THE BODY MASS INDEX IN RELATION WITH THE SELF-PERCEPTION OF WEIGHT AND THE BODY COMPOSITION FROM DIFFERENT POPULATIONAL GROUPS

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The purpose of this paper is to analyze the self-perception of weight in relation with the body mass index and the body composition of three working groups composed of physically untrained young students, young athletes and patients diagnosed with chronic diseases. The working groups consisted of 110 participants: untrained students, athletes and dialysed patients; 50.9% women and 49.1% men; with an average age of 26.03. The BMI of the patients is significantly higher than the BMI of the athletes and untrained students. No significant differences were found between groups in terms of self-perception of weight. Compared to the physically untrained students and patients, the athletes have a significantly higher level of muscle tissue. The athletes also have a significantly lower adipose tissue than that of the physically untrained students and patients. Keywords: THE BODY MASS INDEX, SELF-PERCEPTION OF WEIGHT, BODY COMPOSITION

The contemporary world is experiencing a marked increase in obesity and obesity-related diseases while the history of obesity, analyzed in terms of healing, represents a history of failure (1-4). WHO recommends as a screening modality for overweight and obesity, the body mass index method (5-7). The subjective self-perception of weight, more or less overlapping the actual nutritional state, can trigger a genuine psychopathology at all age groups (8). The body composition is used by health, fitness, clinical and school medicine experts. Regarding weight management, the estimation of the total amount of fat and fat-free mass can be used to determine the actual weight, to help formulate recommendations for diet and physical activity, to monitor the changes in body composition of those who participate in weight reduction or body remodeling programs.

The purpose of this paper is to analyze the body mass index in relation to the self-perception of weight and the body composition of three working groups composed of physically untrained young students, young athletes and patients diagnosed with chronic diseases.

MATERIAL AND METHODS

Material: The working groups were composed of 110 participants, divided into 3 groups: a group of untrained students 70.9% (78), a group of young athletes...
15.5% (17) and a group of dialyzed patients 13.6% (15). In the sample, the gender distribution was: 50.9% (56) women and 49.1% (54) men. The participants’ age ranges from a minimum of 19 and a maximum of 72 years, with an average of 26.03 years and a SD equal to 12.95.

Methods:
1. Determining the BMI (the body mass index)
   The body mass index is calculated using other anthropometric measures, i.e. the weight (Silver Crest electronic scale) and height (stadiometer), using the following formula: $\text{BMI} = \frac{\text{weight}}{\text{height}^2}$.
   The standard BMI classification and the degree of risk for co-morbidities are presented in table I.

   **TABLE I**
   The standard BMI classification
<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI (kg/m$^3$)</th>
<th>The risk for co-morbidities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
<td>Moderate</td>
</tr>
<tr>
<td>Normal</td>
<td>18.5 – 24.9</td>
<td>Medium</td>
</tr>
<tr>
<td>Overweight</td>
<td>25 – 29.9</td>
<td>Slightly increased</td>
</tr>
<tr>
<td>Obesity class I</td>
<td>30 – 34.9</td>
<td>Moderate</td>
</tr>
<tr>
<td>Obesity class II</td>
<td>35 – 39.9</td>
<td>Severe</td>
</tr>
<tr>
<td>Obesity class III</td>
<td>&gt;40</td>
<td>Extreme</td>
</tr>
</tbody>
</table>

2. The self-perception of weight. It was conducted within a population-based survey using a CORT 2004 questionnaire concerning health risk behaviors.

3. Evaluation of certain body composition elements. In order to have a complete picture of the body composition, of insufficient or fat excess and/or muscle deficiency on different segments of the body, we conducted a comprehensive evaluation of body composition using a multi-frequency bioimpedance method (InBody 720).

4. Processing advanced medical statistics. We used version 18 (2010) of the SPSS programme and the Kruskal-Wallis and Mann-Whitney tests for nonparametric data.

RESULTS AND DISCUSSION
1. The body mass index (BMI). The BMI from the group of untrained students varies between 16.43 and 37.77, with an average of 22.76 and a SD of 3.95. The BMI from the group of student athletes varies between 17.82 and 28.12, with an average of 22.22 and a SD of 2.89. The BMI from the group of patients varies between 18.42 and 35.11, with an average of 28.32 and a SD of 4.21 (tab. II).

   The participants in this study can be divided according to the BMI as follows. A 9% (7) of untrained students are underweight, 66.7% (52) are normal weight and 24.4% (19) are overweight or obese. In the student athletes’ group, 5.9% (1) are underweight, 76.5% (13) are normal weight and 17.6% (3) are overweight or obese. In the patients’ group, 6.7% (1) are underweight, 13.3% (2) are normal weight and 80.0% (12) are overweight or obese (fig. 1).
The body mass index in relation with the self-perception of weight and the body composition from different populational groups

TABLE II
The characteristics of the BMI descriptive analysis according to each group

<table>
<thead>
<tr>
<th>BMI</th>
<th>Untrained students</th>
<th>Student athletes</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Valid</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>78</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Missing data</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>22.76</td>
<td>22.22</td>
<td>28.32</td>
</tr>
<tr>
<td>Medium</td>
<td>22.09</td>
<td>21.36</td>
<td>29.84</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>3.95</td>
<td>2.89</td>
<td>4.21</td>
</tr>
<tr>
<td>Minimum</td>
<td>16.43</td>
<td>17.82</td>
<td>18.42</td>
</tr>
<tr>
<td>Maximum</td>
<td>37.77</td>
<td>28.12</td>
<td>35.11</td>
</tr>
</tbody>
</table>

Fig. 1. The distribution of participants’ histogram according to the BMI, for each group

2. The self-perception of weight. From the untrained students’ group, 42.3% (33) consider themselves to be normal weight, 14.1% (11) think they are underweight and 43.6% (34) say they are overweight. In the student athletes’ group, 58.8% (10) state they are normal weight, 17.6 (3) believe they are underweight and 23.5% (4) think they are overweight. In the patients’ group, 46.7% (7) say they are normal weight, 6.7% (1) are underweight and 46.7% (7) believe they are overweight (fig. 2).
3. No significant differences were found between groups regarding the self-perception of weight, p>0.05. We found out that 59% of the untrained students, 58.9% of the athletes and only 33.3% of the patients correctly perceive their weight.

4. Body composition elements. The muscle tissue level is significantly different according to the perception of weight H(2) = 13.69, p<0.001. We have further investigated this difference and the level of statistical significance was reduced to 0.016 due to the Bonferroni correction. The muscle tissue level is significantly reduced at those who perceive themselves as overweight compared to those who consider their weight to be normal U=715, z=-3.05, p<0.01, respectively those who believe they are underweight U=173, z=-2.80, p<0.01. Among those who believe they are under normal weight and those who perceive themselves as normal weight, the differences in muscle tissue percentage are not statistically significant, p>0.016 (fig. 3).

The adipose tissue level is significantly different according to the perception of weight H(2)=25.43, p<0.001. We have further investigated this difference and the level of statistical significance was reduced to 0.016 due to the Bonferroni correction. The adipose tissue level is significantly higher at those who perceive themselves as overweight compared to those who consider their weight as normal U=610, z=-3.83, p<0.001, respectively those who perceive themselves as underweight U=99.5, z=-4.06, p<0.001. Those who perceive themselves as being under normal weight have a significantly lower adipose tissue level than those who perceive themselves as normal weight U=209.5, z=-2.57, p<0.01 (fig. 4).
The body mass index in relation with the self-perception of weight and the body composition from different populational groups

**Fig. 3.** The muscle tissue percentage distribution of the participants according to the perception of weight

**Fig. 4.** The adipose tissue percentage distribution of the participants according to the perception of weight

Previous studies have shown that there is an association between the perception of weight and the obesity control methods, often independent from the actual weight.
In a recent study, Darlow et al. (11) have discovered that patients who perceived themselves as overweight and believed that being overweight is a health problem and who also had a family history of diabetes, had a higher risk of developing this disease. Patients with the same type of association, with obesity and a family history of cardiovascular diseases had higher chances of perceiving themselves as exposed to a higher development risk of various cardiovascular diseases.

**CONCLUSIONS**

The BMI of the patients is significantly higher than the BMI of the student athletes with a large size difference and with an average size difference than that of the untrained students. The differences between the group of untrained students and the student athletes group are not statistically significant, p>0.05. No significant differences between groups were found regarding the self-perception of weight.

Compared to the physically untrained students and patients, the student athletes have a significantly higher level of muscle tissue. The muscle tissue percentage of the patients is significantly lower than that of the physically untrained students. The muscle tissue percentage is positively correlated with the BMI in the student athletes’ group and negatively correlated regarding the physically untrained students’ group.

The student athletes have a significantly lower level of adipose tissue than that of the physically untrained students and patients. The adipose tissue percentage of the patients is significantly higher than that of the physically untrained students. The adipose tissue percentage is correlated with the BMI in the patients’ group and the physically untrained athletes’ group.

**REFERENCES**

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**BORIC ACID IRRIGATION AS AN ADJUNCT TO MECHANICAL PERIODONTAL THERAPY IN PATIENTS WITH CHRONIC PERIODONTITIS**

A group of researchers from the Department of Periodontology of Izmir University, Turkey realized a single-masked, randomized, controlled clinical trial whose purpose was to evaluate the effects of boric acid irrigation as an adjunct to scaling and root planing (SRP) on clinical and microbiologic parameters and compare this method with chlorhexidine irrigation and scaling and root planing alone in patients with chronic periodontitis. In the study were included forty-five systemically healthy patients with chronic periodontitis, divided into three groups: the first group (C) - scaling and root planing + saline irrigation; the second group (CHX) - scaling and root planing + chlorhexidine irrigation; the third group (B) - scaling and root planing + boric acid irrigation. A preclinical analysis was realized to determine an ideal concentration of boric acid. Clinical measurements (plaque index – PI, gingival index – GI, probing depth - PD, clinical attachment level - CAL, and bleeding on probing – BOP) were performed at baseline, 1 month, and 3 months after treatment. Subgingival plaque samples were also taken. Quantitative analysis of *Porphyromonas gingivalis*, *Tannerella forsythia*, and *Treponema denticola* was performed using real-time polymerase chain reaction (PCR) procedures. The concentration of boric acid was 0.75% in this study. All clinical parameters showed statistically significant reduction at all time points compared to baseline in all groups (P <0.001). Whole-mouth PD and CAL reduction was similar in all groups at all time points after treatment (P >0.05). The PD and CAL reductions for moderately deep pockets (PD ≥5 and <7) were greater in the B group compared to other groups between baseline and 1 month (P <0.05). For deep pockets (PD ≥7), reductions were similar in the B and CHX groups (P >0.05). BOP (percentage) was significantly lower in the B group compared with the CHX and C groups in the first month after treatment (P <0.001). GI and PI scores were significantly lower in the B and CHX groups compared with the C group at all time points after treatment (P <0.05). The amounts of *Porphyromonas gingivalis*, *Tannerella forsythia* and *Treponema denticola* were significantly reduced in all treatment groups after 1 month (P <0.05). No statistically significant differences were detected among the groups for microbiologic parameters at any time points after treatment (P >0.05). The obtained data suggest that boric acid could be an alternative to chlorhexidine, and it might be more favorable because boric acid was superior in whole-mouth BOP as well as PD and CAL reduction for moderate pockets in early time periods. (Sağlam M, Arslan U, Buket Bozkurt S, Hakki SS. Boric Acid irrigation as an adjunct to mechanical periodontal therapy in patients with chronic periodontitis: a randomized clinical trial. *J Periodontol*, 2013; 84 (9):1297 – 1308).

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