

**ANALYSIS OF THE NUTRITION HABITS OF 3rd YEAR STUDENTS
OF PHYSICAL EDUCATION AT THE UNIVERSITY OF RZESZÓW
IN THE ACADEMIC YEAR 2018/2019**

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- students
- nutrition
- physical education
- eating habits

Abstract

This thesis aims to analyze nutrition habits of 31 third year students of Physical Education at the University of Rzeszów. Nutrition habits after careful analysis were shown in graphical way on diagrams. To gather information students filled questionnaires and 24-hour nutritional interview was conducted. Research shows that in the group consists of two underweight and one overweight student, according to analyses. The nutrition habits of students shows general trend of misnutrition and lack of supplementation in their diet.

Introduction

The nutrition habits of the Polish population have changed in favor of the previous years, as a result of easier availability of healthy products and lower prices. The awareness of people has also increased as we are informed from all directions about healthy nutrition, often there are promotional campaigns of healthy lifestyle in which there are well-known and liked people who are supposed to additionally encourage people to lead healthy lifestyles. However, it should be noted that we live in times when we have no time for anything, thus we often reach for ready-made products sold in grocery stores, or eat in popular fast food. Therefore, on the one hand, awareness of a healthy lifestyle has increased, but sometimes it is difficult to keep up with the known principles because the lifestyle does not allow us to spend a longer time in the kitchen to prepare a meal or eat it regularly [Goryńska-Goldmann E. Ratajczak E., 2010].

The Institute of Food and Nutrition (hereinafter: IŻŻ) along with the Nutrition and Physical Activity Pyramid also proposed the principles of healthy nutrition. Some of them are discussed in the description of each pyramid level. The basic principle of healthy nutrition is the regularity of meals. The IŻŻ proposes to “consume 4-5 meals at intervals of 3-4 hours”. Another key issue is to drink water, drink at least 1.5 l of water a day and limit alcohol consumption to a minimum or eliminate it completely from the diet [Jarosz M., 2019].

A man mostly consists of water, but its amount in the body changes and depends on factors such as age and gender. An adult woman has 54% water in her body composition, while an adult man has 60% water. With age, the body loses water. It has a building and transporting function, e.g. transporting oxygen from the lungs, thermoregulatory function. It is generally recommended to consume water in the ratio of 30ml / 1 kg of body or 1 ml of water / 1 kcal of consumed products per day [Brzozowska A, Gawęcki J., 2015].

People practicing high-intensity workouts warm up their bodies through muscle work. High body temperature causes sweating, which results in the loss of water from the body. Since it is not possible to store water in the body, water should be systematically supplied to the body, especially during physical exercise, because there is a high risk of dehydration. It is assumed that 1 kcal is 1 ml of water. Before workout, it is necessary to consume about 300-500 ml of water, during workout it is recommended to drink isotonic drinks because apart

from hydration they provide glucose, it is recommended to consume about 400-800 ml. After workout, it is recommended to replenish 150% of the fluid lost during the exercise up to 2-3 hours after the workout. Applying these principles will protect us from dehydration and ensure healthy functioning of the body [Parol D., 2018].

Sports drinks can be divided into 3 main categories:

1. Hypotonic drinks – drinks with reduced mineral content, e.g. water
2. Isotonic drinks – ensure the best hydration of the body, osmolarity approx. (290-300 mOsm/l)
3. Hypertonic drinks – osmolarity content above 300 mOsm/l [Delavier F. Gundill M., 2010].

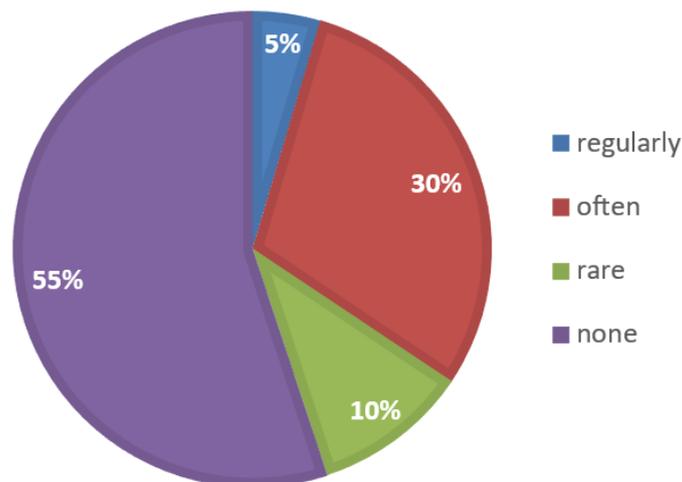
Studies on the nutrition habits of physical education students have not been widely conducted in Polish research centres. The last available research was conducted in 2011 by J. Myszkowska-Ryciak, A. Kraśniewska, A. Harton, D. Gajewska.

Methods and tools

The study was conducted on a group of 31 students of the 3rd year of Physical Education. One of the methods used by the author in this study is a 24-hour nutritional interview. It consists in writing out by the respondent all meals consumed during one day. In order to make the research results more reliable, the author also used a survey with questions concerning diet, eating habits and supplementation. The author is aware of the fact that the supplementation of nutritional interview by the respondents poses certain dangers. One of them may be the lack of reliability of the respondents' answers, the respondents may omit some of the products they eat. The surveyed may not give the basis weight of the consumed products in a reliable way. Therefore, apart from conducting a 24-hour interview, the author conducted a survey, which on the one hand provided data necessary for a better analysis of the discussed issue, and on the other hand verified the information provided in the interview by the subjects.

Research results

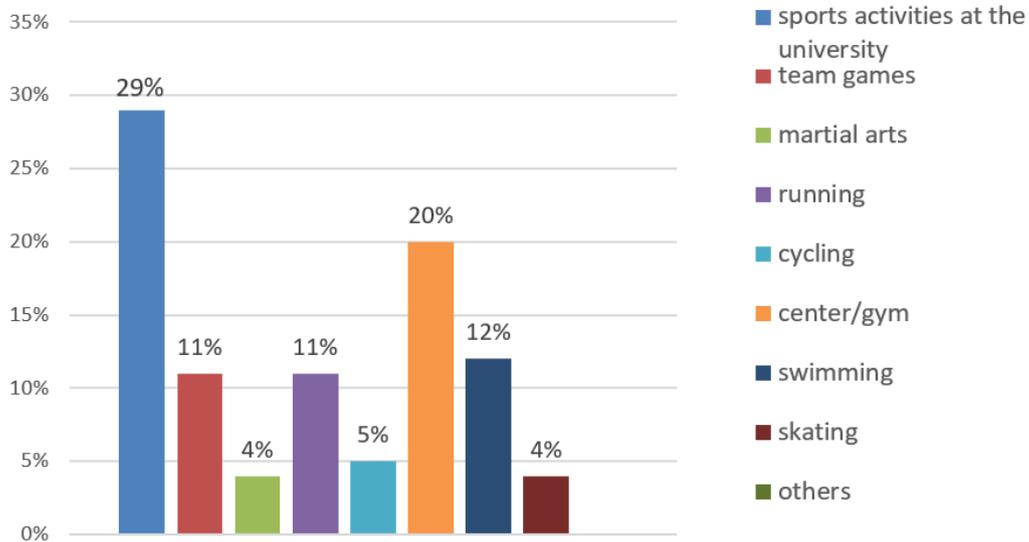
Below were presented the most important research results:



Graph 1. Frequency of physical activity
Source: Elaborated on the basis of own research.

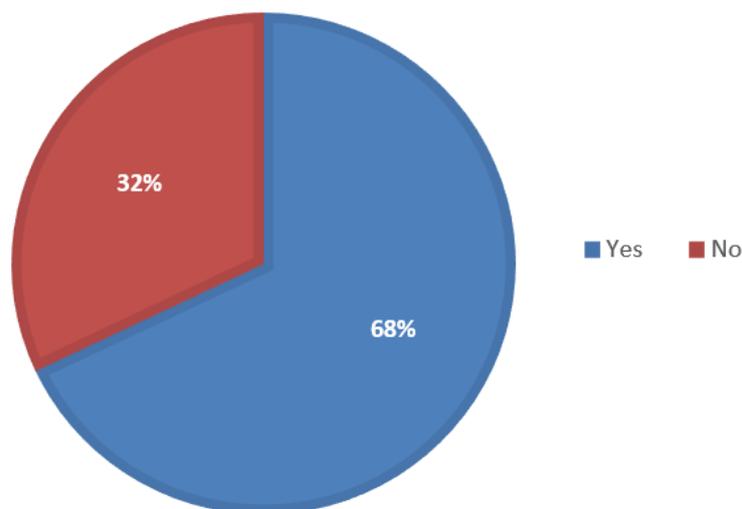
The vast majority i.e. as much as 65% of the surveyed women admitted that they practice various forms of physical activity 3-4 times a week. Physical activity is very important for normal human development, both physical and psychological. It prevents the

occurrence of many diseases and disorders, maintains physical fitness at an appropriate level, and has a positive impact on our health and general well-being. In the survey, 23% of respondents declared physical activity 1-2 times a week, only 10% of the surveyed students practice physical activity regularly – 5-6 times a week, while 2% – completely avoid physical activity.



Graph 2. Preferred type of physical activity
Source: Elaborated on the basis of own research.

Respondents could choose a maximum of two of the suggested answers. The most frequent answer was: sports classes at the university – 29%. This proves that physical education has a significant role in the education process. Education should promote a healthy and sporty lifestyle and encourage students, at various levels of education, including students, to participate in various physical activities, which as can be seen are often their only ones. Equally often, respondents chose fitness classes and a 20% gym. The question showed that swimming, running and team games are also popular. Only twice respondents indicated the answer “other” – they chose yoga and contemporary dance.



Graph 3. Respondents and healthy lifestyles
Source: Elaborated on the basis of own research.

As many as 68% of the surveyed students are of the opinion that they lead a healthy lifestyle. Good eating habits combined with sufficient physical activity prolong and improve the quality of life. Only 32% of respondents admitted that they did not succeed.

The second part of this study consisted of a nutritional interview analysis. As ingredients of nutritional interviews the surveyed students mentioned e.g.:

- 1) wholemeal bread, rye bread,
- 2) vegetables and fruits,
- 3) dairy products, e.g. milk, yoghurt, eggs, cheese,
- 4) chicken breast,
- 5) oatmeal,
- 6) salty snacks,
- 7) candy,
- 8) Fast Food.

31 nutritional interviews were collected. Their analysis showed that the average calorific value of food consumed by the students was 1660 kcal. The average weight of consumed products was 1787,5g. The ingredients, which consisted of meals, were divided into proteins, fats, and carbohydrates. The average weight of protein products consumed was 80g, fats 70g and carbohydrates 182g.

In order to calculate the daily needs of respondents, it is necessary to determine their gender, age, height, weight and frequency of physical activity. After checking the BMI results, it can be concluded that two subjects are underweight and one overweight. These cases should be investigated separately.

The table below shows the research results and the calculated calorific needs to maintain the current body weight. With a particular need for nutrients. The table refers to women who train moderately often at the age of 22 years, weigh 59 kg and have a body height of 166.

Table 1. Daily calorific demand

Calorie requirements for women aged 22 years, moderate frequency workout, weight 59 kg and body height 166			
Daily calorific demand	Protein	Carbohydrates	Fats
1816 kcal	69g	250g	61g

Source: Prepared using an Internet calculator [<https://www.fabrykasily.pl/bmr>].

Table 2. Daily calorific intake of the subjects

Daily calorific intake of the subjects			
Daily calorie intake	Protein	Carbohydrates	Fats
1660 kcal	80g	182g	70g

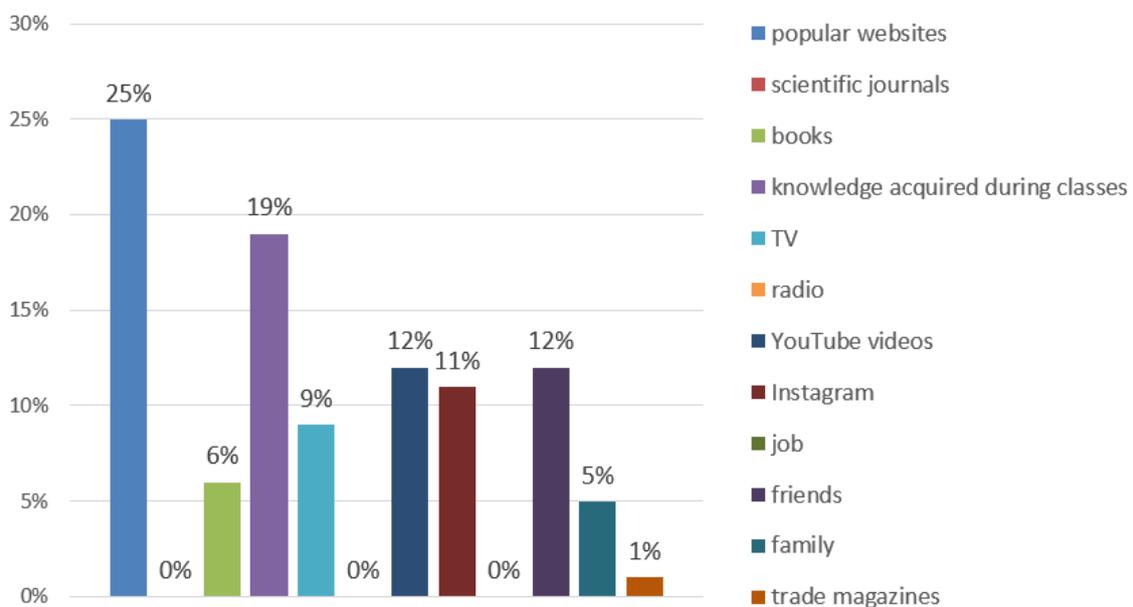
Source: Elaborated on the basis of own research.

Based on comparison of the above tables, the following conclusions can be drawn – the overall calorific demand is too low. The subjects should consume on average more than 150 kcal more daily. The intake of proteins and fats is too high. Proteins by 11g, while fats too much by 9g. The biggest difference is in the consumption of carbohydrates, which is deficient in the respondents' diet. The research provides an average of 60g too little of this nutrient. As can be seen, the biggest differences can be observed in the supply of carbohydrates and general calorific value of meals. Smaller differences are found in the supply of proteins and fats. Too low carbohydrate intake may result in lack of strength and malaise.

The first respondent, whose BMI was below normal, ate only four meals (dumplings, sushi, frozen yoghurt and chips) per day according to a 24-hour dietary interview. Those who consumed these meals provided 2927 kcal during the day. The main problem of the subject is the consumption of incomplete and high-calorie products. The respondent should enrich her diet with wholesome products, fruits and vegetables, and limit the consumption of processed products.

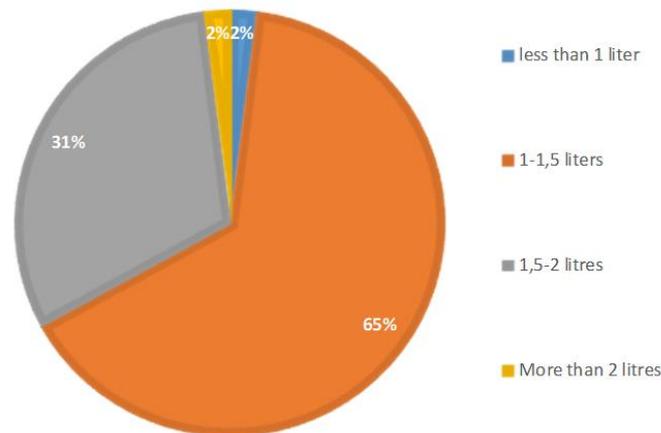
The second respondent, whose BMI index was below normal, consumed 1283 kcal during the day, according to a 24-hour dietary interview. The products consumed are healthy, but in much too small quantities. The subject also reported that she drank almost two liters of water per day.

A third respondent, whose BMI was above normal, consumed 1508 kcal during the day, according to a 24-hour dietary interview. This is an insufficient amount of calories. The problem of this subject is poorly balanced diet. The products she gave in the 24-hour interview are healthy but not in sufficient quantities. The body needs an adequate amount of energy for proper functioning, thus if one day there is not enough energy, the next day it will need it twice as much. If this becomes a habit, it can result in overweight.



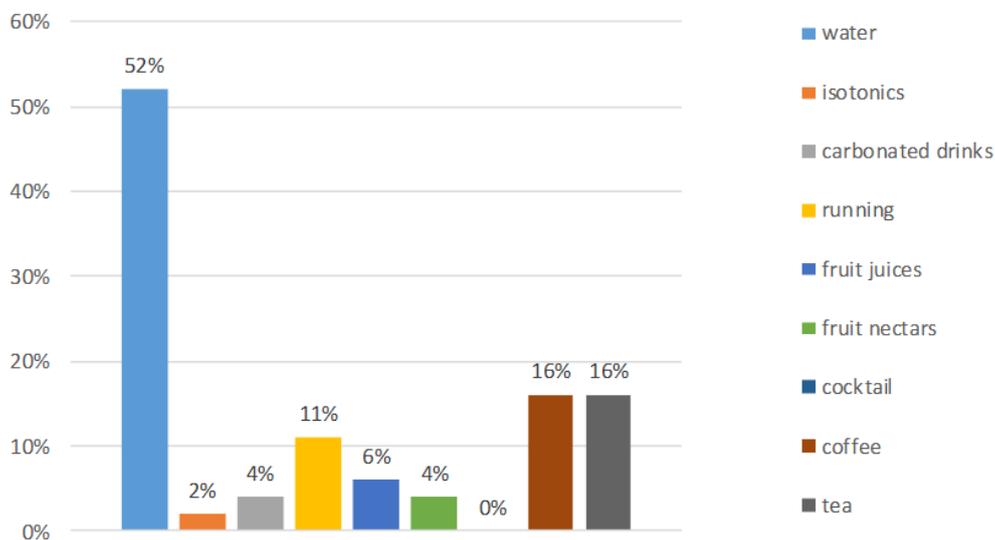
Graph 4. Students' sources of knowledge on healthy nutrition
Source: Elaborated on the basis of own research.

Respondents could select a maximum of 3 of the proposed answers. The most frequently chosen answer was popular websites (25%). It is from them that the surveyed students usually gain knowledge on healthy eating. They are rich in numerous recipes, curiosities and important information on the subject. They also find the knowledge from classes very helpful – 19%, as well as instructional and information videos on YouTube – 12%. The friends' environment is also very popular – 12%. An equally popular answer among the surveyed was Instagram, an extremely well known and popular among young people platform -11%. Less popular sources of information are TV – 9%, books – 6%, family – 5% and trade magazines – 1%. Not once were magazines, radio and work selected. As can be seen, young people prefer more recent methods of learning about healthy eating.



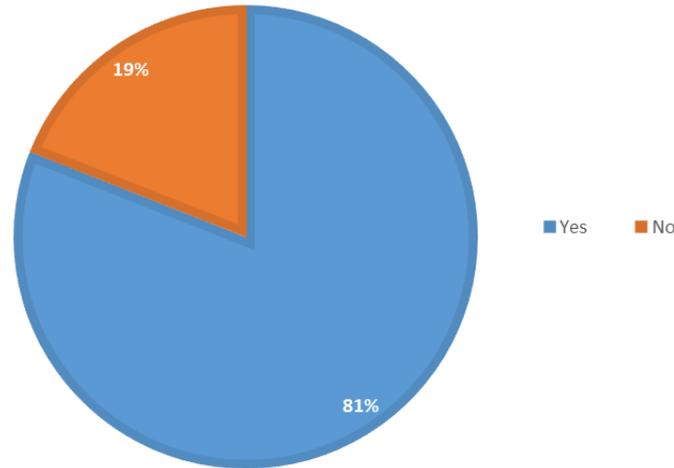
Graph 5. Daily quantity of fluid intake
Source: Elaborated on the basis of own research.

Water is a very important component of our body. Human body in 50-70% consists of water. It is present in every, even the smallest cell of our body. That is why it is so important to properly hydrate our body. Dehydration is a big problem for our body. The daily demand for water in the case of an adult is about 2l. The most common choice, because as many as 65% of respondents consume 1-1,5l of fluids daily. Another most frequently chosen answer was the consumption of water from 1.5-2l of fluids per day, this answer was chosen by 31% of subjects. Only 2% of the surveyed drink less than 1l, i.e. less than normal, and 2% drink more than 2l fluids a day.



Graph 6. Types of fluids
Source: Elaborated on the basis of own research.

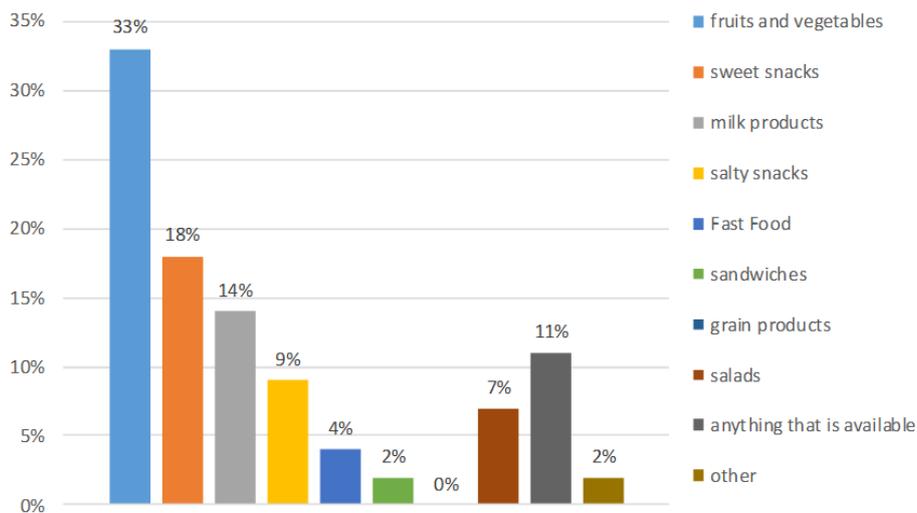
The surveyed students could choose a maximum of 2 of the proposed answers. The most frequent answer was water – it constitutes 52% of all answers. Other selected answers were: coffee and tea 16% each, squeezed fruit juices 6% and colorful carbonated drinks and beverages, nectars 4%. The least frequent respondents chose isotonic drinks 2%. None of the respondents chose cocktails.



Graph 7. Snacks between meals

Source: Elaborated on the basis of own research.

Eating between meals is a common dietary mistake. The most common reason for the problem of snacking is a fast lifestyle which results in lack of time to compose full meals. As many as 81% of students admitted that they sometimes eat between meals. Only 19% abstain from this kind of snacking.

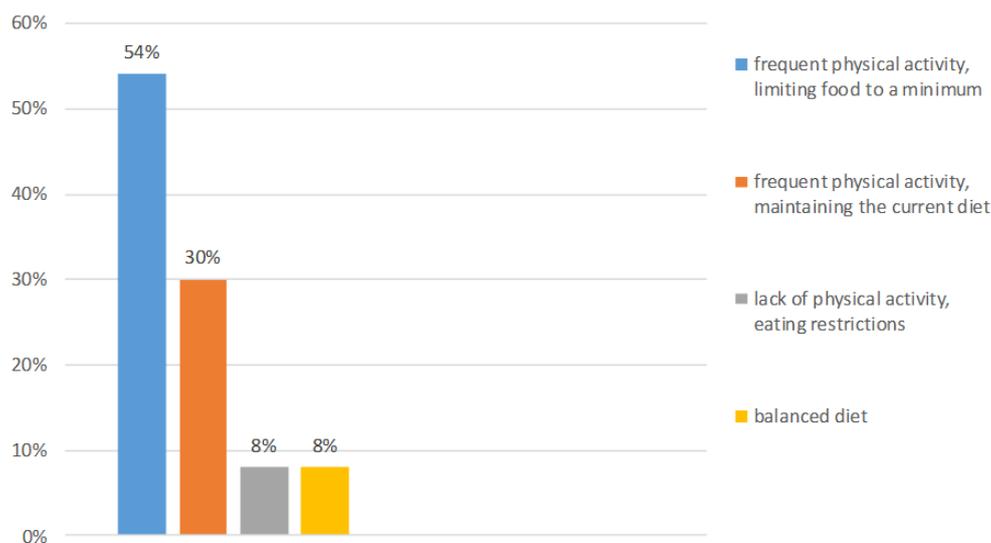


Graph 8. Type of products consumed between meals

Source: Elaborated on the basis of own research.

Respondents could choose up to 2 answers from the suggested ones. The question showed that between meals, students most often reach for fruit and vegetables – the answer was chosen by 33% of the surveyed. Unfortunately, sweets are also popular among them – an answer chosen by 18%. The most frequently repeated answers were also: dairy products 14%, anything within the range of 11%, salty snacks 9%. As many as 4 persons did not answer the above question.

The surveyed were also asked how they tried to achieve their dream goal, which was a slim figure.



Graph 9. How to achieve your dream goal
Source: Elaborated on the basis of own research.

Slightly more than half of this group – 54% of them used a lot of physical activity and reduced food to a minimum in order to achieve their goal. Another frequently chosen answer was that 30% of respondents chose high physical activity, but with old eating habits. Only 8% of the students reached for a balanced diet, also 8% limited their food, but did not use any physical activity, which is not a very good approach. None of the surveyed took advice from a dietitian.

Discussion

Comparison of these results with the research conducted in 2011 by J. Myszkowska-Ryciak, A. Kraśniewska, A. Harton, D. Gajewska shows similarities in terms of nutrition of physical education students. The study conducted by this group of researchers was aimed to compare the nutrition habits of students of the Academy of Physical Education and the Warsaw University of Life Sciences, and the analysis showed that it is the students of physical education who are more prone to making nutritional mistakes. My research has shown that students believe that they eat properly, but that is not true. Students at the Academy of Physical Education in Warsaw eat 5 meals a day only in 58%, while students surveyed by me showed that as much as 65% do not eat regularly. Almost 49% of respondents from Warsaw avoid soft drinks, while Rzeszów students indicated that 52% of respondents most often drink clean water. As many as 78% of Warsaw students eat breakfast every day, while 57% of Rzeszów students eat breakfast less often.

Conclusion

The conducted research has led to the following conclusions:

1. A large part of the surveyed, as many as 68%, believe that they lead a healthy lifestyle.
2. The surveyed responded that their main source of knowledge on healthy nutrition are popular and fashionable websites. Unfortunately, the information provided there is not always supported by scientific knowledge and there is a risk that it is presented by editors without specialist knowledge on the subject. The knowledge they have gained in this way maintains them in a belief that they lead a healthy lifestyle, but after a 24-hour nutritional interview many irregularities can be found. These problems are related to the inadequate calorie intake per day, the intake of too much sweets and the insignificant amount of fluid

- intake per day.
3. Most of the surveyed indicated that they did not use therapeutic diets and weight-loss diets. Respondents who admitted to using a weight-loss diet tried to achieve their goal through high physical activity and limiting the consumption of meals to a minimum. In most cases, it ended in failure to achieve the desired goal.
 4. The daily water requirement for the surveyed during the day is about 2l on average. Most respondents drink only 1l-1.5l of water a day. This is not a satisfactory result due to the fact that the subjects are physically active people, their bodies need much higher hydration than the average person. Scientific research proves that water, which the respondents most often choose in the survey, is not the best way to hydrate the body, much better alternative are isotonic and hypotonic drinks.
 5. As many as 65% of the surveyed admit that they do not eat regularly. One of the factors that may influence the results of this research is an irregular schedule. Respondents do not have time to prepare meals and often decide to quickly provide energy in the form of fruit, sweets or other ready-made meals such as Fast Food.
 6. Only 35% of the surveyed admitted that their diet differs on workout days and non-workout days. The difference most often chosen by the subjects is the different calorific value of meals.
 7. As many as 81% of the surveyed admit eating between meals. Respondents most often choose fruits and vegetables. However, these are healthy snacks, which can be eaten between meals without feeling guilty, also popular – 18%, are snacks in the form of sweets, which should be reduced to a minimum.
 8. Breakfast is the most important meal consumed during the day, because it provides with energy for the whole day. Just over half, 57% of the surveyed admit that they eat breakfast every day. Most often, it is composed on the basis of eggs. However, this is not the best solution, because the first meal should be high in carbohydrates in order to provide as much energy as possible in the morning, which is needed for the whole day.
 9. Only 16% of the surveyed admitted to regular supplementation. This is a surprisingly low result. It is also surprising that only 13% of the 16% of students who use regular supplements admitted to take the supplements before going to both tests and consultations with a specialist. It is very important to consult with people who have appropriate knowledge on a given subject before starting the supplementation, or to conduct tests in order to identify possible missing ingredients in their bodies. By providing the results of tests to the physician, he can clearly state what the appropriate demand for a given ingredient will be and its dosage.
 10. Magnesium was the most frequently chosen supplement among the subjects. It is an important ingredient for maintaining proper muscle function, especially for physically active people. The problem that emerged after the research is the lack of use of any supplementation and the fact that those surveyed, who confirm that they take dietary supplements, do so without consulting qualified people.

In general, it can be stated that students of Physical Education at the University of Rzeszów have an active lifestyle and participate in various sports activities. After a thorough analysis of the conducted nutritional interview, it may be concluded that they do not eat properly in relation to their sports disciplines or physical activity. They define their level of workout as good, but do not use regular supplementation to support them before, during and after physical activity. In addition, the most frequently chosen supplement is not vitamin products, products supporting post-workout regeneration or protecting muscle fibres against degradation, or finally supplementing glycogen losses – but mainly magnesium. Of course, it has its own justified effect, but it should not be used as a basis for the supplementation of the subjects.

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Disclosure statement

No potential conflict of interest was reported by the authors.