

# Health-related Quality of Life Association with Weight Change: Perception versus Reality

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## BACKGROUND

- Obesity is a serious worldwide problem; more than 1.1 billion adults worldwide are overweight, and 312 million are obese<sup>1</sup>
- Over 85% of patients with T2DM are overweight or obese<sup>2</sup>
- Excess body weight is associated with exacerbating diabetes and insulin resistance<sup>3</sup>
- Conversely, weight loss is associated with reduced insulin resistance and improvement in glycemic control.<sup>4</sup> The American Diabetes Association and the International Diabetes Federation guidelines recommend weight loss for all overweight or obese individuals with T2DM<sup>5,6</sup>
- Despite the recommendations, information on quality of life outcomes associated with weight change is limited for individuals with T2DM

## OBJECTIVE

- To compare QOL in adults with T2DM who reported their perception of weight change versus actual weight change

## METHODS

### Study Design

- Cross-sectional analysis of data collected in 2008 among SHIELD respondents with T2DM
- The Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes (SHIELD) is a 5-year population-based survey conducted to better understand the risk for the development of diabetes, as well as disease burden
  - Based upon a screening questionnaire mailed to 200,000 nationally representative households (TNS NFO Household Panel), responses for 211,097 adults in 127,420 households were obtained (64% response rate)
  - A baseline survey was sent in 2004 to 22,001 selected individuals derived from the screening respondents. Since 2005, annual SHIELD surveys have captured self-reported information on health status, attitudes and behaviors, quality of life, and anthropometry from this representative sample of the US population
  - The 2008 survey collected information from 14,921 individuals (71% response rate) and 2,969 respondents had T2DM (20%)

### Study Population

- Respondents were 18 years of age or older
- Self-reported diagnosis of T2DM was based on being "told by a doctor, nurse or other healthcare professional that you have type 2 diabetes"

### Study Measures

- For perceived weight change, respondents were asked to compare their current weight with their weight 1 year ago and indicate if they had gained weight, lost weight, stayed the same, lost weight then gained it back, or gained weight and lost it again
- Actual weight change was measured from self-reported weight from the 2007 SHIELD survey and self-reported weight from the 2008 SHIELD survey (2007 weight – 2008 weight)
- SHIELD-WQ9 questionnaire asked respondents to report how weight change affected 9 aspects of daily life
  - "Thinking about your weight change or lack of weight change over the past year, how did this change affect you in the following areas? worsened, improved, or stayed the same."
    - How I feel physically – physical health
    - My interactions with family
    - My work performance
    - My interactions with co-workers and friends
    - My social activities
    - My daily activities
    - My self-esteem
    - How I feel emotionally – emotional health
    - My overall quality of life
- Overweight was defined as BMI of 25.0–29.9 kg/m<sup>2</sup>, and obese was defined as a BMI ≥30 kg/m<sup>2</sup>

### Statistical Analyses

- T2DM respondents reporting weight loss were compared with T2DM respondents who reported weight gain over the past year. Respondents who reported no change (stayed the same) in weight or fluctuating weight were excluded from the analysis
- Comparisons between T2DM respondents reporting weight loss and those reporting weight gain were conducted using chi-square test for categorical variables and t-tests for continuous variables
- Statistical significance was set *a priori* as  $p < 0.05$

## RESULTS

- A total of 2,969 respondents had T2DM as reported in the 2008 survey, and 1,614 respondents were excluded from the analysis because they reported no weight change ( $n = 1220$ ) or fluctuating weight ( $n = 394$ )

**Table 1. Characteristics of SHIELD T2DM respondents who reported (perceived) losing or gaining weight in the past year,  $n = 1,355$**

Characteristics	Reported weight loss (n = 895)	Reported weight gain (n = 460)
Age, years, mean (SD)	63.0 (11.8)*	60.0 (10.6)
Women, %	61.1	63.9
White, %	74.6	70.7
Education, high school degree or less, %	31.7	36.4
Household income <\$35,000, %	34.9	36.1
Weight, lbs, mean (SD)	209.7 (54.7)*	230.9 (60.8)
Body mass index (BMI) category, %	*	
Normal weight (BMI <25.0 kg/m <sup>2</sup> )	11.8	3.8
Overweight (BMI = 25.0–29.9 kg/m <sup>2</sup> )	25.6	19.6
Obese (BMI ≥30.0 kg/m <sup>2</sup> )	62.6	76.7
Calculated weight change from 2007 to 2008, lbs, mean (SD)	-9.2 (17.0)*	7.1 (16.7)

\* $p < 0.05$  for comparison of reported weight loss vs. weight gain; 1 lb = 0.4536 kg

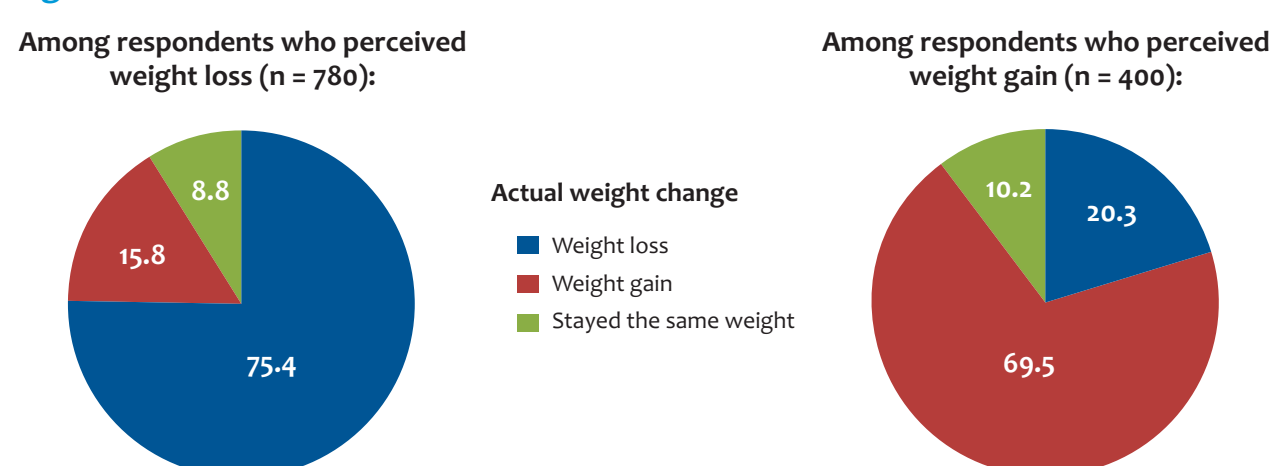
- T2DM respondents who perceived weight loss were older and weighed less at the time of the survey than respondents who perceived weight gain ( $p < 0.05$ ) (Table 1)
- A greater proportion of respondents who perceived weight gain were obese, compared with respondents who perceived weight loss ( $p < 0.001$ )
- Respondents who perceived weight loss actually lost an average of 9.2 lbs, and respondents who perceived weight gain actually had a mean increase of 7.1 lbs

### Perceived versus Actual Weight Change

- Of the 1,355 eligible T2DM respondents, 1,180 completed the SHIELD-WQ9 questionnaire and
  - 780 (66.1%) reported a perception of weight loss
  - 400 (33.9%) reported a perception of weight gain
- For T2DM respondents who perceived weight loss, 75.4% had actual weight loss, 15.8% actually gained weight, and 8.8% had no change in actual weight (Figure 1)
- For T2DM respondents who perceived weight gain, 69.5% had actual weight gain, 20.3% actually lost weight, and 10.2% had no change in weight (Figure 1)

## RESULTS (Continued)

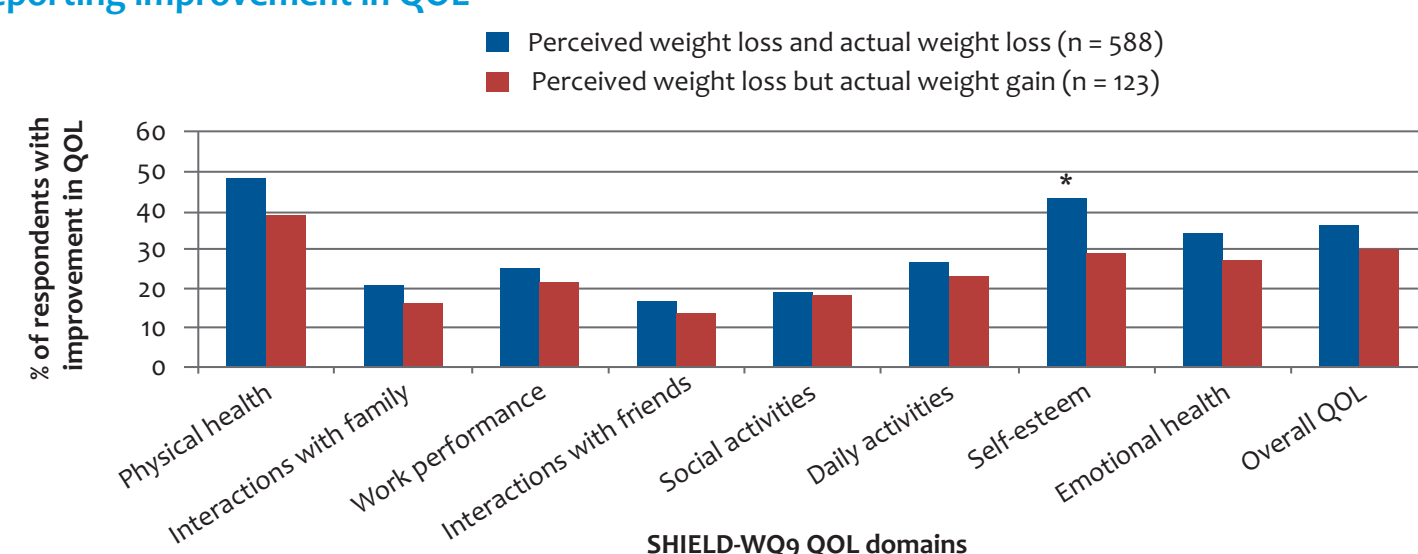
**Figure 1. Percentage of T2DM respondents who perceived weight loss or weight gain by actual weight change\***



\* $r = 0.56$  for correlation between perceived and actual weight change,  $p < 0.001$

### Quality of Life and Weight Change

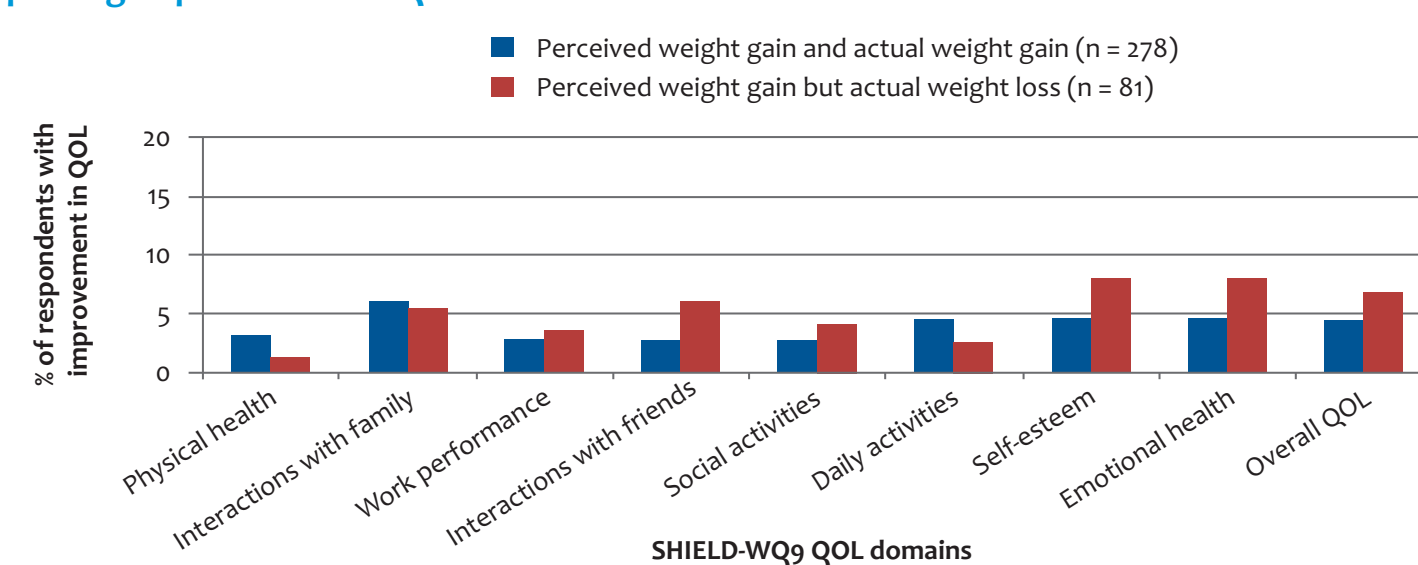
**Figure 2. Proportion of T2DM respondents who perceived weight loss by actual weight change reporting improvement in QOL**



\* $p = 0.004$  for comparison of actual weight loss versus actual weight gain

- QOL did not differ between respondents who perceived weight loss and actually lost weight versus respondents who perceived weight loss but actually gained weight ( $p > 0.05$ ), except for self-esteem ( $p = 0.004$ ) (Figure 2)

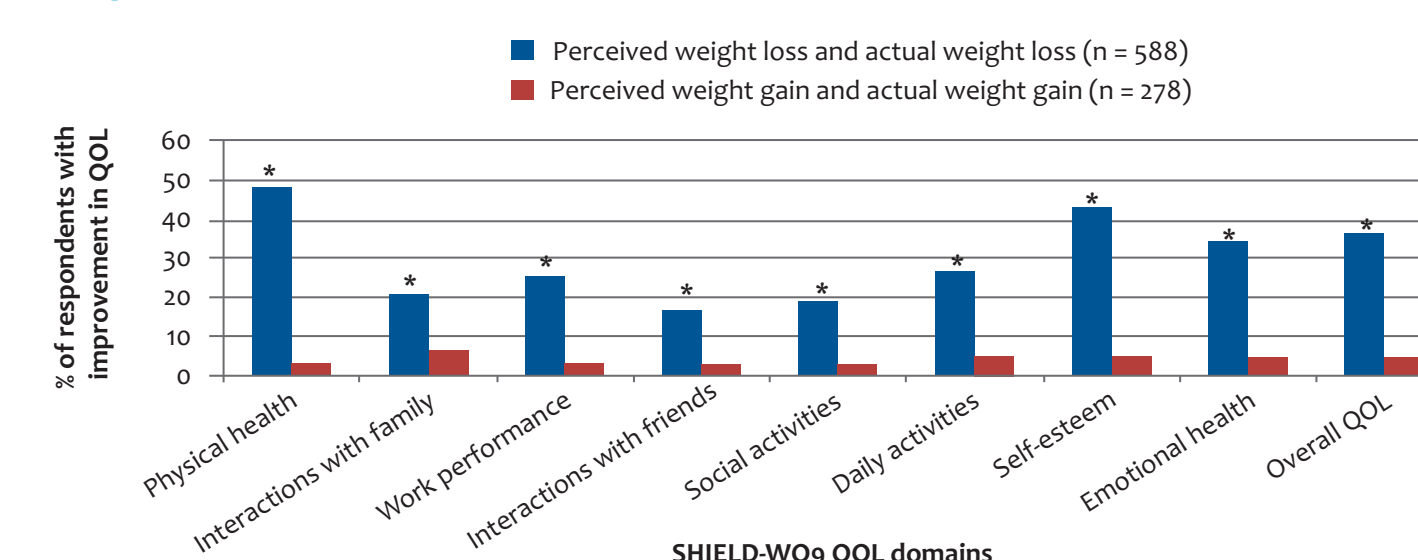
**Figure 3. Proportion of T2DM respondents who perceived weight gain by actual weight change reporting improvement in QOL**



- QOL was similar for respondents who perceived weight gain and actually gained weight versus respondents who perceived weight gain but actually lost weight ( $p > 0.25$ ) (Figure 3)

- Only 3%–8% of T2DM respondents perceiving weight gain indicated improvement in QOL

**Figure 4. Proportion of T2DM respondents who perceived weight loss vs. weight gain reporting improvement in QOL**



\* $p < 0.0001$  for comparison of perceived weight loss vs. weight gain

- Respondents who perceived weight loss and actually lost weight had significantly better QOL than respondents who perceived weight gain and actually gained weight ( $p < 0.0001$ ) (Figure 4)

- Similarly, respondents who perceived weight loss and actually lost weight had significantly better QOL (14%–39% with improvement) than respondents who perceived weight gain but actually lost weight (1%–8% with improvement,  $p < 0.001$ ), except for interactions with friends ( $p = 0.054$ )

## LIMITATIONS

- Diagnosis of diabetes, weight, height, and weight change were self-reported and could not be validated with laboratory tests, medical records review or administrative claims data. However, this bias is similar between the groups compared in this study
- Household panels, like the TNS NFO panel, tend to under-represent the very wealthy and very poor segments of the population and do not include military or institutionalized individuals

## CONCLUSIONS

- Perception of weight loss or weight gain may be as powerful as actual weight loss or weight gain in impacting QOL
  - QOL did not differ between respondents who perceived weight loss and actually lost weight
  - QOL did not differ between respondents who perceived weight gain and actually gained weight
  - Respondents who perceived weight loss regardless of actual weight loss or gain had significantly better QOL than respondents who perceived weight gain regardless of actual weight gain or loss
- Interventions such as diet, exercise, and diabetes therapies that help individuals maintain or lose weight in addition to lowering glucose will assist in optimizing disease management and improving QOL

### References

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### LIST OF ABBREVIATIONS

- BMI** Body mass index
- QOL** Quality of life
- SD** Standard deviation
- SHIELD** Study to Help Improve Early evaluation and management of risk factors Leading to Diabetes
- T2DM** Type 2 diabetes mellitus
- TNS NFO** Taylor Nelson Sofres National Family Opinion
- SHIELD-WQ9** SHIELD Weight Questionnaire – 9 items

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