.3%) could be classified as severely obese (BMI score>35). Our study aimed to find out whether different groups of students show significant differences regarding their weight, so we analyzed the BMI scores in several subgroups created from our main sample. The mean BMI score for the female students 20.80 (SD=3.31), while 22.65 (SD=3.46) for the male students. Based on the results of the Mann-Whitney U test the difference between the two groups is significant ( $p<0.001$ ).

### *Effects of working*

To determine whether those students, who also work while continuing their studies are more prone to becoming overweight, we analyzed the BMI scores in the two subgroups. Altogether 58 students (38.7%) answered that they regularly work. The average of weekly hours worked by the students was 16.63 hours, with a high standard deviation of 11.56 hours. The BMI score in the group of students, who worked was 21.85 (SD=4.04), than those who didn't (21.57, SD=3.04). However, the results of the Mann-

Whitney U test the difference between the two groups is not significant ( $p=0,714$ ). The reason behind is that students just have started to work and have only a few years of work experience.

We aimed to investigate further the explanatory variables of the BMI score, and we found a moderate, but significant correlation between the BMI score and the weekly hours worked by the students ( $r=0.269$ ,  $p=0.028$ ) based on the results of a Spearman's rank correlation analysis.

We also tried to investigate whether students in different grades were more prone to obesity or not. In our sample the first year students had the lowest BMI score (mean: 21.12, SD:2.55). (Figure 1.) However, the results of the Kruskal-Wallis test show that the results are not significant ( $p=0.267$ ).

Figure 1. BMI score in the different grades

Year	Mean	N	Std. Deviation
1,00	21.1191	74	2.55137
2,00	22.5117	31	3.91197
3,00	22.0322	45	4.24058
Total	21.6808	150	3.45230

Source: based on own calculation in SPSS, 2017

### *Health consciousness and eating habits*

The majority of the students ( $n=93$ , 62.0%) reported that they believe they are just as health conscious as their age-group, while 42 students (28.0%) believe they are more health conscious. Our aim was to analyze whether this health-conscious behavior can be detected in their eating habits, health state and lifestyle choices.

Figure 2. BMI score and health consciousness

Health consciousness	Mean	N	Std. Deviation
More health conscious	20.7721	42	2.31435
Just as health conscious	21.8973	93	3.67031
Less health conscious	22.8830	15	4.27757
Total	21.6808	150	3.45230

Source: based on own calculation in SPSS, 2017

In our sample the group of students who considered themselves less health conscious had the highest average BMI score (22.88, SD=4.28), while those who thought they were more health conscious, than their age-group, with a mean BMI score of 20,77 (SD=2,3). It is important to note that these differences were not significant result, as indicated by Kruskal-Wallis test p value, which was equal to 0.122. (Figure 2.)

We were also interested whether we can find any connections between the students reported health consciousness and their nutrition and lifestyle choices. In our sample out of the 14 students, who didn't exercise at all half (n=7) reported that they are less health conscious than their peers, and only 1 student claimed, that they were more health conscious. Those students, who exercised 5 or more times weekly all thought that they were more or just as health conscious as their age-group. Most students in our sample (n=74) exercised once or twice a week, and 74.3% of them reported that they thought that they were just as health conscious as the others. (Figure 3.)

Figure 3. Health consciousness and exercise

			Health consciousness			Total
			More	Same	Less	
Weekly exercise (time exercised)	0	n	1	6	7	14
		%	7.1%	42.9%	50.0%	100.0%
	1-2	n	14	55	5	74
		%	18.9%	74.3%	6.8%	100.0%
	3-4	n	14	24	3	41
		%	34.1%	58.5%	7.3%	100.0%
	5-6	n	9	7	0	16
		%	56.3%	43.8%	0,0%	100.0%
	>6	n	4	1	0	5
		%	80.0%	20.0%	0.0%	100.0%
Total		Count	42	93	15	150
		% within "How many times do you do exercise on a weekly basis?"	28.0%	62.0%	10.0%	100.0%

Source: based on own calculation in SPSS, 2017

In our questionnaire we also asked the students how often they consume fast food on a weekly basis. Only two students reported that they eat fast food at least 5 times a week and both of them answered that they felt they were just as health conscious, than their age-group. The majority of the students (n=90) had fast food 1 or two times weekly, and 66.7% of them

also reported to have the same level of health consciousness than the others. (Figure 4.) Out of the 40 students, who didn't eat fast food 19 thought they were more, and only 2 reported that they were less health conscious than the average. (Figure 4.)

Figure 4. Health consciousness and fast food consumption

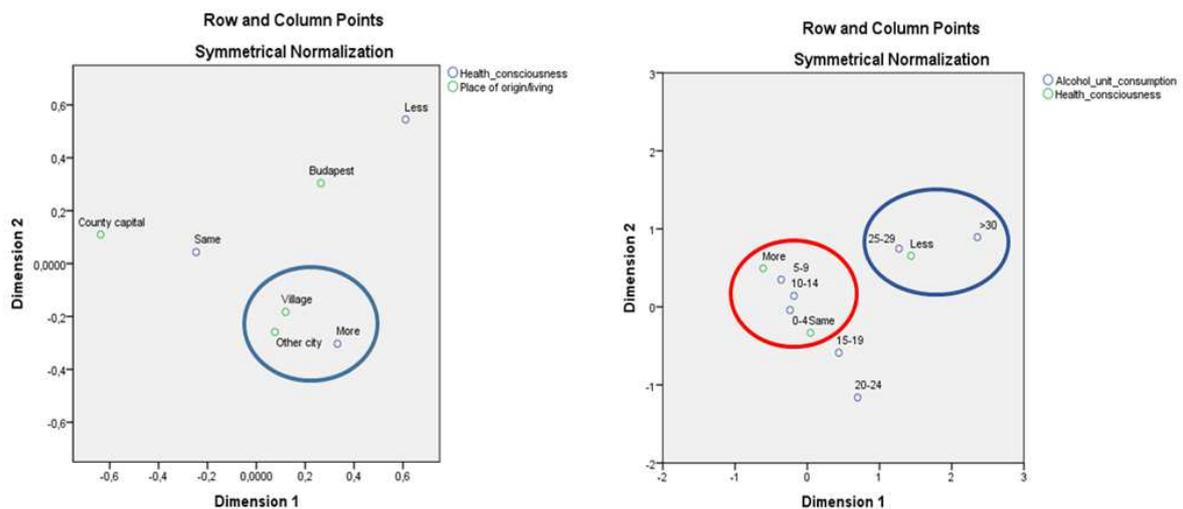
			Health consciousness			Total	
			More	Same	Less		
Fast food meals (occasion/week)	0	n	19	19	2	40	
		%	47.5 %	47.5 %	5.0 %	100.0 %	
	1-2	n	21	60	9	90	
		%	23.3 %	66.7 %	10.0 %	100.0 %	
	3-4	n	2	12	4	18	
		%	11.1 %	66.7 %	22.2 %	100.0 %	
	5-6	n	0	1	0	1	
		%	0.0% %	100.0 %	0,0 %	100.0 %	
	7 or more	n	0	1	0	1	
		%	0.0% %	100.0 %	0.% %	100.0 %	
	Total		n	42	93	15	150
			%	28.0 %	62.0 %	10.0 %	100.0 %

Source: based on own calculation in SPSS, 2017

Using correspondence analysis, in our study we compared the relationship between health consciousness and the following variables: place of origin, alcohol consumption, smoking, unhealthy food price and income. Correspondence analysis can be used to analyze the relationship between two nominal variables graphically in a multidimensional space (Rencher, 2002; Szüle, 2016).

The relationship between health consciousness and place of origin can be observed in a two-dimensional space on Figure 5. We observed that village or other city as place of origin had a closer relationship with having a higher level of health consciousness. To identify the relationship between health consciousness and alcohol consumption (units consumed per week) we also used correspondence analysis and found out that low and average level of health consciousness are close to lower levels of alcohol consumptions (0-4, 5-9, 10-14 units per week).

Figure 5. Correspondence analysis: health consciousness and place of origin and alcohol consumption

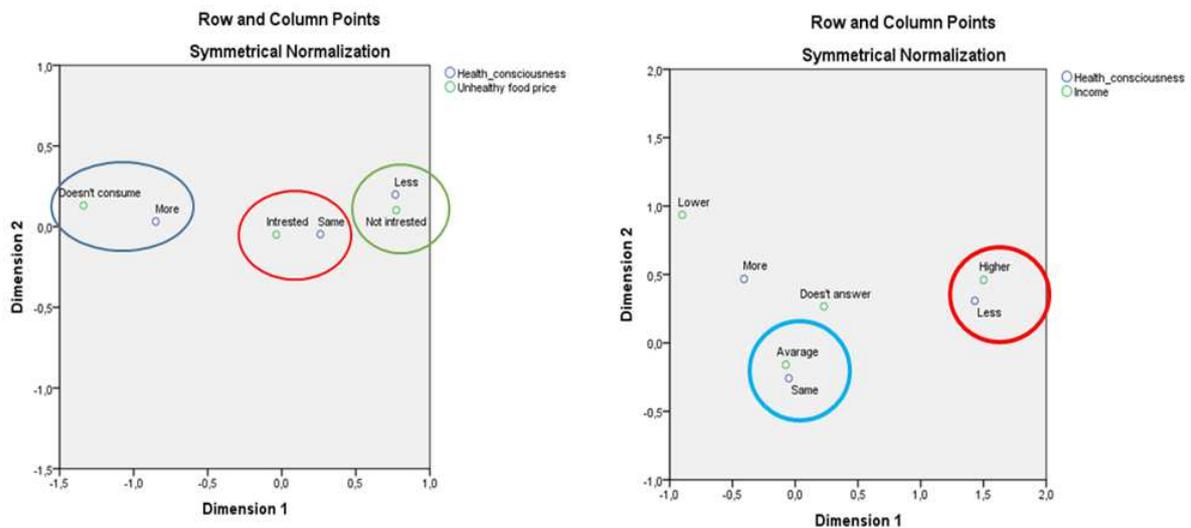


Source: based on own calculation in SPSS, 2017

To find out more about nutritional choices and its relationship to self-reported health consciousness we examined the relationship of students' attitude towards the price of unhealthy foods and their self-reported level of health consciousness. On Figure 6. we can observe that consuming unhealthy products regardless of their price have a closer relationship with lower level health consciousness.

We also wanted to examine whether the students' level of self-reported health consciousness might be dependent on their self-reported income status. We collected data on the latter by asking the students whether they thought their monthly income was higher, lower or the same as the average of their age-group. Figure 6. shows that average income and health consciousness are very close to each other and we can also observe a relatively close relationship between higher income and less health-conscious thinking. It is important to note that both of these variables express a self-reported answer based on the students' subjective thinking and are not measured by objective measures, so they are extremely dependent on the respondents subjective perception of their personal situation.

Figure 6. Correspondence analysis: health consciousness and unhealthy food price or income



Source: based on own calculation in SPSS, 2017

### *Eating habits, shopping habits and short food chain*

In our research we also had the goal to see if health consciousness is in connection with determined eating and shopping habits. We asked questions related to this topic: if they consume home prepared or produced food and if they purchase food ingredients, fruits, vegetables, meal from local markets or prefer another purchasing form. Home-made food, local markets are symbols for healthy life versus pre-produced food and supermarket, hypermarket supply. Local markets belong to the so called short food chains as producers are mainly the sellers on the markets and products do not cover a long distance from the original producer to the final consumer. In our study however most of the students report themselves as health conscious, the shopping habits of the students seem to show a usual way. Most of the students prefer purchasing groceries from supermarkets (68.5%) and only a minority of students reported that they prefer markets (2.9%), therefore we can conclude that students currently do not prefer short food chain, this option is not in focus for the respondents. The reason behind (without proving it in the questionnaire) can be the availability of markets, lack of time, simplicity of other purchasing solution (in a supermarket the supply is wider in terms of products usually) and socializing of this young age group. Related to eating habits we can say that almost half of the respondents eat home-made food 1-2 times per week, another 27.2% eat more than 2 times (3-4, 5-6 and more than 6 times per week). In summary we can say, that more than 2/3 of the students eat home-made food which is a convincing result.

### *Comparison of current sample with the general population*

We also wanted to find out if the students in our sample conducted a healthier lifestyle than the general population, so we compared our results to the data available. The rate of overweight and obese is much lower in our sample than in the Hungarian general population. In the general population the rate of self-reported obesity was 33% of the population (39% in females, 28% in males) in 2014. The rate of self-reported obesity was lower: 21% in Hungary. The measured rate of overweight and obese were 32% and 30% in the same year. In terms of health risks, it is important to note that the total measured rate of overweight and obese in the female population was 60% and almost 65% in the male population in Hungary (OECD, 2017a).

Regarding nutrition habits the daily fruit and vegetable consumption rate in the Hungarian general population was 59% and 46% (OECD, 2017a). In our sample only 2.7% of the students reported that they don't consume any fruit or vegetable on a daily basis, while 38.7% and 35.3% of the students eat fruits or vegetables once or twice a day. It is also important to mention that 23.3% of the students consumes fruits or vegetables at least three times daily.

The average alcohol consumption in the adult Hungarian population was 11 litres per capita, with which Hungary was the 6<sup>th</sup> highest ranked OECD country regarding alcohol consumption in 2012. In the same year the average alcohol consumption among the OECD countries was just 9 litres per adult (OECD, 2014). Most students in our sample started consuming alcohol regularly at the age of 15-16 (54.7%) and the majority (77.2%) consumes less than 15 units of alcohol weekly. Which falls under most international guideline for safe alcohol consumption (Kalinowski & Humphreys, 2016). This is below the average level of alcohol consumption.

Although the percentage of daily smokers in the Hungarian adult population decreased from 30.2% in 2000 to 25.8% in 2014, this rate is still higher than what we can observe in most OECD countries (OECD, 2017b). The students in our sample were mostly non-smokers (81.3%), while only 18.7% reported that they smoke. Also, it is important to mention that the reported smokers in our sample pertain mainly to the group called "party-smokers" as the 54.5% only smokes 0-20 cigarettes on weekly basis.

### *Conclusion*

In our study our aim was to analyze the current health level and lifestyle of students who belong to Z generation. A survey research has been conducted by the authors, participants of the survey were BSc students from Corvinus University of Budapest. Our results indicate that participants belong to a homogeneous group with the comforting message: students are healthier than the average, thin and have a healthy lifestyle. For this group it is not

true that 60% of them is overweight, however this is the case for the Hungarian population.

All researches have their own limitations, this happens in our case too. However, our goal was to ask only BSc students from Corvinus University of Budapest, our sample size is a small sample size (150 students filled in the questionnaire). It is important to mention, that the participants (with the highest entrance scores in Hungary) are really high qualified and well informed students in terms of health and obesity, so the results cannot be generalized to the entire age group.

As future research proposals, 3 ways seem to be interesting to be marked. First is to fill in the same survey for the same age group in Hungary but to different qualifications (for example only elementary school education) in order to observe whether the higher qualification mean a higher health level, a healthier lifestyle. Second option is to repeat the whole survey a few years later in order to see the tendency of the health the students have and the lifestyle they conduct as employees. The third way is to repeat again the survey, but at this time analyze the answers of the late Z generation members and trying to identify the differences between the 2 groups.

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