Association of Body Mass Index, Anxiety and Depression among the School Children of Visakhapatnam District, Andhra Pradesh

D. Premasudhakar1 Dr. B. Dharani Priya2
1,2Department of Organic Chemistry
1,2BVK College, PG Courses, Visakhapatnam

Abstract— Introduction: Obesity is a prevalent metabolic disorder causing co morbid condition worldwide. Anxiety and Depression are globally emerging public health concern psychiatric disorders. The association of these two conditions was studied for the past few years but in south India especially in Andhra Pradesh it is scanty. In view of that we have chosen the association study among the school children of Visakhapatnam.

Objective: The present work is aimed to understand Body Mass Index of the school children and its association with anxiety and depression which are most common symptoms of adolescent children.

Methods and materials: the study group comprises total 400 school children (220 boys and 180 girls) between the ages of 12-17 years. The demographic and anthropometric data has been collected on prescribed proforma along with data of Hospital Anxiety and Depression (HAD) questioner Result: In the present study, the average BMI is normal in both boys (18.82±2.94) and girls (18.87±3.44). Among the study group, abnormal and moderate anxiety together in boys 61.8% and 60.5% in girls, whereas the depression in boys and girls is 49.54% and 39.4% respectively. A prominent observation in the present study is highest anxiety and depression among the 16-17 years’ age group of girls and where is in boy’s highest anxiety score with 12-13 years and highest depression with 14-15 years’ age group.

Conclusion: BMI is normal in both girls and boys. Correlation study has conducted between BMI, anxiety and depression for the present study group. The results shown negative correlation among the girls in both anxiety and depression with BMI, whereas in boys it shows a positive correlation.

Key words: Anxiety, Depression, Body Mass index, School Children

I. INTRODUCTION

Anxiety is an emotion characterized by feelings of tension, worried thoughts and physiological changes like increased blood pressure, diabetes, asthma, heart disease etc. People with anxiety disorders usually have recurring intrusive thoughts or concerns. They may avoid certain situations out of worry [1].

Anxiety disorders are the most common psychiatric diagnosis in school going children worldwide, with an estimated overall prevalence rate of 8% (ranging 4-25%). An Indian study reported the incidence of childhood psychiatric disorders as 18 of 1000[2-3]. The previous studies indicate that adolescents with anxiety disorder have lower academic achievements, poor peer and parental relationship etc. [4-5]. Childhood anxiety has been associated with genetic and various environmental factors, including gender and pattern of parenting [6].

Depression is also a mental disorder in which a person feels discouraged, sad, hopeless, unmotivated, or disinterested in life in general. It is a common psychiatric disorder usually expresses along the anxiety. The condition of the depression significantly observed among the diseased population. Proper diagnosis and counseling is required for them. According to WHO studies it plays a key role in increasing disease burden [7]. It is also associated with poor health behaviors and social challenges. In addition to these an increased risk of suicide.

Usually, the depressive disorder is most probably observed in adolescents rather than in children. Depression is a common disorder among children (<18 years). Approximately 5% of children at any time may suffer from serious depression. The incidence of depression increases with age, especially after the onset of puberty [8]. The incidence of depression among adolescent girls is greater than adolescent boys. These sex differences have been observed between the ages of 13 and 15 years [9-11].

In recent years, many studies have been taken up on association between psychiatric disorders and obesity. The prevalence of obesity is increasing worldwide is due to genetic and life style factors which stimulates the accumulation of excess fat hinders their regular activities and further it leads to psycho social problems [12-14]. Mood disorders like anxiety and depression and its chronicity, severity and co morbid problems associated with children need to be identified early and necessary treatment initiated to limit the deleterious effects on their mental and emotional functions [15-16].

In this context, the current study has been undertaken among the school children of Visakhapatnam urban region with age group 12-17 years to observe the prevalence of anxiety and depression, their underlying causes and associated co morbidities. In addition to this it is also aimed to observe the impact of body mass index with these mood disorders among the study group.

II. MATERIALS AND METHODS

The present study comprised of 400 subjects among them 220 boys and 180 girls of high school children at Visakhapatnam urban region. They are all within the age group of 12 to 17 years. A prior informed consent for the study was taken from the school administration.

The demographic data and Anthropometric data collected through the structured proforma. The anthropometric data, Height and Weight were also recorded from all children using standard anthropometric equipment and Body Mass Index (BMI) was calculated using the formula, BMI = Kg / m².

Hospital Anxiety and Depression (HAD) scale was used to calculate the score of anxiety and depression among the study group. The questioner consists of 14 statements.
which are relevant to either anxiety (seven statements) or depression (seven statements). Each question has four possible responses. Responses are scored on a scale from 3 to 0.

III. RESULTS
The current study includes 400 school children within the age range of 12-17 years. Among them 55% are boys and 45% girls from semi urban area schools of Visakhapatnam.

The distribution of mean and standard deviation of height, weight and BMI of both girls and boys based on age is depicted in table - 1. As per the table almost all the girls are showing normal BMI except for age group of 17 years which show little drop in weight and BMI of both girls and boys based on age is depicted in table - 1.

Table 1: distribution of Height, Weight and BMI according to age group of Girls and Boys of school children

<table>
<thead>
<tr>
<th>AG E (Years)</th>
<th>N</th>
<th>Height</th>
<th>Weight</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>X±SD</td>
<td>X±SD</td>
<td>X±SD</td>
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<td></td>
<td></td>
<td>D</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>12</td>
<td>9</td>
<td>149.8±8.8</td>
<td>41.4±7.9</td>
<td>19.5±3.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>152.3±7.93</td>
<td>42.8±11.49</td>
<td>17.5±3.2</td>
</tr>
<tr>
<td>13</td>
<td>9</td>
<td>151.9±8.6</td>
<td>43.7±7.6</td>
<td>18.6±2.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>152.6±7.2</td>
<td>42.47±10.3</td>
<td>18.1±3.5</td>
</tr>
<tr>
<td>14</td>
<td>7</td>
<td>153.4±8.7</td>
<td>43.87±7.6</td>
<td>18.6±2.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>157.4±8.32</td>
<td>47.4±10.98</td>
<td>19.06±3.7</td>
</tr>
<tr>
<td>15</td>
<td>7</td>
<td>154.5±6.1</td>
<td>48.7±20.22</td>
<td>18.5±3.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>160.6±8.77</td>
<td>50.31±10.9</td>
<td>19.53±4.2</td>
</tr>
<tr>
<td>16</td>
<td>7</td>
<td>152.1±4.7</td>
<td>42.11±5.8</td>
<td>18.5±2.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>163.4±5.54</td>
<td>48.95±6.41</td>
<td>18.32±2.1</td>
</tr>
<tr>
<td>17</td>
<td>5</td>
<td>158.5±7.42</td>
<td>44.66±3.9</td>
<td>17.85±1.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>167.2±6.5</td>
<td>53.87±8.15</td>
<td>19.35±2.6</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>159.7±8.6</td>
<td>48.41±10.</td>
<td>18.87±3.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>153.0±8.6</td>
<td>43.97±8.12</td>
<td>18.82±2.9</td>
</tr>
</tbody>
</table>

Table 2: Anxiety and Depression among school children

The individual correlation of BMI with anxiety and depression in both girls and boys are depicted in graphs from 1-4. From the scatter plot it is observed that among girls the correlation between the BMI with abnormal anxiety is \( r = -0.1319 \) and depression is \( r = -0.0865 \). In case of boys the correlation is found between the BMI with abnormal anxiety is \( r = 0.0684 \) and depression \( r = 0.0929 \).

![Fig. 1: Correlation study of Anxiety with Body Mass Index in Boys](image1)

![Fig. 2: Correlation study of Depression with Body Mass Index in Boys](image2)
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Provided with proper orientation, this orientation benefits us in assessing more accurate and efficient data from the subjects directly. Therefore, this is one of the most comprehensive and approved medical scale which consumes less time and is more effective. This helps in early detection and proper counseling to the identified adolescent children to maintain proper academics and good health.

REFERENCES


