Diet Super

Superfood Consumption and Healthy Diet of University Students of Budapest

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Table of Contents

1. Introduction 2
2. Background and previous research 3
   2.1 Healthy diet 3
   2.2 Superfoods 5
3. Hypotheses and research questions 6
4. Methodology 8
5. Analyses and findings 11
   5.1 Participants 11
   5.2 Healthy diet 12
   5.3 Superfood consumers 17
6. Conclusion 19
7. Bibliography 22
8. Appendix 25

1. Introduction

The study of food is a multidisciplinary area that is explored from diverse perspectives, encompassing various fields such as biology, life sciences, sociology, psychology, marketing, and numerous other disciplines. This field is a gold mine for cultural, nutritional, and lifestyle examinations. Our research digs into the sphere of healthy dining. We examined the eating habits of university students, with specific interest about finding out whether superfoods are present in their diets. As eating habits can be determinants of academic performance (Reuter et al., 2021), the investigation of these habits can point out trends that are relevant to understanding societies' progress.

Superfoods are nourishments, rich in antioxidants and nutrients (Scrinis, 2013). The category is vague, and lacks clear scientific definition, however, it is researched extensively, because of its increasing relevance in the diet of Western societies (Sikka, 2019). Superfoods have multiple types and forms; many fruits and vegetables that are common in Europe can be considered as a superfood (such as broccoli or blueberry), alongside with exotic foods, coming from other continents (such as açaí or chia). The superfood discourse is characterised by arguments about the true value of these foods, as well as about the marketing that surrounds them. In this research, we follow Sikka (2019), by accepting that superfood is a marketing created category, however, we suppose based on Jagdale et al. (2021), that many of these foods have in fact high nutritional values and serve as valuable additives in a balanced and healthy diet.

This paper starts with an overview of previous studies about the eating habits of university students. These studies were conducted in different countries and cities and approached the topic from diverse perspectives. Our survey-based quantitative research investigates the relevance of the comparable studies' findings in the diet of university students of Budapest, Hungary. We specifically focused on aspects of healthiness, national background, gender and living situation, to compare the gathered data to other researches observations. Additionally, the presence of superfoods, as healthy additives, was studied.

This research was based on a preparatory study of the superfood marketing discourse, in which the way superfoods are depicted in marketing articles was examined, as well as the most commonly appearing types of these nourishments. The questions of the survey were based on this analysis, on the side of the reviewed literature of other studies. A self-administered,

online questionnaire was used to find out about the trends, that are present among the university students of Budapest, in terms of eating habits and superfood consumption. The results cannot be regarded as representative, since the sample size was small (n=110), however, they can point out certain directions that can be helpful to address the problem of healthy dieting among university students.

2. Background and previous research

The field of students' eating habits is extensively researched, from different perspectives. Multiple, diverse aspects have been addressed and examined in connection with this. Similarly, the superfood discourse is a focus of several researchers' interest. This study represents a novel contribution to the field as there has not been much prior investigation on the consumption of superfoods among university students. In this paper, we attempt to connect the research field of students' eating habits with the superfood discourse.

2.1 Healthy diet

According to the guidelines of the World Health Organization (2020), a minimum of 400 grams of fruits and vegetables should be consumed by an adult daily. The intake of free sugars should not exceed 10% of the total ingestion, and fats must be kept under a limit of 30% of summed intake. This implies that a balanced diet should incorporate a significant proportion of fruits and vegetables. In this study, fruit and vegetable intake was used as a measurement tool to indicate healthy eating habits.

There are numerous warning studies about the unhealthy diet of university students (El Ansari et al., 2015; Koroknay & Pfau, 2020; Papadaki et al., 2007; Silliman et al., 2004), which show that the issue is of cardinal importance.

In their study on academic performance and eating habits, Reuter et al. (2021) conducted an online survey, with the participation of 577 US undergraduate students, and found that students with unhealthy eating habits, were more likely to show poorer results at university, than their less unhealthily nourished counterparts. Therefore, eating habits might have further

reaching consequences, than only health. This is not to say that diets solely can be accounted for life quality, however poor choices of nourishment show significant correlation with reduced ability to perform well in intense concentration requiring tasks (Reuter et al., 2021). Adequate nourishment is, consequently, of crucial importance.

In an earlier Hungarian study Koroknay & Pfau (2020) found that less than 15% of their sampled population of university students (n=266) consumed fruits and vegetables daily. This means, that most participants' consumption was substantially lower than the World Health Organization guideline suggestions. A comparable study on students in Greece (Papadaki et al., 2007) indicates similar results and concludes that students, who were responsible for the preparation of their own meals, in large extent failed to meet the minimum level of advised fruit and vegetable intake. According to Papadaki et al. (2007), college attendants, who moved away from home, generally demonstrated more unhealthy eating patterns in comparison to those, who lived with their families throughout their college years. Lupi et al. (2015) arrived at the same conclusion, while comparing diets of Italian students living at home and those living away:

> *"Students living at home practiced more sport and consumed more frequently raw and cooked vegetables, fish, meat and poultry, fresh fruit, eggs, bread/cereals. Conversely, students living away from home consumed more often packaged/ready food, beer and spirits, milk and chips"* (Lupi et al., 2015, p. 154).

El Ansari et al. (2015) note that university students regularly eat at campus cantinas, where fruits and vegetables are not necessarily easy to access, which might be a reason for the reduced intake of those. They also remind, that the examined group is price sensitive, and ready-meals or fast-food can provide a cheaper alternative to healthy eating. Cultural differences can also appear in diets, as Németh (2021) found in her examination of international university students' eating habits in Hungary. She suggests that students of foreign origin were more likely to consume fruits and vegetables, than the Hungarian participants of the survey (n=528).

> *"A trend was observed in the findings, with Indian, Pakistani, French, and German students showing a preference for vegetarian dishes, whereas Azeri, Polish, and Ukrainian participants favoured meat options. Mediterranean students tended to opt for fish dishes, as did individuals of Chinese descent"* (Németh, 2021, p. 22).

She also notes that international students in several cases can afford to buy more expensive, as well as healthier foods than locals (Németh, 2021). Ortega et al. (1997) in their research on students in Madrid, shed light on a gendered pattern as well, related to healthy nourishment:

> *"[M]en reported a more frequent consumption of milk, meat products, bread and alcoholic drinks. In contrast, women consumed more salads and fruit. This kind of association between sex and food choice has been well documented in groups of different ages"* (Ortega et al., 1997, p. 20).

Similar trends can be found in a subsequent Turkish study (Basfilinci & Cilingir, 2017), where the authors point out the gendered nature of food choices among college students.

Based on the literature, it can be concluded that the diet of university students is a well-documented research field, where multiple studies point to the direction that students generally tend not to adhere to healthy eating habits. However, cultural, and gendered differences are present.

2.2 Superfoods

The notion of "superfood" does not have deep rooted scientific base and can be regarded as a marketing phrase rather than a precisely defined category (Sikka, 2019). Scrinis (2013) characterises superfood as a nutrition and antioxidant dense sustenance. Hence, it can be regarded as healthy. "The inclusion of superfoods in the daily diet can contribute to reduce the risk of various degenerative diseases, such as cardiovascular diseases, diabetes, metabolic syndrome, obesity, neurological conditions and cancer" (Proestos, 2018, p. 590). It is, however, crucial that the beneficial properties of these foods can only be enjoyed if a balanced diet is kept (Proestos, 2018). According to Jagdale et al. (2021), superfoods can play a health promoting role in a diet, based on their nutritional value, and their increasing presence may allow a more health focused approach in food production. However, they also emphasize the need for further research in this area.

Common element of the claims connected superfood; are the health benefits it provides. The analysis of superfood marketing conducted by Butterworth et al. (2020) revealed that cancer, cardiovascular diseases, and diabetes were the most frequently mentioned illnesses that superfoods were claimed to cure or prevent. As a preparatory phase for this study, we also

conducted a similar analysis of the marketisation of superfoods and found comparable trends. Health claims accounted for the vast majority of the argumentations, often accompanied by the mentioning of disease cure or prevention.

While superfood marketing is characterised by tremendous amounts of health claims, these are not always backed up by scientific facts (MacGregor et al., 2021). It is also important to note, that on the field of food research, several studies are sponsored by food retailer companies, which can appear as a possible bias (Nestle, 2016).

The popularity of superfoods has skyrocketed in recent years (Loyer, 2016), however, it can cause significant environmental and social issues, as many of these foods are produced in rural areas of South America and Asia, and consumed predominantly in Europe and North America. The increasing farming of these products can be harmful of the superfood itself as well: "[T]hese superfoods might at present have a large genetic variability, which if eroded as production intensifies, might potentially lead them to lose some of their purported properties" (Magrach & Sanz, 2020, p. 275).

The discourse on superfoods is characterised by paradoxes that relate to environmentalism and environmental exploitation, as well as claims about health benefits and the actual nutritional value of these foods. The aim of this research was not to investigate these claims, but to examine a consumer group, and find out whether superfood has any significance to the eating habits of university students.

As it is apparent, the diet of college goers is marked by little adherence to dietetic guidelines about healthy nourishment. Since superfoods contain high levels of nutritional components, they may serve as beneficial additives to an otherwise nutritionally deficient diet. The investigation of superfoods in the diet of university students, is therefore of high relevance.

3. Hypotheses and research questions

The main question of this research is related to healthiness of university students, more precisely how healthy university students of Budapest are dieting. As it is recommended by the World Health Organization (2020), a substantial amount of fruits and vegetables has to be included in a well-rounded diet. Therefore, in our research healthiness of students is measured

according to the frequency of fruits and vegetables consumption. The studies conducted by Ortega et al. (1997) on university students in Madrid and on Turkish students by Basfilinci & Cilingir (2017) discovered notable dissimilarities in the eating behaviours and concern about nutrition among students based on their gender. Specifically, female students exhibited a higher level of interest in nutrition and had a diet that was more well-rounded compared to their male counterparts. Thus, the first hypothesis is directed to possible gender differences in healthy diet of students in Budapest. It is assumed that female students in Budapest consume more fruits and vegetables than male students. Besides gender related differences, it is interesting to investigate whether international students eat as healthy as Hungarian students. Similar study has been carried out by Németh (2021), according to her, international students in Hungary tend to have a higher consumption of fruits and vegetables compared to their Hungarian peers. Our second hypothesis states that students coming to Budapest from abroad eat healthier than those students who are coming from within Hungary. On the other hand, moving to another city or country can result in deterioration of an individual's diet. Living at home with parents forms regular eating patterns and provides nutritionally rich food, which can be missing in lives of students who are living away from home (Papadaki et al., 2007). According to that, in the third hypothesis it is anticipated that the dietary habits of students residing in Budapest, specifically those who live in shared housing with non-relatives (such as dormitories and rented apartments), will be less healthy than those who live with their families. Cost was noted as a significant barrier to healthy eating in the study by Amore et al. (2019). Therefore, our fourth hypothesis is related to the influence of economic factors on the respondents' eating habits.

In relation to superfoods, this study raises two questions. The first question is whether superfoods are present in the dietary habits of university students of Budapest or not. To the best of our knowledge, no prior studies have investigated this topic. Implementation of superfoods into diet can help students, who might have irregular eating habits and a nutritionally inadequate diet, improve their overall health and well-being. In their review paper, Jagdale et al. (2021) highlight the importance of incorporating superfoods into a balanced diet for optimal health and well-being. Superfoods may have various advantageous effects, however, to fully experience these effects they have to be consumed as part of a proper nutritious diet (Proestos, 2018). Our second research question is centred on determining whether individuals who consume superfoods also maintain a healthy diet.

In summary, this study attempts to investigate the following hypotheses:

- *1. Female students in Budapest consume more fruits and vegetables than male students.*
- *2. Foreign students eat healthier than those students who are coming from within Hungary.*
- *3. Those students who live in shared accommodation with non-relatives, have a less healthy diet than those who live with their parents.*
- *4. Economic factors have an influence on the eating habits of the respondents.*

In connection with superfoods, we will examine the following questions:

- *1. Are superfoods present in the diet of the observed population?*
- *2. Do superfood consumer respondents maintain an overall healthy diet?*

4. Methodology

In our study we primarily used quantitative methods. However, the research was based on a discourse analysis, we conducted beforehand about the depiction of superfoods in marketing materials. This, supportive study, was based on the method of grounded theory (Keller, 2013) and theorised that superfoods could be connected to a health-promotion segment of marketing discourse (Grace, 1991). The corpus of the analysis was comprised of marketing articles that promote superfood products. These articles were collected from the websites of superfood retailers and from independent blogs or news sites.

During the discourse analysis phase, 11 blogposts were annotated according to specific criteria in order to identify the salient features of the superfoods being promoted. The main categories for the annotation were the following:

- Eating habits – references that connected superfoods to lifestyle choices and food allergies.
- Marketing – appearance of product placements or advertisements.
- Superfood – indicating nutrition content, health benefits or superfood types.

Within these main categories, several subcategories were implemented. These were helpful to find that superfood marketing is dominantly based on health-related arguments. Scrinis (2008)

also found in his study, that the notion of superfood is closely related to healthy eating. Therefore, it is not surprising that health-related argumentations appeared in 78.7% of the examined articles, while references to environment-friendly production (ecological argumentation) only accounted for 14.8%. The least frequently mentioned perspective was that of price (economical argumentation). Only 6.5% of the textual corpus contented reference to cost matters. This can be explained by the finding of Franco Lucas et al. (2022) who point out in their study that superfood consumers generally come from high-income households, hence price is a smaller concern for them, and they are more interested in the healthiness of their food.

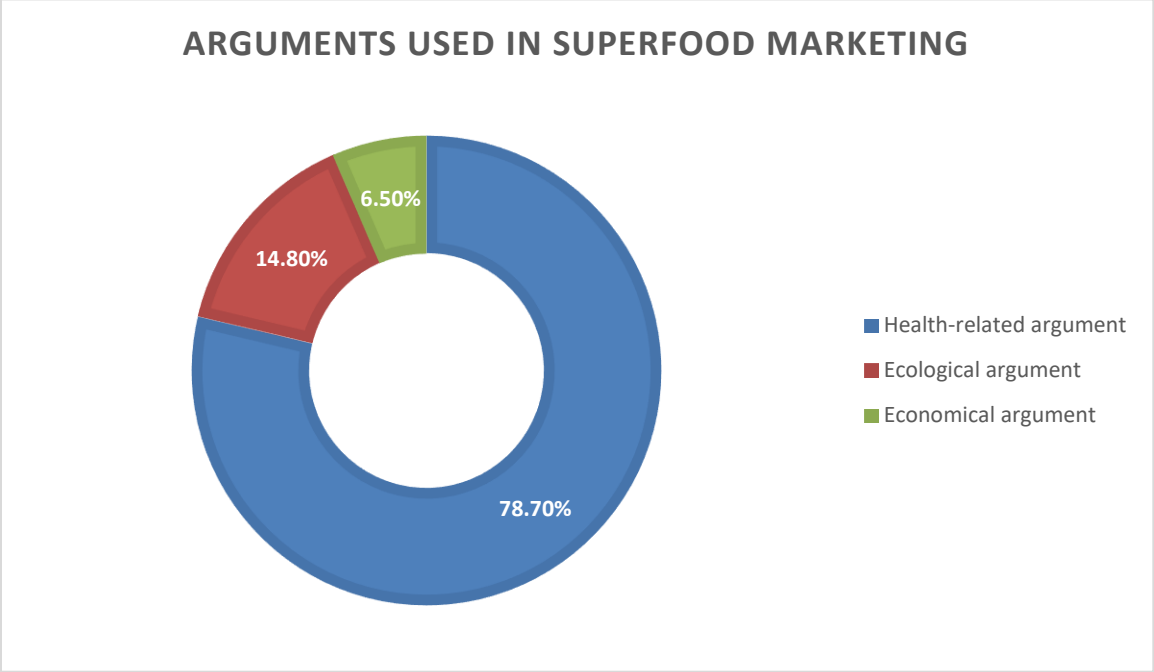

Figure 1. *Arguments used in superfood marketing.*

Based on the aforementioned findings, that indicate the strong presence of health-claims in the superfood marketisation, it can be assumed that superfood consumers are aware of the perceived health benefits of these products, and it is a major influence that leads to its consumption.

In the current phase of the study, based on these results, we aimed to find out about the appearance of superfoods in university students' diet, with a broader interest in their health as well. To be able to point out certain trends in the observed population, an online survey was conducted. The questionnaire consisted of 22 questions, most of which were closed ended.

The question form was divided into two larger parts, an essential part, to address the research issues and a demographic part, to learn about the answerers' background. The essential part consisted of three sub-parts, the first being a general overview about the healthiness of the respondents' diet, assessing questions, such as how often they consumed fruits and vegetables, or if they followed special diets.

The second sub-part specifically examined their familiarity with different types of superfoods and the relevance of those to their eating habits. The measured superfood items were chosen based on their frequency of appearance in the superfood marketing analysis. Which is to say, the following types or categories: açaí, avocado, berries, chia, ginger, nuts, sea moss, spirulina, and quinoa. The respondents had to define the regularity of their consumption of the given items on a scale, with the following tags: never, less than once a week (e.g., only once a month), from one to three times a week, more than three times a week. Given the ambiguity of the term "superfood" (Sikka, 2019), respondents, who were familiar with the notion, were asked to share their opinion on a Likert-scale, how much they agreed with the categorisation of an item as "superfood". The scale offered four options, ranging from complete disagreement (1) to complete agreement (4).

The third sub-part of the survey examined the respondents' habits, regarding shopping, cooking, and eating. The participants were encouraged to share how regularly they cooked on a scale, using the same time-period tags that were implied in the case of the earlier mentioned regularity measurements. According to Pattnayak (2022), an individual's awareness of product choices can reflect their pursuit of healthy eating. In light of this, we gauged participants' product choice consciousness by ascertaining whether they read nutrition labels on products prior to purchase. Furthermore, we sought to learn the most dominant factors that influence the choice of specific food items; thus, respondents were asked to rate the subjective importance of the following notions on a 1-5 Likert-scale (1=lowest, 5=highest): price, freshness of product, place of origin, nutritional value, packaging materials.

The questionnaire was concluded with a demographic part, where gender, level of current university programme, living situation (whether they live alone, in a shared flat, in dorm or with their relatives), country of origin and type of settlement were addressed. As a last question, we gave opportunity to free expression of thoughts regarding the research topic.

The survey was produced with Microsoft Forms online tool and was spread in Facebook and Telegram groups for university students and expats. As many of these groups were

exclusively reserved for the students of certain universities, and the use of social media limited the access to particular groups (Benedict et al., 2019), the sample cannot be regarded as random (Brenner, 2020). The analysis of the results was performed with IBM SPSS Statistics software.

5. Analyses and findings

5.1 Participants

During the survey's active period, 110 respondents answered, but one response was deemed invalid as the respondent was not a university student. The majority of the 109 remaining respondents were from ELTE University (54.1%), followed by Corvinus University (26%). The survey also had participants from BME, BGE, SOTE, Óbuda, METU, IBS, and MATE universities. From the latter university only one respondent is recorded while few students of other higher educational institutions participated in this survey. The majority of the participants who responded to the survey are pursuing their bachelor's degree, whereas only one participant is currently enrolled in a PhD program. Roughly half (53.6%) of the respondents lived in shared accommodation with non-relatives (dormitory/sharing apartment), while 11.8% lived alone, 22.7% lived with family, and 10.9% lived with their partners. 50% of the students are from Hungary, while the remaining 50% come from various countries outside of Hungary. Slightly more than a half of the respondents (59) lived in big cities, 38 in towns or suburban areas, and 12 in villages. In terms of diet, around 80% of respondents did not follow any specific diet, while a few followed vegetarian and gluten-free diets, and only one person was vegan.

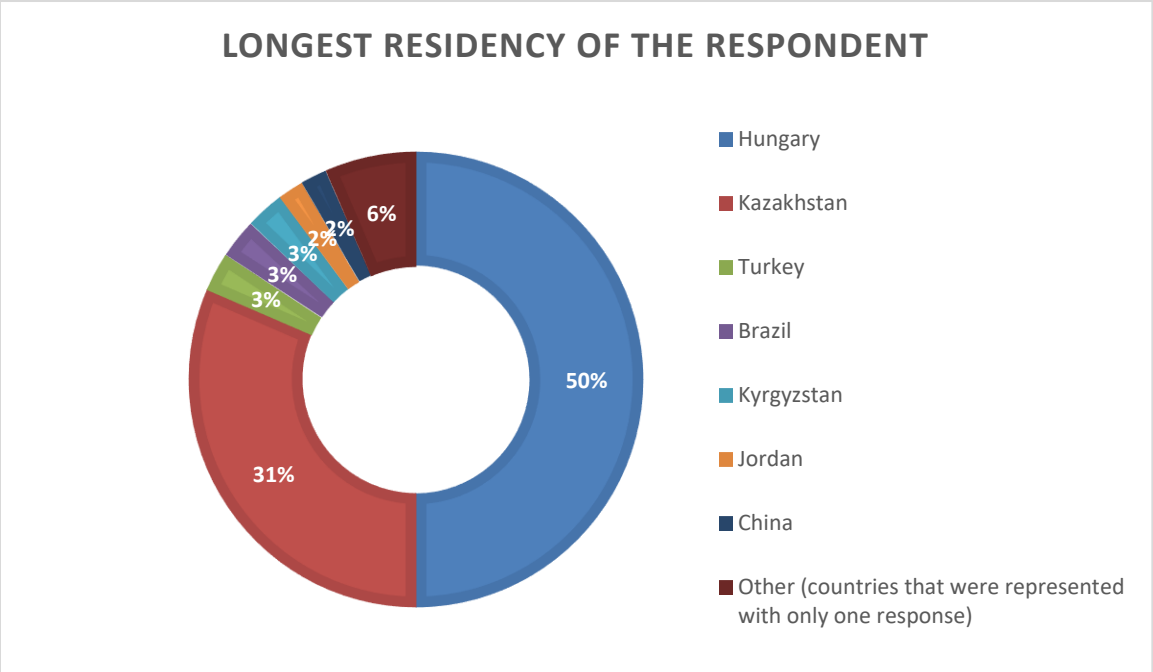

Figure 2. *Longest residency of the respondent.*

5.2 Healthy diet

Eating fruits and vegetables can have positive effects on health (World Health Organization, 2020) and may also impact the productivity of students (Reuter et al., 2021). In the survey conducted, slightly over 50% of the participants reported consuming vegetables more than three times per week, while around 36% reported eating vegetables only between one and three times per week, and 10% reported consuming vegetables less than once a week. Regarding fruits consumption, two participants reported that they never consume fruits, 31 reported consuming fruits less than once a week, 42 reported eating fruits between one and three times per week, and 34 reported consuming fruits more than three times per week. To create a typology for healthy diet, the frequencies of fruits and vegetables consumption were merged, which resulted in four categories:

- "Not healthy" – fruit and vegetable consumption less than once a week (e.g., once a month).
- "Rather not healthy" – fruit and/or vegetable consumption once a week.
- "Rather healthy" – fruit and/or vegetable consumption from more than once to three times a week.
- "Healthy" – fruit and vegetable consumption more than three times a week.

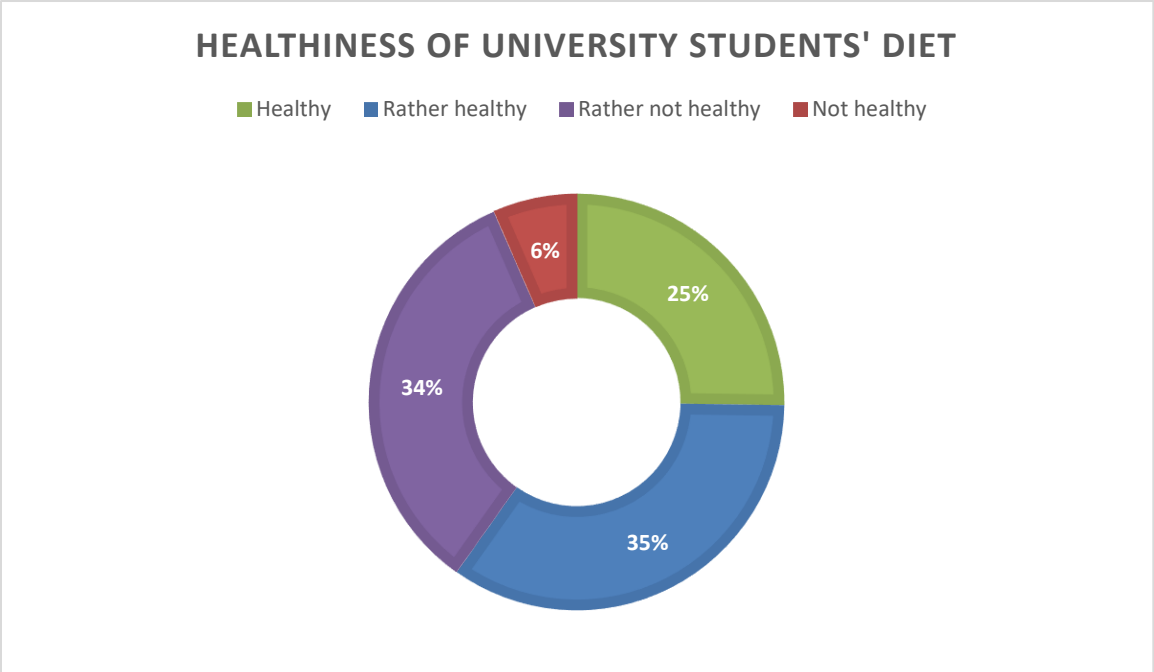

Figure 3. *Healthiness of university students' diet.*

Referring to the individuals who took part in the study, 27 students had a "Healthy" diet, whereas 7 students had a "Not healthy" diet. The number of students who had a "Rather not healthy" diet and those who had a "Rather healthy" diet was almost equal, with 36 and 37 students, respectively. These findings shed light on the initial research question. While a few students face challenges in adhering to a "healthy" diet, the majority of the participants consume vegetables and fruits more than three times a week, indicating that their diets are rich in nutrients which can reflect positively on their ability to perform in the academic field (Reuter et al., 2021). According to the study completed by Amore et al. (2019), for Hawaiian college students, cost was identified as a major barrier to healthy eating. The cost of healthy food options was perceived to be higher compared to unhealthy options, which made it difficult for some students to prioritize healthy eating. To investigate whether price of product is crucial for university students of Budapest, several questions were asked referring to important aspects in connection with grocery shopping. Regarding importance of price of product, relatively same number of students find price "very important" and "rather important" (38 and 36 students respectively. While for 18 students, price is of a "neutral" importance, for 4 of them it is "rather not important". On the other hand, for 5 students, nutritional value of product is "not at all important" and for 12 of them, it is "rather not important". 14 students consider nutritional value

as a “very important” aspect of grocery while 32 think of it as “rather important”. The majority of respondents rated nutritional value as “neutral” (33).

As it was proposed by Ortega et al. (1997), gender appears to have a significant impact on eating behaviours and level of concern about nutrition among students. To investigate if female university students in Budapest consume more fruits and vegetables than male students an Independent Samples T-test was applied, with the null hypothesis that the expected values of healthy dieting between males and females are equal. The Levene’s test (=0.57) indicated that the variances between the groups were not significantly different (on 5% significance level), and therefore, the null hypothesis was confirmed. The mean score for “healthy dieting” among male students was 2.658 and 2.876 for female students, but the t-test significance value was 0.226, indicating no significant difference between the two groups. Due to difference in sample sizes, Hedges’ g is more suitable for further data interpretations. However, the Hedges’ g value was equal to -0.241, suggesting a small difference between the male and female groups. Thus, based on the results of Hedges’ g, the very first hypothesis can be accepted. It can be concluded that the female group exhibited a slightly higher level of interest in nutrition and maintained a more well-rounded diet than the male group.

The sample included an equal number of students from Hungary and other countries who are studying at higher educational institutions in Budapest (53 students from each group). According to previous research done by Németh (2021), it can be assumed that Hungarian students eat less vegetables and fruits, which means they diet less healthy compared to foreign students. In order to test this hypothesis, another Independent Samples T-test was run, this time with the place of longest residency of the respondent as grouping variable. The null hypothesis of the Levene’s test is that the variances in two different groups are equal. The significance value of the Levene’s test equals to 0.8, which is greater than the threshold (0.05) and therefore, confirming the null hypothesis. The mean score for "healthy dieting" was 2.886 for Hungarian students and 2.698 for foreign students, with a t-test significance value of 0.142, indicating no significant difference between the two groups. Since the sample sizes are equal, Cohen’s d was used and its value of 0.209 shows an inconsiderable difference between the groups. Considering the insignificant difference of the means, it can be concluded that, Hungarian students have comparatively healthier diet than foreign students. Observing the statistical findings, the second hypothesis cannot be accepted due to the statistical indifference of the groups. We assume that the reason why our result is different from that of Németh’s (2021) is because our sample consisted largely of students from countries where eating habits are not healthier than the

Hungarian (Otaraly et al., 2020). While Németh (2021) had greater proportion of students from traditionally vegetarian countries.

Living situation can also be considered as a factor that may impact an individual's eating behaviours (Papadaki et al., 2007). To test a relationship between healthy dieting and living situation One Way ANOVA test was applied with healthy dieting as a dependent variable. The value of the Levene's test is not significant (p=0.903), which means that the group variances of the dependent variable along the categories of the independent variable are statistically equal [2.53~3.12~3.16~2.61]. Hence, the F test can be applied to investigate if the independent variable explains a significant amount of the dependent variable's variance. The significance value of the F test is equal to 0.032 (lower than threshold 0.05). Thus, it can be considered that the independent variable explains a significant amount of the heterogeneity of the dependent variable. The ETA-square is 7.01/79.04 =>0.088, which indicates that approximately 8.8% of the variance in the dependent variable can be attributed to the independent variable, which demonstrates a moderate association.

It can be observed from the descriptive table that:

- The healthy diet among those, who are living with their partner is the best on the average (mean=3.16 on a 1-to-4 scale).
- The healthy diet among those, who are living alone is the worst on the average (mean=2.53 on a 1-to-4 scale).
- And the averages of healthy diet among those, who are living with family and in a shared accommodation seem to be between the previous two groups (mean=3.12 and 2.61 respectively).

The Tukey's test has been done since there are no significant differences in the variances of the observed groups. As the research question is focused on the possible differences between students living with family and those living in a shared accommodation, the average differences of those groups were observed only:

- The mean difference between those living with family and in a shared accommodation with non-relatives is 0.5 and the significance of the difference equals to 0.082, (which is higher than the threshold, 0.05), which accepts the test hypothesis that the group means are the same in these two groups.
- Further results can be found in Appendix 6.

The analysis reveals that there exists a notable correlation between the type of living arrangement and healthy eating habits. However, the third hypothesis must be rejected. There are no significant variations in dietary habits between people living with their family and those residing in shared accommodation with non-relatives. Additionally, the results suggest that students who cohabit with their partners tend to have a healthier diet than those who live alone.

Cost was highlighted as a significant obstacle to healthy eating for college students in the studies conducted by Amore et al. (2019) and El Ansari et al. (2015). Some students found it challenging to prioritize healthy eating because they believed that healthy food selections were more expensive than unhealthy ones. One Way ANOVA test was applied in order to observe a relationship between healthy dieting and importance of price while doing groceries, with healthy dieting as a dependent variable. The value of the Levene's test is significant on a 5% significance level (p=0.01), which means that the group variances of the dependent variable along the categories of the independent variable are statistically not equal. Since the Levene's test is significant, Welch test can be applied to examine whether the group means are similar in general. The significance value of Welch test is equal to 0.919 (greater than threshold 0.05). Thus, it can be considered that the independent variable fails to explain a significant amount of the heterogeneity of the dependent variable.

Based on the data from the descriptive table that:

- The healthy diet among those for whom the importance of price of grocery item is "neutral" is the best on the average (mean=2.88 on a 1-to-5 scale).
- The healthy diet among those for whom the importance of price of grocery item is "very important" is the worst on the average (mean=2.7 on a 1-to-5 scale).
- And the averages of healthy diet among those for whom the importance of price of grocery items is "rather important" and "rather not important" seem to be between the previous two groups (mean=2.75 in each).

Since the Levene's test is significant, Tamhane's T2 test is used to examine the differences of means. The average differences of two groups were observed: those, who are on the extreme ends of the average ("neutral" and "very important") and those, who are in between of extremes ("rather important" and "rather not important"):

- The mean difference between those for whom price is “rather not important” and “rather important” equals to 0 and the significance is 1. At a significance level of 5 percent, we can accept that the group means are the same in these two groups.
- The mean difference between those for whom price has “neutral” importance and “very important” is 0.186. The significance is 0.98, which means that it has to be accepted that the group means are the same in these two groups.
- Further test results can be seen in the Appendix 9.

Turning to our fourth hypothesis, it can be concluded that those university students, who have a neutral attitude towards prices of grocery items, are the healthiest. Whereas on the other hand, those students who regard price as very important aspect, tend to be comparatively less healthy. However, it is important to note that statistically these differences are not significant.

5.3 Superfood consumers

In order to find out more about superfood consumers several questions regarding superfood were asked. 35 people were familiar with the term superfood, while 74 were not. It is interesting to note that compared to others, spirulina and chia had most of the responses which consider those products “absolutely” as superfoods. While on the contrary, avocado was considered by a significant number of people as “not” and “mostly not” superfood. We assume that an individual who consumes certain superfoods as well as considers those as superfood, in a way believes in its beneficial effects for health. This is based on previous studies that connect superfood to the practice of healthy eating (Jagdale et al., 2021; Proestos, 2018; Roth & Zawadzki, 2018; Scrinis, 2008). To test this assumption, data from the question “Are you familiar with the term superfood?” has undergone certain manipulations. First, 35 students who are familiar with the term superfood were filtered to demonstrate only those, who consume superfoods fewer than weekly. After that, with implementation of another filter, those who do not or mostly do not consider certain foods as superfoods were sorted out and excluded. Hence, only three people consume superfoods and consider them as such, which reflects positively in the first research question regarding superfoods. Mostly these respondents consume those products that are considered to be superfoods less than once a week (e.g., once a month). Consuming superfoods does not identify one’s diet as healthy, and therefore, having a look on healthiness of a diet is important. While two respondents dieting is categorised as “healthy” and

"rather healthy", one student has "rather not healthy" diet. Two respondents do not have any special diet and one does follow one. While doing groceries, there are several aspects that might be important for one and not important for another at all. It was certainly obvious that price plays a significant role in the decision upon the grocery item, since all the respondents are students. It was revealed that for two students it was very important, while for one, rather important. Moreover, during survey preparation it was assumed that for those who diet healthy, in order to benefit their lifestyle, nutritional value of a certain product is essential. However, as it can be observed, for one of the three students, nutritional value is not important at all and for another, it is rather of neutral importance. More or less the same observation was experienced regarding importance of the place of origin and packaging material of groceries. Those aspects are either not important at all or have a neutral importance for the students. All the three students come from big cities. Moreover, all three are females which also reflects to our previous finding that female students tend to have more nutritious diet compared to their male counterparts. Three of them study in three different universities, namely ELTE, Corvinus and METU with one of them pursuing a degree in bachelor's and two in Master's. Regarding longest residency of the respondents, one of them have been residing in Hungary, while other two outside Hungary. Currently, one of them lives with family, one with partner, and the third one in a shared accommodation with non-relatives.

	Student 1	**Student 2**	**Student 3**
Healthy diet	Healthy	Rather healthy	Rather not healthy
Importance of price	Very important	Very important	Rather important
Importance of nutritional value	Not important	Neutral	Neutral
Importance of place of origin	Not important at all	Neutral	Very important
Importance of packaging material	Not important at all	Neutral	Neutral
Type of settlement	Big city	Big city	Big city
Gender	Female	Female	Female

Figure 4. *Descriptive table of superfood consumers.*

There were no previous researches that we could base hypotheses on, in regard to university students' superfood consumption. Our results are therefore just descriptions of certain patterns

that appeared in our small sample. These could not be compared to earlier findings. It was shown that the respondents seem to distinguish two categories of superfoods, one being nourishments that are fairly known in the European scene (such as avocado), while the other, those which are nearly exclusively appearing with superfood marking (such as chia or spirulina). Trends of the analyses can also point out that relatively few students are familiar with superfoods and even fewer of them consume those.

In summary, our results are as follows:

- *1. Female students in Budapest consume more fruits and vegetables than male students.* – accepted.
- *2. Foreign students eat healthier than those students who are coming from within Hungary.* – rejected.
- *3. Those students who live in shared accommodation with non-relatives, have a less healthy diet than those who live with their parents.* – rejected.
- *4. Economic factors have an influence on the eating habits of the respondents.* – accepted.

Regarding superfoods:

- *1. Are superfoods present in the diet of the observed population?* – yes.
- *2. Do superfood consumer respondents maintain an overall healthy diet?* – yes.

6. Conclusion

This study aimed to investigate how healthy university students of Budapest eat and whether they include certain superfoods into their diets. Taking into consideration previous researches in this field, our research aimed to provide answers to six questions related to the topic that will shed light on the dieting habits of students in Budapest. During the research it came out that 60% of students diet comparatively healthy, considering the assumptions made based on the frequency of fruits and vegetables consumption. Researchers Ortega et al. (1997) and Basfilinci & Cilingir (2017) revealed in their studies that nutrition related concern and eating patterns can be different depending on gender. Therefore, based on our sample we found that among university students of Budapest female students diet healthier than their male counterparts,

although the difference is not significant. Another hypothesis was focusing on revealing differences between healthy dieting of international and Hungarian students. As opposed to the study made by Németh (2021) on university students in Hungary, Hungarian students in Budapest happened to eat more fruits and vegetables compared to international students. It has been revealed that living situation has a notable correlation with healthy eating habits. Although it was expected to observe healthier diet among those who live with their family in comparison to those who live in a shared accommodation, the results showed that there are no significant variations between the two groups. Among the obstacles that students face in maintaining healthy diet is cost of grocery items (Amore et al., 2019). As it was revealed from this study, those students for whom price is very important have less healthier diet on the average.

The study prepared by Jagdale et al. (2021) describes the importance of including superfoods into a well-balanced diet. To our best knowledge, there is no research focusing on the presence of superfood in students' diet. Because of their beneficial impacts to the nutrition and health of an individual, it might be even more relevant for students to incorporate them into their diets to increase productivity and academic excellence. In this study we found that among 110 respondents 3 students consume superfoods and consider them as such. The number is not significant; however, it responds to our question of whether superfoods are present in the diet of students. Moreover, all the 3 respondents are females, which can also reflect to our previous finding that female students tend to eat healthier than male ones. Two students diet comparatively healthy, which is also an important aspect, since according to Proestos (2018) superfood consumption has to be only the part of a well-balanced diet.

The research conducted provided insights into the healthy diets of university students in Budapest and the importance of superfoods. However, due to the limited number of participants, this study cannot be considered representative. Superfoods are a new and rapidly developing topic, and during the preparation of this study, it was discovered that not much research has been done on students in this area. Therefore, we believe that further investigations into the presence and effectiveness of superfoods in the diets of university students should be conducted.

One potential avenue for further study would be to conduct interviews with superfood consumers in order to better understand how they incorporate these foods into their diets to improve their lifestyle. Additionally, an empirical study could be organised to observe how superfood consumption benefits students in terms of academic performance. Based on the patterns found in our results, it would be useful to distinguish two types of superfoods (widely

known, exclusive) in future research. This could help to reduce the ambiguity of the term, and enable more precise investigation. All in all, the continuation of this study in the aforementioned directions, would lead to creating a precedential reference point in the field, enabling other scholars to join the investigation and compare their results to these findings or test the existence of the observed patterns on a larger, representative sample.

7. Bibliography

Amore, L., Buchthal, O.V. & Banna, J.C. (2019). Identifying perceived barriers and enablers of healthy eating in college students in Hawai'i: a qualitative study using focus groups. *BMC Nutr 5*(16).

Basfirinci, C., & Cilingir, U. Z. (2017). Gender-based food stereotypes among Turkish university students. *Young Consumers*, *18*(3), 223–244.

Benedict, C., Hahn, A. L., Diefenbach, M. A., & Ford, J. S. (2019). Recruitment via social media: advantages and potential biases. *Digital health*, *5*, 1-11.

Brenner, P. S. (2020). *Understanding survey methodology*. Springer International Publishing.

Butterworth, M., Davis, G., Bishop, K., Reyna, L., & Rhodes, A. (2020). What is a superfood anyway? Six key ingredients for making a food "super". *Gastronomica*, *20*(1), 46-58.

El Ansari, W., Suominen, S., & Samara, A. (2015). Eating Habits and Dietary Intake: Is Adherence to Dietary Guidelines Associated with Importance of Healthy Eating among Undergraduate University Students in Finland? *Central European Journal of Public Health*, *23*(4), 306–313.

Grace, V. M. (1991). The Marketing of Empowerment and the Construction of the Health Consumer: A Critique of Health Promotion. *International Journal of Health Services*, *21*(2), 329–343.

Franco Lucas, B., Götze, F., Vieira Costa, J. A., & Brunner, T. A. (2022). Consumer perception toward "superfoods": A segmentation study. *Journal of International Food & Agribusiness Marketing*, 1-19.

Jagdale, Y. D., Mahale, S. V., Zohra, B., Nayik, G. A., Dar, A. H., Khan, K. A., Abdi, G., & Karabagias, I. K. (2021). Nutritional Profile and Potential Health Benefits of Super Foods: A Review. *Sustainability, 13*(16), 1-30.

Keller, R. (2013). *Doing discourse research: An introduction for social scientists*. SAGE.

Koroknay Z., & Pfau C. (2020). Egészséges táplálkozással kapcsolatos szokások egyetemi hallgatók körében. *Acta Medicinae et Sociologica*, *11*, 18–29.

Loyer, J. (2016). *The Social Lives of Superfoods*. University of Adelaide PhD thesis.

Lupi, S., Bagordo, F., Stefanati, A., Grassi, T., Piccinni, L., Bergamini, M., & Donno, A. D. (2015). Assessment of lifestyle and eating habits among undergraduate students in northern Italy. *Annali Dell'Istituto Superiore Di Sanità*, *51*, 154–161.

MacGregor, C., Petersen, A., & Parker, C. (2021). Promoting a healthier, younger you: The media marketing of anti-ageing superfoods. *Journal of Consumer Culture*, *21*(2), 164–179.

Magrach, A., & Sanz, M. J. (2020). Environmental and social consequences of the increase in the demand for 'superfoods' world-wide. *People and Nature*, *2*(2), 267-278.

Németh, N. (2021). *A Fenntartható élelmiszer-fogyasztás kulturális aspektusainak vizsgálata a Magyarországon tanuló nemzetközi hallgatók körében*. MATE PhD thesis.

Nestle, M. (2016). Corporate Funding of Food and Nutrition Research: Science or Marketing? *JAMA Internal Medicine*, *176*(1), 13.

Ortega, R. M., Requejo, A. M., Sánchez-Muniz, F. J., Quintas, M. E., Sánchez-Quiles, B., Redondo, M. P., López-Sobaler, A. M., & Andrés, P. (1997). Concern about nutrition and its relation to the food habits of a group of young university students from Madrid (Spain). *Zeitschrift Für Ernährungswissenschaft*, *36*(1), 16–22.

Papadaki, A., Hondros, G., A. Scott, J., & Kapsokefalou, M. (2007). Eating habits of university students living at, or away from home in Greece. *Appetite*, *49*(1), 169–176.

Pattnayak, C. (2022). Dietary awareness of college going girls in present scenario. *International Journal of Home Science, 8*(1), 82-85.

Proestos, C. (2018). Superfoods: Recent Data on their Role in the Prevention of Diseases. *Current Research in Nutrition and Food Science Journal*, *6*(3), 576–593.

Reuter, P. R., Forster, B. L., & Brister, S. R. (2021). The influence of eating habits on the academic performance of university students. *Journal of American College Health*, *69*(8), 921–927.

Roth, A., & Zawadzki, T. (2018). Instagram as a Tool for Promoting Superfood Products. *Annals of Marketing Management and Economics*, *4*(1), 101–113.

Scrinis, G. (2008). On the Ideology of Nutritionism. *Gastronomica*, *8*(1), 39–48.

Scrinis, G. (2013). *Nutritionism: the science and politics of dietary advice*. Columbia University Press.

Sikka, T. (2019). The contradictions of a superfood consumerism in a postfeminist, neoliberal world. *Food, Culture & Society*, *22*(3), 354–375.

Silliman, K., Rodas-Fortier, K., & Neyman, M. (2004). Survey of Dietary and Exercise Habits and Perceived Barriers to Following a Healthy Lifestyle in a College Population. *Californian Journal of Health Promotion*, *2*(4), 82-91.

Otaraly, S., Alikey, A., Sabyrbek, Z., Zhumanova, A., Martynenko, I., & Poteliuniene, S. (2020). Evaluation of Kazakhstan students' views on health, lifestyle, and physical activity. Sport Mont, 18(2), 67-72.

World Health Organization. (2020, April 29). *Healthy Diet*. https://www.who.int/news-room/fact-sheets/detail/healthy-diet

8. Appendix

Statistics

veg_fruits Healthiness of a diet based on vegetables and fruits consumption

N	Valid	107
	Missing	3

veg_fruits Healthiness of a diet based on vegetables and fruits consumption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 not healthy	7	6.4	6.5	6.5
	2.00 rather not healthy	36	32.7	33.6	40.2
	3.00 rather healthy	37	33.6	34.6	74.8
	4.00 healthy	27	24.5	25.2	100.0
	Total	107	97.3	100.0	
Missing	System	3	2.7		
Total		110	100.0		

Appendix 1. *Healthiness of a diet based on vegetables and fruits consumption.*

T-Test

Group Statistics

	gender Gender of the respondent	N	Mean	Std. Deviation	Std. Error Mean
veg_fruits Healthiness of a diet based on vegetables and fruits consumption	1 Male	41	2.6585	.93834	.14654
	2 Female	65	2.8769	.87514	.10855

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
veg_fruits Healthiness of a diet based on vegetables and fruits consumption	Equal variances assumed	.324	.570	-1.217	104	.113	.226	-.21839	.17949	-.57432	.13754
	Equal variances not assumed			-1.198	80.743	.117	.235	-.21839	.18237	-.58126	.14448

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
veg_fruits Healthiness of a diet based on vegetables and fruits consumption	Cohen's d	.89997	-.243	-.634	.150
	Hedges' correction	.90653	-.241	-.630	.149
	Glass's delta	.87514	-.250	-.642	.145

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

Appendix 2. *Independent Samples Test, grouping healthiness of a diet by gender.*

T-Test

Group Statistics

	country_2 Longest residency of the respondent	N	Mean	Std. Deviation	Std. Error Mean
veg_fruits Healthiness of a diet based on vegetables and fruits consumption	1.00 Hungary	53	2.8868	.95395	.13103
	2.00 Outside Hungary	53	2.6981	.84546	.11613

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
veg_fruits Healthiness of a diet based on vegetables and fruits consumption	Equal variances assumed	.060	.808	1.078	104	.142	.284	.18868	.17509	-.15853	.53589
	Equal variances not assumed			1.078	102.520	.142	.284	.18868	.17509	-.15859	.53595

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
veg_fruits Healthiness of a diet based on vegetables and fruits consumption	Cohen's d	.90134	.209	-.173	.591
	Hedges' correction	.90790	.208	-.172	.586
	Glass's delta	.84546	.223	-.161	.605

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

Appendix 3. *Independent Samples Test, grouping healthiness of a diet by longest residency of the respondent.*

Oneway

Descriptives

veg_fruits Healthiness of a diet based on vegetables and fruits consumption

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1 Living alone	13	2.5385	.87706	.24325	2.0085	3.0685	1.00	4.00
2 Living with family	25	3.1200	.83267	.16653	2.7763	3.4637	2.00	4.00
3 Living with partner	12	3.1667	.83485	.24100	2.6362	3.6971	2.00	4.00
4 Living in a shared accommodation with non-relatives (dormitory/sharing apartment)	57	2.6140	.90147	.11940	2.3748	2.8532	1.00	4.00
Total	107	2.7850	.90103	.08711	2.6124	2.9577	1.00	4.00

Appendix 4. *Descriptives of living situation of respondents regarding the healthiness of a diet.*

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
veg_fruits Healthiness of a diet based on vegetables and fruits consumption	Based on Mean	.191	3	103	.903
	Based on Median	.082	3	103	.970
	Based on Median and with adjusted df	.082	3	94.719	.970
	Based on trimmed mean	.170	3	103	.916

ANOVA

veg_fruits Healthiness of a diet based on vegetables and fruits consumption

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.010	3	2.337	3.045	.032
Within Groups	79.046	103	.767		
Total	86.056	106			

Appendix 5. *Tests of Homogeneity of Variances and ANOVA outputs.*

Post Hoc Tests

Multiple Comparisons

Dependent Variable: veg_fruits Healthiness of a diet based on vegetables and fruits consumption

	(I) living_situation Current living situation	(J) living_situation Current living situation	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Tukey HSD	1 Living alone	2 Living with family	-.58154	.29955	.217	-1.3638	.2007
		3 Living with partner	-.62821	.35070	.283	-1.5440	.2876
		4 Living in a shared accommodation with non-relatives (dormitory/sharing apartment)	-.07557	.26925	.992	-.7787	.6276
	2 Living with family	1 Living alone	.58154	.29955	.217	-.2007	1.3638
		3 Living with partner	-.04667	.30765	.999	-.8501	.7568
		4 Living in a shared accommodation with non-relatives (dormitory/sharing apartment)	.50596	.21015	.082	-.0428	1.0548
	3 Living with partner	1 Living alone	.62821	.35070	.283	-.2876	1.5440
		2 Living with family	.04667	.30765	.999	-.7568	.8501
		4 Living in a shared accommodation with non-relatives (dormitory/sharing apartment)	.55263	.27824	.200	-.1740	1.2792
	4 Living in a shared accommodation with non-relatives (dormitory/sharing apartment)	1 Living alone	.07557	.26925	.992	-.6276	.7787
		2 Living with family	-.50596	.21015	.082	-1.0548	.0428
		3 Living with partner	-.55263	.27824	.200	-1.2792	.1740

Appendix 6. *Post Hoc Tests results.*

Oneway

Descriptives

veg_fruits Healthiness of a diet based on vegetables and fruits consumption

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
2 Rather not important	4	2.7500	1.50000	.75000	.3632	5.1368	1.00	4.00
3 Neutral	18	2.8889	.83235	.19619	2.4750	3.3028	2.00	4.00
4 Rather important	36	2.7500	.76997	.12833	2.4895	3.0105	1.00	4.00
5 Very important	37	2.7027	1.05053	.17271	2.3524	3.0530	1.00	4.00
Total	95	2.7579	.91925	.09431	2.5706	2.9452	1.00	4.00

Appendix 7. *Descriptives of importance of price of grocery items for respondents regarding the healthiness of a diet.*

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
veg_fruits Healthiness of a diet based on vegetables and fruits consumption	Based on Mean	3.996	3	91	.010
	Based on Median	2.994	3	91	.035
	Based on Median and with adjusted df	2.994	3	88.531	.035
	Based on trimmed mean	3.939	3	91	.011

ANOVA

veg_fruits Healthiness of a diet based on vegetables and fruits consumption

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.424	3	.141	.163	.921
Within Groups	79.008	91	.868		
Total	79.432	94			

Appendix 8. *Tests of Homogeneity of Variances and ANOVA outputs.*

Robust Tests of Equality of Means

veg_fruits Healthiness of a diet based on vegetables and fruits consumption

	Statistic[a]	df1	df2	Sig.
Welch	.164	3	13.091	.919

a. Asymptotically F distributed.

Appendix 9. *Welch Test.*

Post Hoc Tests

Multiple Comparisons

Dependent Variable: veg_fruits Healthiness of a diet based on vegetables and fruits consumption

Tamhane

(I) imp_price How important is price of groceries?	(J) imp_price How important is price of groceries?	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
2 Rather not important	3 Neutral	-.13889	.77524	1.000	-4.3684	4.0907
	4 Rather important	.00000	.76090	1.000	-4.4426	4.4426
	5 Very important	.04730	.76963	1.000	-4.2594	4.3540
3 Neutral	2 Rather not important	.13889	.77524	1.000	-4.0907	4.3684
	4 Rather important	.13889	.23443	.993	-.5186	.7964
	5 Very important	.18619	.26137	.980	-.5356	.9080
4 Rather important	2 Rather not important	.00000	.76090	1.000	-4.4426	4.4426
	3 Neutral	-.13889	.23443	.993	-.7964	.5186
	5 Very important	.04730	.21516	1.000	-.5363	.6309
5 Very important	2 Rather not important	-.04730	.76963	1.000	-4.3540	4.2594
	3 Neutral	-.18619	.26137	.980	-.9080	.5356
	4 Rather important	-.04730	.21516	1.000	-.6309	.5363

Appendix 10. *Post Hoc Tests results.*