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Body Mass Index and Health

Many Americans are becoming overweight or obese (1-3). These conditions can lead to chronic diseases such as high blood pressure, diabetes, stroke, cancer, and diseases of the gallbladder, heart, and lungs (1-8). Such diseases can reduce the quality of life and can also lead to death (1,4,9). Body Mass Index (BMI) is one of the most commonly used measures of obesity.

What Is Body Mass Index?

BMI is a ratio of a person's weight to height. BMI is commonly used to classify weight as "healthy" or "unhealthy."

How Is BMI Determined?

BMI can be determined by using the following equation:

$$\text{BMI} = 705 \times \frac{\text{Body weight (in pounds)}}{\left(\frac{\text{Height (in inches)} \times \text{Height (in inches)}}{\text{inches}^2} \right)}$$

Example:

A person who is 5 feet 6 inches (66 inches) tall and weighs 155 pounds has a BMI of 25:

1 foot = 12 inches, therefore 5 feet = 5 x 12 = (60 inches) + 6 inches = 66 inches

$$\text{BMI} = 705 \times 155 \div (66 \times 66) = 25$$

What Does BMI Mean?

BMI values between 18.5 and 24.9 are considered "normal" or "healthy" weight (table 1). BMI values between 25 and 29.9 are considered "overweight" and 30 and above are considered "obese." BMIs above 25 are unhealthy and have been shown to increase the risk of certain chronic diseases (1-8). BMIs under 18.5 are considered "underweight."

Table 2 can also be used to estimate BMI. Find height in inches. Move across to the right and choose the nearest weight in pounds. BMI can be found at the bottom of that column.

Can BMI Be Used by Everyone?

For most people, BMI provides a good measure of obesity. However, BMI does not provide actual information on body composition (i.e., the proportions of

Table 1. Body Mass Index categories

BMI	Weight category
Less than 18.5	Underweight
18.5 - 24.9	Normal weight
25 - 29.9	Overweight
30 and above	Obese

Source: National Institutes of Health (NIH), 1998.

Table 2. Body Mass Index look-up table

Height	Weight in pounds																
4' 10" (58")	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167
4' 11" (59")	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173
5' (60")	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179
5' 1" (61")	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185
5' 2" (62")	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191
5' 3" (63")	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197
5' 4" (64")	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204
5' 5" (65")	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210
5' 6" (66")	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216
5' 7" (67")	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223
5' 8" (68")	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230
5' 9" (69")	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236
5' 10" (70")	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243
5' 11" (71")	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250
6' (72")	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258
6' 1" (73")	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265
6' 2" (74")	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272
6' 3" (75")	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279
BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35

Source: Evidence Report of Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults, 1998. NIH/National Heart, Lung, and Blood Institute (NHLBI).

muscle, bone, fat, and other tissues that make up a person's total body weight) and may not be the most appropriate indicator to determine health status for certain groups of people. For example, athletes with dense bones and well-developed muscles or people with large body frames may be obese by BMI standards (i.e., they have BMIs greater than 30) but yet have little body fat. On the other hand, inactive people may seem to have acceptable weights when, in fact, they may have too much body fat. Similarly, a petite gymnast may be considered underweight but not unhealthy (10). BMI, when used for children and adolescents who are still growing (11), pregnant and lactating women, people with large body frames, or petite and highly muscular individuals, should be interpreted cautiously.

How Does BMI Relate to Health?

BMI is generally related to body fat. Higher BMIs usually mean higher body fat (3). As body fat or BMI increases, especially from values equal to or greater than 30, health risks increase(3).

Being overweight (BMI of 25 to 30) or being obese (BMI greater than 30) increases the risk of having high blood pressure, heart disease, stroke, diabetes, certain types of cancer, arthritis, and breathing problems (4-8). Research shows that being obese lowers one's life expectancy (4,9). When overweight or obese people lose weight, they also lower their blood pressure, total cholesterol, LDL (or "bad") cholesterol, increase their HDL (or "good") cholesterol, improve their blood sugar levels, and reduce their amount of abdominal fat (4).

What Research Studies Relate BMI to Diseases and Longevity?

In 1998, the National Institutes of Health issued a report to identify and treat obesity and overweight. Many scientific research studies suggest that weight loss reduces chronic diseases and improves the life span of people who are overweight. This report provided recommendations to clinicians and the public about weight management (3). In developing this report, more than 43,627 research articles were obtained from a search of the scientific literature and reviewed by a panel of researchers. Researchers have examined the importance of weight reduction in people with high blood cholesterol (4), high blood pressure (5), diabetes (6), cancer (7), and osteoarthritis (8), and reported that weight loss reduces the risks for these diseases.

Conclusions

The link between BMI and health shows that overweight or obese people are more likely than those at normal weight to have medical problems such as high blood pressure, high cholesterol, stroke, diabetes, and heart disease. Research studies have shown that even a weight loss of 1-2 pounds per week for 6 months can improve the health of overweight people (3). The goal of weight loss should be to improve health. Rapid weight loss, swings in weight, and improper dieting should not be the goal (12, 13).

Related Web Sites

You can find more information about BMI, weight, nutrition, and health by visiting the following Web sites:

- American Dietetic Association
<http://www.eatright.org>

- American Heart Association
<http://www.americanheart.org>
- NIH/National Heart, Lung, and Blood Institute
<http://www.nhlbi.nih.gov>
- NIH/National Institutes of Diabetes & Digestive & Kidney Diseases
<http://www.niddk.nih.gov/health/nutrit/win.htm>

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