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Impact of self-efficacy on risk aversion in the context of surgical weight loss decision scenarios

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Summary

Obesity is prevalent among a third of US adults and a leading indicator for many chronic diseases. Self-efficacy is important for non-surgical weight loss interventions, but there is less information about the role of self-efficacy in the candidacy phase when there are discussions of side effects and decisions for uptake. This study conducted an experiment set within an online survey assessing risk aversion towards bariatric surgery as a weight loss intervention. The survey asked about hypothetical weight loss scenarios for bariatric surgery among a national probability-based sample of US adults aged 18 years and older. Participants answered their willingness to achieve different weight loss amounts within the context of bariatric surgery in varying risk scenarios. The analysis utilized a repeated-measures linear mixed model. A three-way interaction demonstrated that participants were more willing to take risks under ideal weight loss conditions even with the risk of death, particularly when considering self-efficacy (β = 1.20, P = .05). Margin projections showed that those with lower self-efficacy were more likely to take risks overall. This trend was significant for those with a body mass index of 30 and above in scenarios presenting one's ideal weight as the outcome of bariatric surgery. Adding a measure of self-efficacy within patient assessments could identify those eligible patients who are most likely to adopt bariatric surgery, particularly among those who may have negative post-surgical outcomes due to low self-efficacy levels. Addressing self-efficacy by way of providing support resources in tandem with candidacy consultations may enhance quality of life and post-surgical outcomes.

KEYWORDS

bariatric surgery, obesity, risk aversion, self-efficacy, weight loss

1 | INTRODUCTION

One third of adults in the United States have obesity, a leading indicator for several chronic diseases, including certain cancers, heart disease, hypertension and type II diabetes.[1] Obesity is also correlated with depression and lower quality of life,[2] and the medical costs associated with obesity are estimated at $147 billion annually.[3] Although small reductions in body weight (ie, 5%-7%) can vastly improve the health of individuals who have obesity, individuals rarely value modest weight loss.[4,5] Moreover, bariatric surgery may be the most effective intervention for losing large amounts of weight, but this intervention has low uptake.[6,7] According to the National Institutes of Health, people with a body mass index (BMI) equal to or greater than 40, or a BMI of 35-39.9 with an existing comorbidity, are eligible for weight loss surgery.[8] Yet only 1% of those eligible typically uptake a surgical option to lose weight. One plausible explanation is that individuals

have an aversion to the risks surgery presents. Primarily, bariatric surgery comes with potential risks of chronic diarrhoea, severe infection and death.[9]

Risk aversion has been shown to influence decision-making among patients when presented with weight loss scenarios.[4] Bariatric surgery patients reported that they expected to lose 38% of their total body weight on average and would be disappointed if they did not lose at least 24% of their body weight.[5] This current research indicates that people with obesity appear to be more accepting of incurring a small risk of death to achieve their "dream" weight than to lose clinically meaningful proportions that can have substantial health benefits (eg, 20% or 10% of their current weight).[4,5] Importantly, extant studies did not experimentally differentiate other forms of risk based on type or severity. Thus, it is unclear whether these results were driven by the magnitude of the risk (eg, death). It is critical to examine risk aversion experimentally and examine causal antecedents. Although surgical options for obesity are associated with risks, there are risks simply in having obesity. When presented with treatment options, outcomes including modest weight loss reductions may not provide enough incentive to proceed.[10]

It is unclear how the role of individual attributes may impact risk aversion in this area. When risks are not observable or known, and when individuals lack control, this can result in fear and/or anxiety.[11] Control or confidence, commonly referred to as self-efficacy, is the perception that one can engage in behaviour towards a goal despite perceived barriers.[12] Studies show that weight loss self-efficacy is vital for the success of non-surgical weight loss interventions.[13] However, there is less information about the role of weight loss self-efficacy in assessing the risk of bariatric surgery. One recent study showed that eligible patients perceived bariatric surgery as high risk, but those who were interested were dissatisfied with their current weight loss results and saw surgery as an opportunity to attain their goal weight quickly.[6]

Studying if and how patients' ideal weight or weight loss self-efficacy might interact with risk-related decision-making for surgical weight loss interventions is relevant for clinical practice,[14] particularly due to the rise of obesity rates and forecasted projections.[15,16] Longitudinal models of patient trajectories have also demonstrated that individuals with Class I obesity are likely to continue to gain weight over time.[17-19] The purpose of this study was to examine factors that correlate with the acceptance of risk in relation to bariatric surgery. This controlled experiment varied risk magnitude and amount of weight loss expected. The study also assessed weight loss self-efficacy to see if it moderated the relationship between risk magnitude and amount of weight lost in relation to accepting risk.

WHAT IS ALREADY KNOWN ABOUT THIS SUBJECT

- Several studies have found that weight loss self-efficacy is important for the success of non-surgical weight loss interventions.
- Risk aversion has been shown to influence decision-making among patients when presented with weight loss scenarios.
- There is less information about how critical the role of weight loss self-efficacy is on risk perceptions during the candidacy phase for bariatric surgery, whereas there are discussions of varying levels of side effects.

WHAT THIS STUDY ADDS

- Weight loss self-efficacy was a predictor of participants' willingness to take a high risk in bariatric surgery in the context of achieving one's ideal weight.
- Those with lower weight loss self-efficacy were more likely to take a risk overall, but this trend was significant for those with a body mass index of 30 and above in scenarios presenting one's ideal weight as the outcome of bariatric surgery.
- Adding a measure of weight loss self-efficacy within patient assessments would identify those eligible patients who might be most likely to adopt bariatric surgery.

2 | MATERIALS AND METHODS

2.1 | Study design

The experimental study asked about hypothetical weight loss scenarios for bariatric surgery among a national probability-based sample of US adults aged 18 years and older. Participants were recruited through The GfK Group, and the survey was conducted using a sample from KnowledgePanel in 2013. Eligible individuals were emailed the online survey and received a cash equivalent of $5 for their participation. Within the survey, participants were randomly presented with different experimental conditions that assessed risk aversion in relation to bariatric surgery. This paper presents a subsample of participants meeting the criteria for the diagnosis of clinical obesity (having a BMI greater than or equal to 30) and took part in the experimental portion. Eligible individuals were presented with all experimental scenarios. Participants responded about their risk acceptance to achieve different weight loss amounts within the context of bariatric surgery in varying risk scenarios.

2.2 | Measures

At the start of the survey, participants were asked about their current height and weight, their ideal weight, and demographic variables including age, gender and race/ethnicity. The primary outcome is risk "willingness." Participants were asked to indicate the highest chance of risk they would be willing to take to lose weight in different scenarios (ranging from 0% risk to 100% risk). Specifically, the survey asked,

"*Imagine that you could lose weight with the use of weight loss surgery that involved gastric bypass or banding surgery (sometimes called stomach stapling) and then keep it off with a healthy diet and physical activity. Please answer the next questions with this type of surgery in mind.*"

The outcome of risk willingness was assessed across different scenarios, including different weight loss conditions (a: 10% weight loss or b: percentage for ideal weight loss) within different bariatric surgery side effect levels (a: Low (chronic diarrhoea), b: Moderate (severe infection), and c: High (death)). For example, in the ideal weight loss condition and high risk level scenario, the survey asked, "*What is the highest chance of DEATH you would be willing to stake to lose [##] pounds with stomach surgery?*" The symbol [##] was a number, calculated from each participant's current weight minus their ideal weight asked at the beginning of the survey and auto-filled into the ideal weight scenario questions.

A primary variable of interest was weight loss self-efficacy.[20] The weight loss self-efficacy measure was assessed using 12 items (α = .83). Individuals answered "True" or "False" to general weight loss self-efficacy items such as "*I often doubt whether I have what it takes to succeed at weight control.*" The responses were coded dichotomously, where "False" was coded as one. The items were summed and centred, where a higher score indicates higher self-efficacy to lose weight. In addition, there was a question that inquired about minor comorbidities. The comorbidities available for a portion of the analysis included pre-diabetes and sleep apnoea. These two comorbidities were coded as one if endorsed by participants as having been told by their doctor.

2.3 | Analysis

The analysis was conducted using STATA version 14.2 (StataCorp LP, College Station, TX). Descriptive statistics were assessed for demographic variables, weight loss self-efficacy, and participants' willingness to take risk (by risk level and weight loss condition). We next utilized a repeated-measures linear mixed model for multivariable analyses.[21-25]

Two multivariable models were tested for this study. Model 1 was a constrained model including those individuals with BMIs of 40 and above, or including those with BMIs of 30 and above with self-reported pre-diabetes or sleep apnoea. Model 2 expanded the criteria to those with BMIs of 30 and above. The dependent variable was the percentage of risk individuals were willing to take (Risk Willingness). Predictors included the variables, including each condition (Condition) and risk level (Level) for each individual within each repeated set. Weight loss self-efficacy was included to assess its potential interaction. Covariates were also added to the models, including BMI, age, education, gender and race/ethnicity.

After running the two models, margin projections were plotted for the risk willingness across different levels and conditions by high and low weight loss self-efficacy. For this step, the original self-efficacy variable was recoded into a dichotomous variable by splitting responses at the mean. Those individuals who answered 0% to all scenarios were removed for this analysis. Additional analyses were conducted and found no significant differences in demographics among the randomization order, as well as those missing.

TABLE 1 Descriptive statistics (n = 334)

	Mean (SD) or n (%)
Age	48.3 (14.3)
Gender	
Male	145 (43.4)
Female	189 (56.6)
Race	
Non-Hispanic White	249 (74.6)
Non-Hispanic Black	35 (10.5)
Hispanic	16 (4.8)
Other race/two or more races	34 (10.2)
Education	
Less than high school	26 (7.8)
High school	106 (31.7)
Some college	113 (33.8)
Bachelors degree or higher	89 (26.7)
Comorbidity (pre-diabetes or sleep apnoea)	
Yes	142 (42.5)
No	180 (53.9)
Body mass index (30 and above)	38.7 (6.0)
Weight loss self-efficacy (0-12 range)	5.5 (3.6)

3 | RESULTS

Table 1 outlines descriptive statistics for the sample of individuals with a BMI of 30 and above (n = 334). The mean age was 48.3 (SD = 14.3), and the mean BMI was 38.7 (SD = 6.0). A majority of the sample was Non-Hispanic White (74.6%) and achieved a high school diploma (31.7%) or some college (33.8%). There were also slightly more females (56.6%). The average weight loss self-efficacy score was mid-range at 5.5 (SD = 3.6). In Table 2, the average percentage of risk a participant was willing to take is shown by the different experimental conditions. The average percentage decreases as the risk level increases. However, the average percentage is higher for the ideal weight loss scenarios (low 18.1%, moderate 12.1%, and high 8.6%) compared to the 10% weight loss scenarios (low 13.8%, moderate 7.5%, and high 6.5%).

TABLE 2 Willingness to take risk (by level and condition)

	Condition, mean percentage (SD)	
Risk level	10% weight loss scenario	Ideal weight loss scenario
Low—chronic diarrhoea	13.8 (23.9)	18.1 (25.5)
Moderate—severe infection	7.5 (17.8)	12.1 (22.1)
High—death	6.5 (18.0)	8.6 (19.1)

Table 3 outlines the amount of risk a participant in this sample was willing to take using two repeated-measures linear mixed models. The models include the different experimental condition and risk level scenarios, as well as interactions with weight loss self-efficacy. Model 1 included those with a BMI of 40 and above, as well as those with a BMI of 30 and above with a comorbidity. Results from Model 1 indicate a main effect for taking more risk, on average, with every unit increase where participants hypothetically achieve their ideal weight (β = 11.5, P < .01) compared to the 10% weight loss scenario, holding all other variables constant in the model. There was a significant interaction effect, where participants were less willing to take risk for every unit increase where they hypothetically achieve their ideal weight when taking into account their weight loss self-efficacy (β = −1.32, P = .05).

Model 2 was expanded to include individuals with a BMI of 30 and above. The results indicate that participants were more likely to take more risk for every unit increase where they hypothetically achieve their ideal weight (β = 11.2, P < .001) but less so under the highest risk condition of death (β = −5.80, P = .04). The interactions show a parallel trend where, compared to a low risk of chronic diarrhoea, participants were less likely to take the higher risk of death, even if they would achieve ideal weight (β = −8.30, P = .03), controlling for all other variables in the model. On its own, weight loss self-efficacy was not significantly predictive of risk willingness. Yet, the three-way interaction in Model 2 demonstrated that participants were more willing to take risks under ideal weight loss conditions even with the risk of death, particularly when considering weight loss self-

TABLE 3 Predicting risk willingness using a self-efficacy score[a]

	Model 1	Model 2
	n = 135 (P < .001)	n = 223 (P < .001)
	BMI 40+ or BMI 30+ with comorbidity	BMI 30+
	Beta coefficient (confidence interval)	Beta coefficient (confidence interval)
Body mass index (BMI)	0.40 (−0.18 to 0.97)	0.50* (0.08-0.92)
Main effects		
Condition		
10% weight loss scenario	Ref.	Ref.
Ideal weight loss scenario	11.5** (4.29-18.76)	11.2*** (5.78-16.53)
Risk level		
Low—chronic diarrhoea	Ref.	Ref.
Moderate—severe infection	−4.92 (−12.22 to 2.40)	−4.57 (−9.98 to 0.84)
High—death	−3.37 (−10.64 to 3.91)	−5.80* (−11.20 to −0.41)
Weight loss self-efficacy score	0.21 (−1.00 to 1.43)	0.54 (−0.38 to 1.47)
Interaction effects		
Condition × risk level		
Ideal weight loss × chronic diarrhoea	Ref.	Ref.
Ideal weight loss × severe infection	−2.51 (−12.80 to 7.80)	−2.31 (−9.95 to 5.33)
Ideal weight loss × death	−8.49 (−18.74 to 1.77)	−8.31* (−15.92 to −0.69)
Condition × self-efficacy score		
10% weight loss	Ref.	Ref.
Ideal weight loss	−1.32* (−2.45 to −0.19)	−1.30** (−2.13 to −0.48)
Risk level × self-efficacy score		
Low—chronic diarrhoea	Ref.	Ref.
Moderate—severe infection	−0.60 (−1.74 to 0.53)	−0.50 (−1.32 to 0.33)
High—death	−0.91 (−2.05 to 0.23)	−0.36 (−1.18 to 0.47)
Condition × risk level × self-efficacy score		
Ideal weight loss × chronic diarrhoea	Ref.	Ref.
Ideal weight loss × severe infection	0.70 (−0.91 to 2.30)	0.71 (−0.46 to 1.90)
Ideal weight loss × death	1.22 (−0.39 to 2.83)	1.20* (0.03 to 2.36)

Abbreviation: BMI, body mass index.
[a]Models control for age, education, gender and race/ethnicity.
*P < .05.; **P < .01.; ***P < .001.

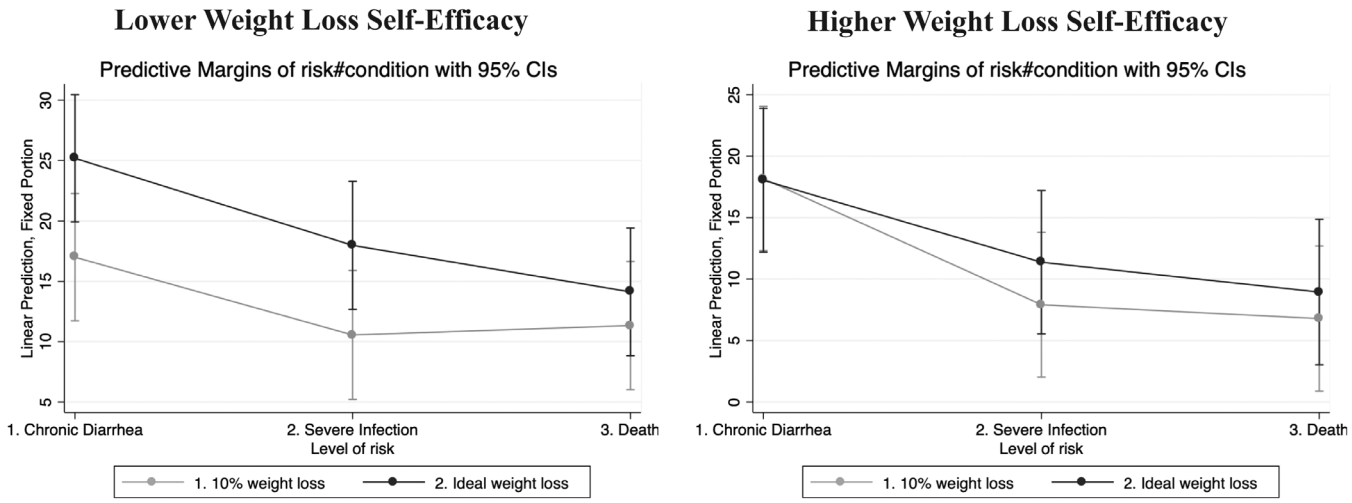

FIGURE 1 Model 1 margin predictions for risk willingness. Light grey = 10% weight loss. Dark grey = ideal weight loss

efficacy (β = 1.20, P = .05). No demographic covariates were statistically significant in either model. A modest increase in BMI was significantly related to risk willingness in Model 2 (β = 0.50, P = .02).

In order to further assess the impact of weight loss self-efficacy within the interactions, follow-up margin predictions were conducted. Figure 1 shows two margin predictions using the dichotomized (high and low) weight loss self-efficacy variable for Model 1. Figure 2 shows two margin predictions for Model 2. The projections demonstrate that individuals in the sample who had lower weight loss self-efficacy were more likely to take risk overall. This trend is significant for those with a BMI of 30 and above in scenarios presenting one's ideal weight as the outcome of bariatric surgery.

4 | DISCUSSION

The results indicate that weight loss self-efficacy is a predictor of participants' willingness to take high risk for bariatric surgery in the context of achieving one's ideal weight for those in the sample with elevated BMIs. In the sample, individuals who had lower weight loss self-efficacy were more likely to take a hypothetical risk of death compared to a risk of chronic diarrhoea from surgery. Results were significant for those individuals with a BMI of 30 and above in scenarios presenting one's ideal weight as the outcome of bariatric surgery. This trend was not significant for those scenarios in which there was moderate risk compared to low risk across all scenarios.

There are important considerations from this study. In clinical practice, adding a measure of weight loss self-efficacy within patient assessments could identify those eligible patients who are most likely to adopt bariatric surgery. In addition, a focus on shared decision-making could optimize appropriate interventions while bolstering patients' weight loss self-efficacy, particularly in relation to post-surgical success as well.[26-28]

This study suggests that weight loss self-efficacy is an important predictor for risk perceptions of bariatric surgery outcomes. It is also important to consider if the severity of obesity itself was a factor in participants' calculation of their willingness to take risk.[11,12,29,30] There are also implications for individuals with low weight loss self-

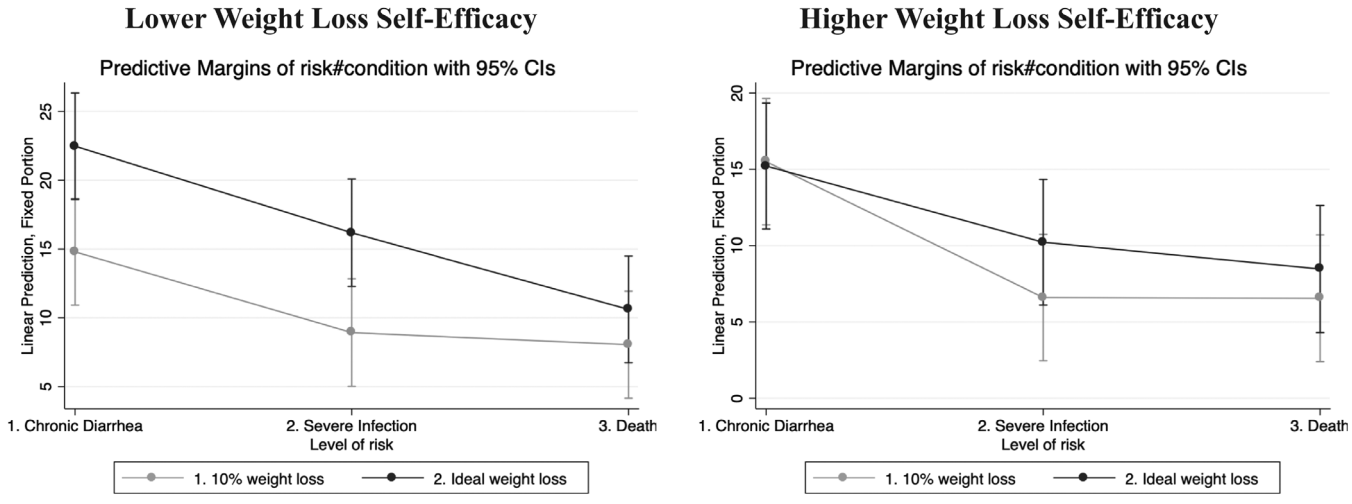

FIGURE 2 Model 2 margin predictions for risk willingness. Light grey = 10% weight loss. Dark grey = ideal weight loss

efficacy. Addressing this by way of providing time and/or tools for increased problem- or emotion-focused coping in tandem with candidacy consultations may enhance quality of life and post-surgical outcomes (eg, reducing relapse rates). Integration of health communication principles[31] for bariatric surgery candidate materials should be strategically tested and applied when aiming to increase risk perceptions or intervene with this target population.[32-35]

This study's contribution should be considered within its limitations. This study included a sample assessing perceptions at one time point. This excluded other factors (eg, comprehensive health history, insurance) that could contribute to treatment decision-making. Bariatric surgery was the only intervention considered for this analysis. In addition, the study compared acute and chronic risks together in analysis, where chronic diarrhoea could also be categorized as a moderate risk provided quality-of-life concerns.[36] Hypothetical thinking can be a challenging task, and individuals with low numeracy or low literacy abilities may have had challenges when presented with numerical risk questions. There could have been additional items in the survey questionnaire about comorbidities (eg, heart disease).[37] Finally, each participant has his or her own ideal weight that may be different from each other, although the statistical analysis aimed to control for this concern.

The current study complements and adds to the literature on risk perceptions for bariatric surgery as a weight loss intervention for eligible individuals with obesity. A strength of this study is that it is grounded in theoretical concepts for individual decision-making. Additional empirical evidence is warranted to further understand specific clinical decision-making within subpopulations. Future research can directly apply and test theories with weight loss self-efficacy constructs to address patient expectations in clinical weight loss and shared decision-making interventions. Although patients with obesity generally prefer large weight reductions, addressing and identifying levels of weight loss self-efficacy among eligible patients could increase the uptake of bariatric surgery and enhance patient outcomes.

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CONFLICT OF INTEREST

No conflict of interest was declared.

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REFERENCES

1. Ogden CL, Carroll MD, Fryar CD, Flegal KM. Prevalence of obesity among adults and youth: United States, 2011-2014. *NCHS Data Brief*. 2015;219:1-8.
2. Luppino FS, de Wit LM, Bouvy PF, et al. Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies. *Arch Gen Psychiatry*. 2010;67(3):220-229. https://doi.org/10.1001/archgenpsychiatry.2010.2.
3. Finkelstein EA, Trogdon JG, Cohen JW, Dietz W. Annual medical spending attributable to obesity: payer-and service-specific estimates. *Health Aff (Millwood)*. 2009;28(5):w822-w831. https://doi.org/10.1377/hlthaff.28.5.w822.
4. Wee CC, Hamel MB, Davis RB, Phillips RS. Assessing the value of weight loss among primary care patients. *J Gen Intern Med*. 2004;19(12):1206-1211. https://doi.org/10.1111/j.1525-1497.2004.40063.x.
5. Wee CC, Jones DB, Davis RB, Bourland AC, Hamel MB. Understanding patients' value of weight loss and expectations for bariatric surgery. *Obes Surg*. 2006;16(4):496-500. https://doi.org/10.1381/096089206776327260.
6. Wharton S, Serodio KJ, Kuk JL, Sivapalan N, Craik A, Aarts MA. Interest, views and perceived barriers to bariatric surgery in patients with morbid obesity. *Clin Obes*. 2016;6(2):154-160. https://doi.org/10.1111/cob.12131.
7. Chan CP, Wang BY, Cheng CY, et al. Randomized controlled trials in bariatric surgery. *Obes Surg*. 2013;23(1):118-130. https://doi.org/10.1007/s11695-012-0798-6.
8. National Heart, Lung, and Blood Institute, National Institutes of Health. *Clinical Guidelines of the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report*. Bethesda, MD: National Heart, Lung, and Blood Institute; 1998.
9. Picot J, Jones J, Colquitt JL, et al. The clinical effectiveness and cost-effectiveness of bariatric (weight loss) surgery for obesity: a systematic review and economic evaluation. *Health Technol Assess*. 2009;13(41):1-190, 215-357, iii-iv. https://doi.org/10.3310/hta13410.
10. Homer CV, Tod AM, Thompson AR, Allmark P, Goyder E. Expectations and patients' experiences of obesity prior to bariatric surgery: a qualitative study. *BMJ Open*. 2016;6(2):e009389-2015-009389. https://doi.org/10.1136/bmjopen-2015-009389.
11. Slovic P. Perception of risk. *Science*. 1987;236(4799):280-285.
12. Bandura A. The primacy of self-regulation in health promotion. *Appl Psychol Int Rev*. 2005;2:245-254.
13. Jerome GJ, Myers VH, Young DR, et al. Psychosocial predictors of weight loss by race and sex. *Clin Obes*. 2015;5(6):342-348. https://doi.org/10.1111/cob.12120.
14. Terranova L, Busetto L, Vestri A, Zappa MA. Bariatric surgery: cost-effectiveness and budget impact. *Obes Surg*. 2012;22(4):646-653. https://doi.org/10.1007/s11695-012-0608-1.
15. Ng M, Fleming T, Robinson M. Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: a systematic analysis for the global burden of disease study 2013. *Lancet*. 2014;384(9945):766-781. https://doi.org/10.1016/S0140-6736(14)60460-8.
16. Finkelstein EA, Khavjou OA, Thompson H, et al. Obesity and severe obesity forecasts through 2030. *Am J Prev Med*. 2012;42(6):563-570. https://doi.org/10.1016/j.amepre.2011.10.026.
17. Wong ES, Wang BC, Alfonso-Cristancho R, et al. BMI trajectories among the severely obese: results from an electronic medical record population. *Obesity (Silver Spring)*. 2012;20(10):2107-2112. https://doi.org/10.1038/oby.2012.29.

18. Finkelstein EA, Ostbye T, Malhotra R. Body mass trajectories through midlife among adults with class I obesity. *Surg Obes Relat Dis*. 2013;9(4):547-553.e1. https://doi.org/10.1016/j.soard.2012.01.004.
19. Busetto L, Dixon J, De Luca M, Shikora S, Pories W, Angrisani L. Bariatric surgery in class I obesity: a position statement from the International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO). *Obes Surg*. 2014;24(4):487-519. https://doi.org/10.1007/s11695-014-1214-1.
20. Straw MK, Straw RB, Mahoney MJ, et al. The master questionnaire: preliminary report on an obesity assessment device. *Addict Behav*. 1984;9(1):1-10. https://doi.org/10.1016/0306-4603(84)90002-9.
21. Hargreaves EA, Mutrie N, Fleming JD. A web-based intervention to encourage walking (StepWise): pilot randomized controlled trial. *JMIR Res Protoc*. 2016;5(1):e14. https://doi.org/10.2196/resprot.4288.
22. Mendoza JA, Baranowski T, Jaramillo S, et al. Fit 5 kids TV reduction program for Latino preschoolers: a cluster randomized controlled trial. *Am J Prev Med*. 2016;50(5):584-592. https://doi.org/10.1016/j.amepre.2015.09.017.
23. Bell JA, Sabia S, Singh-Manoux A, Hamer M, Kivimaki M. Healthy obesity and risk of accelerated functional decline and disability. *Int J Obes (Lond)*. 2017;41(6):866-872. https://doi.org/10.1038/ijo.2017.51.
24. Pearl RL, Wadden TA, Chao AM, et al. Weight bias internalization and long-term weight loss in patients with obesity. *Ann Behav Med*. 2018. https://doi.org/10.1093/abm/kay084.
25. Laird NM, Ware JH. Random-effects models for longitudinal data. *Biometrics*. 1982;38(4):936-974.
26. Weinstein AL, Marascalchi BJ, Spiegel MA, Saunders JK, Fagerlin A, Parikh M. Patient preferences and bariatric surgery procedure selection; the need for shared decision-making. *Obes Surg*. 2014;24(11):1933-1939. https://doi.org/10.1007/s11695-014-1270-6.
27. Stanford FC, Kyle TK, Claridy MD, Nadglowski JF, Apovian CM. The influence of an individual's weight perception on the acceptance of bariatric surgery. *Obesity (Silver Spring)*. 2015;23(2):277-281. https://doi.org/10.1002/oby.20968.
28. Strategies to Overcome and Prevention Obesity Alliance. WHY WEIGHT? A guide to discussing obesity & health with your patients. http://stopobesityalliance.org/wp-content/themes/stopobesityalliance/pdfs/STOP-Provider-Discussion-Tool.pdf. Accessed January 25, 2019.
29. Rosenstock IM. What research in motivation suggests for public health. *Am J Public Health Nations Health*. 1960;50(3 Pt 1):295-302.
30. Armitage CJ, Norman P, Alganem S, Conner M. Expectations are more predictive of behavior than behavioral intentions: evidence from two prospective studies. *Ann Behav Med*. 2015;49(2):239-246. https://doi.org/10.1007/s12160-014-9653-4.
31. Hovland CI, Janis IL, Kelley HH. Communication and persuasion: psychological studies of opinion change. *Am Sociol Rev*. 1954;19(3):355-357.
32. Ancker JS, Senathirajah Y, Kukafka R, Starren JB. Design features of graphs in health risk communication: a systematic review. *J Am Med Inform Assoc*. 2006;13(6):608-618. https://doi.org/10.1197/jamia.M2115.
33. Chaiken S. Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *J Pers Soc Psychol*. 1980;39(5):752-766.
34. Rimal RN, Turner MM. Use of the Risk Perception Attitude (RPA) framework for understanding health information seeking: the role of anxiety, risk perception, and efficacy beliefs. In: Thompson TL, Parrott R, Nussbaum JF, eds. *The Routledge Handbook of Health Communication*. 2nd ed. New York, NY: Taylor & Francis Group; 2011.
35. Harris P, Middleton W, Joiner R. The typical student as an in-group member: eliminating optimistic bias by reducing social distance. *Eur J Soc Psychol*. 2000;30:235-253.
36. Gyrd-Hansen D. Willingness to pay for a QALY: theoretical and methodological issues. *Pharmacoeconomics*. 2005;23(5):423-432. https://doi.org/10.2165/00019053-200523050-00002.
37. American Society for Metabolic and Bariatric Surgery. Metabolic and bariatric surgery. Resources Web site. https://asmbs.org/resources/metabolic-and-bariatric-surgery. Accessed November 16, 2018.

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