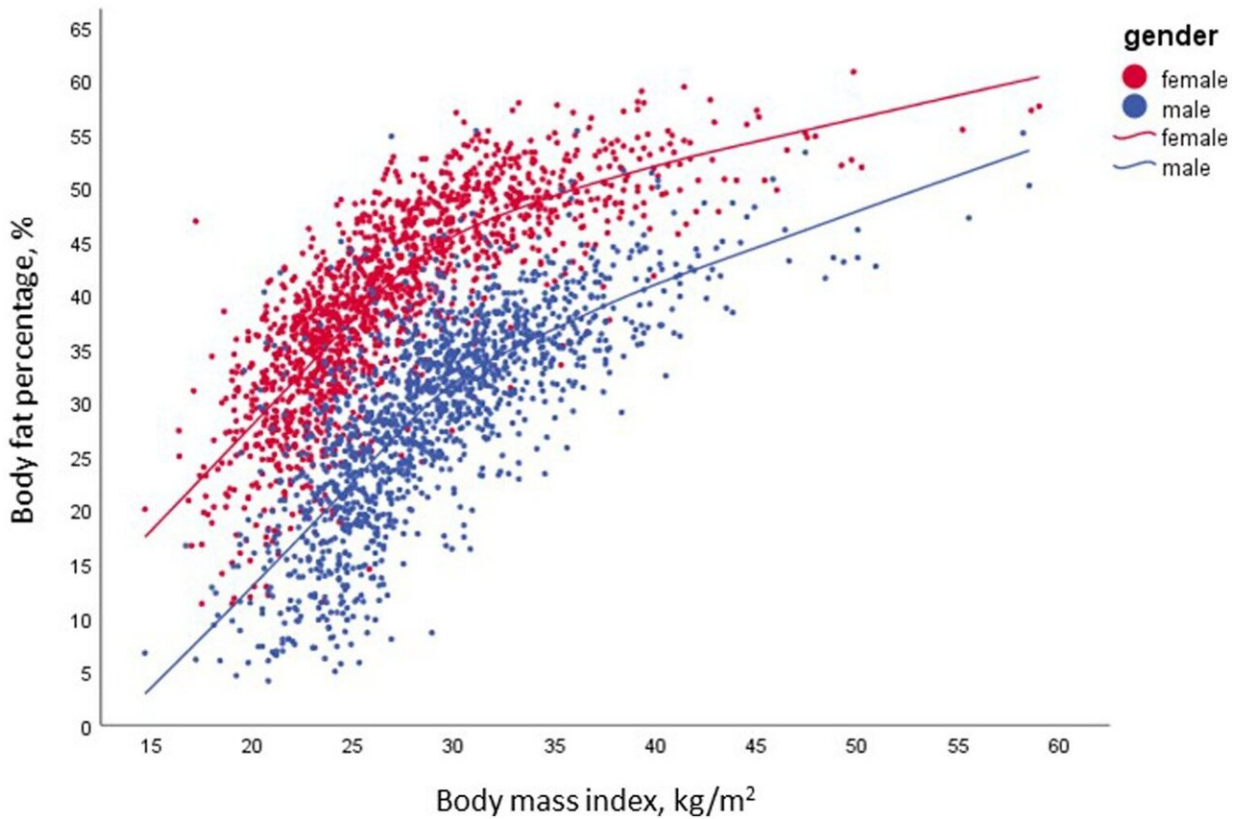


One third of normal-weight individuals are obese, according to study

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The non-linear association between BMI and fat mass; n = 3,001. Credit: *Frontiers in Nutrition* (2023). DOI: 10.3389/fnut.2023.1173488

Researchers from the School of Public Health at TAU's Faculty of Medicine examined the anthropometric data of about 3,000 Israeli

women and men and concluded that body fat percentage is a much more reliable indicator of an individual's overall health and cardiometabolic risk than the BMI index, widely used in clinics today. The researchers suggest that body fat percentage should become the gold standard in this respect and recommend equipping clinics all over Israel with suitable devices.

The study—the largest of its kind ever conducted in Israel, was led by Prof. Yftach Gepner and Ph.D. student Yair Lahav, in collaboration with Aviv Kfir. It and was based on data from the Yair Lahav Nutrition Center in Tel Aviv. The paper was published in *Frontiers in Nutrition*.

Prof. Gepner states, "Israel is a leader in [childhood obesity](#) and more than 60% of the country's adults are defined as overweight. The prevailing index in this respect is BMI, based on weight and height measures, which is considered a standard indicator of an individual's [general health](#). However, despite the obvious intuitive connection between [excess weight](#) and obesity, the actual measure for obesity is the body's [fat content](#), with the maximum normal values set at 25% for males and 35% for females.

"Higher fat content is defined as obesity and can cause a range of potentially life-threatening cardiometabolic diseases: heart disease, diabetes, fatty liver, kidney dysfunction, and more. The disparity between the two indexes has generated a phenomenon called 'the paradox of obesity with [normal weight](#)'—higher than normal body fat percentage in normal-weight individuals. In this study we examined the prevalence of this phenomenon in Israel's adult population."

The researchers analyzed the anthropometric data of 3,000 Israeli women and men, accumulated over several years: BMI scores; DXA scans (using X-rays to measure body composition, including fat content); and cardiometabolic blood markers. About one third of the

participants—1,000 individuals—were found to be within the normal weight range. Of these, 38.5% of the women and 26.5% of the men were identified as "obese with normal weight"—having excess fat content despite their normal weight.

Matching body fat percentage with blood markers for each of these individuals, the study found a significant correlation between "obesity with normal weight" and high levels of sugar, fat, and cholesterol—major risk factors for a range of cardiometabolic diseases. At the same time, 30% of the men and 10% of the women identified as overweight were found to have a normal body fat percentage.

Prof. Gepner says, "Our findings were somewhat alarming, indicating that obesity with normal weight is much more common in Israel than we had assumed. Moreover, these individuals, being within the norm according to the prevailing BMI index, usually pass 'under the radar.' Unlike people who are identified as overweight, they receive no treatment or instructions for changing their nutrition or lifestyle—which places them at an even greater risk for cardiometabolic diseases."

Based on their findings, the researchers concluded that body fat percentage is a more reliable indicator of an individual's general health than BMI. Consequently, they suggest that body fat percentage should become the prevailing standard of health, and recommend some convenient and accessible tools for this purpose: skinfold measurements that estimate body fat based on the thickness of the fat layer under the skin; and a user-friendly device measuring the body's electrical conductivity, already used in many fitness centers.

"Our study found that obesity with normal weight is very common in Israel, much more than we had previously assumed, and that it is significantly correlated with substantial health risks. And yet, people who are 'obese with normal weight' are not identified by today's

prevailing index, BMI. We also found that body fat percentage is a much more reliable indicator than BMI with regard to an individual's general health.

"Therefore, we recommend equipping all clinics with suitable devices for measuring body fat content, and gradually turning it into the gold standard both in Israel and worldwide, to prevent disease and early mortality," states Prof. Gepner.

More information: Yair Lahav et al, The paradox of obesity with normal weight; a cross-sectional study, *Frontiers in Nutrition* (2023). [DOI: 10.3389/fnut.2023.1173488](https://doi.org/10.3389/fnut.2023.1173488)

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