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ORIGINAL ARTICLE

Physical activity and nutrition in higher education students

Actividad física y nutrición en estudiantes de educación superior

Atividade física e alimentação em estudantes do ensino superior

Ermelinda Maria Bernardo Gonçalves Marques[1,2]
ORCID: 0000-0003-3024-8392
Cecilia Maria Fernandes da Fonseca[1]
ORCID: 0000-0002-8543-331X
Renata Jabour Saraiva[3]
ORCID: 0000-0002-2759-8159
Agostinha Esteves de Melo Corte[1]
ORCID: 0000-0002-3079-8370
António Manuel Martins Batista[1]
ORCID: 0000-0001-8854-5344
Andreia Patrícia Borges Lopes[4]
ORCID: 0000-0002-3681-0481

[1]Instituto Politécnico da Guarda, Unidade de Investigação para o Desenvolvimento do Interior. Guarda, Portugal.
[2]Centro de Investigação em Tecnologias e Serviços de Saúde. Porto, Portugal. Centro Académico Clínico das Beiras. Covilhã, Portugal.
[3]Universidade Estácio de Sá. Rio de Janeiro, Brazil.
[4]Unidade Local de Saúde da Guarda. Guarda, Portugal.

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Corresponding author:
Ermelinda Maria B. G. Marques
E-mail: emarques@ipg.pt

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Abstract

The aim was to characterize the lifestyles of students at a higher education institution, in the dimensions of physical activity and nutrition, and to propose intervention strategies based on the results obtained. Exploratory, descriptive, transversal, and quantitative study. Data were collected through the Fantastic Lifestyle questionnaire (EVF) distributed to students of a Higher Education Institution in the interior of Portugal, via email, registered and analyzed using the Statistical Package for Social Sciences, version 22.0. The results obtained in the Physical Activity and Nutrition dimensions of the EVF stand out. A total of 455 students participated in the study, 42.0% reported that they walked, almost always, for at least 30 minutes a day, 14.1% did not practice any physical activity; 56.7% said they sometimes consume vegetables and fruit while 21.1% do it daily. On the other hand, the majority (80.9%) regularly consume some high-calorie foods, 19.4% are pre-obese. It was allowed to assess the situation in order to carry out a planning and implementation of strategies aimed at promoting the practice of regular physical activity and careful eating in a greater number of students, with specific interventions for those who do not practice any physical exercise and those who already have pre-obesity.

Descriptors: Students; Physical Activity; Food.

Resumén

El objetivo fue caracterizar los estilos de vida de los estudiantes de una institución de educación superior, en las dimensiones de actividad física y nutrición, y proponer estrategias de intervención en base a los resultados obtenidos. Estudio exploratorio, descriptivo, transversal y cuantitativo. Los datos fueron recolectados a través del cuestionario Fantastic Lifestyle (EVF) distribuido a estudiantes de una Institución de Educación Superior en el interior de Portugal, vía correo electrónico, registrados y analizados utilizando el Statistical Package for Social Sciences, versión 22.0. Destacan los resultados obtenidos en las dimensiones de Actividad Física y Nutrición del EVF. Un total de 455 estudiantes participaron del estudio, el 42,0% informó que caminó, casi siempre, al menos 30 minutos al día, el 14,1% no practicó ninguna actividad física; El 56,7% dijo que a veces consume verduras y frutas mientras que el 21,1% lo hace a diario. Por otro lado, la mayoría (80,9%) consume habitualmente algunos alimentos ricos en calorías, el 19,4% son pre-obesos. Se permitió evaluar la situación con el fin de llevar a cabo una planificación e implementación de estrategias orientadas a promover la práctica de actividad física regular y una alimentación cuidadosa en un mayor número de estudiantes, con intervenciones específicas para quienes no practican ningún ejercicio físico y aquellos que ya tienen pre-obesidad.

Descriptores: Estudiantes; Actividad Física; Alimentación.

Resumo

Objetivou-se caracterizar os estilos de vida dos estudantes de uma instituição do ensino superior, nas dimensões atividade física e alimentação e propor estratégias de intervenção com base nos resultados obtidos. Estudo exploratório, descritivo, transversal e de carácter quantitativo. Os dados foram recolhidos através do questionário Estilo de Vida Fantástico (EVF) distribuído aos estudantes de uma Instituição de Ensino Superior do interior de Portugal, via correio eletrónico, registados e analisados com recurso ao *Statistical Package for Social Sciences*, versão 22.0. Destacam-se os resultados obtidos nas dimensões Atividade física e Nutrição do EVF. Participaram no estudo 455 estudantes, 42,0% referem que caminham, quase sempre, no mínimo 30 minutos por dia, 14,1% não praticam nenhuma atividade física; 56,7% afirmaram que às vezes consomem verduras e fruta enquanto 21,1% o faz diariamente. Por outro lado, a maioria (80,9%) consome regularmente alguns alimentos hipercalóricos, 19,4% apresenta pré-obesidade. Permitiu-se avaliar a situação de forma que seja efetuado um planeamento e implementação de estratégias que visem promover a prática de atividade física regular e uma alimentação cuidada em um maior número de estudantes, com intervenções específicas naqueles que não praticam nenhum exercício físico e nos que já apresentam pré-obesidade.

Descritores: Estudantes; Atividade Física; Alimentação.

Introduction

Lifestyles can be defined as the set of habits and behaviors in response to everyday situations, apprehended through the socialization process and constantly reinterpreted and tested throughout the life cycle in different social situations that can affect either individual health or collective health[1,2].

A sedentary lifestyle, associated with an incorrect diet, constitutes one of the biggest public health problems. Regular physical activity and healthy eating contribute to increased longevity and prevention of various chronic non-communicable diseases. In addition to its preventive role, the practice of regular physical activity is an important therapeutic adjuvant in a wide range of non-communicable chronic diseases[3-5].

Some authors[6] report that the first indicators of chronic diseases start at a young age and point to an intrinsic association between nutrition and health/disease, in addition to attributing some of the most prevalent diseases in the population, namely chronic diseases, to acquired unhealthy eating habits since childhood.

The inadequacy of the eating habits adopted is considered the main factor responsible for the prematurely lost years of life in Portugal. In 2010, the inadequate eating habits of the Portuguese population accounted for 12% of the total years of life lost, among women, and 15% among men. According to the values found, dietary patterns that are poor in fruit/vegetables and rich in sodium are the main responsible for the loss of years of healthy life[3].

When entering higher education, young people are faced with several challenges, often accompanied by significant changes in their lifestyle and living far from their family. Authors[7] concluded that the normative transitions in the life cycle that involve significant structural changes, such as entry to higher education, constitute a risk factor in the adoption and maintenance of healthy lifestyles, namely in terms of diet and physical activity. In the context of higher education, young people meet new realities, both cultural and social, and are likely to reshape their social circles and daily habits. In addition to these elements, there is an increase in decision-making power and autonomy, reflecting in a greater capacity to manage your time, your daily practices, material resources, social networks, your body and your health[8,9].

According to the General Directorate of Health (DGS)[10], during higher education, many of the students tend to practice less healthy lifestyles. This phenomenon can occur due to anxiety, stress, and the fact that many students are far from their family and away from their eating routines and not practicing physical activity. These dietary changes also occur since students have less time as a result of academic activities, as well as because they feel they are more independent to make their own decisions regarding their diet: what to eat, when, where and with whom.

Students change their eating habits, eating less fruit and vegetables, thus increasing the consumption of sugar, fried food products and fast food. Associated with all this, they practice less physical exercise not controlling their weight and, thus, some of the young people are pre-obesity[10].

In addition to nutrition, it is very important to know the patterns and trends in physical activity among young people in higher education. Emphasize that it is during this period that personality and habits are consolidated and that entry into higher education provides the establishment of new relationships with the possibility of adopting sedentary habits[11].

The practice of regular physical activity is a key protective factor for the prevention and control of non-communicable diseases (NCDs), such as cardiovascular disease, type 2 diabetes, and some types of cancer. Its benefit in mental health is also highlighted, including the prevention of cognitive decline and symptoms of depression and anxiety, as well as its contribution to maintaining a healthy weight and general well-being, which is relevant for young people in education. higher. Global estimates indicate that 27.5% of adults and 81% of adolescents do not adhere to the 2010 WHO recommendations for physical activity, noting that there has been almost no improvement over the past decade.[12].

According to DGS[5], young people must practice at least 60 minutes of physical activity of moderate to vigorous intensity daily. This should include, at least 3 times a week, 20 to 30 minutes of activities such as running, climbing, and descending stairs, jumping or other activities that require the musculoskeletal system to improve muscle strength, flexibility, and bone strength. The latest WHO recommendations for physical activity and sedentary behavior indicate that adults (15-64 years) should perform: i. at least 150 to 300 minutes of moderate-intensity aerobic physical activity; ii. or at least 75 to 150 minutes of vigorous-intensity aerobic physical activity; iii. or an equivalent combination of moderate-intensity and vigorous physical activity throughout the week for substantial health benefits[12].

The fact that the inadequacy of eating habits contributes to the loss of years of healthy life and the estimated that three quarters of the Portuguese population, approximately, over 15 years old does not meet the international recommendations for physical activity, requires intervention with the population in order to promote healthy eating habits and the practice of physical activity[3,4].

Certain habits can negatively affect health, but they can be reversed by looking for healthy habits, such as physical exercise and good nutrition. Higher education institutions have a responsibility to promote cognitive and professional development as well as personal, affective, and social development[8,13]. Thus, they are privileged spaces for the creation of a health-promoting context and, therefore, it is desirable that they develop strategies to promote adequate nutrition and the practice of physical exercise. In this way, they can contribute to reduce the risk of pre-obesity and obesity and, consequently, prevent public health problems.

In order to outline these intervention strategies, in the dimensions of nutrition and physical activity, it is

imperative that institutions know their reality, which motivated this investigation in a higher education institution in the interior of Portugal. In this context, the following objectives were defined to characterize the students' lifestyles in the dimensions of physical activity and nutrition and to propose intervention strategies based on the results obtained.

With this investigation, it will be possible to have a portrait of the lifestyle of the community of students under study regarding the practice of physical activity and nutrition, which will allow the delineation of intervention actions aimed at the identified problems and promoting changes with benefits in your health.

Methodology

The methodological approach adopted in this work is part of an exploratory, descriptive, transversal, and quantitative study.

The target population were all students from a higher education institution in the interior of Portugal in the 2016-2017 school year, in a total of 2 286. The study involved obtaining information from the participants, who responded to the data collection instrument, from anonymously, freely and knowing the objectives of the study. The data collected does not allow tracking any of the individuals, as per the opinion of the National Data Protection Commission. A total of 455 students participated in the study, which constitutes approximately 20% of the target population, with a sampling error of 4.2%.

The data collection instrument was built with the Google Forms® tool and sent via email to all students, after proper authorization, and was available from January to March 2017. Making the data collection instrument available in digital format makes it easier filling it out minimizes/reduces data transcription errors and, consequently, contributes to the fidelity and validity of the data, in addition to facilitating access to it. The instrument consisted of two parts, the first with a set of questions related to the sociodemographic characterization, school context and anthropometric measures of the student. The second part integrates the Fantastic Lifestyle Questionnaire (EVF)[14] to assess the lifestyle, this study reporting only to the practice of physical exercise and nutrition.

The collected data were registered and analyzed using the Statistical Package for Social Sciences (SPSS), version 22.0. To meet the objectives established for this study, a descriptive univariate and bivariate analysis was carried out based on the scores obtained in the physical activity and nutrition dimensions of the EVF scale, as a function of the sociodemographic characterization, school context and anthropometric measurements of the participants. To assess the association between variables, depending on their type, we used the Spearman correlation coefficient, the Chi-frame Independence Test (TIQ) with Cramer's V coefficient or the Mann-Whitney U test. In the analysis of the results, a significance level of 5% was considered.

Results

Of the 455 students who responded to the data collection instrument, most were female, aged between 18 and 53 years (mean 22.9 years with s=6.2), the majority (79.8%) attend degree courses, highlighting the Nursing course (n=180). Attending higher education implied a change of residence for the majority (68.4%) and most live with colleagues/friends in a house/apartment and go to visit their family weekly (Table 1).

Table 1. Sociodemographic and school context characteristics of the participants. Guarda, Portugal, 2017

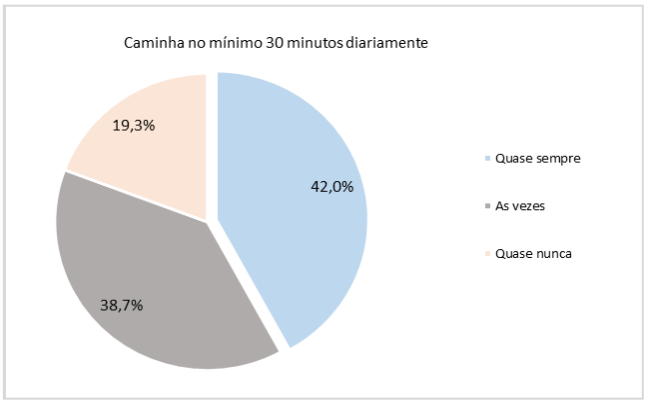
Characteristics		***N***	**% (*n*=455)**
Sex	Feminine	315	69,2
Marital status	Single	414	91
Course	Graduation	363	79,8
Course year	1st	199	43,7
Change residence	Yes	311	68,4
Lives with colleagues/friends in a house/apartment	Yes	190	41,8
Go to the family home weekly	Yes	184	40,4
Scholarship	Yes	214	47,8

This work focuses on the results obtained in the physical activity and nutrition dimensions of the EVF questionnaire. Considering the items related to the practice of physical activity, 42.0% reported that “almost always” walk daily, with a minimum of 30 minutes, 38.7% only do it “sometimes”. It should be noted that 19.3% answered “almost never” (Graph 1).

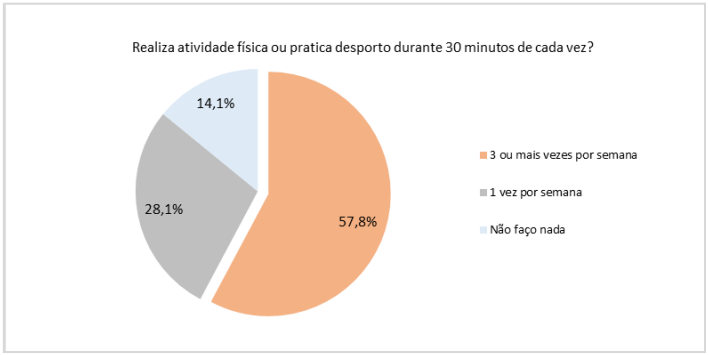
The majority (57.8%) of the study participants practiced 30 minutes of physical activity or sport (Graph 2), doing it “3 or more times a week”. Of those who practice physical activity, male students (68.9%) and students in the degree course in Sport (100%) stand out, who claim to exercise “3 or more times a week”. The data indicated the existence of an association between the results in the item "I walk at least 30 minutes daily" and being or not students in the 1st year of the course (TIQ with p<0.001 and Cramer's V =0.19) and whether they reside with the family during the school term (TIQ with p<0.001, Cramer's V=0.217). In this

sense, the analysis carried out indicated that students in the 1st year (U Mann-Whitney with p<0.001) and those who do not live with their family (U Mann-Whitney with p= 0.005), were the ones who most reported "walking in the minimum 30 minutes daily". This practice was also higher in males compared to females (U Mann-Whitney with p= 0.029).

Graph 1. Taking a 30-minute walk daily by the participants. Guarda, Portugal, 2017



Graph 2. Execution of physical activity or practice of sport by the participants. Guarda, Portugal, 2017



In terms of food and based on the "nutrition" dimension of the EVF, 56.7% stated that they "sometimes" consume vegetables and fruit, while 21.1% do it "daily". On the other hand, the majority (80.9%) "regularly" consume some high-calorie foods and only 9.5% report that they do not consume this type of food (Table 2). The results indicate an association between sex and "eating two servings of vegetables and three of fruit daily" (TIQ with p=0.014, Cramer's V = 0.137) and with "eating high-calorie foods or fast food" (TIQ with p=0.026, V Cramer = 0.127), indicating that females consume the most in both cases.

Table 2. Respondents' eating habits. Guarda, Portugal, 2017

Nutrition		***N***	**% (*n*=455)**
Eat two servings of vegetables and three servings of fruit daily	Almost never	101	22,2
	Sometimes	**258**	**56,7**
	Everyday	96	21,1
Eating high-calorie foods (sweet and/or savory) or fast food	None of these	43	9,5
	Some of these	**368**	**80,9**
	All	44	9,7

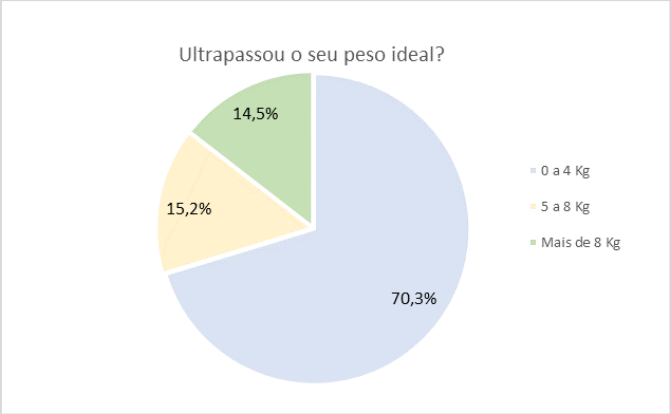
The majority (70.3%) of the students in the sample reported having exceeded the ideal weight between 0 and 4 kg (Graph 3). Statistically significant differences were observed in the question "exceeded the ideal weight" depending on the year of the course (U Mann-Whitney with p = 0.009), obtaining the best results for 1st year students.

Based on self-reported weight and height, it was possible to calculate the Body Mass Index (BMI) for 454 students, of which 70.3% had Normal BMI (18.6 – 24.9), 4.8% grade 1 obesity and 19.4% pre-obesity (25 - 29.9)[2].

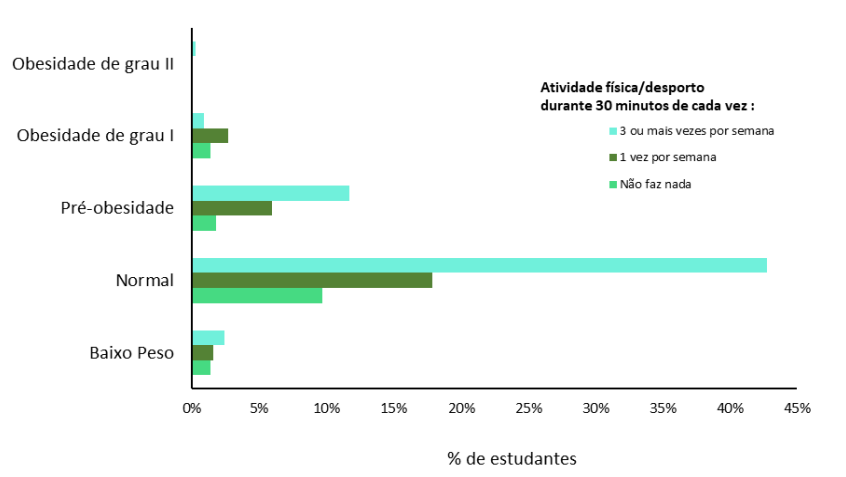
It is observed (Graph 4) that it is in the participants with Normal BMI (18.6 – 24.9) that a large part of the students practices physical activity "3 or more times a week" (42.7%), as well as those who practice "1 time a week" (17.8%). It is noteworthy the fact that there are participants who are pre-obesity (25 - 29.9) and who reported practicing

physical activity "3 or more times a week" (11.7%) and "1 time a week" (5, 9%). Furthermore, in individuals with grade 1 obesity, there is a small percentage that practiced physical activity "once a week" (2.6%). It is noteworthy that of the 263 participants who reported practicing physical activity 3 or more times a week, the majority (n=194; 73.8%) had a Normal BMI.

Graph 3. Distribution of participants in the question "Did you exceed your ideal weight?". Guarda, Portugal, 2017



Graph 4. Classification of BMI and performance of physical activity or practice of sport. Guarda, Portugal, 2017 (n=454)



Differences were observed in BMI by sex (U Mann-Whitney with $p < 0.001$) and by year of the course (U Mann-Whitney with $p=0.012$), with higher values in males and students who were not in the first year. There was a strong correlation between BMI and "exceeding the ideal weight" with a Spearman correlation coefficient of 0.675 ($p<0.001$), varying in the same direction.

Discussion

The results of the study carried out in the context of physical activity and nutrition, are mostly in line with the literature consulted.

The results show that most students participating in the study practice 30 minutes of physical activity or sport at a time and do it 3 or more times a week. Male students and students from the Bachelor's Degree in Sport are mostly those who practice physical activity 3 or more times a week. These results can be associated with the fact that the practice of physical exercise is a main area of the sport course and not a fundamental area of the other degree courses, as is the case of the nursing course, as shown by a study[15], in which the dimensions of physical activity and diet had lower mean values, as this is not a central area of the course.

In the present study, it was found that females practice less physical activity than males, walking less than 30 minutes a day, which agrees with the study conclusions[15]. On the other hand, students who attended the 1st year of the course and who did not live with family members, during the school period, said they walked more than 30 minutes a day, compared to those who attended other years of the course and those who lived with family members. This situation may be related to the fact that students in the 1st year are in the adaptation phase and that the higher education institution, where the present study took place, is in a small town with little public transport, which may also justify the fact that students who do not live with their family are those who walk more than 30 minutes a day. According to DGS[5], young people should practice at least 60 minutes of

physical activity of moderate to vigorous intensity daily. This should include, at least 3 times a week, 20 to 30 minutes of activities such as running or walking, which is in line with the results obtained in this study. It is therefore relevant to encourage this type of extracurricular activities.

Regarding the results obtained in terms of nutrition, most participants (78.9%) said that "almost never" or only "sometimes" consume two servings of vegetables and three of fruit a day and that only 9.5% of participants said not to eat high-calorie foods or fast food. This conclusion is corroborated by a study[6], in which it was also verified that the students' eating habits were inadequate due to the low consumption of fruits and vegetables, opting for fast food. In the present study, it was concluded that females consumed more vegetables and fruit, but also more high-calorie foods and fast food, compared to males. These results may possibly be justified by the fact that students have difficulties in managing time in order to fulfill academic activities, neglecting the care with meals, as well as because they feel that they are more independent to make their own decisions in relation to their food, by the influence of the group of peers with whom they start to share the new experiences or because they are far from their family environment.

Inappropriate eating habits allied to a sedentary lifestyle contribute to the increase in pre-obesity, such was what was found in 19.6% of the participants in this study, based on the value of BMI. The results indicated differences by sex, with males presenting higher BMI values than females, and students who attended the 2nd year of the course or later had higher values, compared to those in the 1st year. Students who attend the 1st year of the course are at an early stage of adapting to higher education and the possible experience away from their family, which may justify the fact that they are the ones who considered having exceeded the ideal weight. It was found that the students who most reported having exceeded the ideal weight were those who most had a higher BMI, as expected. The fact that the BMI value was calculated based on the information transmitted by the students is highlighted, suggesting that it be evaluated by the researchers in future studies.

It was found that students who practice more physical activity or sport are those with normal BMI, which reinforces the need to implement strategies that increase the practice of these activities. This conclusion is also supported by a study[16], which refers to the increase in the number of higher education students with pre-obesity and obesity, caused, among other factors, by the decrease in physical activity and increased levels of sedentary lifestyle.

There are behavioral changes, particularly in terms of nutrition and physical activity, but not all students adopt a negative behavior/attitude. Nevertheless, it appears that admission to higher education has an influence on the students' lifestyles and sometimes negatively, changing their behavior towards less healthy lifestyles, as verified in the results of this investigation in the dimensions of physical activity and food. In this sense, interventions that aim to minimize the impact of the transition that these students experience should be programmed, through the promotion of healthy lifestyles and, consequently, promoting health and well-being[7].

As one of the focuses of this work, physical activity, an intervention measure at this level could involve applying the new model of physical activity promotion being implemented by the National Health Service (NHS) with a younger population, namely in school students higher. This new model emerged in the National Program for the Promotion of Physical Activity, in 2019, which integrates the promotion of physical activity in health care and is based on three components: brief counseling for the practice of physical activity, a new multidisciplinary consultation, physical activity consultation, articulation between the NHS and community resources that promote physical activity and exercise. One measure that could allow students to increase the practice of physical activity would be to harmonize teaching hours and the timetable of institutional spaces for this practice, which may be a very relevant aspect, given the characteristics of the geographic area where the study was carried out (very cold weather in winter). In the same vein, it would be important to carry out dissemination and awareness-raising actions among students about the importance of putting into practice the WHO recommendations for physical activity and sedentary behavior, which could be developed by peers, namely students of the sports course[5,12].

About eating habits, for them to be healthy, they do not need to have a restrictive or monotonous diet. On the contrary, different foods contribute different nutrients which potentially enrich each person's food day. Insufficient consumption of fruit, vegetables, whole grains and oleaginous fruits and excessive consumption of salt are among the main inappropriate eating behaviors[10].

In Portugal, more than 50% of Portuguese adults are overweight. As food is a factor that contributes to this fact, it is necessary to promote the consumption of foods that constitute a healthy eating pattern and create conditions for the population to value, appreciate and consume them, integrating them into their daily routines. In the case of higher education students, their eating habits change, especially in the first year of the course. This may be motivated by the fact that many students move outside their family environment, have a greater workload, experience difficulties in time management and, possibly, the influence of the peer group itself. In this context, they opt for industrialized products, quick meals or even skipping meals, which is accompanied by a decrease in the intake of fruits, vegetables and legumes.

It is therefore important to implement measures, namely: to define a food/nutritional strategy for higher education residences and canteens. This strategy could involve social action services having the support of a nutritionist who would provide information about dietary recommendations for this age group, to support students in their choices. These strategies should also seek to provide students with skills so that they can cook affordable, quick and, at the same time, nutritionally adequate meals. On the

other hand, bars and food vending machines in these spaces should have an added responsibility, offering balanced, varied, economical and appealing menus to the large number of students who have meals in these places. Portuguese legislation limits the food products that may be available in the spaces in the Ministry of Health institutions (Order No. 7516-A/2016 and Order No. 11391/2017) and that there are guidelines for primary and secondary schools. secondary education, but this does not happen in higher education institutions, which would be recommendable. There are several studies in which the need to change the food supply is pointed out as it is nutritionally inadequate and, therefore, limits the possibility of students choosing healthy foods[6,17-20].

Higher Education Institutions are therefore important spaces for the application of strategies to promote healthy lifestyles, namely in terms of physical activity in diet, promoting practices leading to the reduction of overweight and obesity and the maintenance of a weight adequate. In this way, students are trained who, at the same time, are involved in active and effective participation in building a healthy society.

In short, it is important to address issues such as physical activity, diet and chronic illnesses associated with these two issues in order to persuade young people about the consequences that can result from a sedentary life and inadequate nutrition. A low level of literacy in these areas can increase the risk of developing chronic non-communicable diseases[21].

Conclusion

The dimensions of physical activity and nutrition are part of the lifestyle, which were the object of study in this work, which focused on higher education students.

The results obtained indicate a low consumption of vegetables and fruit and a high consumption of high-calorie foods or fast food, however, most participants practice 30 minutes of physical activity or sport at a time and do it 3 or more times a week. The representativeness of pre-obesity is around 20%.

It is therefore important to carry out studies in this area and to increase literacy on physical activity and eating habits, with emphasis on higher education students as they are in a crucial phase of growth in terms of autonomy and independence.

One of the limitations of the study is related to the sample size and the fact that the BMI is calculated based on the students' self-reported height and weight, which in future studies is suggested to be evaluated by the researcher.

Nevertheless, it is considered that this work made a relevant contribution to the knowledge of the behavior of students in the dimensions of physical activity and nutrition, and to point out strategies that promote good practices in these dimensions, especially in students who do not practice any physical exercise and who present pre-obesity.

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