



Influence, Significance and Importance of Body Mass Index in Scientific Research and Various Fields of Science

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Abstract

Modern generations of humans pay a lot of attention to a healthy lifestyle, and body mass index is the most popular determinant of health. This tool is used by all people, both amateur trainers, as well as professionals, scientists and researchers. It is used in gym, laboratory, medical office, home, just everywhere and by everyone. BMI indicator applies in different fields of science, trying to determine different aspects of its impact on physical, psychological and social aspects of life. This mini review presents selected examples of the use of body mass index in various fields of science by scientists from different countries.

Keywords: BMI; Body; Mass; Index; Indicator; Health; Research; Science

Introduction

Body mass index (BMI), otherwise known as the Quetelet II index from the Belgian founder Adolphe Quetelet (in the 19th century), is used to determine the body mass index by the body mass quotient expressed in kilograms (kg) by the square of body height expressed in square meters (m²):

Body mass index helps to estimate the risk of underweight and obesity of examined person. The phenomenon of obesity and underweight may be associated with the development of diseases classified as civilization diseases, such as diabetes, stroke, atherosclerosis, hypertension and nutrition disorders. The World Health Organization (WHO) has identified six ranges defining the state of the subject (Table 1).

BMI	Nutritional Status
<18.5	Underweight
18.5–24.9	Normal weight
25.0–29.9	Pre-obesity
30.0–34.9	Obesity class I
35.0–39.9	Obesity class II
40.0 <	Obesity class III

However, one of the most commonly used tools was created for adults. For children it is recommended to use centile grids. The downside of BMI is that it is impossible to distinguish muscle tissue from adipose tissue, which in athletes, especially in people practicing strength sports, can be misleading and misinterpreted [1]. The aim of the work is to present, through numerous publications, the comprehensive application of the Quetelet II index in various articles and fields of science.

Body Mass index overview in Scientific Research

Body mass index according to World Health Organization is commonly used tool in many different scientific fields. One of research area is disease prophylaxis, which concentrate on studies concerning morbidity risk in various disease, particularly civilization diseases. Authors engage in this problematic is articles where BMI rate used to determine obesity level in highly developed countries in Europe. Research results led into raising consciousness of increasing obesity tendency, and consequently, the need for introduction of prophylaxis and awareness raising programs regarding risks of wrong nutrition habits and their influence on BMI rate, in particularly exposed countries [2-7]. Different problematic was presented by Ohlsson and Bygdell, who described the correlation of

increased BMI during the puberty phase and increased stroke risk in adulthood. Authors based on the research results, alarmed that young people, whose body mass index is increasing over the years, in future are in stroke risk group. These facts indicates the need for introducing action, which significantly reduce BMI or will help to maintain it on recommended level [8-12].

A very important aspect of use body mass index is the problem of diabetes. Research shows that high level of BMI has significant influence on its development, as well as keeping appropriate BMI value could stop and prevent the evolution of the disease [13-17]. Body Mass Index is also used in nutrigenomics, a branch of science which is focused on influence of nutrients on genes expression and metabolic changes. Authors of this works are mainly focusing on correlations between gene polymorphisms and BMI index, which are closely connected with development of civilization diseases like type II diabetes and obesity. With regard to articles related to human health issues its worth to mention about physiology and their works, where by BMI level is used for indicating, overweight and obesity, especially abdominal obesity which are common in women in reproductive age and development of this disability show increasing tendency along with age. Other physiological aspect is the relation between BMI and human bacterial flora [18-21]. It's worth to mention about biomechanical sciences with the researches being conducted focusing on the correlations between the BMI and bone density and structure, as well as the forces acting on joints during movement [22-26].

Regarding to anthropological studies, authors used BMI in diagnosis as applicability range in kids and youths, presents restrictions of BMI rate, as well as using anthropometric survey to prediction where is measurement of body mass index. It is valuable in modern sport science, where the researchers are evaluating the correlations between the body mass index and physical fitness and activity in different groups [27-32].

Conclusions

The Body mass index allows to determine the state of nutrition through mathematical calculations obtained on the basis of anthropometric measurements of height and body weight. It is an indicator used in various fields of science from anthropology, through diabetology, sports science, and even with nutrigenomics. Its use allows to determine the state of nutrition or disorders occurring in it, which in turn is a reference to various aspects of scientific research. The body mass index, however, does not always reflect the reality to the right degree. It should not be used in the traditional form in the case of children or people with an athletic figure. In case of children, modified calculation formula of the indicator should be used, while for athletes it have to be interpreted very carefully.

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