EXPERT REVIEWS

Is obesity contagious?

Expert Rev. Endocrinol. Metab. 3(1), 21–22 (2008)

Russ Lopez
Department of Environmental Health, Boston University School of Public Health, Talbot 2E, 715 Albany Street, Boston, MA 02118, USA
Tel.: +1 617 414 1439
Fax: +1 617 638 4857
rptlopez@bu.edu

Evaluation of: Christakis N, Fowler J. The spread of obesity in a large social network over 32 years. *N. Engl. J. Med.* 357(4), 370–379 (2007).

A recent article using longitudinal data from the Framingham Heart Study found that weight gain was similar between friends. The influence of friends was found to be stronger than that of siblings or spouses. If this association reflects an underlying relationship, it implies that social norms, shared experiences and similar environments might be more important in weight gain than underlying strict biologic or genetic factors. It may also imply that new intervention strategies that use social marketing or peer-group efforts to reduce obesity might lead to successful weight control. A goal should be to enlist the help of friends to assist people to keep from gaining weight. Given the high prevalence of obesity in the USA and elsewhere, this study provides an interesting alternative foundation for addressing this important public health concern.

KEYWORDS: Framingham Heart Study • friendship • obesity • set point theory

In July 2007, a study was published in the *New England Journal of Medicine* suggesting that there was an association between one's friends' obesity status and one's own, an association that was stronger between same-sex friends than it was between siblings and spouses [1]. Putting aside the headlines in the popular press that implied that your friends could make you fat, the study has some important implications for research and treatment of the ongoing obesity epidemic in the USA.

Methods

The study authors, Nicholas Christakis and James Fowler, used data from the Framingham Heart Study, following just over 12,000 people from 1971 to 2003. After controlling for a number of potential confounders, including age, sex and education, it was found that the risk of obesity increased by 57% if a friend was obese, 40% if a sibling was obese and 37% if a spouse was obese.

The study, like all studies, was not perfect. For one thing, while the authors controlled for geographic distance, Christakis and Fowler did not control for neighborhood effects, such as population density, street connectivity or even access to supermarkets or nutritious food, all items that other researchers have found to have an impact on physical activity and obesity risk. In this study, two friends may end up living in distant states but might still prefer similar neighborhoods; suburban Boston may look more like suburban Houston than it resembles the downtown core of the metropolis. Of course it could be argued that neighborhood choice may be one of the pathways that friendship might influence obesity risk; but given the recent research on the role of the built environment in obesity and physical inactivity risk, the omission is important. Still, Christakis and Fowler deserve praise for their entrepreneurial undertaking of an important study that utilized intricate networking of social relationships among a large cohort. Their graphic illustration of the friendship relationships presents another valuable tool that more researchers should take advantage of. Similarly, the study is one more triumph for the shepherds of the Framingham Heart Study. Once again this cohort has produced important findings that may lead to increased understanding of complex diseases.

Results & discussion

Association should never be confused with causality, but if the results of this study are reflective of an underlying relationship between

 10.1586/17446651.3.1.21 ISSN 1744-6651

friendship, obesity status and personal obesity risk, there are a number of implications for people concerned about slowing weight gain or reducing the risk of obesity.

First of all, the findings pose problems for the adherents of the theory that there is a genetic predestination for any person's weight. This 'set point' theory posits that there is a weight that a person's body tries to maintain [2–4]. Try to lose weight and the body slows down metabolism or stimulates appetite until weight is increased (the opposite, that people can't gain weight no matter what, receded from discussion some time ago once it became clear that at least two thirds of the population can gain weight quite easily). The set point theory has always been problematic for no other reason than that it is hard to imagine that there were tens of millions of Americans who had been predetermined to be obese but that starvation and food deprivation were keeping them thin until the mid 1990s. But these friends' data creates another problem for the set point theory. It is very unlikely that two friends would just happen to have similarly high-weight set points prior to their meeting or that they were unable to achieve their similar higher set points until after one friend first became obese. More likely it is environmental and social factors that influence weight gain. Maybe the set point, if real at all, is just a reflection of all the myriad factors that influence weight status.

More optimistically, the findings suggest that there may be a role for social marketing and in shifting societal norms for diet, exercise and weight status. There had long been noticeable differences in BMI between and among various demographic groups, including a much higher obesity rate for black women but around a normal (for the USA) rate for black men [5]. Given the wide genetic diversity within these groups, the causes for these increased obesity risks should lie within social networks and shared social norms, experiences and environmental conditions that influence diet, physical activity and acceptable weight ranges.

If friendships do influence weight, then they might also be used to prevent or treat obesity. Friends could be used to change obesity-related behaviors, perhaps in methods that parallel efforts to reduce drunk driving through 'designated driver' campaigns, smoking cessation methods that have targeted teen peer networks, or safer sex campaigns that worked to reduce HIV infections in certain high-risk groups. If your friends are all concerned about weight, perhaps you will similarly work to keep your weight down. Certainly it might make it easier to stick to a reduced diet or keep up with an exercise regimen if your friends are similarly striving to keep their weight down. Public health advocates might experiment with peer groups to prevent or reduce obesity. Even if a drug to treat obesity emerges, getting the drug to a population that needs to take it (perhaps on a daily or more frequent basis) for more or less a lifetime is going to be problematic. Given that so much of the public do not take their medications at present, there is no reason to think that merely prescribing another medication will work on its own, particularly in the most at-risk populations. Perhaps group efforts, aimed at clusters of friends or peer networks, might be the solution to the delivery of preventive and curative services.

A final lesson of the study is the value of long-term cohort studies. While simpler and less resource-intensive, cross-sectional or time-consuming clinical trials are valuable, only a cohort study with the quality and diversity of variables, such as the Framingham Heart Study can truly help shed light on the complex etiology of diseases, such as obesity. We should be grateful for the work of the Framingham researchers, including Christakis and Fowler, for increasing our understanding of the development of obesity.

Financial & competing interests disclosure

The author has no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.
No writing assistance was utilized in the production of this manuscript.

References

1 Christakis N, Fowler J. The spread of obesity in a large social network over 32 years. *N. Engl. J. Med.* 357(4), 370–379 (2007).

2 Pasquat P, Apfelbaum M. Recovery of initial weight and composition after long-term massive overfeeding in men. *Am. J. Clin. Nutr.* 60(6), 861–863 (1994).

3 Levin B. Factors promoting and ameliorating the development of obesity. *Physiol. Behav.* 86(5), 633–639 (2005).

4 Levin B. Central regulation of energy homeostasis intelligent design: how to build the perfect survivor. *Obesity (Silver Spring)* 14(Suppl. 5), 192S–196S (2006).

5 Ogden CL, Carroll, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of overweight and obesity in the United States, 1999–2004. *JAMA* 295(13), 1549–1555 (2006).

Affiliations

- Russ Lopez, DSc, MCRP
Department of Environmental Health, Boston University School of Public Health, Talbot 2E, 715 Albany Street, Boston, MA 02118, USA
Tel.: +1 617 414 1439
Fax: +1 617 638 4857
rptlopez@bu.edu