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# CONSTATATIVE STUDY ON OVERWEIGHT AND OBESITY IN CLASS IV STUDENTS IN SUCEAVA

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**Abstract**:
Overweight and obesity have recently become public health problems, in a continuous increase, if we look mainly at the figures in the studies regarding children. More and more people of all ages, especially children, they have weight problems and are obese, having a very fast growth. Statistics from the Ministry of Health show that 40% of children are overweight, in the last 10 years their number has increased by 18%, and in terms of the number of obese children, it has doubled in the last 7 years.

## Introduction

Preventing overweight and obesity among children is a public health issue, and requires close monitoring of those with a tendency to gain weight. The environment encourages overeating through an abundant supply of high-fat foods, with a high energy density, easily accessible, relatively cheap, pleasant to the taste and served in large proportions. The most alarming is the increase in the spread of obesity among the child population.[7]

The problem of overweight and excessive growth of obesity since childhood can be prevented or slowed down by implementing diversified programs, if the company focuses more on the causes. There are many causes, some more crucial than others, but through a balanced diet, combined with systematic physical activity, it can prevent obesity and overweight in all children around the world. [8]

Obesity sets in when a person consumes more calories than his or her body can burn.[1] The treatment of obesity leads to the decrease of the associated risk factors, in relation to the degree of weight reduction, through the action on some predisposing factors. Losing weight, keeping the former obese within the limits of normal body weight, are imperatives of utmost importance. By realizing them, not only does a patient recover, but especially the life-threatening cardiovascular complications are prevented.[6] Physical activity is essential for controlling overweight and obesity. After a very low-fat diet, physical activity plays the most important role in modern complex therapy of obesity.[5] Exercise can be a

preventive or curative, recovering sanogenetic factor, carried out within certain limits and under certain conditions, even under medical supervision. [4] The calculation for the assessment of excess weight is performed by determining the body mass index (BMI = G (kg) / H (m2)). In the case of children, the value of BMI is interpreted on the basis of nomograms, so that children with a BMI between 85 and 95 percentile are considered overweight, and those with a BMI> 95 percentile are obese.

| **CLASSIFICATION** | **BMI PERCENTILES** |
|---|---|
| SUBPOND | < Percentiles 5 |
| NORMOPONDERE | Percentiles 5–85 (- exclusive) |
| OVERLAPPING | Percentiles 85–95 (- exclusive) |
| OBESITY | ≥ Percentiles 95 |

## Matherial and method

Following the anthropometric measurements (height and weight), on a number of 300 fourth-grade children from schools in Suceava, and 40% of them are obese.

The research was carried out during the school year 2021 - 2022 on a number of 120 children (girls and boys) from schools in Suceava, the subjects subject to research being represented by fourth grade students, girls and boys.

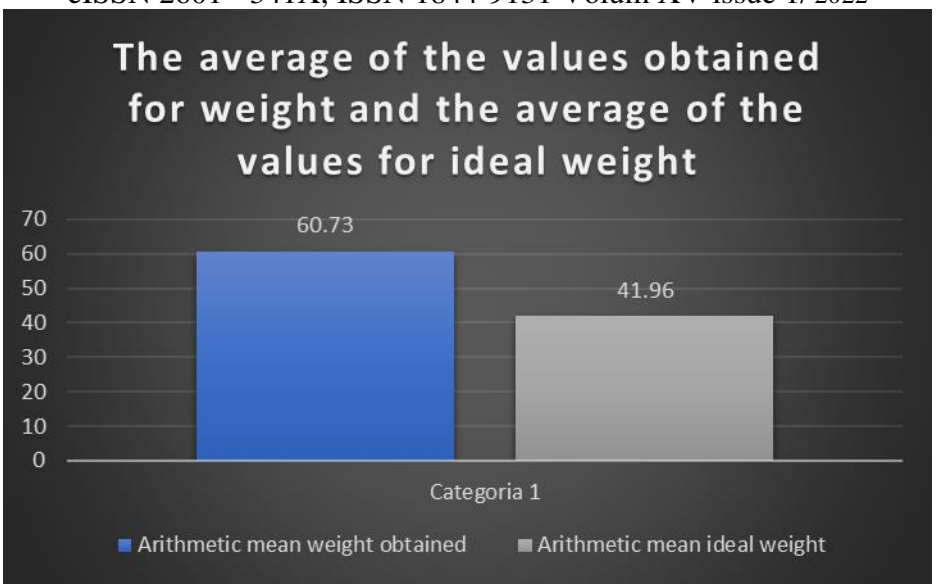
## Discussions

Sample "Jean Beart" Gymnasium School, "Miron Costin", "Saint John the New" Primary School, Suceava

| Nr. crt. | Students' initials | Height (cm) | Weight (kg) | BMI (percentiles) | Ideal weight (kg) |
|---|---|---|---|---|---|
| | | M.I. | M.I. | M.I. | |
| 1 | A.M. | 142 | 48 | ≥P P 95 | 28 – 40 |
| 2 | B.I. | 143 | 50 | ≥P P 95 | 29 – 40 |
| 3 | C.L. | 144 | 49 | ≥P P 95 | 29 – 40 |
| 4 | C.C. | 144 | 51 | ≥P P 95 | 29 – 41 |
| 5 | D.L. | 146 | 50 | ≥P P 95 | 29 – 43 |
| 6 | D.O. | 147 | 52 | ≥P P 95 | 30 – 43 |
| 7 | E.G. | 147 | 53 | ≥P P 95 | 30 – 43 |

| | | | | | |
|---|---|---|---|---|---|
| 8 | F.P. | 149 | 52 | ≥P P 95 | 31 – 43 |
| 9 | F.E. | 149 | 55 | ≥P P 95 | 31 – 43 |
| 10 | G.V. | 150 | 55 | ≥P P 95 | 32 – 44 |
| 11 | G.S. | 151 | 57 | ≥P P 95 | 32 – 44 |
| 12 | H.I. | 151 | 59 | ≥P P 95 | 33 – 44 |
| 13 | I.I. | 153 | 55 | ≥P P 95 | 34 – 44 |
| 14 | J.Z. | 153 | 60 | ≥P P 95 | 33 – 45 |
| 15 | L.S. | 156 | 56 | ≥P P 95 | 33 – 46 |
| 16 | L.M. | 157 | 58 | ≥P P 95 | 33 – 47 |
| 17 | M.T. | 157 | 60 | ≥P P 95 | 34 – 47 |
| 18 | M.N. | 158 | 59 | ≥P P 95 | 34 – 47 |
| 19 | N.O. | 159 | 61 | ≥P P 95 | 35 – 48 |
| 20 | O.T. | 161 | 63 | ≥P P 95 | 36 – 50 |
| 21 | P.S. | 163 | 66 | ≥P P 95 | 37 – 57 |
| 22 | S.C. | 166 | 70 | ≥P P 95 | 38 – 55 |
| 23 | S.D. | 168 | 69 | ≥P P 95 | 39 – 57 |
| 24 | S.I. | 168 | 70 | ≥P P 95 | 39 – 57 |
| 25 | S.P. | 169 | 71 | ≥P P 95 | 39 – 58 |
| 26 | Ș.C. | 170 | 73 | ≥P P 95 | 41 – 58 |
| 27 | T.S. | 171 | 74 | ≥P P 95 | 41 – 58 |
| 28 | T.V. | 172 | 75 | ≥P P 95 | 42 – 59 |
| 29 | V.O. | 174 | 76 | ≥P P 95 | 43 – 61 |
| 30 | Z.E | 175 | 75 | ≥P P 95 | 43 – 61 |
| Arithmetic mean | | 157.10 | 60.73 | 41.96 | |
| Standard deviation | | 10.15 | 8.82 | | |
| Coefficient of variability (%) | | 6.46 | 15 | | |

Graph no.1. Arithmetic mean for the obtained weight and arithmetic mean for the ideal weight

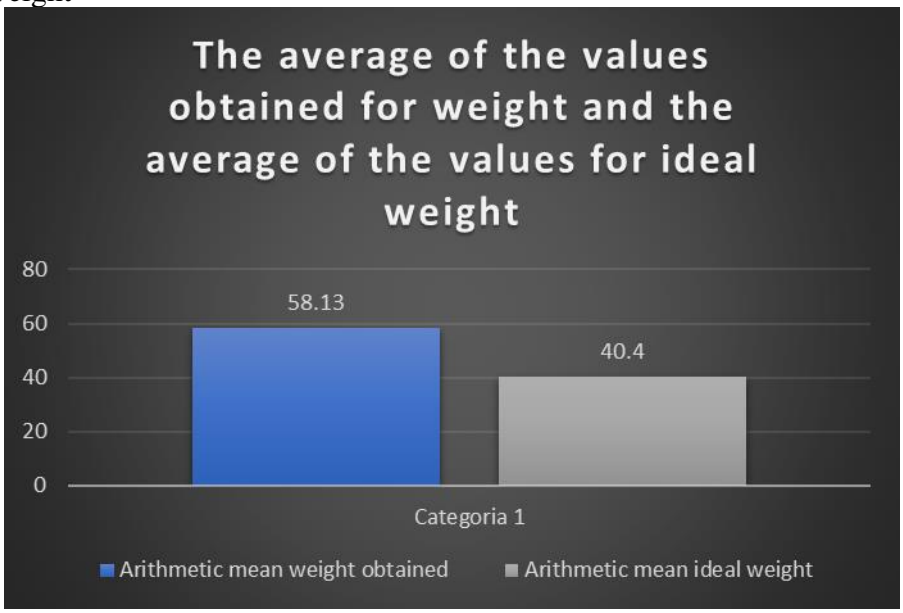



Sample Gymnasium School nr. 4, 8, 10 , Suceava

| Nr. crt. | Students' initials | Height (cm) | Weight (kg) | BMI (percentiles) | Ideal weight (kg) |
|---|---|---|---|---|---|
| | | M.I. | M.I. | M.I. | |
| 1 | A.O. | 141 | 46 | ≥P P 95 | 28 – 39 |
| 2 | A.P. | 142 | 48 | ≥P P 95 | 28 – 40 |
| 3 | A.T. | 143 | 50 | ≥P P 95 | 29 – 40 |
| 4 | A.V. | 144 | 49 | ≥P P 95 | 29 – 41 |
| 5 | B.I. | 144 | 51 | ≥P P 95 | 29 – 43 |
| 6 | B.E. | 145 | 52 | ≥P P 95 | 30 – 43 |
| 7 | B.D. | 145 | 54 | ≥P P 95 | 30 – 43 |
| 8 | B.L. | 146 | 51 | ≥P P 95 | 31 – 43 |
| 9 | C.E. | 147 | 53 | ≥P P 95 | 31 – 43 |
| 10 | C.I. | 147 | 56 | ≥P P 95 | 32 – 44 |
| 11 | D.O. | 148 | 53 | ≥P P 95 | 32 – 44 |
| 12 | D.P. | 149 | 54 | ≥P P 95 | 33 – 44 |
| 13 | D.M. | 149 | 55 | ≥P P 95 | 34 – 44 |
| 14 | E.V. | 150 | 55 | ≥P P 95 | 33 – 45 |
| 15 | F.B. | 150 | 57 | ≥P P 95 | 33 – 46 |
| 16 | F.N. | 151 | 56 | ≥P P 95 | 33 – 47 |
| 17 | G.I. | 151 | 58 | ≥P P 95 | 34 – 46 |
| 18 | H.P. | 153 | 58 | ≥P P 95 | 34 – 46 |
| 19 | I.R. | 153 | 59 | ≥P P 95 | 34 – 46 |
| 20 | J.C. | 154 | 60 | ≥P P 95 | 35 – 50 |
| 21 | L.D. | 154 | 62 | ≥P P 95 | 36 – 57 |

| | | | | | |
|---|---|---|---|---|---|
| 22 | L.I. | 155 | 60 | ≥P P 95 | 35 – 55 |
| 23 | M.R. | 156 | 63 | ≥P P 95 | 33 – 46 |
| 24 | M.O. | 158 | 65 | ≥P P 95 | 34 – 47 |
| 25 | N.I. | 161 | 62 | ≥P P 95 | 36 – 50 |
| 26 | O.L. | 164 | 66 | ≥P P 95 | 37 – 57 |
| 27 | P.N. | 167 | 69 | ≥P P 95 | 39 – 57 |
| 28 | R.O. | 169 | 71 | ≥P P 95 | 39 – 58 |
| 29 | V.R. | 172 | 75 | ≥P P 95 | 42 – 59 |
| 30 | V.S. | 174 | 76 | ≥P P 95 | 43 – 61 |
| Arithmetic mean | | 152.73 | 58.13 | 40.40 | |
| Standard deviation | | 8.82 | 7.56 | | |
| Coefficient of variability (%) | | 6 | 13 | | |

Graph no.2. Arithmetic mean for the obtained weight and arithmetic mean for the ideal weight

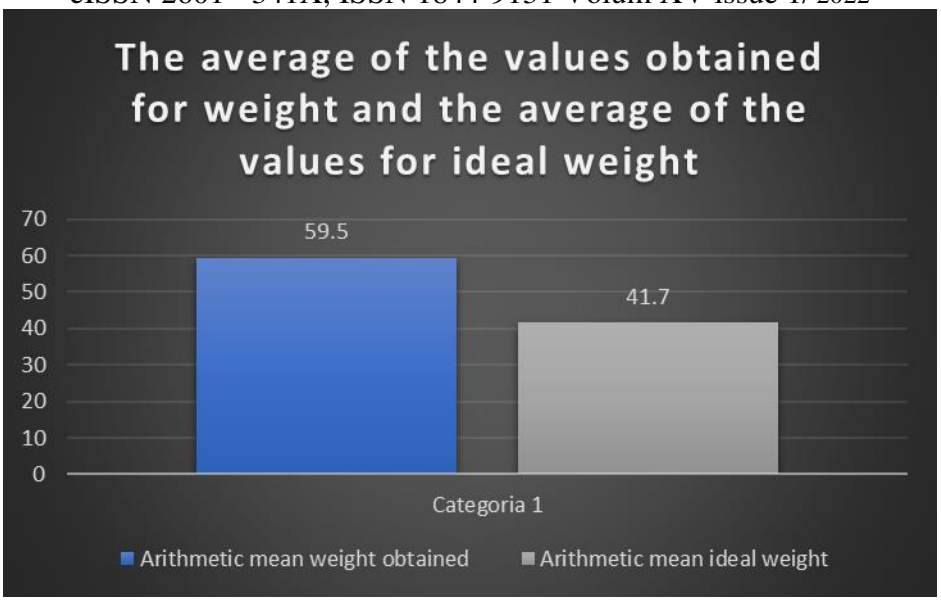



Sample Gymnasium School nr.1, 3, nr.9 "Ion Creangă", Suceava

| Nr. crt. | Students' initials | Height (cm) | Weight (kg) | BMI (percentiles) | Ideal weight (kg) |
|---|---|---|---|---|---|
| | | M.I. | M.I. | M.I. | |
| 1 | A.C. | 147 | 50 | ≥P P 95 | 31 – 43 |
| 2 | A.E. | 147 | 52 | ≥P P 95 | 31 – 43 |

| | | | | | |
|---|---|---|---|---|---|
| 3 | A.R. | 148 | 51 | ≥P P 95 | 31 – 44 |
| 4 | A.I. | 150 | 54 | ≥P P 95 | 32 – 44 |
| 5 | B.U. | 150 | 56 | ≥P P 95 | 32 – 44 |
| 6 | B.V. | 151 | 54 | ≥P P 95 | 32 – 45 |
| 7 | B.Ş. | 151 | 55 | ≥P P 95 | 32 – 45 |
| 8 | C.D. | 151 | 57 | ≥P P 95 | 33 – 45 |
| 9 | C.T. | 152 | 55 | ≥P P 95 | 33 – 45 |
| 10 | C.O. | 152 | 56 | ≥P P 95 | 33 – 45 |
| 11 | D.L. | 153 | 55 | ≥P P 95 | 34 – 46 |
| 12 | D.R. | 153 | 57 | ≥P P 95 | 34 – 46 |
| 13 | E.B. | 154 | 57 | ≥P P 95 | 35 – 47 |
| 14 | E.S. | 155 | 54 | ≥P P 95 | 35 – 47 |
| 15 | F.C. | 155 | 58 | ≥P P 95 | 35 – 48 |
| 16 | F.N. | 156 | 56 | ≥P P 95 | 35 – 48 |
| 17 | G.I. | 156 | 59 | ≥P P 95 | 36 – 48 |
| 18 | G.P. | 156 | 61 | ≥P P 95 | 36 – 49 |
| 19 | G.V. | 157 | 60 | ≥P P 95 | 36 – 49 |
| 20 | H.C. | 157 | 63 | ≥P P 95 | 36 – 49 |
| 21 | I.D. | 157 | 65 | ≥P P 95 | 36 – 50 |
| 22 | I.F. | 159 | 63 | ≥P P 95 | 36 – 50 |
| 23 | J.L. | 159 | 66 | ≥P P 95 | 36 – 51 |
| 24 | L.E. | 160 | 63 | ≥P P 95 | 36 – 52 |
| 25 | L.T. | 160 | 68 | ≥P P 95 | 37 – 52 |
| 26 | M.F. | 161 | 64 | ≥P P 95 | 38 – 52 |
| 27 | M.G. | 162 | 66 | ≥P P 95 | 38 – 53 |
| 28 | N.O. | 163 | 67 | ≥P P 95 | 39 – 53 |
| 29 | P.R. | 166 | 70 | ≥P P 95 | 40 – 54 |
| 30 | R.A. | 170 | 73 | ≥P P 95 | 42 – 57 |
| Arithmetic mean | | 155.60 | 59.50 | 41.70 | |
| Standard deviation | | 5.43 | 5.84 | | |
| Coefficient of variability (%) | | 4 | 10 | | |

Graph no.3. Arithmetic mean for the obtained weight and arithmetic mean for the ideal weight

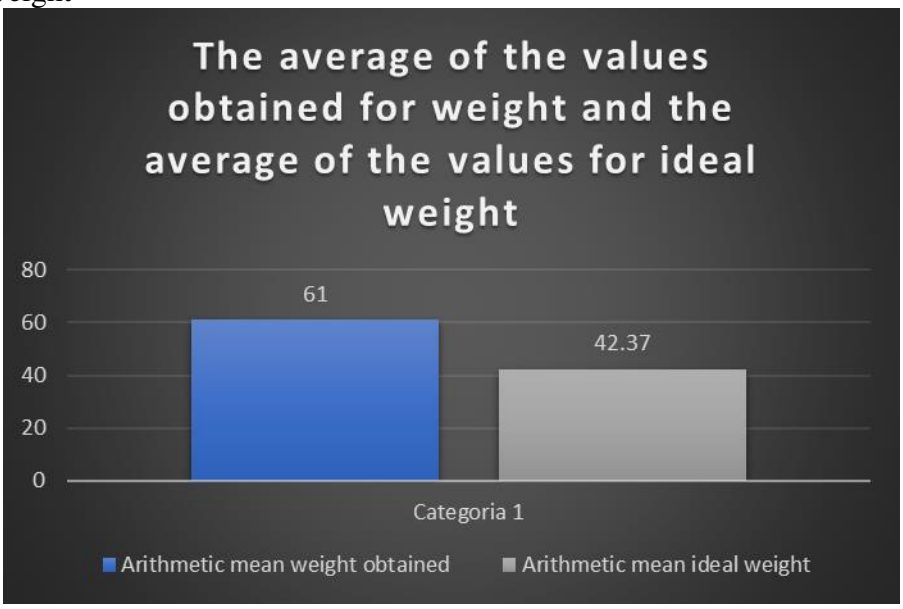



Sample "Ciprian Porumbescu" Art College, Philadelphia Theoretical High School, High School with Sports Program, Suceava

| Nr. crt. | Students' initials | Height (cm) | Weight (kg) | BMI (percentiles) | Ideal weight (kg) |
|---|---|---|---|---|---|
| | | M.I. | M.I. | M.I. | |
| 1 | A.A. | 147 | 50 | ≥P P 95 | 31 – 43 |
| 2 | A.C. | 147 | 51 | ≥P P 95 | 31 – 43 |
| 3 | A.F. | 148 | 51 | ≥P P 95 | 31 – 44 |
| 4 | A.R. | 148 | 53 | ≥P P 95 | 32 – 44 |
| 5 | B.C. | 149 | 53 | ≥P P 95 | 32 – 44 |
| 6 | B.E. | 150 | 54 | ≥P P 95 | 32 – 45 |
| 7 | B.I. | 151 | 54 | ≥P P 95 | 32 – 45 |
| 8 | C.A. | 152 | 55 | ≥P P 95 | 33 – 45 |
| 9 | C.C. | 152 | 56 | ≥P P 95 | 33 – 45 |
| 10 | D.A. | 153 | 56 | ≥P P 95 | 33 – 45 |
| 11 | D.T. | 154 | 57 | ≥P P 95 | 34 – 46 |
| 12 | E.O. | 155 | 58 | ≥P P 95 | 34 – 46 |
| 13 | F.R. | 156 | 60 | ≥P P 95 | 35 – 47 |
| 14 | F.V. | 157 | 60 | ≥P P 95 | 35 – 47 |
| 15 | G.I. | 157 | 61 | ≥P P 95 | 35 – 48 |
| 16 | G.M. | 159 | 63 | ≥P P 95 | 35 – 48 |
| 17 | H.S. | 159 | 65 | ≥P P 95 | 36 – 48 |
| 18 | I.D. | 160 | 63 | ≥P P 95 | 36 – 52 |
| 19 | I.L. | 162 | 66 | ≥P P 95 | 38 – 53 |
| 20 | J.V. | 163 | 64 | ≥P P 95 | 39 – 53 |

| | | | | | |
|---|---|---|---|---|---|
| 21 | L.E. | 164 | 65 | ≥P P 95 | 38 – 51 |
| 22 | L.D. | 164 | 67 | ≥P P 95 | 38 – 51 |
| 23 | L.P. | 165 | 68 | ≥P P 95 | 38 - 52 |
| 24 | T.R. | 165 | 65 | ≥P P 95 | 39 – 53 |
| 25 | Z.D. | 165 | 69 | ≥P P 95 | 39 – 53 |
| 26 | P.S. | 166 | 66 | ≥P P 95 | 39 – 53 |
| 27 | R.C. | 166 | 70 | ≥P P 95 | 40 – 54 |
| 28 | S.D. | 168 | 69 | ≥P P 95 | 40 – 54 |
| 29 | V.I. | 168 | 70 | ≥P P 95 | 42 – 57 |
| 30 | U.P. | 169 | 71 | ≥P P 95 | 42 – 57 |
| Arithmetic mean | | 157.97 | 61 | 42.37 | |
| Standard deviation | | 7.02 | 6.45 | | |
| Coefficient of variability (%) | | 5 | 11 | | |

Graph no.4. Arithmetic mean for the obtained weight and arithmetic mean for the ideal weight




**Conclusions**

Following the initial anthropometric measurements applied on the 120 subjects, we found that in the first chart for the subjects from the "Jean Beart" Gymnasium School, "Miron Costin" and the Primary School "St. Ioan cel Nou "Suceava, the arithmetic mean for the weight obtained is 60.73, and the arithmetic mean for the ideal weight is 41.96, the difference between the two being 18.77 kilograms.

In the second chart for the subjects from the Gymnasium School Nr. 4, 8, 10 Suceava, the arithmetic mean for the weight obtained is 58.13, and the arithmetic mean for the ideal weight is 40.40, the difference between the two being 17.73 kilograms.

In the third graph for the subjects from the Gymnasium School No.1, 3, 9 "Ion Creangă" Suceava, the arithmetic mean for the obtained weight is 59.50, and the average for the ideal weight is 41.70, the difference between these two being of 17.8 kilograms.

In the fourth graph for the subjects from "Ciprian Porumbescu" College, Philadelphia Theoretical High School, Suceava High School with Sports Program, the arithmetic average obtained for weight is 61, and the average for ideal weight is 42.37, the difference between the two being 18.63 kilograms.

Following these measurements, we developed alternative teaching strategies embodied in a number of 3 exercise structures on 3 different levels of physical stress, in order to accelerate weight loss over a period of 10 months corresponding to a school year. The exercise structures were applied during the thematic link for 20-25 minutes. As these students do not participate in the thematic link, they will work separately at maximum intensity the proposed exercise structures. These structures of exercises performed with the weight of one's own body included combinations of different motor actions. In structuring these exercises, the particularities of the age of the young student were taken into account, simultaneously with the level of each of the physical demands at maximum and supramaximal intensities.

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