

In fighting obesity, targeting popular teens not all that effective

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In the fight against teenage obesity, some researchers have proposed targeting popular teens, in the belief that such kids would have an outsize influence on their peers.

But in a Loyola University Chicago study, researchers were surprised to find that this strategy would be only marginally more effective than targeting overweight kids at random.

Results are published in the journal *Social Science & Medicine*.

"I don't think targeting popular kids would be worth the extra effort it would take to identify them," said David Shoham, PhD, MSPH, senior author of the study. Shoham is a professor in the Department of Public Health Sciences of Loyola University Chicago Stritch School of Medicine.

Previous studies by Shoham and other researchers have found that a person's circle of friends may influence that person's weight. A 2012 study published in PLoS ONE by Shoham and colleagues found that students were more likely to gain weight if they had friends who were heavier than they were. Conversely, students were more likely to get trimmer - or gain weight at a slower pace - if their friends were leaner than they were.

The new study extended these findings. It's based on a survey of 624 students at a rural high school in the Midwest. Each student was asked to

name up to five male and five female friends. Also, each student's body mass index (BMI) was recorded. (BMI is calculated from a person's height and weight; a BMI over 25 is considered overweight and a BMI over 30 is considered obese.)

Using this real-world data, researchers performed *in silico* experiments to test various hypotheses and weight-loss interventions. (*In silico* means performed on a computer.)

Not surprisingly, these computer simulations found that overweight kids who were friends with other overweight kids gained more weight than overweight kids whose friends were healthy weight.

"You can catch obesity from your friends if they are overweight or obese," Shoham said. "Conversely, if your friends are at healthy weights, you likely will gain less weight."

However, researchers were surprised by what they found when they simulated weight-loss programs in which overweight kids lost 4 BMI points. In one such weight-loss intervention, researchers randomly selected a group of overweight kids. In a second intervention, the researchers selected overweight kids who were highly popular. (A student's popularity was based on how many other kids named the student as a friend.)

When randomly selected kids were targeted to lose weight, the school's overall overweight/obesity rate dropped from 24 percent to 19.5 percent. When the most popular kids were targeted to lose weight, the result was only marginally better, with the school's overall overweight/obesity rate dropping to 18.7 percent.

"Targeting popular kids has been suggested as an approach for fighting obesity, smoking and other unhealthy behaviors in teens," Shoham said.

"Our study indicates that unfortunately this approach may not be especially effective."

Previous studies have used computer simulations to explore obesity interventions based on friendship patterns. But these patterns have been based on made-up or otherwise unrealistic representations of kids' social networks. (By social networks, researchers mean face-to-face friendships, not Facebook, Instagram, Snapchat, etc.)

"We tried to make the networks as realistic as possible," Shoham said. "So rather than make up a network from scratch, we used adolescents' real social networks as the starting point. Moreover, we allowed the social network to be dynamic, reflecting the real-world tendency for teen networks to change over time."

Shoham cautioned that the study will not be the final word on whether social networks will be a useful tool for preventing or treating obesity. There are many other possible social network interventions that have not yet been explored. Also, some of the assumptions Shoham made in building the model may be too simplistic or otherwise wrong. For example, Shoham assumed that adolescents behave like their average [friends](#). But there are other ways, such as teasing, in which adolescents may influence one another. Shoham also left out other influences from the model, such as parents.

"Nevertheless, we based our simulations as much as possible on real-world data," Shoham said. "So despite the limitations of our study, we believe it is a significant step forward in designing better and more useful simulations – and also in ruling out interventions that could prove to be dead ends."

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of Health's Institute of Child Health and Human Development.

The study is titled, "Leveraging social influence to address overweight and obesity using agent-based models: the role of adolescent social networks."

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