Study says obesity doesn't protect patients with cardiovascular disease

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This is an image of a weight scale. Credit: CDC/Debora Cartagena

Demographers Samuel Preston of the University of Pennsylvania and Andrew Stokes of Boston University set out to solve a puzzle: Why is it that study after study shows obese or overweight people with cardiovascular disease outliving their normal weight counterparts? Would this phenomenon, referred to as the obesity paradox, hold up when approached within different parameters?

According to their latest research, published in the journal *Obesity*, the answer is no. When accounting for weight history in addition to weight at the time of survey and when adding in smoking as a factor, obesity is harmful, not helpful, to someone with cardiovascular disease.

"There are claims that … it's good to be obese when you have cardiovascular disease, that if you have fat stores, maybe you'll live longer," said Preston, a sociology professor in Penn's School of Arts & Sciences. "It's conceivable that there are health advantages. But we show they are overwhelmed by the disadvantages of being obese, once you control for these two sources of bias."

To get these results, Stokes and Preston started with data from more than 30,400 participants of the National Health and Nutrition Examination Survey between 1988 and 2011. The survey is a nationally representative sample considered the gold standard in the United States. Of those participants, 3,388 had cardiovascular disease.

Most research of this type looks only at weight at time of survey. For example, if a participant who long weighed 300 pounds lost one-third of his mass by the time he weighed in, he would be counted at 200 pounds.

Stokes and Preston opted to include weight history, a key innovation, said Stokes, who earned both his master's degree and Ph.D. from Penn and is now an assistant professor in the department of global health at BU. Not doing so, he said, "would be like classifying a lifelong smoker who quit the day before the survey as a non-smoker, even though we know that if you're a lifelong smoker you carry those risks over even if you stop smoking."

This step allowed the researchers to identify a control group of people who had been normal weight their whole lives, those considered low-risk for disease.

Adding weight history "turns out to have a profound effect on the findings," Stokes said, eliminating the mortality advantage for those who are overweight or obese.

Incorporating the second factor, smoking, also contributed to resolving the paradox. Smokers are less likely to be obese, and those who are obese are less likely to smoke. This correlation is much stronger for those with cardiovascular disease, so the researchers limited their pool to lifelong non-smokers.

Accounting for weight history makes the obesity paradox disappear. Excluding smokers? That's when being obese equates to significantly higher mortality for those with cardiovascular disease.

The researchers said these results could improve disease treatment, since some clinicians may use the obesity paradox in patient care decisions.

"There's every reason to imagine that clinicians are at least confused," Preston said, "and in some cases, are believing that being overweight or obese is a good thing among people with cardiovascular disease, diabetes and other conditions for which a paradox has been demonstrated." Conditions like stroke, kidney disease and high blood pressure, for example.

"This may be trickling down into clinical decision making," Stokes added, "which is concerning because we don't think it's a real finding."

More information: Andrew Stokes et al. Smoking and reverse causation create an obesity paradox in cardiovascular disease, *Obesity* (2015). DOI: 10.1002/oby.21239

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