

INVITED EDITORIAL

Body Mass Index: Possibilities for Reconsidering Cut-offs

Anthropological variations in height, weight and physique are amazing as they reflect the way nature operates to bring about variety. A person being too fat or too thin invites public interest and curiosity. The two most important and visible indicators of a human are weight and height which are used to calculate Body Mass Index (weight/height²) (BMI). The World Health Organization and Centre for Disease Control and Prevention came out with recommendations on BMI cut-offs to designate people who are overweight and fat and are relatively at a higher risk of metabolic diseases. BMI, previously referred to as Quetelet's index, named after Adolfe Quetelet, a Belgian statistician of the nineteenth century, has withstood the test of time. On the principle of dimensionality, he thought that weight among humans should increase as a cube of height, which to his surprise did not happen except during infancy. However, the square of height correlated very well with body weight and hence it became the rationale for the present formula.

It is interesting to observe the huge variations in BMI of living human beings around the world. A whopping BMI value of 204 kg/m², the highest ever recorded, is in the name of Khalid bin Mohsen Shaari. On the other hand, women with anorexia nervosa often have a BMI that goes below 15 kg/m², thus showing the lower extreme. Globally, adults of the countries of Tonga, Samoa, Niue, Nauru and Cook islands have an average BMI on the upper side which crosses the mark of 30kg/m². People of Southeast Asian countries like Vietnam are among the slimmest, with an average BMI that hovers around 20-21kg/m².

The concept of using BMI in the general population for health purposes is based on the assumption that there is a fairly strong correlation between BMI and body fat. Exceptions to this fact do exist, especially in the case of athletes who have less body fat and old people who have more body fat for the same values of BMI. Elite sportsmen of shot put, discus and hammer throw events generally have a BMI higher than 30 kg/m². These sportsmen are highly muscular but according to World Health Organization classification, many of them would be termed as obese. Similarly, Asians have more fat than Whites, who in turn are fatter than Africans at the same BMI level. Thus anthropological diversity is also responsible for these exceptions.

Body proportions may play an important role in giving meaning to BMI. The individuals of African American origin generally have long legs in relation to their trunks compared with the Whites. Sitting height to standing height ratio (SH/S), also known as Cormic index, is highly variable among humans; the Australian aborigines have a smallest ratio indicating relatively shorter trunks, whereas the Japanese have

relatively larger trunks. Experts feel that these differences may bring about variations in BMI of up to 6 kg/ m². Scientists have tried to include a correction to the BMI by using sitting height ratio to obtain a more rational alternative.

Body proportions and body fat variations for similar BMI values make a strong point for reconsidering the BMI cut-offs and for using sitting height ratio to adjust BMI values for different geographical regions and anthropological groups in determining health consequences.

SP Singh, Professor (Retired)
Former Dean of Life Sciences
Punjabi University Patiala, India
Editor-in-Chief, Human Biology Review