Abstract

Background: Overweight and obesity are significant public health issues in developed and developing countries, not only for adults but also increasingly for children. The issue of body weight as a risk factor for chronic diseases such as diabetes, heart disease, stroke and cancer has increased dramatically over the last decade in India. For this reason this kind of research was important to promote the healthy life of populations. Methodology: The present investigation retrospectively studied the prevalence of BMI level in youth populations of various areas of Perambalur district, Tamilnadu, India during the period February 2018 to April 2018. Body mass index (BMI) was determined by the standard procedures. Results: A total of 363 participants were included in this study. In these population 63.82% were females and 36.18% were males. The frequency of BMI distribution was normal range (18.5 to less than 25.0) were 80%, underweight (less than 18.5) were 12.1%, overweight (25.0 to less than 30.0) were 5.5%, class I obesity (30.0 to 35.0) were 2.4%, respectively. Conclusion: Based on the results, it was concluded with the prevalence of normal level of BMI was high among the youth populations of Perambalur district, Tamilnadu, India. It demonstrate the healthiness of the young populations.

Keywords: BMI, Obesity, Perambalur district, Youth population, Height, Weight & Health

1. Introduction

India is undergoing in the fast economic changeover. At this stage in the connected epidemiological change, the country is facing the twice the burden of communicable and non-communicable diseases. As in all such transitions, nutrition plays a prominent part (Romieu et al., 1997). Obesity representing one tremendous part of the continuum, is a preventable risk factor for chronic degenerative diseases (Burnin, 1994) while chronic energy insufficiency (CED), though less directly preventable, is associated with impaired physical capacity, reduced economic productivity, increased mortality, and poorer reproductive outcomes. Custom monitoring of nutritional status through the compilation of anthropometric data is a straightforward approach that is both economical and can be rapidly applied to large numbers of people (Schieve et al., 2000). The body mass index (BMI) is a useful index of relative weight that can be applied to define obesity and can be used to assess individual and community nutritional status. With its enormous population and extremes of economic conditions, India is in a unique position in its epidemiological and nutrition changeover that may portend the experience of many developing countries (Shetty & James, 1994).

WHO has suggested classifications of bodyweight that comprise degrees of underweight and gradations of excess weight that are associated with increased danger of some non-communicable diseases (WHO, 1995; WHO, 2000). These classifications are based on body-mass index (BMI), calculated as weight in kilograms divided by height in meters squared (kg/m2). As a measure of comparative weight, BMI is easy to acquire. It is an satisfactory substitute for thinness and fatness, and has been directly related to health risks and death rates in numerous populations. Furthermore, obesity is associated with a diffidently increased risk for near the beginning all-cause mortality. It seems likely that health advantages inspired by modern medicine are being battered by the current obesity epidemic (McGee, 2005).

Type 2 diabetes, cardiovascular disease and increased mortality are the most important sequel of obesity and abdominal fatness, but other associations are seen in musculoskeletal disorders, limitations of respiratory function, and reduced physical functioning and quality of life (Seidell et al., 2001). To date, there has been no reported representative study on the prevalence of BMI in Perambalur district, Tamilnadu, India. To ensure this purpose, the present investigation was carried out and results were tabulated.

In this study present the BMI profile and reference data from a baseline survey of a youth populations in Perambalur district, Tamilnadu, India. In describing, for the first time, the distribution of BMI of a broadly representative urban Indian population in relation to educational background, age, and tobacco use, we are able to
identify groups at risk of extreme forms of malnutrition. Moreover, determining BMI does not require sophisticated equipment and it is easy to calculate. This allows for discussion of the implications for future research and public health policy.

2. Materials and Methods:

2.1 Subjects:

Body mass index (BMI), the classification of obesity was determined using the person’s body mass index (BMI) which was based on height and weight. Of the 500 individuals originally selected 363 fulfilling the inclusion criteria were included in our study.

Children below 18 yrs, people with fever, body builders/highly trained athletes, patients undergoing dialysis, patients with osteoporosis, people having weight loss problems, weight loss associated with cancer, subjects with hepatitis B or C infection, tuberculosis, hemophilia and other severe coagulation disorders and subjects using drugs (like diuretics) were excluded.

2.2 Measurements:

Body weight was measured to the nearest 0.1 kg in light indoor clothing with out shoes, using a digital scale. Height was measured using same portable stadiometer. A correction of 0.5 kg was made for the weight of the cloths.

Data recorded on a predesigned proforma were entered in a Microsoft Excel spreadsheet. All the entries were double-checked for any possible keyboard error. Descriptive statistics for all the anthropometric parameters were computed. The formula for calculating BMI is as follows:

\[
\text{BMI} = \frac{\text{weight (kg)}}{\text{height (m)}^2}
\]

Obesity as defined by the World Health Organization is shown in Table 1.

Table 1: BMI Criteria

<table>
<thead>
<tr>
<th>Classification</th>
<th>BMI Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under weight</td>
<td>Less than 18.5</td>
</tr>
<tr>
<td>Normal or Acceptable</td>
<td>18.5 to less than 25.0</td>
</tr>
<tr>
<td>Over weight</td>
<td>25.0 to 30.0</td>
</tr>
<tr>
<td>Obese (Class I)</td>
<td>30.0 to 35.0</td>
</tr>
<tr>
<td>Obese (Class II)</td>
<td>35.0 to 40.0</td>
</tr>
<tr>
<td>Obese (Class III)</td>
<td>40.0 and over</td>
</tr>
</tbody>
</table>

2. Results:

The age of subjects ranged between 18 – 23 years with a mean of 20.5 years. All the variables studied followed normal distribution (Table 1). The overall prevalence and gender specific prevalence of BMI categories are shown in Table 1 and Table 2 for people aged 18 – 23 years. In comparison to normal category individuals, males were significantly more likely to be classified as underweight and less likely to be.

Table 1: Distribution of overall BMI values:

<table>
<thead>
<tr>
<th>Category</th>
<th>Subjects</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage (%)</td>
</tr>
<tr>
<td>Under weight</td>
<td>44</td>
<td>12.1%</td>
</tr>
<tr>
<td>Normal</td>
<td>290</td>
<td>80%</td>
</tr>
<tr>
<td>Overweight</td>
<td>20</td>
<td>5.5%</td>
</tr>
<tr>
<td>Class I obese</td>
<td>09</td>
<td>2.4%</td>
</tr>
<tr>
<td>Total</td>
<td>363</td>
<td>100%</td>
</tr>
</tbody>
</table>

As shown in Figure 1, the prevalence of people who were classified as underweight, normal, overweight and class I obese in the combined analysis of data was 12.1%, 80%, 5.5% and 2.4% respectively. According to these results it’s clear that the major part of population group possesses a normal BMI range and the class I obese was slight group. Table 2 demonstrates that there is considerable variation in the prevalence within categories of BMI according to gender. The level of overweight category was partially increased when compared to the overweight category. The overweight level also slightly increased when compared to the class I obesity. In overall perception the distribution of normal range of BMI was high in percentage. It demonstrated that the youth populations of Perambalur district of Tamilnadu state possessed a good and healthy lifestyle and maintenance. In other point of view the underweight category was observed over 12.1% of populations. It described there is still in need of awareness on body mass index and its associated risk factors among the youth populations of this district. The underweight category was characterized by a lack of essential food intake, lack of awareness and poorer life quality. There is still in emerging need of awareness about the health, BMI and its connected health risk factors.

Figure 1: Overall prevalence of BMI:

The prevalence of those classified as underweight was slightly high in the male group. The problem of underweight in males represents a different etiology, to that in youth and is due to declining health and physical status associated with the lifestyle. This issue of underweight in males could have social origins, for example due to an inability to shop, loss of a family members,
decreasing the motivation to cook, or living alone. The proportion of those classified as overweight and obese also slightly increases in the male populations.

It is important to note that overall, the prevalence within the normal category, in the youth population, is more than 70%. The prevalence of overweight in the female group is twice that of the male group. These increases in the proportions of overweight and reductions in the normal category when comparing the male and female groups are also seen in the data, but to a smaller degree.

The distribution of normal range of BMI of both male and female was moderately similar when compared between these results. But the normal range of BMI of females was slightly high (85.18%) when compared to the males group (69.54%). The distribution of overweight category was showed a vast difference between male (11.49%) and females (4.2%). The male group showed a highest overweight range when compared to the female group. The class I obesity distribution among the population showed a almost similar results. The male group showed a 2.9% when female showed 2.11% of class I obesity.

Table 2: Distribution of BMI values according to gender specific data:

<table>
<thead>
<tr>
<th>Category</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage (%)</td>
</tr>
<tr>
<td>Under weight</td>
<td>28</td>
<td>16.0%</td>
</tr>
<tr>
<td>Normal</td>
<td>129</td>
<td>74.13%</td>
</tr>
<tr>
<td>Overweight</td>
<td>12</td>
<td>6.89%</td>
</tr>
<tr>
<td>Class I obese</td>
<td>05</td>
<td>2.67%</td>
</tr>
<tr>
<td>Total</td>
<td>174</td>
<td>99.98%</td>
</tr>
</tbody>
</table>

According to the gender specific data, it was demonstrated that the normal range of BMI was possessed by the female group (85.18%) than a male group (74.13%). The underweight range was higher in male group (16.09%) than female group (8.46%). The overweight also seems to be little higher in male group (6.89%) than in female group (4.23%). The class I obese range was likely the same within male and female groups.

Figure 2: Prevalence of gender specific BMI value:

There is a considerable difference between the male and female results because of different lifestyle habits of both. The number of male and female participants was almost similar but not the same. So it does not make the notable changes amongst the both results. In nature, the male and female showed a different life style. The physical activity, food intake, mental workout, illness, social impacts, television impacts and personal considerations was differing from male and female. These can be influenced on the variations among the distribution of BMI in youth populations.

4. Discussion:

Underweight was significantly associated with women, people aged between 15 and 29 years, people still at school, and people not in the labor force. With respect to health-related variables, underweight was significantly associated with smoking and never having had a cholesterol test done.

Overweight was significantly associated with men, people in the 40 to 69 age groups, people living in rural India, people with a trade qualification, people with an monthly household income between Rs.6,000 and Rs.1,20,000 and people born overseas. In terms of socio-economic status, overweight people were more likely to be in the medium socioeconomic group, and those who were either employed or not in the labor force (e.g. retired). With respect to health related variables, overweight was significantly associated with diabetes, having had a cholesterol test done, having high cholesterol levels, and ever having been told they have high blood pressure.

Obesity was significantly associated with people aged between 30 and 69 years, people who were unemployed, people who had a medium to low socio-economic status, and those who earned lower incomes. Obesity was not significantly associated with either gender or migrant status. With respect to health-related variables, obesity was significantly associated with diabetes, asthma, high cholesterol levels, and high blood pressure.

Out of the total population studied, there was more number of obese and overweight populations were smaller than that of normal. Male obese population was more predominant than female, but in overweight category, males dominated the females. The previous studies has already showed that the prevalence of obesity and overweight was more among females than in men, but in the current study prevalence of overweight was more among males (Jayasingh & Christina, 2013). The observed age-related changes in body composition are consistent with reported effects of growth hormone deficiency and the increasing prevalence of growth hormone deficiency with age together with an age-related decline in sex steroids, particularly testosterone in men (Rudman et al., 1981; Van Den Beld et al., 2000). Higher body mass index (BMI) is associated with morbidity and mortality especially that related to diabetes mellitus and cardiovascular diseases (WHO, 1995).

India, with 1.2 billion people is the second most populous country in the world and is currently experiencing rapid epidemiological transition. Under nutrition due to poverty which dominated in the past, is being rapidly replaced by obesity associated with affluence (Mohan et al., 2006). Industrialization and urbanization also contribute to increased prevalence of obesity. Studies from different parts of India have provided evidence of the rising prevalence of obesity (Mohan et al., 2006; Bhardwaj et al., 2011; Deepa et al., 2009 and Misra & Khurana, 2008). However, most reports have been region specific (mostly from urban areas). Further, different studies have used different methodologies, definitions and cut-off points for defining obesity, making comparisons difficult.
In countries like India, the rise in obesity prevalence could be attributed to the increasing urbanization, use of mechanized transport, increasing availability of processed and fast foods, increased television viewing, adoption of less physically active lifestyles and consumption of more "energy-dense, nutrient-poor" diets (WHO, 2003; Bell et al., 2003 & Misra et al., 2003).

Nearly 70 per cent of India’s population resides in rural areas. Even a small increase in prevalence of obesity in rural areas could lead to a huge increase in the number of obese individuals in India. The present study showed a marked increase in BMI values in the rural areas compared to those reported in an earlier study in rural south India. The increase in prevalence of obesity among the rural population may be due to rapid changes in lifestyle in rural areas (Ramachandran et al., 1992). The strengths of this study were that the study sample was truly representative of the regions studied in terms of geography, socio-economic status and population size and the sample size was large (n=363).

4. Conclusion:

This study concludes that the prevalence of BMI among the Youth populations of Perambalur district was shown the highest range of normal BMI level (80%). Class I obese was least level (2.4%). This was demonstrated the youths of Perambalur district was having the appropriate height and weight and maintaining the good lifestyle and healthiness. But the also the underweight range was observed on 12.1% of population. It indicates they still need the awareness on maintaining the healthy lifestyle.

7. References