

# Body Mass Index, Self Weight Perception and the Intention of Changing the Weight in Teens of 11-18 Years

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*The research intends to investigate the body mass index, the self-weight perception and the intention of changing the weight in teenagers, from Timisoara, Romania. The data sample was made of 243 students of 11-18 years old: 37.9% in middle school and 62.1% in high school; 56.4% girls and 43.6% boys. The manner of work was a cross-sectional study, study case type. The results show that in middle/high school there are: underweight 39.8%/22.9%, normal weight 51.1% and overweight and obese, 9.1%/8.3, with a significant difference between the 2 age groups, the difference being very small. 62.2% of middle school students and 51.7% of the ones in high school appreciate their own weight as having the normal value. 24.4% of the middle school students and 32.4% of high school students consider that they have a weight over the normal value, and at 15-18 years old, girls perceive weight as being significantly higher than boys. The students want to lose weight, 42.7% of middle school students and 42.8% of high school students. At 11-14 years old, boys want to gain weight more frequently than girls.*

**Keywords:** teenagers, body mass index, self-weight perception

Childhood obesity correlates with a high risk of obesity and adult age associated pathologies. In comparison with normal weight children, the ones with high BMI have respiration difficulties, high risk of fractures, high blood pressure, premature increase of cardiovascular disease markers, insulin and psychological effects resistance [1].

At individual level, obesity prevention in children can be made by limiting the energy contribution from fat and sugar, increasing the consumption of fruits and vegetables, whole grains cereals and seeds, exercising at least 60 min per day.

At community and society level, public and private entities must be involved in order to offer the starting points in the right decisions and in the accessibility of healthy food choices, but also in exercising environment [2].

Recently, in an investigation [3] that included data from 4 population studies from Germany and 34,240 children with ages between 3-18 years old, was calculated the impact on obesity of familial, social, intrauterine life and immediately postpartum factors and also the life style. The identified determinants can explain 77.7 % of obesity prevention. Taking into account the risk pertaining to each factor calculated by the authors, they consider that in children, the efficiency of lifestyle interventions in overweight and obesity prevention is limited, and they plead in favor of interventions, aimed towards familial and social environment, especially promoting the reduction of the time spent in front of the screen.

Proof which concerns the spread, nature and effects of child food marketing shows that advertising, mainly, is very common all around the world. The advertising is oriented for food with high content of fat, sugar or salt. The commercials from TV programs influence the children's food preferences, buying requests and consumption

models, and indeed, the children are exposed to a large variety of other marketing techniques. The marketing for child food products is now a global phenomenon and tends to be pluralistic and integrated, using more messages in more channels [4].

We proposed a study concerning the aspects associated to the body mass index in teenagers from Timisoara, Romania.

## Experimental part

### Material and methods

The study sample had a total of 243 students from a Timisoara high school: 37.9% in middle school and 62.1% in high school; 56.4% girls and 43.6% boys, the two groups being homogenous from gender distribution point of view,  $p=0.248$ ; with ages between 11-18 years old, the average age being 15.04 years old with a standard deviation of 2.124.

The work method was a cross-sectional study, study case type, based on using the CORT 2004 questionnaire concerning the behaviors with health risk in teenagers and youngsters. The questionnaire was validated by the Ethics Commission from Victor Babes University of Medicine and Pharmacy, Timisoara.

The study was made with the written approval of the education unit. The students' inclusion in the study was made after the consent clearly expressed by each study participant, respecting the individual rights.

The data processing and interpretation uses modern methods of advanced medical statistics, using the PASW 18 (SPSS 18) 2010 software. The threshold value of statistical significance was settled to  $p<0.05$ , excepting the situations where the Bonferroni correction was applied, where the accepted threshold level was mentioned in the

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text. For comparing the ordinal data we used the Mann-Whitney and Kruskal-Wallis test. The chi-square test was used for ordinal/nominal data.

## Results and discussions

### Body mass index (BMI)

The body mass index of the study participants is between 14.38 and 48.44. The 11-18 years old students are from all categories, from underweight to obese. The average BMI value is of 20.61 and DS of 3.538, this being a normal value. For the groups of students taken in the study, the values are displaced towards right, most values being in the normal weight area (fig. 1).

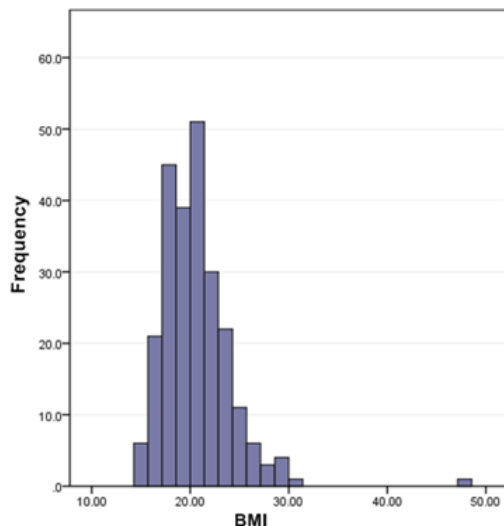


Fig. 1. Study participants' distribution according to body mass index

The students were placed according to BMI in the following groups: underweight with  $BMI < 18.5$ , with a percentage of 28.8%; normal weight with BMI between 18.5 and 24.9, with a percentage of 62.1%; overweight defined with a BMI between 25 and 29.9, and obese with BMI over 30, with a percentage of 9.2%.

The students' classification according BMI weight class is shown below, separately for middle school and high school. In middle school, the underweight represent 39.8%, the normal weight represent 51.1%, and the overweight and obese, 9.1%. In high school, the underweight are in percentage of 22.9%, normal weight in percentage of 68.8%, and the overweight and obese in percentage of 8.3%.

We applied a variation analysis to determine the gender and age categories effect on BMI in the teenagers group of 11-18 years old. The interaction between age category and gender was not statistically significant,  $p=0.932$ . We found a significant difference between the 2 groups,  $p=0.001$ , the difference being very small. The gender differences were not statistically significant,  $p=0.431$  (fig. 2).

### Self-weight perception

In middle school, the majority, 62.2% appreciate their own weight as being approximately at normal value, 24.4% consider that they have a weight over the normal value (girls more frequently) and 13.3% consider own weight as being under the normal value.

In high school, 51.7% appreciate their own weight as being approximately at normal value, 32.4% consider that they have a weight over the normal value (girls more frequently) and 15.9% consider own weight as being under the normal value (fig. 3).

In the 11-14 age group we found no differences between genders for self-weight perception,  $p=0.186$ . In the 15-18 age group, girls perceive their weight significantly more increased, in comparison to boys  $U=2046$ ,  $z=-2.17$ ,  $p=0.029$ . We found no differences of self-weight perception

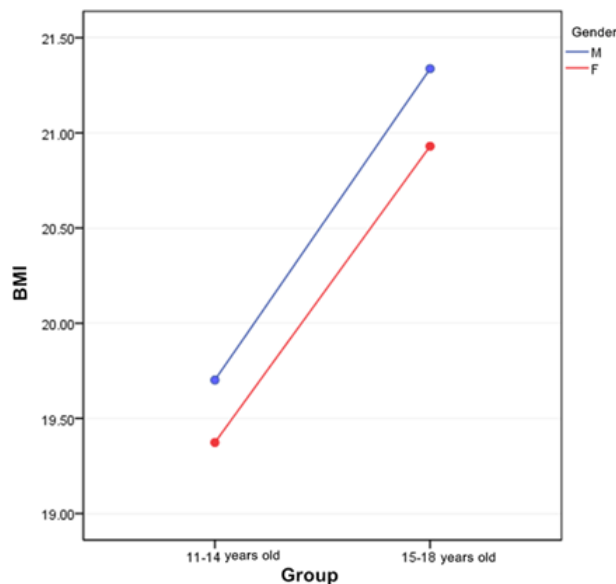


Fig. 2. Middle and high school students' distribution according to body mass index classification, on genders

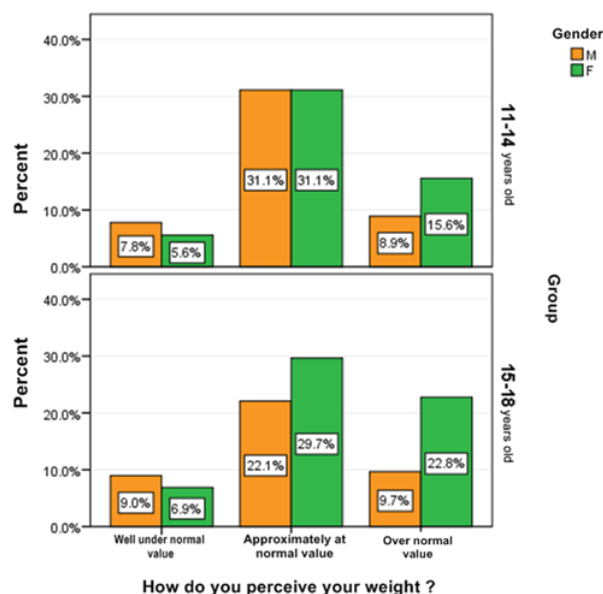


Fig. 3. Percentage distribution of middle and high school students according to the manner in which they appreciate their own weight, on genders

in the 2 age groups, neither in girls ( $p=0.459$ ), nor in boys ( $p=0.969$ ).

### Actions of modifying the body weight in the near future

A percentage of 87.6% of middle school students and 91% of high school students plan to take action concerning their own weight in the near future (fig. 4). Most frequently, they want to lose weight, 42.7% of middle school students and 42.8% of high school students, mostly girls. On the second place are the ones who want to keep their current weight, 31.5% of middle school students and 26.9% of high school students, especially high school girls. On the third place are the students who want to gain weight, 13.5% of middle school students and 21.4% of high school students, especially high school boys.

Excluding from the analysis the students who do not want to take any action in the near future, in the 11-14 years old age group, we found that frequently, boys want to gain weight more than girls,  $U=736.5$ ,  $z=-2.18$ ,  $p=0.029$ . Following the same procedure, in the 15-18 years old age group, we found no differences between genders in the

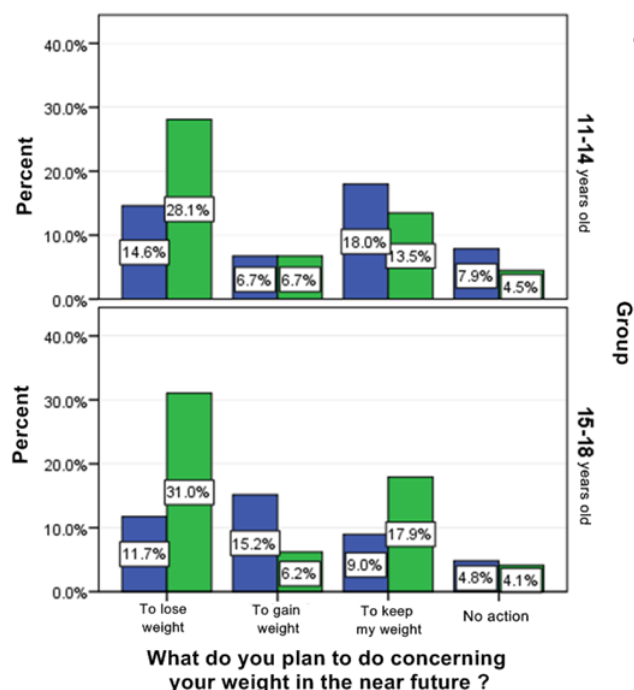


Fig. 4. Percentage distribution of middle and high school students according to what they are planning to do, in the near future, concerning their body weight, on gender

actions which they want to take, concerning their own weight,  $p=0.100$ .

Excluding from the analysis the students who do not want to take any action in the near future, we found no differences in the 2 age groups, concerning the actions which they want to take, concerning their own weight, neither in girls ( $p=0.895$ ), nor in boys ( $p=0.264$ ).

For the batches taken for study, BMI is within the normal limit for 62.1% of the participants and over the normal limit, representing the overweight and obese participants, at 9.2%, similar results with other studies [5], on the same population from western Romania. The statistical analysis has highlighted significant statistical differences between the 2 age groups, the 15-18 years old group having a significantly more increased BMI than the 11-14 years old group. Gender does not have a significant interaction with BMI increase between the 2 age groups. The difference between BMIs might be explained with the height-weight development and with body composition differences presented between the 2 age groups.

Self-weight perception represents an aspect of self-body image awareness. The girls from 15-18 years old group perceive their weight significantly more increased, in comparison with the boys of the same age. Using the data from a cross-sectional study that included 2195 teenagers, Yan and colleagues [6] had applied a multivarious analysis and found that age, gender, marital status of parent-guardian were independently associated with wrong perception of body weight, controlling the value of the real BMI.

Other authors [7] concluded that teenagers who overestimate their weight are exposed to risk factors with effects on health: seventh grade teenagers, who overestimated their weight, reported significantly more frequently the consumption of substances, depressive symptoms, violence and reduced levels of optimism, in comparison with the ones that perceived their weight correctly. Teenagers can have social difficulties in integration in schools or Universities. They feel not included

because they cannot participate in social activities; they do not have a permanent contact with the collectivity [8,9].

Considering the measures that their plan to take concerning their weight, we found significant differences only in the 11-14 years old group, where boys significantly want, more frequently than girls, to gain weight.

In a cross-sectional study that used YRBSS data from 2007 [10], the authors found that participants of both genders who perceived their weight correctly, have significantly more chances than the ones who perceived it wrong, to report their attempt to keep or lose weight through healthy methods. The boys who perceived their weight wrongly have reported, more rarely than the one who perceived their weight correctly, reaching the recommended levels of fruits and vegetables and physical activity.

## Conclusions

According to BMI weight class, in middle school we have overweight students 39.8%, normal weight 51.1% and overweight and obese 9.1%; in high school, overweight 22.9%, normal weight 68.8% and overweight and obese 8.3%, with a significant difference between the 2 age groups, the difference being very small. The differences between genders are not significant statistically. 62.2% of middle school students and 51.7% of high school students appreciate their own weight as being approximately at a normal value. 24.4% of middle school students and 32.4% of high school students consider that they have a weight over the normal value. 13.3 and 15.9% of students consider that they have a weight under the normal value. In the 15-18 years old group, girls perceive their weight significantly more increased than boys.

In 87.6% of middle school students and 91% of high school students plan to take action concerning their weight, in the near future; most frequently, they want to lose weight, 42.7% of middle school students and 42.8% of high school students. In 11-14 years old we found that, boys want to gain weight more frequently, in comparison to girls.

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Manuscript received: 21.11.2017