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**Original Article**

# Studies concerning the importance of physical exercise in prevention and treatment the obesity in children with ASD

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**Abstract:**
*Problem statement*: Infantile obesity is a problem in contemporary society, the number of overweight children in Europe is steadily increasing. Among the causes of obesity is the lack of physical activity along with inappropriate nutrition, lack of sleep, watching/playing on TV / PC and over-protective parents. When children with ASD also face excessive weight gain, specific measures must be taken, including the use of physical exercise. *Method*: We wanted to carry out a study aimed at the prevention and treatment of obesity in children with ASD *Results*: statistical indicators show an improvement of the tested parameters, a decrease in the abdominal slice, an increase in the fitness of the participating children, all this stating that our objectives were achieved. *Conclusions*: Obesity can be prevented, its negative effects decreasing, and an increase of the of health level.
**Key words**: obesity, ASD, prevention, treatment, physical exercise**.**

## Introduction

Obesity has become a serious public health problem in most industrialized countries, affecting a growing segment of the population. Above all, obesity should be considered less aesthetics problem and more a health one that entails medical complications, temporary or permanent disabilities, reduced life span, and, last but not least, a high cost for whole society.

According to recent studies [1] in Romania the obesity rate is 20% and 31% of Romanians are overweight. Obese people are liable to a whole range of medical complications: general, cardiovascular, anesthetic, lung, endocrine-metabolic, osteo-articular, etc. The interest in obesity has been awakened precisely by its bad consequences concerning morbidity and mortality through degenerative and attrtion diseases, significantly more common among obese people than normo and especially hypoponderal individuals.

Public health strategies must focus on healthy people, including children, but attention should also be given to people who already have different forms of obesity. That is why it is very important to identify obesity early and remove it as soon as possible. Practicing exercise has an important role in optimizing health and bringing or maintaining the body at ideal weight [2].

We consider that it is extremely important to practice physical exercise in all its forms by effecting sets of exercises adapted to each subject. In our conception, the activity is extremely important and necessary for the harmonious development of the whole body.

## Materials and methods

The importance of physical activity in the treatment of obesity is probably underestimated. Both, in the overweight child and adult, many authors noted a decrease in physical activity compared to normoponderal groups. We have shown that sedentaryism is often present in the obese people and it will increase as obesity progresses. This is why the increase in the physical activity programme is mandatory in the treatment of obesity. The achievement of this goal is done through physical exercise and medical gymnastics. By well-chosen exercises it can stop the evolution and even correct some physical deficiencies caused by the installation of obesity. The physiological effects are obvious and immediate. Breath improves, respiratory capacity increases, breathing rate decreases.

The educational effects of physical exercises are emphasized by improving neuromotor and psychomotor functions [3]. Physical exercises favorably influence the intellectual, moral-voltive and affective functions, contributing to the formation of character and the perfection of personality. The prophylactic effects of physical exercises are known, at the basis of the physical culture being the idea of continuously health and vigor maintaining and strengthening, of increasing and improving the functions of the body, of strengthening its fighting and of defending capacity against diseases.


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**The aim** of the research is to sensitize the population about the importance of practicing physical exercise in reducing the adverse effects of obesity concerning the quality of life, and to propose a prevention program for children that are diagnosed with ASD (Autistic Spectrum Disorder).

**Working hypothesis**

We considered that through an in-depth knowledge of the effects caused by obesity and by an early intervention of the prevention means, but especially stopping the development, it can diminish its harmful effects on the children with ASD. We assumed that by personalizing physical exercise in the daily program of children, it is possible to reduce or even stop the negative effects of obesity.

**Research objectives**

The research objectives were:

- promoting a better understanding of the term "obesity" among children, understanding the specific characteristics and needs of people suffering from this nutritional - metabolic disease;
- choosing the subjects of the study, personalized means and tests;
- conducting the study and drawing conclusions.

**The research approach**

At the beginning of the research we selected a number of 10 children diagnosed with ASD, who had an increased weight index and showed a real interest for exercise. After we talk to them and they saw the activity program, they agreed to take part of this study. The present research was carried out at the physiotheraphy gym from University of Pitesti, which is equipped with a bicycle, walking and running track, as well as within the AASD Center.

The experiment lasted 3 months. At the beginning of the experiment we made somatic measurements to study the body structure, especially the following somatic parameters: height, weight and abdominal perimeter, slices measurement. In the initial test, the measurements were focused on the Kraus test (1,2,3).

Table 1. Resesarch subjects

| No. | Name and surname | Age | Height cm | Weight kg | | Abdominal slice cm |
|---|---|---|---|---|---|---|
| | | | | I.T | F.T. | |
| 1. | F.A | 8 | 110 | 45 | 40 | 6,3 |
| 2. | G.D | 6 | 105 | 40 | 32 | 5,7 |
| 3. | T.E | 7 | 115 | 53 | 47 | 6,2 |
| 4. | S.O | 7 | 123 | 52 | 47 | 4,8 |
| 5. | G.E | 8 | 127 | 56 | 50 | 4,5 |
| 6. | T.A.I | 9 | 130 | 58 | 51.2 | 6,2 |
| 7. | G.I | 7 | 112 | 47 | 43 | 5,6 |
| 8. | L.G | 10 | 135 | 59 | 52 | 6,0 |
| 9. | S.A | 9 | 139 | 53 | 49 | 4,8 |
| 10. | V.B | 8 | 127 | 50 | 47,3 | 5.5 |

Table 2. Initial test values

| No. | Name and surname | Age | Height cm | Kraus 1 Test cm | Kraus 2 Test cm | Kraus 3 Test degrees |
|---|---|---|---|---|---|---|
| 1. | F.A | 8 | 110 | -5 | 5 | 4 |
| 2. | G.D | 6 | 105 | -6 | 6 | 5 |
| 3. | T.E | 7 | 115 | -7 | 4 | 7 |
| 4. | S.O | 7 | 123 | -8 | 7 | 5 |
| 5. | G.E | 8 | 127 | -4 | 5 | 6 |
| 6. | T.A.I | 9 | 130 | -7 | 7 | 8 |
| 7. | G.I | 7 | 112 | -6 | 7 | 5 |
| 8. | L.G | 10 | 135 | -9 | 5 | 7 |
| 9. | S.A | 9 | 139 | -7 | 6 | 5 |
| 10. | V.B | 8 | 127 | -8 | 7 | 6 |

Exercises programme model

| No. | Exercises description | Exercises graduation |
|---|---|---|
| 1 | Position: The subject is in dorsal decubitus, the arms stretched near the body with palms on the floor, with straight lower limbs. Action of the subject: lifting the legs perfectly straight, at a certain height and return on the ground, slowly, in the initial position. | 3 x10 reps |
| 2 | Position: The subject is in dorsal decubitus, arms around the body and stretched legs forward. Action of the subject: The stretched legs go vertically by flexing the knees from the vertical position, the lower limbs being left to the ground about 30 cm from the vertical, then returning. | 3 x10 reps. |
| 3 | Position: The subject is in dorsal decubitus, arms around the body and legs stretched out. Action of the subject: raising the upper trunk (only the shoulder blades) from the ground and returning with inspiration. It can be done with leg support, with knees stretched or bent. | 3 x10 reps |
| 4 | Laterally decubitus. With the arm placed on the ground, stretched under the head in line with the body, the other hand on the hip. From this position, lifting the lower limb (abduction of the lower limb) with the knee extended and inspiration, then returning with exhale. | 3 x10 reps |
| 5 | Laterally decubitus. With leg support and knees stretched, hands on the neck, lateral torso lifting at an angle of about 30 cm to the ground. Next, the same exercise is performed from the lying position on the opposite side. | 3 x10 reps |
| 6 | Dorsal decubitus. Arms around the body, the palms resting on the floor: raising the legs to the vertical and, from this position, performing the "bicycle", the leg should be stretched perfectly when a cyclical movement is completed. | 3 x10 reps. |
| 7 | Sitting on the ground with legs stretched forward. The arms around the body, palms on the floor: go in the sitting position with crossed legs, hands held on the knee and kneeling with the palms twice, then returning to the starting position. During the exercise the back is kept as straight as possible and the head is stable. The correct sitting with the crossed legs means that the soles are approaching to the pelvis and that the knees are as far apart as possible. Breathing is done regularly throughout the exercise | 3 x10 reps |
| 8 | Dorsal decubitus. With the arms around the body: bringing the knees to the chest with a quick movement, followed by the legs stretching to the vertical and their slow descent (having the knees perfectly stretched) | 3 x10 reps |

Table 3. Final test results

| No. | Name and surname | Age | Abdominal slice cm | | Testul Kraus 1 (cm) | | Testul Kraus 2 (cm) | | Testul Kraus 3 (grade ) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | T.I. | T.F | T.I. | T.F | T.I. | T.F | T.I. | T.F |
| 1. | F.A | 8 | 6,3 | 5,9 | -5 | 1 | 5 | 9 | 4 | 8 |
| 2. | G.D | 6 | 5,7 | 5,1 | -6 | -1 | 6 | 10 | 5 | 10 |
| 3. | T.E | 7 | 6,2 | 5,6 | -7 | 0 | 4 | 11 | 7 | 11 |
| 4. | S.O | 7 | 4,8 | 4,1 | -8 | -2 | 7 | 13 | 5 | 9 |
| 5. | G.E | 8 | 4,5 | 3,9 | -4 | 3 | 5 | 12 | 6 | 10 |
| 6. | T.A.I | 9 | 6,2 | 5,2 | -7 | 1 | 7 | 12 | 8 | 14 |
| 7. | G.I | 7 | 5,6 | 4,9 | -6 | 0 | 7 | 10 | 5 | 9 |
| 8. | L.G | 10 | 6,0 | 4,8 | -9 | -3 | 5 | 14 | 7 | 10 |
| 9. | S.A | 9 | 4,8 | 4,0 | -7 | -1 | 6 | 10 | 5 | 9 |
| 10. | V.B | 8 | 5.5 | 4,7 | -8 | -2 | 7 | 14 | 6 | 11 |

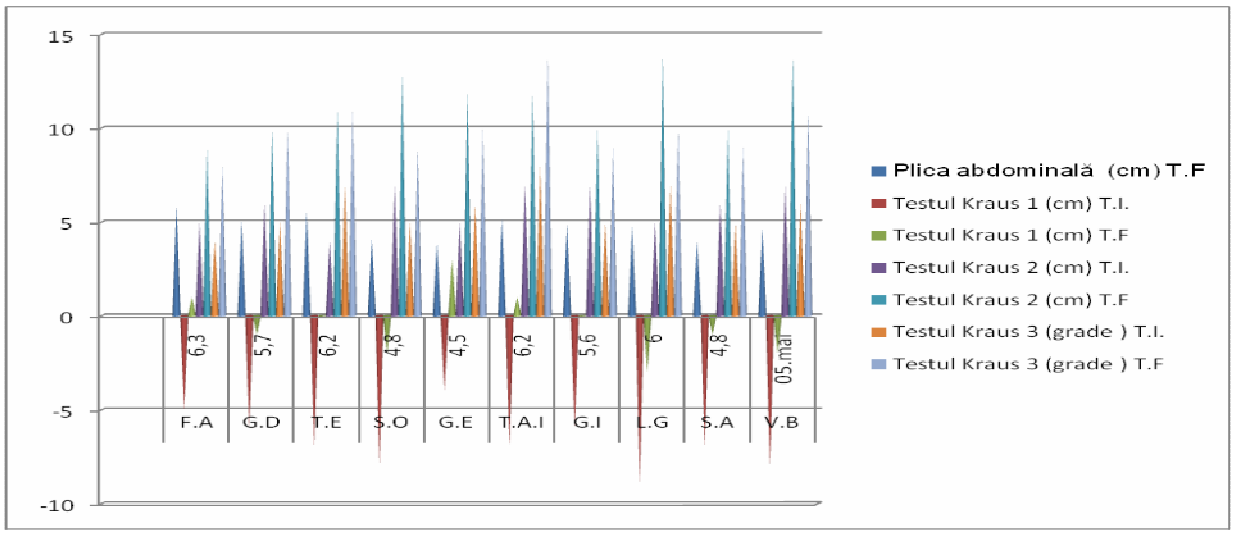


*Chart 1. Tested parameters evolution*

**Results and discussion**

In what concerns the measurement of the abdominal slice, there is a difference between the two tests, so that if in the initial test was the results average was 5.56, the average of the final test was 4.82, i.e. an average grade, what reveals a decrease in abdominal fat and an improvement of the fitness.

The results of the initial test at the Kraus 1 test, the average was 6.7, and in the final test the average was-0.4, thus an increase in mobility.

The results of the initial test on the Kraus 2 test, the average was 5.9, and at the final test the average was 11.5, therefore, the best values were obtained.

At the Kraus 3, the average of the initial values was 5.8 degrees and in the final test the average was 10.1 degrees. This test has a higher degree of difficulty, which is given by changing the position of both the upper and lower limbs: (the hands are no longer around the body but are at the level of the neck and the lower limbs are in triple flexion of approx. $70^0$)

**Conclusion**

• Obesity is one of the major favourable factors for the hip, knee and hip arthritis sufferers, the main incriminating pathogenic mechanism being the biomechanical overload of these bearing joints.

• Regular practice of exercise has benefits at all levels, so that in addition to improving body mass indexes, they can shape their bodies in a harmonious and vigorous way, they can form a healthy beviour and a healthy mental and physical lifestyle, can influence the proper and harmonious evolution of the body.

• Physical education has means that are judiciously used in particular programs according to the needs of each child can lead to improving the quality of life of children with ASD.

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