OBESITY IN CHILDHOOD AND ADOLESCENCE

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ABSTRACT

Introduction: Nowadays, obesity is considered a global pandemic since in 2014 it reached 1,9 billion people. This problem has been more present in younger populations, being mainly influenced by their eating habits and sedentary lifestyle. The objective of this study is to determine the prevalence of overweight and obesity in children and adolescents, relating it to their risk factors.

Materials and Methods: A total of 327 students aged between 9 and 19 years old (133 were male and 194 were female) participated in this study. They completed a questionnaire and the lipid profile was evaluated.

Results: Most of the students had a normal body mass index. 59 students were overweight (mostly female), 16 were obese and 7 had a lower weight than expected. In the group of overweight and obese students, 43,1% and 50%, respectively, had reduced HDL values and a higher level of triglycerides was observed in 60,3% of overweight students and 56,2% of obese students.

Conclusion: There is a relevant prevalence of overweight and obese individuals in this population. It is confirmed that the role of some risk factors such as physical inactivity and eating habits is really important in the development of this problem.

Keywords: Obesity (D009765); Childhood (D002648); Adolescents (D000293); Sendentarism (D057185); Eating Habits (D005247)

INTRODUCTION

Obesity is included in a crucial group of factors that lead to the development of several cardiovascular pathologies, which is one of the main causes of mortality worldwide. This public health problem has been progressively affecting children and adolescents and its prevalence has been increasing at an alarming rate (1). Obesity and overweight are mainly caused by the existing disproportion between food intake and energy spending and this difference may have genetic, metabolic, environmental, behavioral, social, cultural origins, among others (2,3). Excess of weight is one of the problems that start in childhood and continue to develop and worsen in adulthood, which can later result in diseases such as diabetes mellitus and other cardiovascular pathologies (4,5).

Increased body mass index (BMI) (6, 7-9), poor eating habits (10,11), abnormalities in the lipid profile and lack of regular physical exercise (9) are risk factors and major predictors of the development of arterial hypertension and other cardiovascular diseases. Regarding dietary habits, excessive consumption of red and processed meats is associated with high fat intake, leading to the development of overweight or obesity (12,13).

Globally, about 80% of adolescents do not exercise regularly enough (14,15). This problem affects several countries, regions and is present regardless of the sex (15). Some studies confirm that physical activity decreases as children and adolescents grow and, thus, the sedentary lifestyle associated with obesity is also increasing more and more among young adults (16,17). Currently, the probability of a sedentary young person becoming and inactive adult is increasing and since this inactivity is associated with several cardiovascular pathologies, it is essential to find strategies and programs to counter this trend (15). Nowadays, the sedentary habits of young people include using cellphones and game consoles, watching

517

Eur. Chem. Bull. 2023, 12(Special Issue 6), 517-521

television, using the computer and studying or reading while sitting. These practices may be associated with reduced sleep time, an unfavorable body adiposity index and lower physical capacity and resistance (15,17).

Some lifestyle modifications that prevent the development of cardiovascular diseases are weight reduction if the individual is overweight or obese, practicing physical activity regularly, adopting a healthy and balanced diet and the intervention of the individual's own family (10). The development and evolution of these factors are progressively more present in the younger population, making its early detection and treatment more and more relevant (9).

Main body of paper

All participants or their guardians signed the informed consent and they filled in a questionnaire with questions about the practice of physical exercise and eating habits. The lipid profile was evaluated and information on age, weight and height was collected. Subjects were classified according to percentile tables for sex and age. According to the Directorate-General for Health, an individual is considered to be obese if the BMI is greater than or equal to P95; who is overweight, if the BMI is between P95 (inclusive) and P85 and who has an adequate weight, if the BMI is below P85 (18) as shown in Table 1.

Table 1. BMI classification according to percentiles, according to the Directorate-General for Health.

Classification	BMI
Obese	>= P95
Overweight	Between P95 e P85
Normal	<P85

Legend: P - Percentile

First, the variables obtained through the questionnaire, the anthropometric data of each individual and the assessment of the lipid profile, were coded using the IBM SPSS program (Statistical Package for the Social Sciences) version 22. After data collection and after coding the variables, a quantitative and qualitative descriptive analysis was carried out in order to test the hypotheses between the variables under study, through some strategies such as non-parametric tests, the calculation of averages, minimum and maximum values and absolute data. Finally, the confidence interval of 95% was established and $p \leq 0.05$ was used as a criterion for statistical significance. In order to test the distribution of the sample, the Kolmogorov-Smirnov test was used. Cross-reference tables and the Chi-Square test were used to carry out and study the crossing of different variables. When carrying out this research on human beings, it was essential that the entire research team respected, guaranteed and complied with all the principles mentioned in the Declaration of Helsinki. All student data was encoded using number codes, ensuring full confidentiality and identity protection for all participating individuals.

The individuals who participated in this study were aged between 9 and 19 years and the age group from 15 to 16 years was the most frequent. In the analysis of the distribution of individuals by sex, it was noticed that 40.7% (n=133) of the participants were male and 59.3% were female (n=194).

The average weight of this population is 54.69 kilograms (kg), with a minimum of 23 kg and a maximum of 107 kg. About height, the average was 1.60 meters (m), with a minimum of 1.30 m and a maximum of 1.89 m. Regarding the body mass index, it was found that 74.9% of the students (n=245) had a normal BMI, 18% of the students (n=59) were overweight, mostly female, 4.9% were obese (n=16) and the percentage of obese is the same in both sexes (2.4%) and 2.1% of students (n=7) had a lower weight than expected (Graph 1).
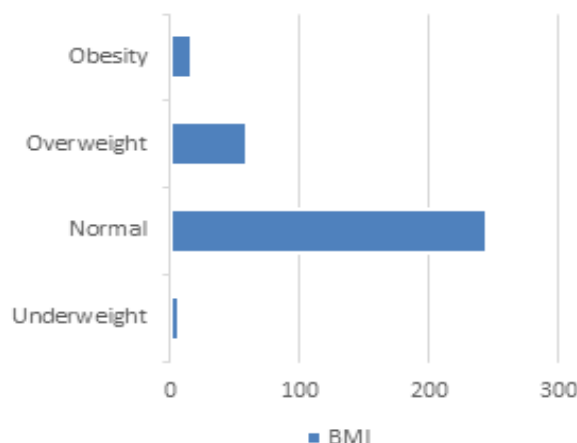
Graph 1. Graph of the Distribution of Individuals by Body Mass Index.

High levels of total cholesterol were present in 3.4% of overweight students and the remaining percentage was found in students with normal or underweight BMI. In the group of overweight and obese students, 43.1% and 50%, respectively, had reduced HDL values. Individuals who had high LDL values had a BMI within the normal range. It was also observed that increased triglycerides were present in 60.3% of overweight students and in 56.2% of obese students.

In the analysis of the overweight group, 62.7% (n=37) almost always eat meat in their meals compared to only 1.7% (n=1) who almost never eat meat. Only students who eat meat sometimes or almost always suffer from obesity. All students who adopt a vegetarian diet had a normal BMI. However, after using the Chi-Square test, it was found that there is no statistically significant relationship between meat intake and BMI (p=0.883).

The relationship between physical exercise and BMI is not statistically significant (p=0.937), but it was observed that students who practiced more hours of physical activity per week outside the school context had a lower percentage of overweight and obesity.

In a study carried out in Portugal with a sample of children and adolescents, a percentage of overweight individuals (28.3%) was higher than the percentage found in this study (18%), like the percentage of obese young people. (9). In contrast, Fan et al observed a percentage of 6% of overweight individuals and 1.9% of obese individuals (6). Zhang et al found that the highest percentage of obese students was observed in males, which differs from the results found in the studied sample, in which it is observed that there is the same percentage of obese students in both sexes (19). On the other hand, Muhihi et al (20), when studying the body mass index, noticed that it was more prevalent in females, as observed by Mohan et al (21), corroborating the data observed in the group of overweight students in the present study.

Since the region where this study was carried out is an underdeveloped region in terms of initiatives such as programs that encourage the practice of physical exercise and/or the realization of public and free screenings, it is clear that this is a less informed and interested population in this type of activities, reducing the chances of stabilizing the sedentary lifestyle and the rapid diagnosis of various pathologies. The limited amount of spaces dedicated to the practice of physical exercise and sports associations can influence the rate of sedentary lifestyle in this population and, consequently, the prevalence of overweight or obese young people. The presence of fast-food restaurants can influence the type of food that students eat outside.

Ensenyat et al, confirmed that there are no differences between the sexes, regarding physical inactivity (36), however, in this study it was found that females present higher percentages on the practice of physical exercise only in the school context.

In the study by Chaput et al, it is recommended that children between 4 and 17 years of age practice physical activity for at least 60 minutes a day (15). Several evidences were found that the benefits in terms of cardiovascular health increase, as the time and intensity of physical exercise also increase (15). These benefits resulting from the regular practice of physical exercise affect factors such as adiposity, lipid profile, blood pressure, physical level, cognition, quality of life and cardiovascular events (15,17).

519

Eur. Chem. Bull. 2023, 12(Special Issue 6), 517-521

Adolescence is a critical period in the development of each individual and is marked by decisive changes at a psychological and biological level. This phase of instability and increased responsibilities allows individuals to start making their own decisions regarding their habits and lifestyle, including physical exercise and eating habits. For this reason, acquiring more independence, in a transition phase, can lead to the adoption of habits that do not favor cardiovascular health and well-being, such as the excessive consumption of processed foods and practicing less physical exercise.

The relationship between obesity and insulin resistance is known, it is known that insulin resistance triggers hepatic steatosis and inflammation, characterized by an increase of lipids in the liver and a greater synthesis of triglycerides. Adipose tissue is a key component in the development of dyslipidemia, characterized by this increase in triglycerides and a consequent decrease in HDL concentration. Thus, obese or overweight young people have a higher risk of developing cardiovascular pathologies earlier than individuals with a BMI within the normal range (32,44).

Ensenyat et al, found that most of the children's physical inactivity time was spent with their parents (outside the school context and during weekends) (17). For this reason, it is essential to suggest that the family should include certain changes in lifestyle, since the family environment can be the main modeler of the child's behaviors. By contradicting these routines and investing in the regular practice of physical exercise, young people are strengthening the cardiorespiratory system, stimulating the proper functioning of bones and muscles and improving cardiometabolic health (17). In addition to these benefits, physical activity reduces depressive symptoms, improves cognitive function and mental health, and is associated with improved school performance (14).

CONCLUSION

There is a high prevalence of overweight and obesity in this population. It is confirmed that the role of some risk factors such as physical inactivity and eating habits (specifically meat intake) is very relevant in the development of overweight in young individuals. Some changes in the lifestyle of children and adolescents can prevent the development of overweight and obesity, protecting their cardiovascular health.

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520

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521

Eur. Chem. Bull. 2023, 12(Special Issue 6), 517-521