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DISSERTATION

PHYSICAL ACTIVITY AND RISK FACTORS FOR OBESITY AND HYPERTWNSION IN CHILDREN AGED 9-10 YEARS OLD.

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CONTENTS

1. INTRODUCTION

1.1 GENERAL CONSIDERATION

Obesity is a growing problem in children and adolescents being named today by right as one of the greatest challenges of healthy development of the population in the 21st century (1)

Obesity and overweight children remain troubling because obesity is multifactorial origin and is characterized by excessive adipose njëgrumbullimi, an increase in body weight and therefore the risk to health is not good. (2,3)

Growth factors of obesity registered in recent years have multiplied. On the one hand it comes to customs and modifiable risk factors that attributed to individual behavior (11) that are nevertheless related to collective complex dynamics involving friends, family and even institutions and socio-cultural organizations, sports and mass media. (12)

One of the reasons for increasing prevalence of obesity and related diseases appear to be the reduction of daily physical activity and excessive consumption of foods, especially those with high density energy (3, 13) performed by children during two decades.

WHO refers about 20 million obese children up to age 5 vjeç. 1 in 10 children showed obese in 2010, which means most likely to develop type 2 diabetes, hypertension, insomnia, psychological and social disorders. The most troubling aspect of the problem is that these children remain obese in adult age (5), developing more serious pathologies that tend to lead to reduced quality and length of life.

Preventing the growth of obesity in children presents today a challenge to public health, because it is very hard to tackle the obesity install, is very high probability of being a teenager or adult obese, it is difficult to correct the customs wrong adult nutritional, acquired in childhood.

Studies in adults provide evidence that patterns of low physical activity are associated with an excessive risk of chronic diseases, including hypertension (16).

On the other hand, increased daily physical activity leads to a reduction of risk for a number of chronic diseases kardiorespiratore, especially reduces the risk of hypertension in children (17).

Unfortunately, there is currently little evidence that describe the potential for increased physical activity to mitigate cardiovascular risk in children. More importantly, it is unclear whether increased physical activity can protect youth from overweight and obesity, the increase of high blood pressure and chronic diseases associated with obesity and overweight in childhood. (18).

The purpose of this study is to provide a summary of current literature describing the impact of overweight and obesity on blood pressure and its determinants in children aged 9-10 years (family, family income, living style, types food and method of feeding).

2. THE PURPOSE OF THE STUDY

2.1 The purpose of the study:

1. Evaluation of the prevalence of overweight, obesity and hypertesion among children aged 9-10 years.

2. Create a data bank on the epidemiological situation of nutritional status (obesity, underweight) of the population in the study group, with the specific purpose of modifying behavior is incorrect food.

3. Use of the data as an important background for the activation and operation of a chain of corrective interventions, programmed and continuous in time, based on information and education initiatives.

Questions of research:

1. What is the prevalence of obesity in children scholars 9- 10 years to see this by:

• Age.

• Gender.

• Residence.

2.2 Hypothesis and variables in study:

This study has the following assumptions:

• Increase in the age of children increases the likelihood of increased BMI.

• Women are likely to have greater BMI.

• Children in urban areas have a higher BMI.

• Physical activity reduces BMI and decreases the values of arterial pressure and cholesterol, triglyceride.

The dependent variable is exactly Body Mass Index (BMI).

Independent variables, age, sex and residence.

BMI percentiles were used because BMI scores of children are highly dependent on age and gender. Thus, BMI percentiles are used as an input dependent, where children 85-95 percentile were defined as overweight, and those with over 95 percentile as obese.

3. MATERIALS AND METHODS

3.1Type of study:

This study is cross-sectional was, with two components:

Descriptive: This component refers to the description / assessment of the prevalence of overweight, obesity in children aged 9-10 years.

Analytical: This component refers to the evaluation of risk factors for obesity related to demographic characteristics.

3.2 Study Participation

A total of 548 children at fifth grade elementary school(boys and girls) aged 9-10 years old were enrolled in this study.

3.3 Data collection

Data presented in this study are from year 2014-2015. 10 elementary scholl were randomly selected from 30 sbools placed in the district of Elbasan.
At first we prepared:

• Model of letter of information and cooperation management staff of schools and teaching staff, and parents on the initiative for assessing the growth of children.

• Model letter of information for parents regarding the initiative for assessing the growth of children and child permit the inclusion of his / her study. (ANEX 1)

• Form examiner child (ANNEX 2)

• Form the examiner to return from school (ANNEX 3)

Anthropometric measurements of children were conducted by weighing and portable brand Stadiometres Seca.Measurement on body mass and body height were made to calculate BMI in 548 children aged 9-10 years. BMI was calculated using usual formula(kg/m^2).

Measurement of arterial pressure was conducted with EMI Pediatric Aneroid Blood Pressure Monitor Sphygmomanometer CHILD Sized Cuff with a highly trained staff of first (3 consecutive measurements dormant for a period of 2 weeks).

During our study to collect data on we drafted a separate tab, the fulfillment of which was based on data from the children and their parents, in the measurement of parameters anthropometric, the measurement of blood pressure as well as data obtained by laboratory testing at the start and end of the study on children resulting overweight, obese or hypertensive.

The personal data of each child was initially codified and thrown in Excel.

3.4 The laboratory study

Performing analysis was conducted biochemical laboratory of the Hospital "Dr. XH. Kongoli "Elbasan.

Laboratory testing of samples includes:

• Hemograme test including the number of erythrocytes, Hb.

• Assessment of routine biochemical parameters.

These laboratory tests were carried out by this laboratory equipment:

Hemograma was conducted via Mythic 18 device.

Biochemical analysis was conducted through 310 BTS device.

Based on the recommendations of WHO were classified by:

• With dyslipidemia, as a criterion for dislipidemia relied on data measuring total cholesterol (TC), triglycerides (TG).

• With hyperglycemia (diabetes) was taken as a criterion level of fasting blood sugar test blood and suspected cases of diabetes mellitus type I took and measurement of glycemia 2 hours after meals.

• Malnutrition, was assessed on the basis of clinical criteria as weight, height, muscle mass.

• BMI, the body mass index calculates depending on weight and height (kg / m2).

•Obesity was defined as BMI> 25 kg / m2 for children. Based on BMI values were assessed and degree of obesity.

4. STATISTICAL ANALYSIS

Data were analyzed with SPSS statistical program.

Continuous variables:
BMI, height, weight, diastolic blood pressure, systolic blood pressure, blood glucose, Cholesterol, Triglycerides are presented with their deskriprive statistics: average, standard deviation (SD), median, minimum and maximum.

Categorical variables were described as percentages.

Student test was used for two independent samples to compare averages of variables continue.

ANOVA one way test and ANOVA two way was used for comparison of averages continued amongst variables and the interaction of variables between them.

Pearson parametric correlation to assess the relationship between variables continues.

To compare the proportions between categorical variables used χ^2 test.

It is also using the likelihood ratio (odds ratio) to assess the association of overweight and obesity by sex.

P value $\leq$ 0:05 is considered statistically significant.

All tests were two-way. Tables and graphs are used to visualize the data.

4. RESULTS

Socio-demographic characteristics of the population of 548 children aged 9-10 years included in the study are presented in the following table.(Table 4.1)

Table 4.1.

Variables	N	%	P
Gender			
Girls	260	47.4	0.4
Bojs	288	52.6	
Age in years (M, SD)	9.4 (±0.5)		
Age group, years			
8	1	0.2	0.3
9	284	51.8	
10	259	47.3	
11	4	0.7	
Residence			
Rural	136	24.8	<0.01
Urban	412	75.2	
School			
Abdyl Paralloi	50	9.1	
Ali Agjahu	58	10.6	
Alush Lleshanaku	28	5.1	
Bardhyl Popa	44	8.0	
Fadil Gurmani	38	6.9	
Jorgji Dilo	80	14.6	
Qamil Guranjaku	74	13.5	
Qemal Haxhihasani	76	13.9	
Sule Harri	100	18.2	

In total the study participated 548 children from 10 different schools in Elbasan. 260 (47.4%) of children are female and 288 (52.6%) of them were male, without significant difference between them. Girls and boys are equally represented in the study.

Rural residence were 136 (24.8%) of the children, and the urban residence are 412 (75.2%) of children (<0:01), but they are representative of their respective population of urban and rural children.

By age 9 years were 284 (51.8%) children, and age 10 years were 259 (47.3%) children, with no difference between them, p = 0.3. One (0.2%) child is aged 8 years and 4 (0.7) children aged 11 years.

The average age of the children involved in the study was 9.4 (± 0.5) years.

Table 4.2. Statistics summarized variable

Variables	M	SD	Median	Minimum	Maximum
Height	141.139	6.8477	141	121	162
Weight	35.788	9.3972	33	20	72
BMI	17.892	3.9287	16.8	11.4	33.8
PA dias	61.173	7.6489	60	50	90
PA Sis	106.088	9.846	105	80	145
Blood Glucose	92.332	8.1152	91.5	9	125
Cholesterol	153.308	43.1288	151	89	374
Triglycerides	80.159	26.0042	78	45	182
Activity/min /week	109.38	55.843	90	90	270

Table 4.3. The values of BMI children

BMI	N	%	95%CI
Underweight	378	69.0	64.9 – 72.8
Normal	111	20.3	17 – 23.9
Overweight	48	8.8	6.5 – 11.5
Obes Grad I	11	2.0	1 – 3.5

Table 4.4. The values of the percentile BMI children

BMI	N	%	95%CI
Underweight	48	8.8	6.5 – 11.5
Normal	361	65.9	61.7 – 69.8
Overweight	66	12.0	9.4 - 15
Obes	73	13.3	10.5 -16.4

The prevalence of obesity in our study is 2% 95% CI (1-3.5%).

Percentile method
-Prevalence of Malnutrition is 8.8%
- The normal weight is 65.9%
- The obesity 12%
- The obesity 13.3%

Table 4.5. BMI values by gender

BMI	Boys N (%)	Girls N (%)
Underweight	172 (66.2)	206 (71.5)
Normal	63 (24.2)	48 (16.7)
Overweight	20 (7.7)	28 (9.7)
Obes Grad I	5 (1.9)	6 (2.1)

Underweight or malnourished are 172 (66.2%) boys and 206 (71.5%) girls;

Normal weights were 63 (24.2%) boys and 48 (16.7%) girls;

Overweight were 20 (7.7%) boys and 28 (9.7%) girls;

Grade I obese are 5 (1.9%) boys and 6 (2.1%) girls;

No significant difference observed between boys and girls in terms of BMI values. ($\chi 2 = 5.1$ $p = 0.2$)

Table 4.6. Prevalence of overweight + obesity by gender

Gender	Yes n (%)	No n (%)	Total
Girls	25 (9.6)	235 (90.4)	260
Boys	34 (11.8)	254 (88.2)	288
Total	59 (10.8)	489 (89.2)	548

It noted that boys are 1.3 times more likely to be overweight and obese, but no significant difference between them: OR = 1.3 95% CI (0.7 - 2.1) p = 0.4

Table 4.7. BMI values to children by residence

BMI	Rural N (%)	Urban N (%)
Underweight	105 (77.2)	273 (66.3)
Normal	21 (15.4)	90 (21.8)
Overweight	10 (7.4)	38 (9.2)
Obes Grad I	0	11 (2.7)

Underweight or malnourished are 105 (77.2%) of children who live in rural areas and 273 (66.3%) of children who live in the urban area;

Normal weight were 21 (15.4%) of children who live in rural areas and 90 (21.8%) of children who live in the urban area;

Overweight were 10 (7.4%) of children who live in rural areas and 38 (9.2%) of children who live in the urban area;

Grade I obese are only 11 (2.7%) of children who live in the urban area.

Observed significant difference between children who live in the urban area and children who live in rural areas in terms of BMI values. ($\chi 2 = 7.8$ p = 0:04).

Obesity is an urban phenomenon and children in the urban area a less active compared to children residing in rural areas because of the different way of life, eg city children spend more hours watching TV, computer, etc.

Table 4.8. BMI values by age

BMI	8 n (%)	9 n (%)	10 n (%)	11 n (%)
Underweight	1 (100)	203 (71.5)	172 (66.4)	2 (50)
Normal	0	49 (17.3)	61 (23.6)	1 (25)
overweight	0	25 (8.8)	22 (8.5)	1 (25)
Obes Grad I	0	7 (2.5)	4 (1.5)	0

No significant difference observed in terms of BMI values by age. ($\chi 2 = 5.7$ p = 0.8)

As with the method of BMI, the percentile method shows no significant age difference ($\chi 2 =$ 4.5 p = 0.8).

By comparison method and the method of percentile BMI noted that all the results are the same interpretation.

The only difference between the two methods is that the method of percentile majority of pupils is classified as normal weight and increased the number of children with overweight and obese ones.

Results of the study are very valuable because the reduction of the BMI index also reduces the value of percentile for converting percentiles of BMI values.

Percentile values were calculated by gender specific, for boys and girls and by age respectively.

As in our study the BMI method is recommended for screening (screening), ie for the identification of subjects who are overweight and obese - ie the percentile method depistim- not used as is the case of our study (106).

Table 4.8. Statistics summarized variables by gender

Variables	Gender	M	SD	Median	Minimum	Maximum
Height	F	141.627	7.0266	141	121	160
	M	140.698	6.6636	140.75	122	162
Weight	F	36.008	9.1616	34	20	67
	M	35.59	9.6165	32.5	21	72
BMI	F	17.916	3.8654	17	12.4	32.5
	M	17.87	3.9915	16.65	11.4	33.8
PA dias	F	61	7.2719	60	50	90
	M	61.33	7.9834	60	50	90
PA Sis	F	106.069	10.0379	105	80	140
	M	106.104	9.6869	105	90	145
Blood glukose	F	92.804	7.7462	94	75	125
	M	91.906	8.4252	90	9	123
Cholesterol	F	151.742	42.7982	152	89	374
	M	154.722	43.4509	151	90	360
Triglycerides	F	78.635	25.8012	75	45	182
	M	81.535	26.1546	80	45	169
Activity/min/ week	F	107.308	53.1667	90	90	270
	M	111.25	58.1824	90	90	270

Table 4.9. Statistics summarized variables by residence

	Residence	M	SD	Median	Minimum	Maximum
Height	R	140.082	7.1412	140	123	162
	U	141.488	6.7205	141	121	160
Weight	R	33.674	7.9801	31.65	20	58
	U	36.486	9.7285	34	21	72
BMI	R	17.068	3.223	16.16	12	26.5
	U	18.164	4.1026	16.95	11.4	33.8
PA dias	R	60.75	6.0562	60	50	80
	U	61.313	8.1079	60	50	90
PA Sis	R	103.838	6.9145	105	90	135
	U	106.83	10.5399	105	80	145
Blood glukose	R	91.603	5.7003	90	78	112
	U	92.573	8.7602	92	9	125
Cholesterol	R	141.125	35.0829	146	89	300
	U	157.33	44.7883	154	90	374
Triglycerides	R	74.25	21.5296	75	45	158
	U	82.109	27.0622	80	45	182
Activity/min/week	R	103.235	47.1543	90	90	270
	U	111.408	58.3384	90	90	270

Table 4. 10. Statistics summarized the variables by age

	Age	M	SD	Median	Minimum	Maximum
Height	8	137		137	137	137
	9	140.175	6.8124	140	121	161
	10	142.222	6.7652	142	126	162
	11	140.5	6.3509	137.5	137	150
Weight	8	27.5		27.5	27.5	27.5
	9	35.243	9.4702	32.5	20	69
	10	36.342	9.2681	34	21	72
	11	40.75	11.9757	37.5	31	57
BMI	8	15		15	15	15
	9	17.853	4.0169	16.75	11.4	32.1
	10	17.908	3.8332	16.8	12.7	33.8
	11	20.35	4.1805	19.8	16.5	25.3
PA dias	8	60		60	60	60
	9	61.141	7.7072	60	50	90
	10	61.154	7.5693	60	50	90
	11	65	10.8012	62.5	55	80
PA Sis	8	105		105	105	105
	9	105.87	9.7633	105	90	140
	10	106.309	10.0273	105	80	145
	11	107.5	5	105	105	115
Blood glukose	8	99		99	99	99
	9	92.377	8.737	92	9	123
	10	92.181	7.4064	90	75	125
	11	97.25	6.3443	97	90	105
Cholesterol	8	140		140	140	140
	9	154.208	44.0406	151	89	374
	10	152.042	42.4469	152	90	345
	11	174.75	18.8038	172	155	200
Triglycerides	8	90		90	90	90
	9	80.546	25.3382	79.5	45	169
	10	79.556	26.7965	75	45	182
	11	89.25	28.1469	95	50	117
Activity/min/week	8	90		90	90	90
	9	110.282	57.0158	90	90	270
	10	108.069	54.1973	90	90	270
	11	135	90	90	90	270

Table 4. 11. Comparison of variables gender

Variables	Girls		Boys		t	p
	M	SD	M	SD		
Height	141.627	7.0266	140.698	6.6636	1.5	0.1
Weight	36.008	9.1616	35.59	9.6165	0.5	0.6
BMI	17.916	3.8654	17.87	3.9915	0.1	0.8
PA dias	61	7.2719	61.33	7.9834	0.5	0.6
PA Sis	106.069	10.0379	106.104	9.6869	0.04	0.9
Glukose	92.804	7.7462	91.906	8.4252	0.9	0.3
Cholesterol	151.742	42.7982	154.722	43.4509	0.8	0.4
Triglycerides	78.635	25.8012	81.535	26.1546	1.3	0.2
Activity	107.308	53.1667	111.25	58.1824	0.8	0.4

Table 4.12. Comparison of variables according to residence

Variables	Rural		Urban		t	p
	M	SD	M	SD		
Height	140.082	7.1412	141.488	6.7205	2.0	**0.04**
Weight	33.674	7.9801	36.486	9.7285	3.3	**<0.01**
BMI	17.068	3.223	18.164	4.1026	3.2	**<0.01**
PA Diastolik	60.75	6.0562	61.313	8.1079	0.8	0.3
PA Sistolik	103.838	6.9145	106.83	10.5399	3.8	**<0.01**
Glukose	91.603	5.7003	92.573	8.7602	1.8	0.06
Cholesterol	141.125	35.0829	157.33	44.7883	4.3	**<0.01**
Triglycerides	74.25	21.5296	82.109	27.0622	3.4	**<0.01**
Activity	103.235	47.1543	111.408	58.3384	1.6	0.1

Table 4.13. Comparison of the variables by age

	Age	Mean	SD	F-ratio	P
Height	8	137		4.2	**<0.01**
	9	140.175	6.8124		
	10	142.222	6.7652		
	11	140.5	6.3509		
Weight	8	27.5		1.2	0.3
	9	35.243	9.4702		
	10	36.342	9.2681		
	11	40.75	11.9757		
BMI	8	15		0.7	0.5
	9	17.853	4.0169		
	10	17.908	3.8332		
	11	20.35	4.1805		
PA Diastolik	8	60		0.3	0.8
	9	61.141	7.7072		
	10	61.154	7.5693		
	11	65	10.8012		
PA Sistolik	8	105		0.1	0.9
	9	105.87	9.7633		
	10	106.309	10.0273		
	11	107.5	5		
Glukose	8	99		0.7	0.5
	9	92.377	8.737		
	10	92.181	7.4064		
	11	97.25	6.3443		
Cholesterol	8	140		0.4	0.7
	9	154.208	44.0406		
	10	152.042	42.4469		
	11	174.75	18.8038		
Triglycerides	8	90		0.2	0.8
	9	80.546	25.3382		
	10	79.556	26.7965		
	11	89.25	28.1469		
Activity/min/week	8	90		0.3	0.7
	9	110.282	57.0158		
	10	108.069	54.1973		
	11	135	90		

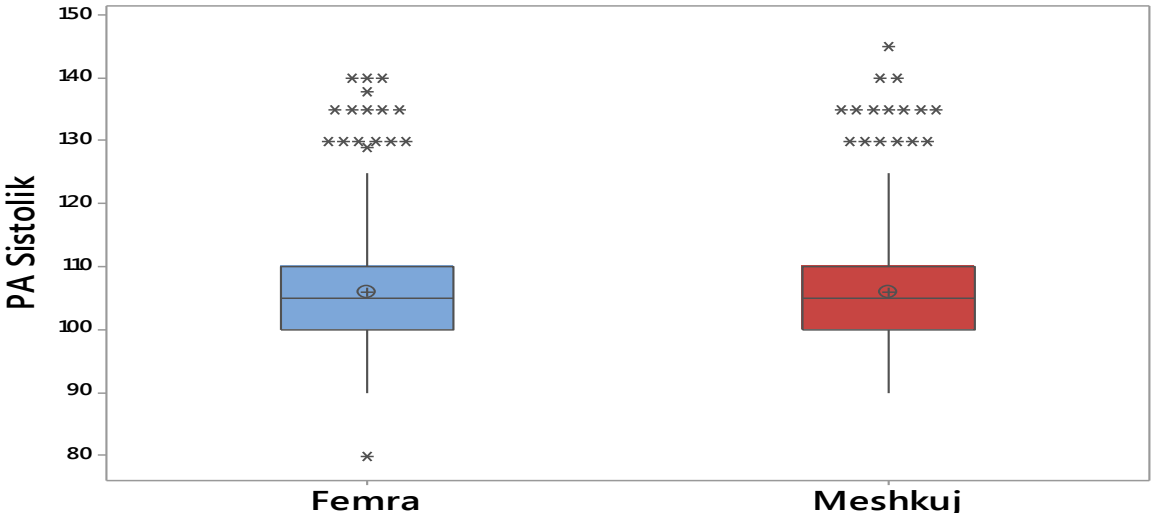

Figure 4.1. Comparison of PA systolic according to gender

The average of systolic PA in girls is M = 106.1 (± 10) while boy's M = 106.10 (± 9.69), with no significant difference between them (t = 0:04 p = 0.9).

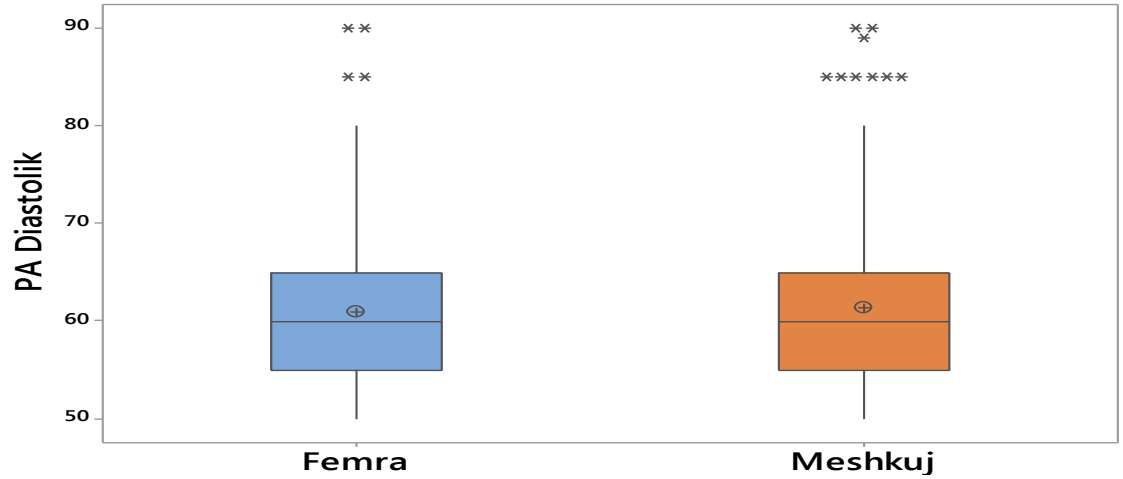

Figure 4.2. Comparison of PA diastolic according to gender

The average of PA diastolik in girls is M = 61.0 (± 27.7) while boy's M = 61.33 (± 7.98, with no significant difference between them (t = 0.5 p = 0.6).

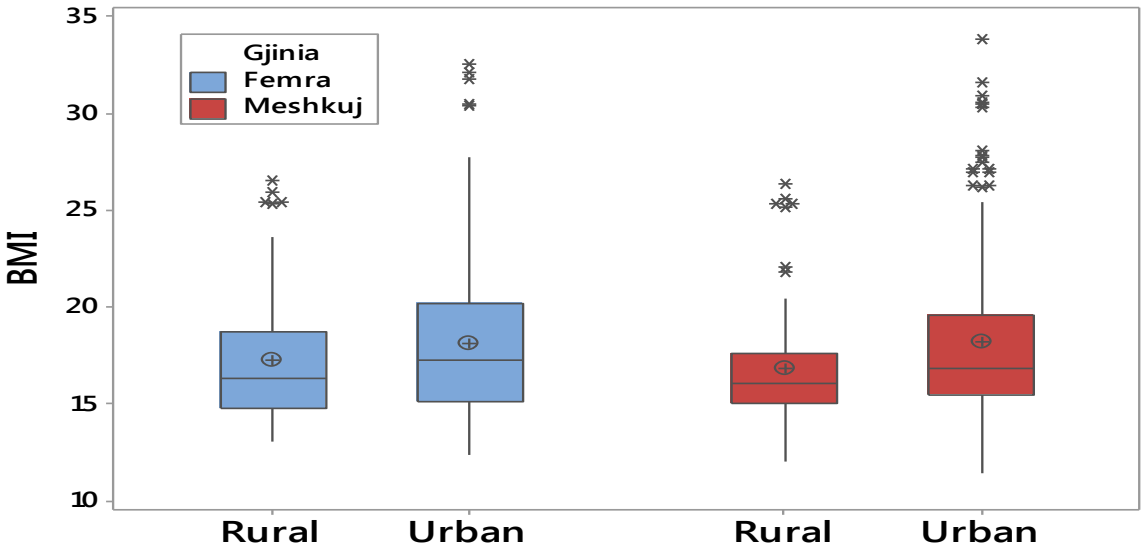

Figure 4.3. Comparison of BMI according to gender and place of residence

The average BMI of girls is M = 17.92 (± 3.87), while the boy`s is M = 17.87 (± 3.99), with no significant difference between them (t = 0.1 p = 0.8).

The average BMI for children residing in rural areas is M = 7.10 (± 0:28) and for those living in urban areas is M = 18:16 (± 4.10), **with significant difference** between them (t = 3.2 p <0.01).
The interaction of sex with the settlement does not affect the BMI (two way ANOVA F-ratio = 0.3 p = 0.5).

The average BMI of the age of 8 is M = 15, aged 9 years is M = 17.85 (± 4.0), aged 10 years is M = 17.90 (± 3.83) and age 11 is M = 20.3 (± 18.4) with no significant difference between them (one way ANOVA F-ratio = 0.7 p = 0.5).
The interaction of gender with the residence does not affect the BMI (two way ANOVA F-ratio = 1.1 p = 0.3).

The average value of cholesterol in girls is M = 151.7 (± 42.8) while in boys is M = 154.7 (± 43.5), with no significant difference between them (t = 0.8 p = 0.4).

The average value of cholesterol for children residing in rural areas is M = 141.1 (± 35.1) while those living in the urban area are M = 157.3 (± 44.8) **with significant difference** between them (t = 4.3 p <0:01).

The interaction of gender with the residence does not affect cholesterol (two way ANOVA F-ratio = 0:06 p = 0.8).

The average value of triglycerides in girls is M = 78.6 (± 25.8) while in boys is M = 81.5 (± 26.2), with no significant difference between them (t = 1.3 p = 0.2).

The average value of triglycerides to children residing in rural areas is M = 74.3 (± 21.5) while those living in the urban area are M = 82.1 (± 27.1), **with significant changes** between them (t = 3.4 p <0:01).

The interaction of gender with the residence does not affect triglycerides (two way ANOVA F-ratio = 0.3 p = 0.5).

The average value of glycemia in girls is M = 92.8 (± 7.75) while in boy's M = 92.2 (± 6.85), with no significant difference between them (t = 0.9 p = 0.3).

The average value of of glycemia for students residing in rural areas is M = 91.6 (± 5.7) while those living in the urban area is M = 92.7 (± 7.3), with no significant change between them (t = 1.8 p = 0:06).

The interaction of gender with the residence does not affect blood glucose (two way ANOVA F-ratio = 0.7 p = 0.3).

Women have an average activity M = 107.3 (± 53.2) minutes per week while men M = 111.3 (± 58.2) minutes per week, with no significant difference between them (t = 0.8 p = 0.4).

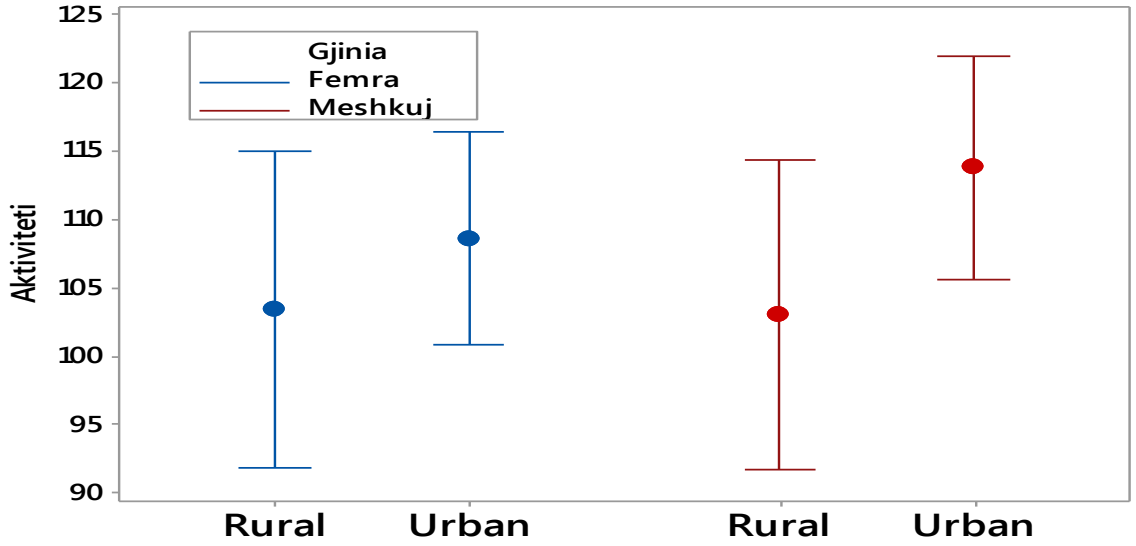

Figure 4.4. Comparison of activity by Residence and Gender

Activity average for children residing in rural areas is M = 103.2 (± 47.2) minutes per week, and for those living in urban areas M = 111.4 (± 58.3) minutes per week, with no significant change between them (t = 1.6 p = 0.1).

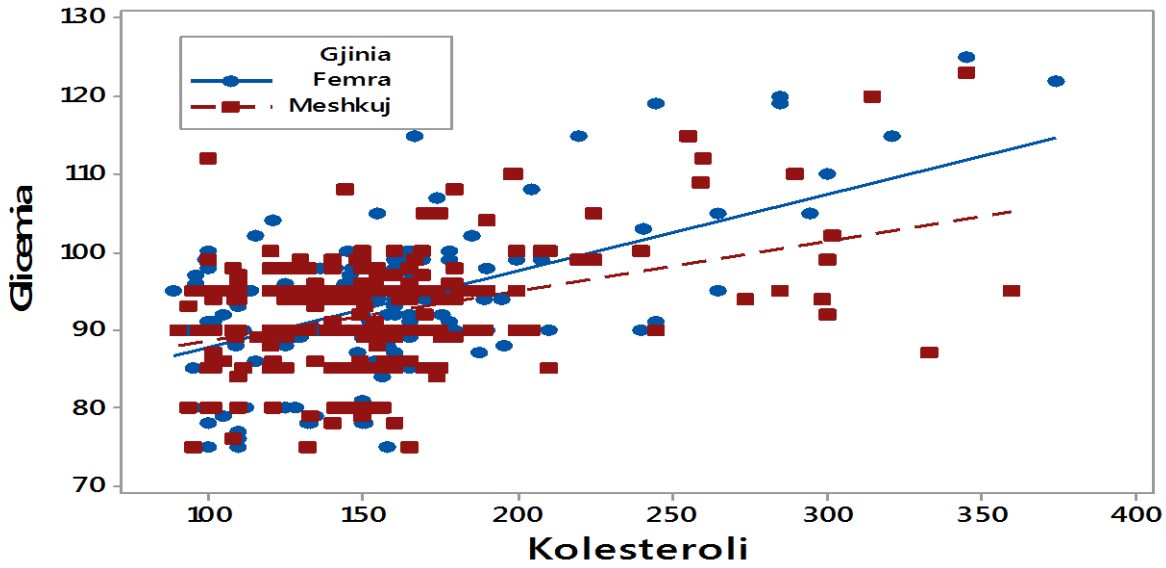

Figure 4.5. Correlation of cholesterol with blood glucose by gender

We observed moderate statistically significant correlation between the values for total cholesterol and blood glucose in children (r = 0:41 p <0.001) as girls (r = 0:54 p <0.001) and boys (r = 0:40 p <0.001).

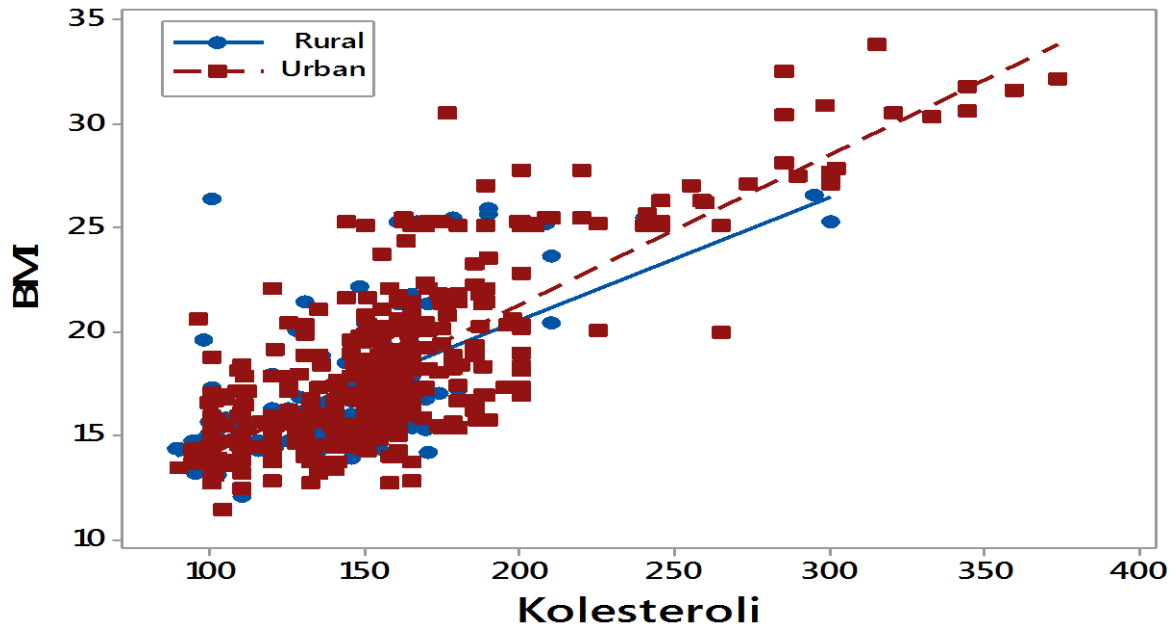

Figure 4.6. Correlation of cholesterol with the BMI by residence

We o bserved strong statistically significant correlation between the values of cholesterol and the BMI for the total students (r = 0.77 p <0.001) as for students of rural schools (r = 0.64 p <0.001) as well as urban schools (r = 0.78 p <0.001).

We observed strong statistically significant correlation between the values of cholesterol and

the BMI for children aged 9 years (r = 0.75 p <0.001) and for children aged 10 years (r = 0.78 p <0.001) while not visible to the age of 11 years (0:04 p = 0.9) - due to the small number of students.

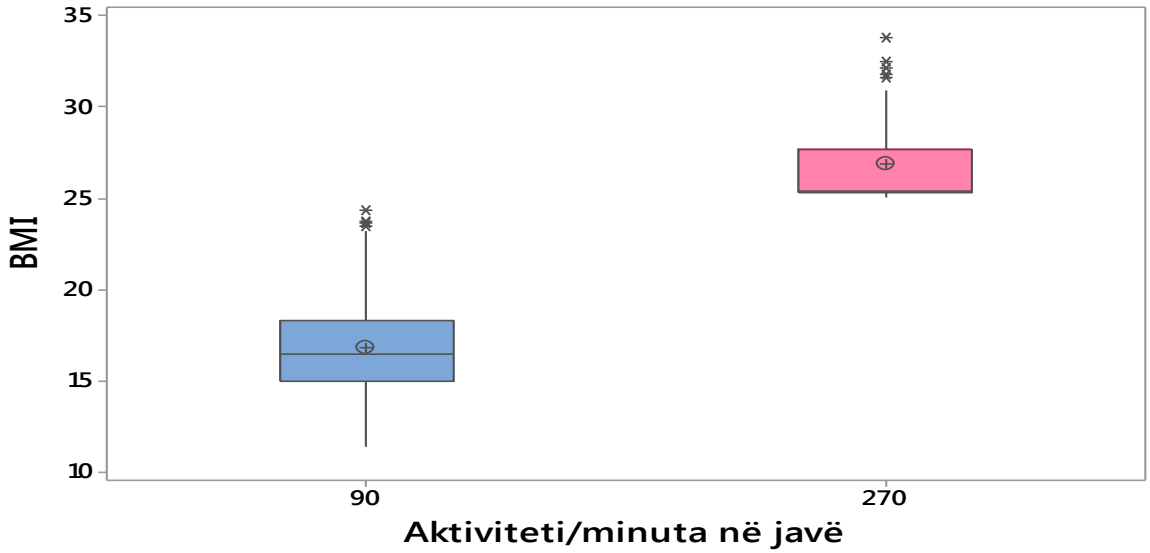

Figure 4.7. Comparison of the BMI by activity

The average BMI among children who do 90 minutes of activity per week is M = 16.81 (± 2:39) while to children with overweight and obese who were selected to perform 270 minutes of activity per week is M = 29.87 (± 2:37), with significant changes between them (t = 30.8 p <0:01).

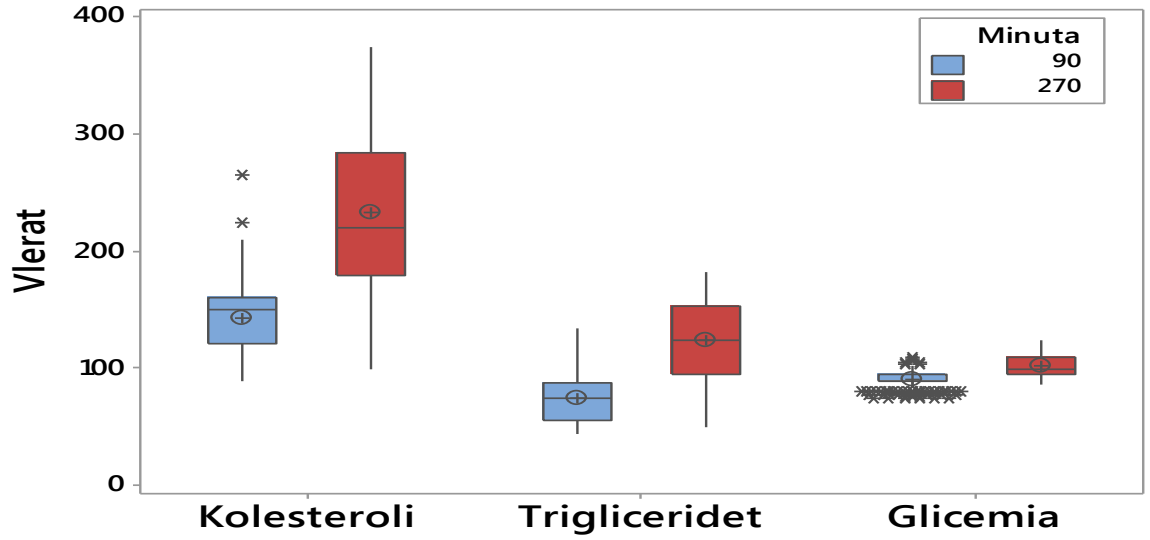

Figure 4.8. Comparison of the values of cholesterol, triglycerides and glycaemia by activity

The average value of cholesterol in children performing 90 minutes of activity per week is M = 143.6 (± 27.3) and among children in overweight and obese who were selected to

perform 270 minutes of activity per week is M = 233.7 (± 62.34), **with significant difference** between them (t = 5.10 p <0.001).

The average value of triglycerides in children who perform 90 minutes of activity per week is M = 74.9 (± 18.9) and among children in overweight and obese who were selected to perform 270 minutes of activity per week is M = 123.8 (± 34.5), **with significant difference** between them (t = 7.10 p <0.001).

The average value of glycaemia to children who have completed 90 minutes of activity per week is M = 91.3 (± 5.8) whereas children with overweight and obese who were selected to perform 270 minutes of activity per week is M = 102.5 (± 10.3) **with significant difference** between them (t = 8.2 p <0.001).

Children who are overweight and obese have higher values of fat and glycemic compared with normal-weight children and malnutrition.

Variables Comparison of Student before and after training

59 students with overweight and obesity underwent training with increased physical activity 270 minutes per week.

Table 4.14. Characteristics of children participating in training

Variables	N	%
Age, M SD	9.5 (0.5)	
range	9-11	
Gende		
Girls	25	42.4
Boys	34	57.6
Residence		
Rural	10	16.9
Urban	49	83.1

Table 4.15. Statistics summarized variables before training

	Mean	SD	Median	Minimum	Maximum
BMI	26.874	2.3678	25.4	25.06	33.8
Weight	55.215	6.5363	55	44	72
PA Diastolik	73.085	10.679	75	50	90
PA Sistolik	123.102	12.306	125	105	145
Blood Glukose	102.492	10.313	100	86	125
Cholesterol	233.661	62.425	220	100	374
Triglycerides	123.831	34.488	125	50	182

Table 4.16. Statistics summarized variables after training

	Mean	SD	Median	Minimum	Maximum
BMI	24.985	3.4254	24.4	16.66	33.3
Weight	54.792	8.2554	55	35	75
PA Diastolik	70.102	11.272	70	55	90
PA Sistolik	116.797	15.1359	120	85	140
Blood Glukose	103.22	8.3626	100	90	120
Cholesterol	203.034	41.5109	200.5	102	300
Triglycerides	113.525	28.5472	111	52	200

Table 4.17. Comparison of the variables before and after training

Variables	Before		After		t	P
	Mean	SD	Mean	SD		
BMI	26.874	2.3678	24.985	3.4254	5.7	**<0.01**
Weight	55.215	6.5363	54.792	8.2554	0.5	0.6
PA Diastolik	73.085	10.6792	70.102	11.272	2.1	**0.04**
PA Sistolik	123.102	12.306	116.797	15.1359	4.2	**0.01**
Blood Glukose	102.492	10.313	103.22	8.3626	0.5	0.6
Cholesterol	233.661	62.4247	203.034	41.5109	6.6	**<0.01**
Triglycerides	123.831	34.488	113.525	28.5472	5.6	**<0.01**

BMI values before training is M = 26.8 (± 2:36) and after training is M = 24.9 (± 3.4) with **significant difference** between them (paired t = 5.7 p <0:01)

Diastolic PA before training is M = 73.1 (± 10.8) and after training is M = 70.1 (± 11.3) with **significant difference** between them (paired t = 2.1 p = 0:04)

PA systolic before training is M = 123.1 (± 12.3) and after training is M = 116.8 (± 15.1) with **significant difference** between them (paired t = 4.2 p = 0:01)

Glycaemia before training is M = 102.5 (± 10.3) and after training is M = 103.2 (± 8.4) with

no significant difference between them (paired t = 0.5 p = 0.6)

Cholesterol before training is M = 233.7 (± 62.4) and after training is M = 203 (± 41.5) with **significant difference** between them (paired t = 6.6 p <0:01).

Triglycerides before training is M = 123.8 (± 34.5) and after training is M = 113.5 (± 28.5) **with significant difference** between them (paired t = 5.6 p <0:01)

These results confirm the usefulness of physical activity in reducing overweight and obesity

Table 4.18. Comparison of the BMI before and after training by gender

	Gender	M	SD	Median	Minimum	Maximum	P*
Before	Girls	26.766	2.5238	25.4	25.06	32.5	
	Boys	26.953	2.2817	26.25	25.1	33.8	
After	Girls	24.725	3.0919	23.835	20.2	31.7	**<0.01**
	Boys	25.089	3.698	24.5	16.66	33.3	**<0.01**
	Residence						
Before	Rural	25.63	0.4762	25.4	25.2	26.5	
	Urban	27.128	2.5187	25.6	25.06	33.8	
After	Rural	23.537	2.7597	22.95	20.2	29.5	**0.04**
	Urban	25.23	3.5152	24.45	16.66	33.3	**<0.01**
	Age						
Before	9	26.942	2.3287	25.4	25.06	32.1	
	10	26.85	2.4854	25.75	25.1	33.8	
	11	25.3		25.3	25.3	25.3	
After	9	24.903	3.6672	24.4	16.66	31.7	**<0.01**
	10	25.066	3.2502	24.345	20.2	33.3	**<0.01**
	11	22.7		22.7	22.7	22.7	**<0.01**

*Vlera e ***p*** e llogaritur me: paired samples t-test

It noted that the BMI is significant reduced in both sexes, as children who live in rural areas as well as those living in urban areas and in all age groups.

These results confirm the usefulness of the training in all aspects: gender, location and age.

6. DISCUSSION

In total, 548 participated in the study aged between 9-10 years old students from various schools in the district of Elbasan. 260 (47.4%) of children were girls and 288 (52.6%) of them were boys, without significant difference between them. Girls and boys are equally represented in this study.

136 (24.8%) of children are residing rural while urban residence were 412 (75.2%) of children (<0:01), but they are representative of the respective populations of the pupils of urban and rural area. The average age of children is 9.4 (± 0.5) years.

The prevalence of obesity in our study is 2% 95% CI (1-3.5%).

20 (7.7%) of boys and 28 (9.7%) of girls are Overweight;

5 (1.9%) of boys and 6 (2.1%) of girls are Obese Grad I ;

No significant difference observed between boys and girls in terms of the BMI values.

It noted that boys are 1.3 times more likely to be overweight and obese, but no significant difference between them.

10 (7.4%) of pupils living in rural areas and 38 (9.2%) of pupils living in urban area are overweight;

11 (2.7%) of pupils living in the city are Obese Grad I.

Observed significant difference between students who live in urban areas and the pupils living in rural areas in terms of the BMI values.

Obesity is an urban phenomenon and pupils living in the urban area has less active life compared with children living in rural areas because of the different way of life, eg city pupils spend more hours watching TV, computer, etc.

The average systolic PA girls is M = 106.1 (± 10) while the boys is M = 106.10 (± 9.69), with no significant difference between them.

The average disstolik PA girls is M = 61.0 (± 7.27) while boys is M = 61.33 (± 7.98, with no significant difference between them.

The average length of girls is M = 141.63 (± 7:03) while the boys is M = 140.70 (± 6.66), with no significant difference between them.

The average weight of girls is M = 36.01 (± 9.16), while the boys is M = 35.59 (± 9.62), with no significant difference between them.

The average the BMI of the girls is M = 17.92 (± 3.87) while boys is the most = 17.87 (± 3.99), with no significant difference between them.

The average the BMI for children living in rural area is M = 7.10 (± 12:28) while those living in the urban area is M = 18:16 (± 4.10), with significant difference between them.

The interaction of gender with the residence does not affect the BMI.

The average BMI of the age of 8 is M = 15, aged 9 years is M = 17.85 (± 4.0), aged 10 years is M = 17.90 (± 3.83) and age 11 is M = 20.3 (± 18.4) no significant difference between them.

The interaction of gender with the residence does not affect the BMI. Interaction of residence with age does not affect the BMI.

The average value of cholesterol levels in girls is M = 151.7 (± 42.8) while in boys is M = 154.7 (± 43.5), with no significant difference between them.

The average value of cholesterol levels in children living in rural area is M = 141.1 (± 35.1) while those living in the urban area is M = 157.3 (± 44.8, with significant difference between them.

The interaction of gender with the residence does not affect the level of cholesterol in the blood.

The average value of triglyceride levels in girls is M = 78.6 (± 25.8) while in boys is M = 81.5 (± 26.2), with no significant difference between them.

The average value of triglyceride levels for children living in rural area is M = 74.3 (± 21.5) while those living in the urban area is M = 82.1 (± 27.1), with significant difference between them.

The interaction of gender with the residence does not affect the level of triglycerides (two way ANOVA F-ratio = 0.3 p = 0.5).

The average value of the glycemic level in girls is M = 92.8 (± 7.75), while in boys is M = 92.2 (± 6.85), with no significant difference between them.

The average value of of glycemia for children who live in rural area is M = 91.6 (± 5.7) while for those in the urban area is M = 92.7 (± 7.3), no significant difference between them.

Girls have an average activity M = 107.3 (± 53.2) minutes per week while boys M = 11.3 (± 58.2) minutes per week, with no significant difference between them.

The average activity of children living in rural areas is M = 103.2 (± 47.2) minutes per week, while in urban areas M = 111.4 (± 58.3) minutes per week, with no significant difference between them.

Activity average age of 8 years is M = 90 minutes, at the age of 9 years is M = 110.28 (± 57.0) minutes, at the age of 10 is M = 108.06 (± 54.19) minutes and at the age of 11 is M = 135 (± 90) minutes, with no significant difference between them.he interaction of gender with the residence does not affect glycemic levels.

Activity is not affected by the interaction of gender with age.

Activity is not affected by the interaction of residence with age.

Students who are overweight and obese have higher values of blood pressure, fat and glycemic compared with children of normal weight and malnutrition.

59 students with overweight and obesity underwent training with increased physical activity

270 minutes per week.

Weight before training is M = 55.2 (± 6.5) and after training is M = 54.8 (± 8.2) with **no significant difference between them.**

BMI values before training is M = 26.8 (± 2:36) and after training is M = 24.9 (± 3.4) with **significant difference between them**.

True weight but no significant change while the children are extended while BMI has proved significant.

Diastolic blood pressure before training is M = 73.1 (± 10.8) and after training is M = 70.1 (± 11.3) with **significant difference between them.**

Arterial systolic pressure before training is M = 123.1 (± 12.3) and after training Ashton M = 116.8 (± 15.1) **with significant difference between them.**

Glycaemia before training is M = 102.5 (± 10.3) and after training is M = 103.2 (± 8.4) with **no significant difference between them.**

Cholesterol before training is M = 233.7 (± 62.4) and after training is M = 203 (± 41.5) with **significant difference between them.**

Triglycerides level before training is M = 123.8 (± 34.5) and after training is M = 113.5 (± 28.5) **with significant difference between them.**

These results confirm the usefulness of physical activity in reducing overweight and obesity.

It noted that BMI is significant reduced in both sexes, as children living in rural areas as well as children living in urban areas and in all age groups.

These results confirm the usefulness of the training in all aspects: gender, location and age.

7. CONCLUSION

- Obesity is a major problem of public health that requires urgent intervention. Several factors seem to lead to obesity as boys and girls, to the attention should be paid to the role of children's involvement in daily physical activity.

- The prevalence of obesity in children aged 9-10 years old in the district of Elbasan is 2% 95% CI (1-3.5%).

- No difference was found between boys and girls.

- 2.7% of pupils living in the city are Obese.

- Obesity is an urban phenomenon.

- Overweight and obese children have higher values of fat and glycemic compared with children with normal weight and malnutrition.

- 59 children with overweight and obesity underwent training with adding physical activity to 270 minutes per week.

- After the training was reduced so important BMI values; Diastolic PresionitArterial; Arterial systolic pressure; cholesterol; Triglycerides.

- These results confirm the usefulness of physical activity in reducing overweight and obesity.

- The BMI is significant reduced in both sexes, as children living in rural areas as well as children living in urban areas and in all age groups.

- These results confirm the usefulness of the training in all aspects: gender, location and age.

8.RECOMMENDATIONS

Recommendations for physical activity at the individual level.

- All children aged 9-10 years should include at least 1 hour per day in average physical activity (walking, riding, cycling, dancing, swimming, games).

- At least 2 times a week some of these activities should help to enhance and maintain muscular strength, flexibility and bone health system (80).

- Physical activity for more than 60 minutes to provide health benefits.

- Daily physical exercise should be mainly in the aerobic zone.

Recommendations for physical activity at the family level.

- Promoting physical activity guidelines from the family environment is an important link on the involvement of children in physical activities.

- Family is the most important environment during development from childhood and that has a huge impact on children's behavior and consequently helps children maintain a normal weight and educates promoting healthy and active lifestyles.

- Parents should be the prime example of involvement in physical activity for their children. They should set a time in the family to perform some physical exercises together, plan trips or walking with their children or go after dinner at a playground on foot rather than watch TV or videogame.

- Associations of parents can promote extra-curricular school activities by considering the school as a safe place where children can deal with different sports.

- Family can enhance life skills among its members. When performing physical activities for children and adolescents, their personality and preferences should be considered. It is important to establish a routine exercise for at least an hour a day.

- Increase the motivation of children from the family and their support, while practicing active habits will be very important for them to keep them interested.

- Parents need to show an interest in physical education classes in school or a specific activity, they should encourage children to do physical activities individually.

- Parents should encourage children in various physical activities by not allowing them to surrender even when they are not capable.

Recommendations for physical activity at school environment.

- Physical activity in schools remains a key point of promoting physical activity.

- School is the key to develop, implement and to maintain policies that allow a healthy life for every individual for the sole reason that almost half of children spend time in them.

- Our curricula should provide further expansion of physical education programs and sports

suitable for children under age.

- Physical education should be recognized as an integral part of education and should be a national priority. For many years the physical education of children is overlooked in school curricula programs or by reducing or without due regard to physical activities.

- Schools should develop individualized plans (by age group) to promote a healthy way of life through participation in physical activities and sports.

- Active and healthy programs should include all of the school community, so that all students involved in these activities regardless of gender, race or age.

- Construction of the gaming sites on school grounds should be considered as free children in the schedule may be included in different games of praktikasportive 20-30 minutes a day.

- Recommend that required hours of physical education should provide 2 to 3 hours per week for all levels of education.

- Schools should support and physical activities are promojë while providing space and time students who want to be active in sports, arts, institutional or traditional.

- Extracurricular physical activity. Schools in cooperation with the council of parents should develop specific programs championships extracurricular physical, active games and sports healthy respect the principles of fair play, inclusion and stay fit.

- Schools should prevent the sale of food and beverages energy in its.

Recommendations for physical activity at the local government level.

Local governments should promote cooperation and relations between communities, schools, health centers and families.

- Local government should promote and encourage sports resources (already built sports equipment, sports clubs and sports schools SPACE blocks) for the practice of recreational physical activities by citizens outside certain hours of use.

- Clubs and community based organizations should be considered as key factors in the development of strategies to reduce obesity in children and adolescents.

- Local governments should establish policies to promote a simple and secure environment for the exercise of physical activity and healthy way of living, where citizens can move (walk or ride a bicycle) in urban and outdoor environments.

- Sports organizations, sports federations and the Olympic Committee should propose programs of physical activities and sports for all, regardless of age, ability or other personal characteristics.

- Improving attitudes towards physical activity of adults (teachers, parents, practitioners and general health, etc.) versus exercise and physical activity between education (guides of

physical activities, educational seminars etc.) and increasing the participation of government organizations National sports for all programs (lessons of physical activities for teachers or professionals) are important aspects of having more physically active young people in society.

- Young people with low socio-economic or ethnic minorities may be more prone to disability and obesity. Special efforts should be made to ensure that physical activity is promoted in these groups with sensitivity towards cultural values and beliefs.

Recommendations for physical activity at the level of central government

-Promoting public information campaigns about the importance of health, risk of obesity and its health consequences, as well as the awareness of population especially children and adolescents for a healthy lifestyle.

- The Government should develop a national educational program to promote healthy eating and physical activity.

- Promotion of groups that include representatives of the food industry, consumers, media and food agencies, encouraging healthier ways of eating.

- The Government should develop a national educational program that includes the latest information about the importance of physical activity and nutrition way.

- The government should also develop a program plan for physical education classes, in which case the place is to prevent obesity through physical activities for school children and adolescents.

- The Government should promote the creation of multidisciplinary groups that encourage physical activity and health education subsystem.

- The government should promote tax policies that enable a healthy lifestyle.

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