Published in final edited form as:

Obes Res Clin Pract. 2017 ; 11(1): 123–126. doi:10.1016/j.orcp.2016.11.004.

The value of health and weight loss among primary care patients with moderate to severe obesity: Do quality of life factors have a larger influence than comorbidities?

Christina C. Wee*, Mary B. Hamel, Karen W. Huskey, and Roger B. Davis

Division of General Medicine and Primary Care Beth Israel Deaconess Medical Center and Harvard Medical School Boston, MA, United States

Introduction

Given obesity's wide-ranging health and quality of life (QOL) consequences [1–3], it is not surprising that a majority of adults with obesity desire and attempt weight loss each year [4]. Few studies, however, have examined the degree to which patients with obesity value weight loss and the risks they are willing to assume to lose weight. In prior work, we demonstrated that patients seeking bariatric surgery are willing to assume high risk to lose weight [5]. Moreover, while clinicians and health payers often prioritise metabolic and health complications as an impetus for treatment, patients may actually prioritise quality of life considerations. In this context, we examined the relative importance of demographic factors, comorbid conditions, and QOL in explaining patients' diminished well-being and the value they place on weight loss.

Methods and procedures

We interviewed by telephone and reviewed the medical records of 337 English- and Spanish-speaking participants aged 18–65 from 4 diverse primary care practices in the greater-Boston area. Details of our study and sample characteristics have been previously described [6,7].

We asked about patients' perspectives on weight including whether they desired weight loss, their ideal weight, the minimum amount of weight loss they would be satisfied with, and the factors they considered very important in their quest to lose weight. To quantify patients' overall well-being and the value they place on different levels of weight loss, we estimated the "utility" they associated with their current weight and with different levels of weight loss using a modified version of the standard gamble method, the gold standard approach to estimating utility [8]. Participants were posed a series of standard gamble scenarios. They were first asked to consider the classic hypothetical choice: the certainty of continuing with their current health/weight or taking a gamble with two possible outcomes; the positive outcome of "perfect health" and a negative outcome of immediate death. We then administered additional scenarios where we asked patients to envision a treatment that

*Corresponding author at: Beth Israel Deaconess Medical Center, 330 Brookline Ave, Boston, MA 02215 United States. cwee@bidmc.harvard.edu (C.C. Wee).

would produce different levels of weight loss but was associated with a small risk of dying. Participants then estimated the highest risk of dying they were willing to assume to achieve each weight outcome: patients' self-reported "ideal" weight, weight loss associated with a BMI of 25 kg/m² ("highest healthy weight"), 20% weight loss, and 10% weight loss. We calculated patients' utility for their current state benchmarked against the health/weight state of highest value to the patient (assigned a utility value of 1.00 [7]). For example, if a patient responds that he/she is willing to accept the highest risk of dying to achieve their ideal weight and that risk is 5%, then he/she is calculated to have a current health utility of 0.95.

In addition, we collected demographic, clinical (including comorbid conditions via medical record), and QOL data via using the Impact of Weight on Quality of Life-lite (IWQOL-lite), a 31-item instrument developed to capture 5 domains specific to obesity [9] — physical function, self-esteem, sexual life, public distress and work.

Data analysis

We developed a series of multivariable linear regression models to examine the relative contribution of demographic, clinical, and QOL factors to health utility using *SAS* statistical software package (Cary, NC). Our first model considered only age, sex, race and ethnicity, and education. Subsequent models additionally considered BMI and then comorbid conditions and QOL separately. We examined the change in model R^2 for each model relative to the preceding model to assess the relative importance of newly added factors. Model R^2 (0.00–1.00) can be interpreted as the proportion of the variability in outcome measured by variables in the model. The adjusted model R^2 determines whether a model is superior to another model after accounting for the number of variables in each model.

Results

Of patients, 91% perceived their weight as posing at least a moderate health risk. Participants would be satisfied only if they lost on average a minimum of 22% of their weight; 70% believed they needed to lose 20% or more to derive any health benefits. The majority of patients cited health concerns (86%), appearance (62%), and physical limitations (69%) as very important motivators as compared to psychosocial (33%) or sexual dysfunction (30%).

Table 1 presents patients' willingness to accept mortality risk to lose weight and the associated utility values. In general, patients placed a lower value on achieving perfect health than on achieving substantial weight loss. Table 2 presents the relative contribution of demographic, clinical, and quality of life factors in explaining patient variation in utility. Sociodemographic factors explained only 3% of the variation in patients' utility ($R^2 = 0.03$) and BMI and comorbidities were not a significant correlates. In contrast, QOL scores were significantly associated improved the model by threefold (adjusted R^2 increased from 0.017 to 0.047), explaining almost twice the variation beyond sociodemographic factors and BMI together.

Comment

In our study, primary care patients with moderate to severe obesity placed higher value on being at their ideal weight and losing 20% of their weight than on being in perfect health. Patients reported a health utility of 0.94 meaning that on average they were willing to assume a 6% risk of dying to achieve their most valued outcome; nevertheless, patients' values were highly variable. QOL factors were more important than demographic factors, BMI level above 35 kg/m², or comorbidities although all of these factors only explained 10% of the variation in patients' utility or well-being.

Our study is one of the few studies that directly measure the health utility associated with being moderately or severely obese. The value patients associate with moderate to severe obesity in our current study is comparable to the value associated with mild clinical depression of 0.92 reported elsewhere [10]. Recently, we published a study focused on the value patients who seek bariatric surgery place on weight loss and perfect health [11]. The mean utility was substantially lower at 0.87 than in the current study; this is not unexpected given that patients seeking bariatric surgery had higher BMIs and are likely more adversely affected by their obesity than those seen in primary care.

A high proportion of patients in our study had the misconception that they needed to lose at least 20% of their weight to derive any health benefit, even though modest weight loss (5%–10%) produces improvements in comorbidities and cardiovascular risk factors [12]. In our earlier study of patients seeking bariatric surgery, patients who had the same misperception were more likely to be disappointed with a weight loss of 20% [11]. Taken together, these findings suggest that we need to do a better job highlighting the benefits of modest weight loss to patients. Given that weight loss maintenance is difficult to accomplish and requires patient commitment, it is important for patients to believe that the weight loss they are working so hard to achieve and maintain is actually worthwhile.

Importantly, our study found that patients with lower QOL were more likely to assume risk to lose weight than those with higher QOL scores and that QOL considerations were more important than either BMI or obesity-associated comorbidities in explaining how much patients with obesity devalue their current health state. Hence, studies evaluating the effectiveness of weight control treatments need to not only focus on clinical endpoints but also on how a particular treatment affects patients' QOL.

Our study has limitations including unclear generalizability. Direct measures of health utility are cognitively challenging and patients may misconceptualise the standard gamble. Patients' QOL scores may also reflect severity of illness not adequately captured by our adjustment for comorbid conditions.

In summary, we found that the racially and socioeconomically diverse obese primary care patients in our study value achieving substantial weight loss more than achieving perfect health. QOL impairment appeared more important to how patients value their current weight and health than BMI or comorbid conditions. Our findings suggest that clinical care and future research need to consider patients' perspectives in health decisions related to obesity and weight control therapies.

Acknowledgments

This study was funded by the National Institute of Diabetes, Digestive and Kidney Diseases (R01 DK073302). Dr. Wee was also supported by (K24DK087932). The sponsor had no role in the design or conduct of the study; the collection, management, analysis, and interpretation of the data, and the preparation, review or approval of the manuscript. Dr. Wee conceived the research question, designed the study, obtained funding, supervised the conduct of the study, and drafted the manuscript. Ms. Huskey had full access to all the data, conducted all the analyses, and takes responsibility for the integrity of the data and accuracy of the data analysis. Dr. Davis provided statistical expertise and along with Drs. Hamel and Wee assisted with interpreting the data. All authors provided critical revision of the manuscript for intellectual content and approved the final manuscript. We thank the patients for participating in our study.

References

1. Clinical guidelines on the identification, evaluation and treatment of overweight and obesity in the United States. 1998
2. Calle EE, et al. Overweight, obesity, and mortality from cancer in a prospectively studied cohort of U. S. adults. *N Engl J Med*. 2003; 348(17):1625–38. [PubMed: 12711737]
3. Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity* (Silver Spring). 2009; 17(5):941–64. [PubMed: 19165161]
4. Nicklas JM, et al. Successful weight loss among obese U.S. adults. *Am J Prev Med*. 2012; 42(5): 481–5. [PubMed: 22516488]
5. Wee CC, et al. Expectations for weight loss and willingness to accept risk among patients seeking weight loss surgery. *JAMA Surg*. 2013; 148(3):264–71. [PubMed: 23553327]
6. Patel KV, et al. Prevalence and impact of pain among older adults in the United States: findings from the 2011 National Health and Aging Trends Study. *Pain*. 2013; 154(12):2649–57. [PubMed: 24287107]
7. Wee C, et al. Sex, race, and the adverse effects of social stigma vs. other quality of life factors among primary care patients with moderate to severe obesity. *J Gen Intern Med*. 2015; 30(2):229–35. [PubMed: 25341644]
8. Shepard, DS. Gold, MR. Siegel, JE. Russell, LB., Weinstein, MC., editors. Cost-effectiveness in health and medicine. New York: Oxford University Press; 1996. *J Ment Health Policy Econ*. 1999; 2(2):91–2.
9. Kolotkin RL, et al. Development of a brief measure to assess quality of life in obesity. *Obes Res*. 2001; 9(2):102–11. [PubMed: 11316344]
10. Wells KB, Sherbourne CD. Functioning and utility for current health of patients with depression or chronic medical conditions in managed, primary care practices. *Arch Gen Psychiatry*. 1999; 56(10):897–904. [PubMed: 10530631]
11. Wee CC, et al. Expectations for weight loss and willingness to accept risk among patients seeking weight loss surgery. *Arch Surg*. 2013; 148(March 3):264–71.
12. Shekelle PG, et al. Pharmacological and surgical treatment of obesity. *Evid Rep Technol Assess* (Summ). 2004; (103):1–6.

Table 1

Patient preferences for health and weight loss and their willingness to accept mortality risk.^a

	% willing to assume some mortality risk	Acceptable mortality risk among those willing to assume risk		Utility value ^b	
		Mean (s.d.)	Median (Q1, Q3)	Mean (s.d.)	Median (Q1, Q3)
Health/weight outcome					
Current	–	–	–	0.94 (0.25)	1.00 (0.98, 1.00)
10% weight loss	25.9	4.3 (13.8)	1.0 (0.1, 5.0)	0.95 (0.24)	1.00 (0.99, 1.00)
20% weight loss	36.7	9.6 (28.3)	2.0 (0.1, 10.0)	0.97 (0.20)	1.00 (1.00 ^c , 1.00)
BMI 25	39.5	10.2 (29.3)	2.0 (0.1, 10.0)	0.98 (0.18)	1.00 (1.00, 1.00)
Perceived ideal weight	45.2	9.8 (28.9)	2.0 (0.1, 10.0)	0.98 (0.17)	1.00 (1.00, 1.00)
Perfect health	25.4	9.6 (26.5)	2.0 (1.0, 10.0)	0.96 (0.22)	1.00 (1.00 ^c , 1.00)

^aResults are weighted to account for the sampling design and is generalisable to the eligible primary care practice population.

^bUtility values refer to the value a patient places on that particular health state or outcome. Lower values are associated with less desirable health states.

^cEstimates of 0.999 were rounded to 2 decimal places.

Table 2

Relative contribution of demographic, clinical, and quality of life factors in explaining patient variation in utility.^a

	Model 1 Demographics only	Model 2 Model 1 + BMI	Model 3 Model 2 + comorbidities	Model 4 Model 2 + IWQOL Score
Sample size	n = 334	n = 334	n = 334	n = 288
Model R ²	0.034	0.041	0.055	0.077
Adjusted R ²	0.013	0.017	0.01	0.047
Sex				
Male	0.03 (0.02)	0.03 (0.02)	0.03 (0.02)	0.03 (0.02)
Female	Reference	Reference	Reference	Reference
Race				
White	Reference	Reference	Reference	Reference
African American	0.03 (0.02)	0.02 (0.02)	0.02 (0.02)	0.009 (0.02)
Hispanic	−0.03 (0.03)	−0.03 (0.03)	−0.03 (0.03)	−0.05 (0.04)
Other	0.05 (0.05)	0.04 (0.05)	0.04 (0.05)	0.03 (0.06)
Education				
High school or less	Reference	Reference	Reference	Reference
Some college	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.02 (0.02)
4-year college degree	0.04 (0.02) ^b	0.04 (0.02)	0.04 (0.02)	0.04 (0.02)
Age	−0.0006 (0.001)	−0.0005 (0.001)	−0.0003 (0.001)	−0.0003 (0.001)
BMI	–	−0.002 (0.002)	−0.002 (0.002)	−0.001 (0.002)
Comorbidities	–	–	–	–
Cardio/cerebrovascular disease			0.04 (0.04)	
Asthma, sleep apnea			−0.02 (0.02)	
Depression, anxiety			0.03 (0.02)	
Arthritis, back pain			0.003 (0.02)	
Diabetes			0.02 (0.03)	
High blood pressure			−0.01 (0.02)	
Other disease ^c			0.002 (0.02)	
IWQOL-lite				
Overall summary, per 10-point increase	–	–	–	0.01 (0.05) ^b

^aEstimates associated with characteristics refer to the change in utility associated with the variable. E.g. In model 1, patients with a 4-year college degree have utilities that are significantly higher by 0.04 points than those with a high school or lower education. Similarly in model 4, every 10-point increase in IWQOL-lite score (higher QOL) is associated with a 0.01 increase in health utility.

^bResults reached statistical significance at a $p < 0.05$.

^cIncludes high cholesterol, gastroesophageal reflux disease, gallbladder disease, serious liver disease, and cancer.