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A comparison of Health-Related Quality of Life among Normal-Weight, Overweight and Obese adolescents

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Abstract

The present study was conducted to compare the dimensions of Health-Related Quality of Life in normal weight, overweight and obese adolescent boys and girls. A sample of 240 boys and girls, 80 each with normal weight, overweight and obese were randomly selected from high school students. Participants’ weights were measured by using a digital weighing machine and their heights were measured with an inflexible metal meter scale. To assess Health-Related QOL the SF-36 questionnaire were used. Data were analyzed by using multivariate analyses of variance. Findings indicated on the dimension of physical functioning normal weight individuals fared better than the other two groups and overweight individuals fared better than the obese group. On the dimension of Role limitations due to physical health, the normal weight group was in a more favorable position than the other two groups. On the dimensions of Social functioning, pain, and general health, the normal group was only better than the obese group. In this study was concluded that the negative effects of overweight and obesity weren’t obvious on all the dimensions of Health-Related QOL, but it was the physical dimensions that were adversely affected.

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1. Introduction

Overweight and obesity in these last recent years have turned to one of problematic affairs in human societies, and it seems to influence many aspects of society and the individuals. Correspondingly, World Health Organization in 1998 by issuing a manifestation declared that development of population of obesity people is becoming epidemic, and improvement of the procedure with such speed could be a real threat (World Health Organization, 1998). Nowadays the significance of obesity in world is related to prevalence of obesity among children and adolescents. These days at least 27% of children and 21% of adolescents are obese; this indicates that in these last two decades there has been an increase of about 54% in children and 39% in adolescent's overweight (McCarty, 1996). Further any kind of sicknesses and psychological disorders in these periods must be taken in to account (World Health Organization, 1998). There have been various studies about obesity done in Iran; however, about the quality of life it lack enough study and further research in the area is needed. Quality of life is described by World Health Organization as: "individuals understanding of their own situation in life, and in cultural texture and system

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of values which they live with; this understanding is related to their goals, expectations, standards, and worries" (World Health Organization, 1994).

Quality of life is considered in different ways. An example of this consideration is Health-Related Quality of Life (Health-Related QOL). The term Health-Related QOL is used in measuring influence of various irregularities, infirmity and long term and short term illnesses and also is used in different populations. In fact Health-Related QOL is used for evaluating daily life's pressure on health (Acquadro & et al., 2003). Health-Related QOL can be checked in eight dimensions including: Physical function, Role limitations due to physical health, Pain, General health, Energy/fatigue, Social functioning, Role limitations due to emotional problems and Emotional well-being.

Like the other illness and pressing situations, obesity and overweight can be one the factors which influence individual's quality of life and turn it to low and poor quality of life. Therefore, measuring Health-Related QOL can distinguish the resulted pressures and changes in the mentioned dimensions. By concluding the previous studies, it is possible to declare that some of the researches related to obesity and quality of life suggest that there is a relation between high BMI (body mass index) and crooked quality of life and when BMI is so high (intense obesity), the weakness and harm in quality of life will be intense. However many other studies have mentioned only the relation between BMI mass and weakness in physical aspects of life quality and in psychological aspects no relations have been reported. Thus in all of the studies there is convergence in physical aspects of life quality and there is divergence in psychological aspects. For example in research on 145 couple of siblings Richards, Adams & Hunt (2000) get in to point that quality of all dimension of index SF–36 and index of emotional weal in subjects with intense obesity are significantly low when compared with that of subjects with normal weight. Moreover, individuals with intense obesity felt their general healthiness in low level and had more critical state compared to normal individuals. Also Swallen, Reither, Haas & Meier (2005) in their study on sample of adolescents found negative relation between BMI and physical quality of life. In other words by increase of BMI the physical quality of life would decrease and become weaker; however, relationship with psychological aspects of quality of life was not significant.

Therefore the following researching question rises. 1. Do eight dimensions of Health-Related QOL in different levels of BMI differ among adolescents?

2. Materials and methods

2.1. Subjects

Statistical universe of the study was 55100 high school students studying in 4th district of education organization of Tabriz city (in Iran). In sampling, regarding the generic state and three metrical groups there were 6 levels of sampling and consequently the comparison was made for six groups. The intended samples were selected by method of two steps random–cluster sampling and simple random sampling. First the essential information about the high schools and overall number of the students of the mentioned region was received from the education organization. In first step of sampling, by random–cluster sampling, among the boyish and girlish high schools eight schools (4 boyish schools and 4 girlish schools) were selected randomly schools were visited. Then again by cluster sampling (each class as a cluster) 18 classes were selected from three grades including first grade, second grade, and third grade. Each class had average of 35 students. Finally 9 girlish classes and 9 boyish classes were selected. The reason of choosing 18 classes was regarding to amount of obesity prevalence in Tabriz city (about 20%) and also possibility of omitting some of samples in different steps, so that it would be possible to find the intended obese samples.

Weight of every 630 students (305 girls and 325 boys) was measured by digital balance and their height was measured by metal meter with no elasticity. After calculating BMI for each subject, individuals were classified using the CDC standard which had determined the bound of normal weight in percentile of 5 to 85 (5 ≤ BMI ≤ 85), bound of overweight in percentile of 85 to 95 (85 ≤ BMI ≤ 95), bound of obesity in percentile of 95 and above (95 ≤ BMI).

In the next step using simple random sampling, from group of people whom their BMI assigned them as obese, 40 students were selected as intended sample. Then for each obese person randomly a person with overweight and a
person with normal weight were chosen and two groups were organized. In other words subjects were three weight groups formed with 40 student of each genre and totally six group consisted of 40 student was formed. In fact 240 individuals were chosen as overall intended sample.

2.2. Questionnaire

Health-Related QOL standard questionnaire SF–36: The SF–36 has eight subscales including: Physical function, Role limitations due to physical health, Role limitations due to emotional problems, Energy/fatigue, Emotional well-being, Social functioning, Pain and General health. Final translation and determination of standard questionnaire SF–36 for people with 15 ages and over 15 ages have been done in Iran. Reported a coefficient for the eight subscales are in range of 65% to 90% which shows good inner persistency of these subscales. Other measuring such as getting the validity was considered which verified suitability of the tool in Iran society (Montazeri, Ghestasbi, Vahdani niya, 2005).

2.3. Data analysis

In analyzing the data, MANOVA using the SPSS 16.0 software was employed.

3. Result

In this study each group of obesity, overweight and normal weight – each having 80 weight groups – had equal number of participants. There were 120 participants from each genre, therefore overall number participants was 240.

Initially, in order to check the default of variances equality of Health-Related QOL eight subscales, in the groups of the study, Leven's test was used and it confirmed the results.

To answer to question (Do eight dimensions of Health-Related QOL in different levels of BMI differ among adolescents?) summary of descriptive results obtained from SF–36 questionnaire is presented in table 1.

<table>
<thead>
<tr>
<th>subscales</th>
<th>BMI group</th>
<th>M</th>
<th>SD</th>
<th>subscales</th>
<th>BMI group</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical function</td>
<td>Obesity</td>
<td>60.67</td>
<td>10.555</td>
<td>Role limitations due to physical health</td>
<td>Obesity</td>
<td>57.92</td>
<td>20.321</td>
</tr>
<tr>
<td></td>
<td>Overweight</td>
<td>72.08</td>
<td>12.497</td>
<td></td>
<td>Overweight</td>
<td>62.92</td>
<td>15.603</td>
</tr>
<tr>
<td></td>
<td>Normal weight</td>
<td>70.97</td>
<td>14.004</td>
<td></td>
<td>Normal weight</td>
<td>72.17</td>
<td>18.942</td>
</tr>
<tr>
<td>Role limitations due to emotional problems</td>
<td>Obesity</td>
<td>51.11</td>
<td>33.875</td>
<td>Energy/fatigue</td>
<td>Obesity</td>
<td>60.17</td>
<td>14.900</td>
</tr>
<tr>
<td></td>
<td>Overweight</td>
<td>56.11</td>
<td>34.983</td>
<td></td>
<td>Overweight</td>
<td>63.67</td>
<td>16.921</td>
</tr>
<tr>
<td></td>
<td>Normal weight</td>
<td>59.44</td>
<td>29.491</td>
<td></td>
<td>Normal weight</td>
<td>64.75</td>
<td>17.622</td>
</tr>
<tr>
<td>Emotional well-being</td>
<td>Obesity</td>
<td>59.40</td>
<td>17.825</td>
<td>Social functioning</td>
<td>Obesity</td>
<td>69.37</td>
<td>15.511</td>
</tr>
<tr>
<td></td>
<td>Overweight</td>
<td>63.60</td>
<td>14.870</td>
<td></td>
<td>Overweight</td>
<td>75.42</td>
<td>18.973</td>
</tr>
<tr>
<td></td>
<td>Normal weight</td>
<td>65.13</td>
<td>18.486</td>
<td></td>
<td>Normal weight</td>
<td>81.67</td>
<td>16.985</td>
</tr>
<tr>
<td>Pain</td>
<td>Obesity</td>
<td>68.21</td>
<td>14.425</td>
<td>General health</td>
<td>Obesity</td>
<td>63.89</td>
<td>14.750</td>
</tr>
<tr>
<td></td>
<td>Overweight</td>
<td>74.63</td>
<td>17.417</td>
<td></td>
<td>Overweight</td>
<td>68.75</td>
<td>13.583</td>
</tr>
<tr>
<td></td>
<td>Normal weight</td>
<td>76.42</td>
<td>16.204</td>
<td></td>
<td>Normal weight</td>
<td>72.71</td>
<td>15.002</td>
</tr>
</tbody>
</table>

The results obtained from Wilks' Lambda suggest that among the three groups, at least in one of the scale of Health-Related QOL there is a significant difference (F = 5.749 and P < 0.0005) therefore in the next step the
analyses related to effects between subjects are checked in three levels of BMI.

Regarding the results presented in Table 2 which are about the effects between subjects, three groups of BMI had significant differences with each other in 5 subscales including: physical function (F = 44.639 and P < 0.0005), Role limitations due to physical health (F = 9.205 and P < 0.0005), Social functioning (F = 7.583 and P < 0.001), Pain (F = 4.404 and P < 0.014), General health (F = 5.557 and P < 0.005). However, subscales including Energy/fatigue, Role limitations due to emotional problems and Emotional well-being there was no significant difference.

Table 2. Summary of test results of effects between subjects in three groups of BMI.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical function</td>
<td>11518.611</td>
<td>2</td>
<td>5759.306</td>
<td>44.639</td>
<td>0.0005</td>
</tr>
<tr>
<td>Role limitations due to physical health</td>
<td>6272.500</td>
<td>2</td>
<td>3136.306</td>
<td>9.205</td>
<td>0.0005</td>
</tr>
<tr>
<td>Role limitations due to emotional problems</td>
<td>2111.111</td>
<td>2</td>
<td>1055.556</td>
<td>0.962</td>
<td>0.384</td>
</tr>
<tr>
<td>Energy/fatigue</td>
<td>688.611</td>
<td>2</td>
<td>344.306</td>
<td>1.310</td>
<td>0.272</td>
</tr>
<tr>
<td>Emotional well-being</td>
<td>1057.244</td>
<td>2</td>
<td>528.622</td>
<td>1.795</td>
<td>0.169</td>
</tr>
<tr>
<td>Social function</td>
<td>4532.986</td>
<td>2</td>
<td>2266.493</td>
<td>7.583</td>
<td>0.001</td>
</tr>
<tr>
<td>Pain</td>
<td>2235.208</td>
<td>2</td>
<td>1117.604</td>
<td>4.404</td>
<td>0.014</td>
</tr>
<tr>
<td>General health</td>
<td>2341.628</td>
<td>2</td>
<td>1170.814</td>
<td>5.557</td>
<td>0.005</td>
</tr>
</tbody>
</table>

As it is observed in summary of descriptive results obtained from SF-36 questionnaire about eight subscales of Health-Related QOL (Table 1), among three groups of the study, all of the subscales have the lowest average in obese group and have the greatest average in normal weight groups. In order to determine and compare the significance differences of the groups, the Bonferroni recursive test was used and the results are presented in the following.

- Physical function subscales: the results of Bonferroni suggest that in this scale average of each group has a significant difference with that of two other groups. In other words, average differences of normal weight with obesity, normal weight with overweight, obesity with over weight is significant.
- Role limitations due to physical health subscales: in this scale difference of normal weight with two other groups is significant. However, obese and overweight groups have no significant difference.
- Social function, Pain and General health subscales: in these sub scales only two groups of obesity and normal weight have significant differences; differences of overweight with other groups is not significant.

4. Discussion and Conclusion

The achieved results in considering the searching question suggest that normal weight group in five dimensions of Health-Related QOL including: Physical function, Role limitations due to physical health, Social functioning, Pain, and General health at least had a better state than that of two groups of obesity and overweight. In other words, normal weight group in the mentioned dimensions of Health-Related QOL had better quality than two other groups.

In physical function dimension; moreover, normal weight group had better quality than two other groups, overweight groups also had better quality than obesity groups. However, in Role limitations due to physical health dimension only normal weight group had a better quality than the two other groups. In Social functioning, Pain, and General health dimensions only normal weight group had differences in the intended dimensions with obese group.

In fact it can be concluded from the results, in obesity and overweight individuals harms of physical dimensions of Health-Related QOL is more severe than that of psychological dimensions. In these dimensions and especially in Physical function dimension by BMI increase, the quality of the dimension severely becomes poor. These results are
consistent with those results of Swallen, Reither, Haas & Meier (2005). Because in their study on sample of adolescents found negative relation between BMI and physical quality of life. In other words by increase of BMI the physical quality of life would decrease; however, relationship with psychological aspects of quality of life was not significant. In a study by Fallon & et al. (2005) on black adolescent girls and white adolescent girls concluded that in both of the groups overweight and obesity had a direct relationship with poor quality of life. Although in white groups this relation was stronger, and by BMI increase more dimensions of their life quality (even in psychological aspects) became distorted when compared to black groups. Researchers concluded from these results, that effect of development and western culture in life quality understanding by individuals can influence the results a lot. As in the present study on a developing society in psychological aspects of Health-Related QOL no differences were observed in groups of obesity, overweight and normal weight. Because in the under developed countries compared to developing countries obesity and overweight are not regarded as a bad state and even in many cases individuals overweight is signified as a sign of healthiness. Therefore, in the present study, lack of difference in psychological aspects of the Health-Related QOL can be because of the mentioned reasons.

In research on 145 couple of siblings Richards, Adams & Hunt (2000) get in to point that in quality of all dimension of index SF–36 subjects with intense obesity are significantly low when compared with that of subjects with normal weight. Zeler, Roaring, Madi, Denials & Ingh (2006) in a study considering 33 adolescents with an intense obesity (who were getting ready to have an operation in order to lose weight), figured out their intense distorted Health-Related QOL. These adolescents had basic problems both in psychological and physical Health-Related QOL. Therefore the results of the two mentioned studies and that of present study don't verify each other. The mentioned difference can be because of intended subject incompatibility. Thereby these researchers have used subjects with intense obesity (BMI above 35) and it can justify the reason of distortion in all dimensions of Health-Related QOL. Whereas in the present study for selecting obese group, CDC classification is used and even individuals with BMI of 30 are settled in obese subjects.

References


