Cost-effectiveness of Obesity Interventions: Will We Know It When We See It?

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In this issue of *Pediatrics*, Quattrin et al1 present the results of a cost-effectiveness analysis of a family-based obesity treatment (FBT) program relative to an information-based control intervention (IC). The IC educated parents to encourage their children to have a weight loss goal of 0.5 to 1 lb per week. Parents then attended 16 group meetings; each meeting delivered dietary and/or physical activity advice. In between meetings, a health coach telephoned the parents to remind them to attend the meetings. The FBT group attended the same number of group meetings and received the same information. They also received education on parenting techniques both at the group sessions and during brief individual sessions with a health coach, at which time the health coach would also problem solve any concerns raised. Parents in FBT were further instructed to monitor their children’s weight and their own weight twice a week and received additional dietary (1500 and 1800 kilocalories per day for mothers and fathers, respectively), physical activity, and sedentary activity recommendations. Parents were also instructed to record food intake and activity for their children and themselves in a diary by crossing off icons detailing food groups and physical and sedentary activities undertaken.

The authors report that after 2 years, child percent over BMI (%OBMI) change decreased by 1.98 U in the FBT group versus an increase of 4.37 U in the IC group. Parents lost 5.95 kg in the FBT group versus 0.16 kg in the IC group. One way to consider the impact of FBT is by evaluating the incremental cost-effectiveness ratio (ICER) relative to IC. This is the incremental cost of FBT compared with IC divided by the incremental benefit on the basis of the differences in %OBMI, BMI, or body weight. For children, the ICER was $117.01 per U, and for parents, the ICER was $83.95 per U of %OBMI. Parental ICERs for BMI and body weight were a $128.32 per U reduction in BMI and $347.20 per kg lost, respectively.

The authors are to be commended for a successful intervention and a careful evaluation of the data. However, I must confess that despite being an obesity researcher and a health economist with dozens of cost-effectiveness articles published, I had difficulty interpreting these results. I suspect readers (and most importantly, policymakers who may be in a position to act on these results) will be similarly confused.

The reasons for my confusion stem from several factors. First, quantifying improvements in childhood obesity is tricky given that children are growing, and one cannot simply use BMI change as a marker of success. The authors here used %OBMI. This is defined as follows: [(child’s actual BMI minus the 50th percentile BMI)/50th percentile BMI] × 100. The result indicates how much a child is over- or underweight relative to the 50th percentile BMI reference standard specific to his or
her age and sex. This is a reasonable measure, but unfortunately, there is no standard in the literature as to what a meaningful change in %OBMI is. A search of “percent over BMI” or “% over BMI” on PubMed yields only 4 articles, 1 being by this team, despite the fact that hundreds of randomized controlled trials targeting overweight youth have been published. Greater efforts to standardize primary end points for youth-based obesity interventions would allow for an easier interpretation of results and how effectiveness compares not just to control but to other studies targeting overweight youth.

The issue of comparability is further complicated when one extends the results to cost-effectiveness. It is unclear to me whether ICERs of $117.01 and $83.95 per U of %OBMI for children and parents, respectively, are good or bad. I again suspect most readers will be similarly confused. Fortunately, I was able to shed some light on this issue because the authors presented the parental ICER of $347.20 per kg lost in FBT relative to the control group, and I could compare this result with those in one of my other publications that also focuses on weight loss interventions targeting adults. If not for the significant benefit to children, the ICER for FBT would suggest that it is not a great value for the money. For example, it is costlier per kilogram lost than Weight Watchers (at $155 per kg lost) and the weight loss drug phentermine and topiramate extended-release capsules (at $204 per kg lost).

These comparisons highlight the importance of identifying a common metric to present the net cost-effectiveness for both children and adults so that policymakers are better able to interpret the results. The authors provide evidence in their study that FBT is cost-effective relative to control (albeit based on a hard-to-interpret measure of effectiveness), but from a policy perspective, that is not the relevant question. Policymakers want to know which interventions present the greatest bang for the buck. This requires not only comparing FBT with control but also with myriad other interventions that may be under consideration. If health economic considerations are to be part of this discussion, cost-effectiveness analyses should be reported by using a common ICER that allows for comparisons across health domains. The National Institute for Health and Care Excellence in the United Kingdom and the World Health Organization use cost per quality-adjusted life year (QALY) gained and disability-adjusted life year (DALY) saved, respectively, and present criteria for what constitutes a cost-effective intervention. For example, in the United States, it is commonly stated that interventions that improve QALYs at a cost of <$50,000 per QALY are a good value for the money. Although converting results from weight loss outcomes to ICERs focusing on QALYs or DALYs requires additional assumptions, it is doable, and efforts should be made to present cost-effectiveness results by using 1 of these measures. Without greater efforts to standardize cost-effectiveness results, it will be difficult to convince policymakers that FBT or other child- or family-based weight loss initiatives truly represent a good value.

As a final word of caution, the Quattrin et al article, as with many others aiming to influence rates of obesity or chronic disease, positions the intervention in part to address “rising health care costs associated with obesity.” This is misleading. Cost-effective interventions buy health improvements (eg, QALYs) at a reasonable price, but they do not save money. From a cost-effectiveness perspective, preventive interventions targeting youth are least likely to save money because cost-effectiveness guidelines recommend that all future cost savings be discounted at an annual rate of 3.5% in recognition of the fact that people prefer money today to money in the future. By way of example, at a discount rate of 3.5%, $10,000 in 30 years is worth only $3563 today. Therefore, if an intervention generated $10,000 in savings in 30 years but costs more than this amount to implement, the intervention would not be considered cost saving. Given the long period between the investment in childhood obesity prevention and when the greatest cost savings are likely to accrue, I am skeptical that these interventions could ever be cost saving. This is not to say that they should not be supported but only that we need to better educate our stakeholders, and ourselves, of what our investments in child health are truly buying.

### Abbreviations

- %OBMI: percent over BMI
- FBT: family-based obesity treatment
- IC: information-based control intervention
- ICER: incremental cost-effectiveness ratio
- QALY: quality-adjusted life year
- DALY: disability-adjusted life year

### References


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Pediatrics 2017;140;
DOI: 10.1542/peds.2017-1916 originally published online August 25, 2017;

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