

Standardization of BMI criterion for the population of Mumbai

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Abstract

Introduction: The health risks associated with increasing BMI are continuous and interpretation of BMI grading in relation to risk may differ for different ethnic groups. There is a need for developing different BMI cut-off points for different ethnic groups due to the increasing evidence that the association between BMI, percentage of body fat and body fat distribution differ across populations and therefore, the health risks increases below the cut-off point of 25 kg/m² that defines overweight in the current WHO classification. **Objective:** To standardize the BMI criterion for the population of Mumbai, BMI variation in different age groups and correlation of BMI variation & co morbidities. **Subjects:** The study included apparently healthy 1000 individuals, 500 males and 500 females in the age group of 20-70 years. Terminally ill, pregnant females, mentally and physically challenged individuals were excluded. **Procedure:** The subjects were chosen according to the inclusion and exclusion criteria. Their weight and height were measured, and BMI was calculated. Their medical condition was documented. Sex-specific receiver operating curve was used to assess the sensitivity and specificity of BMI cut off. **Results:** In the age group of 20 - 40 years, 4.3% of the individuals have increased BMI related medical problems whereas in the age group of 41 - 70 years, it is 19.6%. The incidence is significantly high in the people with age 41 and above. The BMI cut off for both the sexes in the age group of 20 - 70 years is 24 kg/m² (specificity = 81.1%, sensitivity = 72%). The BMI cut off for the females is 25kg/m² (specificity = 80%, sensitivity = 80%) and 24kg/m² for the males (specificity = 77.9%, sensitivity = 73%). The BMI cut off for both the sexes in the age group of 20 - 40 years is 25 kg/m² (specificity = 72.2%, sensitivity = 76%). The BMI cut off for the females is 25 kg/m² (specificity = 100%, sensitivity = 69.5%) and same for the males (specificity = 61.5%, sensitivity = 82.5%). The BMI cut off for both the sexes in the age group of 41- 70 years is 24 kg/m² (specificity = 82.5%, sensitivity = 76.6%), the BMI cut off for females is 24kg/m² (specificity = 82%, sensitivity = 84.9%) and same for the males (specificity = 81.3%, sensitivity = 75.3%). **Conclusion:** For the population of Mumbai, the BMI cut off for both the sexes in the age group of 20 - 70 years is 24 kg/m², 25kg/m² for females and 24kg/m² for males. The BMI cut off varies in different age groups. The BMI cut off for both the sexes in the age group of 20 - 40 years is 25 kg/m² (25 kg/m² for females and 25kg/m² for males). The BMI cut off for both the sexes in the age group of 41- 70 years is 24 kg/m² (24kg/m² for females and 24kg/m² for males). A direct correlation of BMI variation and co morbidities is found.

Keywords: Body mass index; Mumbai population, Obesity.

Introduction

According to the WHO, body mass index (BMI) is a simple index of weight-for-height.

The international classification of adult underweight according to BMI given by the WHO is as per the American and the European population.

The health risks associated with increasing BMI are continuous. Interpretation of BMI grading in relation to risk may differ for different ethnic groups. There is a need for developing different BMI cut-off points for different ethnic groups due to the increasing evidence that the association between BMI, percentage of body fat and body fat

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distribution differ across populations and therefore, the health risks increases below the cut-off point of 25 kg/m² that defines overweight in the current WHO classification.

The WHO expert consultation concludes that the proportion of Asian population with a high risk of type 2 diabetes and cardiovascular disease is substantial at BMIs lower than the existing WHO cut-off point for overweight.

The Indian population is different from the American and European population in respect to the type of body frame, muscle mass and body fat composition and fat distribution. The lifestyle of the Indians being very different from the Americans and the Europeans and alarmed by the reports that India will become the global diabetes mellitus capital by 2050, there is a need to revise the BMI value for India. Therefore, we started with first step of miles journey, conducted this pilot study in Mumbai to derive the BMI cut off for overweight and obesity.

Aims & Objectives

Aims

To standardize the BMI criterion for the population of Mumbai.

Objectives

- To observe standard BMI value for the population of Mumbai.
- To observe BMI variation in different age groups.
- To study correlation of BMI variation and co morbidities.

Methodology

Type of study

Prospective study

Sample size

1000 individuals in the age group of 20 - 70 years

Age group	No. of males	No. of females
20 - 30	100	100
30 - 40	100	100
40 - 50	100	100
50 - 60	100	100
60 - 70	100	100
Total	500	500

Inclusion criteria

Apparently healthy individuals in the age group of 20 to 70 years.

Exclusion criteria

- ✓ Critically ill
- ✓ Physically and mentally disabled
- ✓ Pregnant females

Material used

- ✓ Calibrated bathroom weighing scale
- ✓ Non elastic measuring tape

Procedure

- Choosing the subjects according to the inclusion and exclusion criteria.
- Measuring their weight with the help of a bathroom weighing scale in kilograms.
- Measuring their height with the help of a non elastic measuring tape.
- The person is made to stand against the wall with feet closed. The gaze was straight and was instructed to take a deep breath. The vertex was marked. The distance was measured from the ground in meters.
- BMI calculated in kg/m²
- Medical history noted.

Data Analysis

The incidence of medical conditions increases as the BMI increases.