



Eating habits of undergraduate health graduates

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ABSTRACT

Introduction: In 2021 non-communicable diseases caused 90% of deaths and 85% of comorbidities in the European region of the World Health Organization. An unbalanced diet is one of the behavioral factors associated with mortality from non-communicable diseases. In Portugal 53.6% of adults are overweight or obese. Often the transition to university is associated with students leaving their parents' home, so there is often a change in the eating pattern of young adults.

Objective: To verify whether attending the last year of a degree course in the health area can be a factor promoting a complete, balanced and varied diet.
Methodology: Quantitative descriptive exploratory

study, based on the hypothesis: there is a relationship between attending a degree course in the health area and students' eating habits. This study was carried out at a university in Northern Portugal. A non-probabilistic convenience sampling was used, with the inclusion criterion being: being a final-year student in the health area of the university under analysis. We used a questionnaire in *google forms*, developed by the authors, divided into two parts: (i) sociodemographic questionnaire; (ii) questionnaire on eating habits. Results: 97 questionnaires were sent out and obtained 100% of responses. More than half of the respondents had five or more meals during the day and, although the majority had lunch away from home, almost all had dinner at home. About 91% of the respondents revealed that they did not comply daily with the recommendations of the food wheel for a healthy diet. The totality of those who favored the group of foods rich in fat ate their lunch away from home. **Conclusion:** Obesity is a growing concern, especially in more developed societies. There is evidence linking a diet rich in processed foods, fat, simple sugar, and salt with diseases such as hypertension and diabetes. However, lack of time, low economic resources, and a society that increasingly privileges speed and efficiency seem to be reasons to perpetuate the choice for an unbalanced diet.

Keywords: Health Science Students, Eating Behavior, Food and Nutrition Education

1 INTRODUCTION

In 2021 non-communicable diseases caused 90% of deaths and 85% of comorbidities in the World Health Organization (WHO) European region. Tobacco use, sedentary lifestyle, alcohol consumption, and unbalanced diet are the behavioral factors associated with mortality from noncommunicable diseases (World Health Organization, 2022).

Obesity is a non-communicable, multifactorial, and complex disease characterized by excessive adiposity. It is a risk to individual health, since it is one of the main determinants of morbidity and mortality, increasing the risk of cardiovascular diseases, some types of cancer, type 2 diabetes



mellitus and chronic respiratory diseases . In Europe, 60% of adults, 7.9% of children under five years old and one in three schoolchildren are obese or overweight, so it is urgent to act, at global public health level, in this area. It is estimated that this disease causes more than 1.2 million deaths annually in Europe. There are two factors associated with this disease: (i) preconception and gestational exposure to obesity; (ii) unhealthy diet and sedentary lifestyle (World Health Organization, 2022).

Portugal is the country in Europe with the highest prevalence of overweight in children, as 30.7% are overweight and 11.7% are obese (Ministry of Health, 2018). In addition, 53.6% of adults are overweight or obese (Gregório et al., 2020) and eight out of ten elderly people are overweight (Ministry of Health, 2018).

The food wheel is a circular graphic representation that aims to promote a varied, complete and balanced diet. The foods are distributed into seven groups, with the proportional size to what should be ingested per day, not forgetting water, which is in the center of the wheel to remind us of the need for its daily consumption in a complete diet. Each day, varying the consumption of foods within each group, 4 to 11 servings of tubers, cereals, and derivatives should be consumed (28%); 3 to 5 servings of vegetables (23%); 3 to 5 servings of fruit (20%); 2 to 3 servings of dairy products (18%); 1.5 to 4.5 servings of meat, fish and egg (5%); 1 to 2 servings of legumes (4%); 1 to 3 servings of fats and oils (2%); and 1.5 to 3 liters of water (Faculdade de Ciências da Nutrição e Alimentação da Universidade do Porto, 2004). The distribution of foods on the wheel is according to the nutrients present in each one and the need to consume them.

Nutrients are substances present in the food composition, obtained through the digestive process. It is from them that the body obtains the necessary nutrients to maintain a good state of health. Their absorption occurs mostly in the small intestine, and then passes through the bloodstream to the whole body. They are divided into seven classes: (i) proteins - which are responsible for the growth, maintenance, and repair of cells, tissues, and organs; (ii) carbohydrates - which are the main source of energy for the body's functions.(iii) lipids - which are the major energy suppliers, responsible for the transport of vitamins A, D, E and K, constituents of cellular structures such as hormones, and protectors of organs from external aggressions; (iv) vitamins - which are essential for the growth and maintenance of the body's balance, regulating its chemical reactions; (v) minerals - which ensure the conservation and renewal of tissues, the proper functioning of nerve cells and intervene in some of the body's reactions; (vi) food fibers - which are essential for the regulation and promotion of good health; and (viii) water - which is responsible for the transport of nutrients and other substances in the body, is the means for body reactions to occur and a source of maintenance of body temperature (Faculdade de Ciências da Nutrição e Alimentação da Universidade do Porto, 2004).

The best source of protein is from foods of animal origin (dairy products, meat, fish and eggs), but green and dry legumes when combined with cereals are a good alternative to them. The main



sources of carbohydrates are rice, pasta, flour, bread, cereals, legumes, fruit and honey. They are divided into simple (glucose, fructose, lactose, sucrose), complex (starches present in some fruits and vegetables, bread, cereals and pasta) and complex and indigestible (dietary fiber) according to the chains that compose them. Complex carbohydrates should be preferred, including them in all meals even if in small quantities, because they are also sources of vitamins, minerals and fiber and low in fat, promoting prolonged satiety. Lipids are present in foods of animal origin (butter, lard, cream, eggs - yolk - and fat from meat and fish) and vegetable (olive oil, edible oils, nuts, some tropical fruits). They are found in food in the form of triglycerides and are divided, according to their chemical structure, into (i) saturates, which raise blood cholesterol levels and can be found in high-fat dairy products, sausage/charcuterie products, poultry skin and red meats; (ii) monounsaturates, which lower blood cholesterol levels and can be found in olive oil and peanut oil; (iii) polyunsaturates, which do not raise blood cholesterol levels and can be found in fat from white meats, vegetable oils, nuts, and fish such as salmon, sardines, and mackerel. Vitamins are present in foods of animal and plant origin. According to their solubility they are divided into water-soluble (soluble in water) and fat-soluble (soluble in fat). The water-soluble ones include vitamin C and the B-complex vitamins, and the fat-soluble ones include vitamins A, D, E and K. Minerals are divided according to daily needs. For amounts below 100mg/day they are classified as trace elements - zinc, selenium, molybdenum, manganese, iodine, fluorine, iron, chromium, and copper - higher amounts are classified as minerals - calcium, chlorine, sulfur, phosphorus, magnesium, potassium, and sodium. Fiber does not supply energy, but promotes good intestinal function, reduces cholesterol levels, helps regulate glucose levels in the bloodstream, and promotes satiety, preventing obesity risk behaviors. They are present only in foods of plant origin - cereals, legumes, fruits, and vegetables. They are divided according to their solubility in water - soluble and insoluble. The former are present in legumes, fruits such as apples and citrus fruits, barley, oats, and vegetables, and help lower blood glucose and cholesterol levels. The latter are found in whole grain cereals, low refined flours, nuts, fruits with edible seeds, and the more fibrous part of vegetables. As they are not soluble, they promote intestinal transit. Water is the nutrient that requires the largest quantity to meet daily needs, which vary according to factors such as age, losses through vomiting, diarrhea and fevers, physical activity and climate (Faculdade de Ciências da Nutrição e Alimentação da Universidade do Porto, 2004).

Between October 2015 and September 2016, the Faculty of Medicine of the University of Porto promoted a national food survey. It included 6553 citizens, aged between 3 months and 84 years old. The main conclusions were: (i) 17% of the population ingested at least one soft drink or nectar per day; (ii) more than 10% of the total energy intake of 15.4% of the Portuguese population was based on the consumption of simple sugars belonging to the group of sweets (cookies, cereals, cakes, etc.); and (iii) one in two Portuguese did not consume the amount of vegetables or fruit recommended by the



WHO (Ministério da Saúde, 2018). In fact, the high consumption of red meat and sodium, the low consumption of whole grains (Gregório et al., 2020), and the fact that sugary drinks are one of the main sources of sugar in adolescents and children (Ministério da Saúde, 2018) contribute to overweight, obesity and, consequently, loss of healthy life years in the Portuguese population.

A national health survey, conducted in 2019, in individuals aged 15 or older, showed that 66.4% of participants assumed to consume fruit daily, 41.7% assumed to consume vegetables daily, 13.6% reported never consuming fruit, and 26.7% never consuming vegetables. In addition, 29% mentioned consuming meat daily, 34.8% assumed to do so 4 to 6 times per week, and 47.9% of participants assumed to consume fish 1 to 3 times per week (Gregório et al., 2020).

On average, from the age of 18, young adults enter higher education and 42% of them are displaced from their family residence (Ministry of Science, Technology and Higher Education and Ministry of Environment, 2022). This transition is often associated with changes in young people's eating patterns and an increase in sedentary lifestyles, due to the need to extend study hours (Barros et al., 2021).

In agreement with the aforementioned, we intended to verify if the attendance of a degree in health can be a factor promoting a complete, balanced and varied diet .

2 METHODOLOGY

This study used a descriptive exploratory quantitative study, based on the hypothesis: there is a relationship between attending a degree course in health and students' eating habits.

This study was conducted at a university in Northern Portugal, after approval by the Ethics Committee. A non-probabilistic convenience sample was used, with the inclusion criterion being: being enrolled in the last year of the health area course of the university under analysis. In this course, 97 students were enrolled.

As an instrument for data collection, we used a questionnaire in *google forms*, developed by the authors, divided into two parts: (i) sociodemographic questionnaire; (ii) questionnaire on eating habits, which was previously pre-tested. The questionnaire was sent by email to each of the students.

The data were treated using the Statistical Package for Social Sciences (SPSS), version 27, and a 5% significance level.

The healthy eating variable included those individuals who ate their meals according to the Food Wheel.

The sociodemographic characteristics and eating habits were analyzed using descriptive statistics.



3 RESULTS

A total of 97 questionnaires were sent out and 100% responses were obtained. The age of the students ranged from 20 to 29 years old. The majority (78%) were female.

More than half (69.1%) of the respondents had five meals, or more, during the day. Almost all (96.9%) had breakfast, 63.9% had mid-morning meal, 99% had lunch and dinner, 93.8% had a snack, and less than half (46.4%) had supper.

The majority (54.6%) of students reported eating lunch away from home. However, 97.9% had dinner at home.

About 91% of the respondents revealed that they do not comply daily with the recommendations of the food wheel for a healthy diet, and therefore, only 9% choose a healthy diet. More than half (67%) consumed cereals, derivatives, and tubers daily, 92.8% used dairy products daily, 47.4% consumed vegetables daily, more than half (63.9%) consumed fruit daily, 32% consumed legumes daily, 82.5% consumed meat, fish and/or eggs daily, and 37.1% used fats and oils daily.

The variable "place where lunch was eaten" was related to the most preferred food group: 63.4% of the respondents who preferred the "meat, fish and eggs" food group and all those who preferred the high-fat food group (*fast food*) ate their lunch away from home.

4 DISCUSSION OF RESULTS

As expected, the sample was predominantly female, since, in the health area, more vacancies are filled by female than by male students (PORDATA, 2022).

Despite the demanding nature of the course attended by the students under analysis, most of them tried to have five or more meals throughout the day. Different results were obtained in the study of Capitão (2011), which associated the low number of meals eaten by medical students with less parental control on the subject, as well as less help in cooking meals, and of Alves and Precioso (2017), where most respondents did not eat more than four meals a day.

Effectively, factors such as anxiety, caused by the demands of undertaking and completing a higher education course (Espíndola et al., 2021), unhealthy eating habits compensated by restricting the number of meals to maintain weight (Capitão, 2011; Santos et al, 2021), lack of financial resources (Angotti & Zangirolani, 2019; Angotti & Zangirolani, 2022), and lack of time, associated with the evaluative demands of a higher education course (Duarte et al., 2013) often legitimize a lower number of meals in students. However, the fact that these are health students attending the last year of their course seems to justify the results obtained, since they will be more aware of the implications that their food choices have on their health (Capitão, 2011; Espíndola et al., 2021).

In relation to the place where they ate their meals, most respondents ate lunch away from home, as shown in the study of Duarte et al. (2013), most likely due to the number of hours available for



lunch, which restricts trips home and/or as a way to reduce transportation costs. Even so, a much higher majority (97.9%) ate dinner at home, corroborating other studies (Martins, 2009). This behavior may be based on an awareness of economic savings and/or, in the case of non-displaced students, a preference/imposition to have this meal with the family.

Most respondents did not eat a healthy diet, as evidenced in other studies where fast food, soft drinks and simple sugars were frequent (Alves, 2014; Alves & Precioso, 2017; Duarte et al., 2013; Feitosa et al., 2010; Paixão et al., 2010; Rodrigues, 2012). In addition, individuals who had lunch away from home favored *fast food*. In fact, Moreira (1999) explains, in the course of his exposition, that the desire to become independent, associated with the requirement of participation in social activities and, consequently, less free time, may be responsible for the adoption of deviant eating patterns, such as those of cafeterias, where home-cooked meals are replaced by snack meals, characterized by high contents of simple sugars and fats.

With regard to the consumption of the different groups of the food wheel, we found that: (i) the value found in the 2019 national survey (Gregório et al., 2020) regarding the daily consumption of vegetables was close to the one recorded in this study (41.7% to 47.4%) and more studies reported low consumption of vegetables in university students (Bento et al., 2021; Martinez et al., 2016; Rodrigues, 2012); (ii) a higher frequency of consumption of fats and oil when compared to the group of legumes (37.1% to 32%). A fact also evidenced in the studies of Cavadas and Linhares (2019) and Rodrigues (2012); (iii) although a high number of respondents used dairy products daily (92.8%), slightly more than half favored the group of cereals, derivatives and tubers (67%). These facts are opposite to those found in the study of Bento et al. (2021); (iv) although more than half (63.9%) assumed the daily consumption of fruit, the number of students who assumed the daily consumption of meat, fish and/or eggs was much higher (82.5%), as found in other studies (Bento et al., 2021; Cavadas & Linhares, 2019; Rodrigues, 2012); and (v) all respondents who favored the group of foods rich in fat ate lunch away from home. These findings may be related to (i) university students' lack of time to cook their own meals; (ii) a limited budget, which limits a varied, balanced and healthy diet; (iii) lack of knowledge to cook some foods, namely vegetables, and (iv) in the case of displaced students living in university residences, lack of conditions to cook meals and/or lack of accessibility to healthy food products provided by higher education institutions (Martinez et al., 2016). On the other hand, attending higher education also marks the independence of young adults, which is often reflected in changes in eating patterns and food choices (Rodrigues, 2012), particularly due to the loss of parental control (Alves, 2014).

Considering the aforementioned reasons, the use of *fast food* is a viable alternative (Martinez et al., 2016), as it is quick to acquire and consume and low cost.



This study has limitations, and therefore the results should be considered with caution, since data were collected through self-completion questionnaires and responses may be subject to desirability bias. Second, the specificity of the sample and the use of a non-probabilistic sampling in a single educational establishment limits the generalizability of the results. Finally, the study design did not allow us to determine if the values obtained were constant throughout the years of the course or if they suffered variations, among others, with the increase of knowledge in the area and/or the workload.

5 CONCLUSION

Obesity is a growing concern, particularly in more advanced societies.

Fast food restaurants are multiplying all over Europe.

The university student, particularly in the health area, has evidence that links a diet rich in processed foods and in fat, simple sugar and salt with diseases such as hypertension and diabetes. However, the lack of time to cook, considering the activities inherent to an academic life, low economic resources (it should be noted that *fast food* restaurants' menus are usually more affordable when compared to those of traditional restaurants) and a society that increasingly favors speed and efficiency, and therefore values the option for *fast food*, seem to be reasons to perpetuate students' choices for unbalanced diets.

In this study, although more than half of the participants (69.1%) had five meals, or more, throughout the day, about 91% reported that they did not comply daily with the recommendations of the food wheel for a healthy diet. In fact, less than half (47.4%) reported eating vegetables daily, which is the second group of the food wheel that should be eaten in larger quantities daily. Other points to note are: (i) the fact that more students in the study assumed to consume fats and oil daily (37.1%) than to consume legumes (32%); (ii) a high number (92.8%) to consume dairy products daily, but not as high to use the group of cereals, derivatives and tubers (67%) - the group to be privileged in the food wheel; (iii) and, although more than half (63.9%) assume the daily consumption of fruit, the number of students who assume the daily consumption of meat, fish and/or eggs was much higher (82.5%). It should be noted that all the respondents who favored the high-fat food group ate their lunch away from home.

These results are worrisome, even more so for students in their last year of a health degree. Choosing a balanced and varied diet is fundamental for good physical and mental health in the long term. However, this study seems to indicate that attending a health degree is not a determining factor for the adoption of a complete, balanced and varied diet

Changing the food choices of college students can be a challenge, since many of them are in a phase of greater independence and freedom, namely to make decisions about their diet. And despite



the measures, implemented by successive governments, aimed at reducing salt and sugar consumption, namely by increasing taxes and reformulating food products, the use of fast food is still a reality.

It is up to health and higher education institutions to help by choosing a healthy diet, reminding people of the risks associated with diets high in fat, salt, and simple sugars, and providing alternatives to *fast food*.

Health professionals, particularly community nurse specialists in the area of family health nursing, play a major role in students' food choices and, during their consultations, should involve the individual and the family to promote a balanced diet and prevent risky eating habits.

On the other hand, it is suggested that educational institutions (i) offer to a greater extent meals with an abundance of vegetables, greens, lean proteins, whole grains and fruits, reducing the choice of less healthy foods; (ii) team up with health units to promote lectures and/or workshops to educate about nutrition and varied and healthy eating and raise awareness of the impact that food choices have on health in the short, medium and long term; (iii) involve students, namely by promoting cooking workshops and/or group activities, in the selection and preparation of a healthy diet; and (iv) partner with restaurants to offer discount vouchers when the decision is for a balanced and healthy diet. In addition, the distance between educational institutions and restaurants that favor foods rich in simple sugars, fats and salt should be increased.

Effectively, changing the food choices of college students takes time and effort, yet by adopting strategies and a consistent approach, it is possible to encourage healthier choices and improve their health and well-being.



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