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Perceived weight status and weight change among a U.S. adult sample

Monica L. Wang, ScD, MS[1], **Christina F. Haughton, MPH**[2], **Christine Frisard, MS**[2], **Lori Pbert, PhD**[2], **Christine Geer**[1], and **Stephenie C. Lemon, PhD**[2]

[1]Department of Community Health Sciences, Boston University School of Public Health, Boston, Massachusetts, USA

[2]UMass Worcester Prevention Research Center, Division of Preventive and Behavioral Medicine, University of Massachusetts Medical School, Worcester, Massachusetts, USA

Abstract

Objectives—Examine bi-directional associations between weight perception and weight change over time among adults.

Methods—Data are from adult employees (N=623) across 12 U.S. public high schools participating in a cluster-randomized multilevel weight gain prevention intervention. Data were collected at baseline, 12 months, and 24 months. Perceived weight status (very/somewhat underweight, just right, somewhat overweight, very overweight) were obtained via self-administered surveys. Weight (kg) was measured by trained staff. Change in weight was calculated as the difference between baseline weight and weight at each follow-up timepoint. Structural equation models were used to assess bi-directional associations of perceived weight status and change in weight over time. Models adjusted for study condition, gender, age, race/ethnicity, education level and previous timepoint.

Results—The sample was 65% female with a mean age of 44.6 (SD=11.3). Nearly two thirds of the sample consisted of people with overweight (38.8%) or obesity (27.3%). Structural equation models indicated that baseline weight predicted subsequent perceived weight status (β=.26; $p<.001$), whereas baseline perceived weight status did not predict subsequent change in weight, adjusting for previous timepoint and covariates.

Conclusions—Results do not support bi-directional causality between weight perception and weight change in an adult sample.

Keywords

weight perception; weight; adults

Corresponding author: Monica L. Wang, ScD, MS, Assistant Professor, Department of Community Health Sciences, Boston University School of Public Health, 801 Massachusetts Avenue, Crosstown Center 4th floor, Boston, MA 02118, Phone: 617-414-1357, Mlwang@bu.edu.

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Conflicts of Interest

The authors have no conflicts of interest to disclose.

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Introduction

Obesity and associated morbidities remain a public health concern, with over two-thirds of U.S. adults currently classified as overweight (33.0%) or obese (35.9%) (1). Identifying and understanding modifiable determinants of obesity, including psychosocial factors such as knowledge, attitudes, and perceptions, are crucial for informing behavioral weight loss/management programs. Previous research cites inaccurate weight status perception, particularly underestimation of weight status (e.g., individuals with overweight who perceive themselves as healthy or normal weight, individuals with obesity who perceive themselves as “a little overweight”), as a barrier to pursuing healthy weight loss or management efforts (2, 3, 4, 5, 6).

The effect of inaccurate weight status perception on weight change and related behaviors may also vary according to body mass index (BMI)-based weight status. Data from the National Longitudinal Study of Adolescent Health indicate that healthy weight adolescents who misperceived themselves as overweight had higher odds of developing obesity over 12 years compared to adolescents who accurately perceived their weight status (7). In contrast, other studies of adolescents and young adults report that weight misperception among individuals with overweight or obesity (specifically, misperceiving themselves to be at a healthy weight) was associated with less BMI gain over time (8, 9) and decreased likelihood of engaging in unhealthy or disordered eating behaviors (10) than those who accurately perceived their weight status. Within the eating disorders literature, weight misperception and overweight perception are associated with eating disorder risk (11) and disordered eating or weight control behaviors (10, 11, 12). Such findings suggest that targeting weight status overestimation among individuals with healthy weight may reduce risk of unhealthy weight management and related outcomes, including obesity and disordered weight control behaviors.

In order to address weight status misperceptions, several studies recommend increasing knowledge to properly self-identify BMI-based weight status (2, 4, 5, 13). A large cohort study of adults examining changes in weight perceptions discussed the role of physicians in addressing inaccurate weight perceptions by discussing weight concerns with patients through strategies such as motivational interviewing (3). However, specific recommendations for how public health practitioners can broadly target weight status misperceptions are lacking.

Contrary to previous studies suggesting an association between inaccurate weight status perception and healthy weight management, a recent study of three cohorts reported that perceived overweight status was associated with weight gain over time, independent of actual weight status (9). The authors speculated that this association may mediated by stress-induced overeating, which can be exacerbated by perceived overweight status. After adjusting for stress-induced overeating, the association between overweight perception and weight gain was no longer significant (9). Results from this study suggest that perceiving oneself as overweight, regardless of whether or not this perception is accurate, may be a risk factor for stress-induced overeating and subsequent weight gain. These findings are supported by other research suggesting that negative or stressful perceptions of weight may

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lead to underreporting dietary intake or other counteractive behaviors that may hinder healthy weight achievement (6, 14). The inconsistent literature suggests that the association between weight perception and weight status may be bidirectional; one factor may influence the other, and the direction and magnitude of this association may differ as individuals lose, gain, or maintain weight over time.

The directionality and magnitude of the longitudinal association between weight perception and weight change among adults warrant further examination. Further understanding the role of weight perception on weight over time will enhance interventions that target healthy weight management. This study examined bi-directional associations between weight perception and weight change over time among adults in the U.S.

Methods

Setting, Design, and Participants

Data from this study are from a cohort of adults participating in a cluster-randomized controlled trial of a school worksite weight gain prevention intervention (2010–2012). Site and participant recruitment, enrollment, baseline measures, and site stratification by school size and urbanicity were completed prior to randomization of schools to study condition. Twelve public high schools in Central Massachusetts participated. Data were obtained from school employee participants at baseline and at 12- and 24-month follow-up. Criteria for study participant eligibility were: English-speaking; no plans to leave employment in the next two years; worked ≥ 15 hours per week; not pregnant or had not given birth in the past 6 months; and no physical impediment to being weighed. Trained study staff screened employees and obtained written informed consent from eligible participants. A total of 841 participants were enrolled in the study. Study attrition rate at 24 months was 19.2%.

The two-year multilevel school worksite intervention was informed by the social ecological model (15) and consisted of individual, interpersonal, and organizational-level strategies promoting weight management through healthy eating and physical activity. Participants in the comparison condition received print and electronic materials featuring information on behavioral weight management. Additional information regarding study recruitment, retention, study conditions, and measures are described in detail elsewhere (16).

Measures

The primary predictor, perceived weight status, was measured via self-administered, self-report survey. Participants were asked to rate their weight as very underweight, somewhat underweight, just right, somewhat overweight, or very overweight. Very underweight and somewhat underweight were combined into one category due to few participants (<4%) who rated themselves in these categories.

Accuracy of weight perception consisted of 3 categories: 1) *accurate* (participants with a baseline BMI within a healthy weight range and who perceived themselves as “just right”, participants with a baseline BMI within the overweight range and who perceived themselves as “somewhat overweight”, and participants with a baseline BMI within the obese range and who perceived themselves as “very overweight”); 2) *overestimate* (participants with a

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baseline BMI within the healthy weight range and who perceived themselves as “somewhat overweight” OR “very overweight” and participants with a baseline BMI within the overweight range and who perceived themselves as “very overweight”); and 3) *underestimate* (participants with a baseline BMI within the overweight OR obese range and who perceived themselves as “just right” OR “very/somewhat underweight”, participants with a baseline BMI within the obese range and who perceived themselves as “somewhat overweight”, and participants with a baseline BMI in the healthy weight range and who perceived themselves as “very/somewhat underweight”). No participants in the analytic study sample had a baseline BMI within the underweight range; thus, the accuracy of weight perception variable does not include this group. “Accurate” served as the referent group for this variable.

Weight was measured by trained staff using portable digital scales (readings were recorded to the nearest $2/10^{th}$ pound), and height was measured to the nearest $1/8^{th}$ inch using portable stadiometers. For anthropometric measurements, participants removed shoes and wore light clothing. BMI was calculated as weight in kilograms divided by meters squared (kg/m^2). BMI-based weight status categories included: underweight (<18.5 kg/m^2), healthy weight (18.5–24.9 kg/m^2), overweight (25.0–29.9 kg/m^2), or obese (≥ 30.0 kg/m^2). Change in weight was calculated as the difference between baseline weight and weight at each follow-up timepoint.

Socio-demographic characteristics were obtained via self-report surveys and included gender, age (years), race/ethnicity (White, Hispanic/Latino, Black/African American, Asian, American Indian/Alaskan Native, Hawaiian/Pacific Islander, and/or Other), and education (highest level attained). Due to the small number of participants who were non-White in the study sample (<5%), race/ethnicity was categorized into two categories for study analysis (White vs. non-White). All study measures were obtained at baseline, 12 months, and 24 months. The Institutional Review Board at the University of Massachusetts Medical School approved study protocol and procedures.

Statistical Analysis

Frequencies for categorical variables and means and standard deviations for continuous variables were computed to describe baseline study sample characteristics. The proportions of participants by weight perception over time were estimated from logistic regression models that adjusted for study condition. Partial Pearson correlation coefficients quantified the association between weight perception and weight change at each timepoint, holding study condition constant. Mixed models were used to examine baseline accuracy of weight perception (referent group=accurate) as a predictor of weight change, controlling for study condition, timepoint, baseline weight, gender, age, race/ethnicity, and education.

Structural equation models were used to assess bi-directional associations of perceived weight status and weight change over time and adjusted for study condition, gender, age, race/ethnicity, and education. Robust standard errors were calculated using the generalized Huber/White/sandwich estimator to account for clustering of participants within schools. To examine if perceived weight status predicted weight change, models tested the association between perceived weight status at the timepoint of interest (baseline or 12 months) and

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subsequent weight change (from baseline to 12 months or 12 months to 24 months), adjusting for weight measured at the initial timepoint of interest and covariates. Models additionally tested for an interaction between baseline BMI-based weight status (healthy weight, overweight/obese) and baseline weight perception (very/somewhat underweight, just right, somewhat overweight, very overweight).

To examine if weight predicted perceived weight status, models tested the association between weight at the timepoint of interest (baseline or 12 months) and subsequent weight status perception (12 or 24 months), adjusting for perceived weight status at the initial timepoint of interest and covariates. Path coefficients were standardized to compare associations of different predictors with the outcome. The coefficients represent the expected impact of a standard deviation (SD) difference in one variable compared to the SD difference in another. Data were analyzed using Stata LP, version 14.1 (College Station, TX).

Results

Of the 841 participants who were initially enrolled, those who became ineligible after baseline due to pregnancy or other weight-related health conditions or those who did not have at least one follow-up assessment (N=59) were excluded from analyses. Participants who were missing data on one or more of the study variables (N=154) and who were underweight at baseline (N=5) were also excluded, resulting in a final analytic sample of 623.

The study sample of school employees (N=623) was mostly female (65.0%), non-Latino White (96.0%), had a college degree or higher (78.5%) and averaged 44.6 years (SD=11.3) (Table 1). Participants' mean weight and BMI at baseline were 79.1 kg (SD=18.2) and 27.8 kg/m^2 (SD=5.5), respectively. Nearly two-thirds of the sample consisted of participants with overweight (38.8%) or obesity (27.3%), and no participants were in the underweight category. With respect to perceived weight status, the majority (58.5%) perceived themselves as "somewhat overweight" at baseline, compared to 25.3% perceiving themselves as "just right" and 13.3% perceiving themselves as "very overweight" (see Table 2 for proportions over time). Most participants (59.9%) accurately perceived their weight status at baseline, 15.9% overestimated their weight status, and 24.2% underestimated their weight status.

Results in Table 3 report partial correlations adjusted for study condition between perceived weight status at baseline, 12 months, and 24 months, and weight change at 12 and 24 months follow-up. With the exception of the correlation between perceived weight status at 12 months and change in weight at 24 months, all correlations were significant (p's<.05). Baseline perceived weight status was positively correlated with baseline weight (ρ=.48; p<.001) and negatively correlated with change in weight at 12 (ρ=−.10; p=.014) and 24 months (ρ=−.13; p=.002).

With respect to accuracy of weight perception, overestimation and underestimation of weight status were not associated with weight change compared with accurate weight status perception (p=.62 and p=.80, respectively) in the fully adjusted mixed model. In models

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examining perceived weight status as a predictor of weight change, the interaction between weight perception and baseline BMI-based weight status was not significant (p=.49). Figure 1 presents results from multivariable structural equation models examining bi-directional associations of weight perception and weight change among participants. Higher baseline weight was associated with higher subsequent weight perception. Results indicated that participants' baseline weight predicts subsequent perceived weight status (β=.26; p<.001), although baseline perceived weight status did not predict subsequent weight change, adjusting for baseline weight and covariates. The effect of baseline weight on 12 month weight perception (.26) was large compared to the effect of baseline weight perception on 12 month change in weight (−.05).

Discussion

The role of weight status perception on weight over time is not well understood. The mixed body of literature suggests that weight perception and weight status may influence each other but the direction and magnitude of these associations may differ over time. This study is among the first to examine bi-directional associations of weight status perception and change in weight over time among a U.S. adult study sample.

Previous research on the link between weight perception and weight has yielded mixed findings. Some studies indicate that perceiving oneself as overweight is positively associated with healthful weight management behaviors or attempts (17, 18, 19, 20). Recent studies suggest that inaccurate weight status perceptions may have protective or detrimental effects depending on weight status. Among adolescents and young adults, individuals with healthy weight who misperceived themselves as overweight had increased odds of developing obesity than their peers with accurate weight perceptions (7), whereas underestimating weight status among individuals with overweight or obesity (e.g., misperceiving themselves to be at a healthy weight) was associated with less BMI gain over time (8). Other findings point to adverse outcomes (e.g., unhealthy weight control behaviors, eating disorder risk) associated with overweight perception across weight status (11, 21, 22). Robinson et al.'s 2015 study (9) of adults from three longitudinal cohorts in the U.S. and the U.K. found that participants who perceived themselves as overweight were at increased risk for subsequent weight gain, regardless of actual (i.e., BMI-based) weight status, though this study did not explore bi-directionality between perceived weight status and weight. Potential mechanisms for the association between overweight perception and weight gain may be that individuals with who perceive themselves as overweight or obese are likely to under-report their daily energy intake, which can undermine weight management efforts (6, 14), or that stress-induced overeating may mediate the association between perceived overweight status and weight gain (9). The current study addresses an important gap in the literature by examining bi-directional associations between weight status perception and weight over time among U.S. adults. Results indicated that participants' baseline weight predicted subsequent perceived weight status, though baseline perceived weight status did not predict subsequent weight change.

One possible explanation for the aforementioned findings is that perceived weight status may not capture weight satisfaction or body image, constructs associated with weight loss

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behaviors (11, 23). The lack of association between weight perception and weight change and between weight perception accuracy and weight change in this study may be due to discordances between individuals' weight perception and weight satisfaction. Individuals who perceive themselves as overweight or healthy weight (regardless of accuracy) and are satisfied with their weight and/or have positive body image may not be motivated to engage in behavior change that leads to subsequent weight loss. Previous research on weight satisfaction and weight-related outcomes is also mixed. Some studies indicate that weight dissatisfaction is a potential motivator for weight loss and that those who are dissatisfied with their weight are more likely than those who are satisfied with their weight to engage in weight loss behaviors (23, 24), whereas a large cross-sectional study among adults found that weight dissatisfaction was associated with unhealthy weight management behaviors (e.g., decreased physical activity and fruit and vegetable consumption) (25). In addition, the links between weight perception, weight satisfaction, and perceived health have implications for population-based obesity prevention and intervention efforts. Repeated cross-sectional samples (1976–2006) of a nationally representative sample of U.S. adults indicate weak associations between obesity (based on self-reported height and weight) and perceptions of poor health (26). Such findings suggest that U.S. adults may not necessarily perceive excess weight as associated with poorer health, particularly if they view their weight as satisfactory or normative. Future studies examining weight perception and weight change should consider isolating the effects of weight perception and weight satisfaction within the context of reference groups; understanding these associations may inform psychosocial targets of weight management interventions.

Another explanation for the different results between the current study and Robinson et al.'s study is that the current study sample was comprised of middle-aged adults (the majority of whom were overweight or obese at baseline) who were interested in participating in a weight gain prevention study; thus the relation between weight, perceived weight status, and weight management efforts in this study is inherently different than that of the three observational cohorts (two cohorts consisting of child populations followed into young adulthood) examined in Robinson and colleagues' study. Finally, the current study had a shorter study follow-up period (2 years) compared to Robinson et al.'s study (7 years in cohort 1; 22 years in cohort 2; 9–10 years in cohort 3), which may be too short of a time period to detect bi-directional associations between perceived weight status and weight over time.

Findings from this study should be considered given study strengths and limitations. To our knowledge, this is the first study to examine bi-directional associations between weight perception and weight over time among U.S. adults, the majority of whom were overweight or obese. Limitations include social desirability bias in self-reported study measures (e.g., participants in a weight gain prevention study may be more inclined to under-estimate their perceived weight status over time) and measurement bias from the restricted variability of responses for the weight status perception item. The study was not sufficiently powered to run stratified analyses by baseline BMI-based weight status. Given that this was a secondary analysis of an intervention study, the possibility of an intervention effect on weight perception among participants in the intervention sites exists. We examined for effect modification by study condition using a test of interaction; results were not statistically significant (data not shown). The study sample consisted of U.S. public high school

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employees of predominantly White racial/ethnic background; thus, results may not be generalizable to other populations. Finally, the two-year follow-up period may not capture the extent and progression of bi-directional associations between weight perception and weight that may occur across the lifecourse.

Conclusion

Results from the current study suggest that weight status perception may not be a primary psychosocial target of healthy weight management and that behavioral interventions may benefit from focusing on other objectives to enhance weight loss or management. Understanding how individuals interpret perceptions of their weight with respect to body satisfaction and other potential health consequences may be important. Additional research that examines longitudinal associations between weight perception and weight change, includes diverse study samples that allow for assessment of interaction effects by gender and race/ethnicity, and explores potential mechanisms for the association between weight perception and weight gain is needed.

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References

1. Ogden, CL.; Carroll, MD.; Kit, BK.; Flegal, KM. Prevalence of obesity in the United States, 2009–2010. National Center for Health Statistics; Hyattsville, MD: 2012. NCHS data brief, no 82
2. Johnson-Taylor WL, Fisher RA, Hubbard VS, Starke-Reed P, Eggers PS. The change in weight perception of weight status among the overweight: comparison of NHANES III 1988–1994 and 1999–2004 NHANES. International Journal of Behavioral Nutrition and Physical Activity. 2008; 5
3. Johnson F, Cooke L, Croker H, Wardle J. Changing perceptions of weight in Great Britain: comparison of two population surveys. BMJ. 2008; 337:a494. [PubMed: 18617488]
4. Naghshizadian R, Rahnemai-Azar AA, Kella K, Weber MM, Calin ML, Bibi S, et al. Patient perception of ideal body weight and the effect of body mass index. J Obes. 2014; 2014:491280. [PubMed: 25614830]
5. Hwang JH, Ryu DH, Park SW. Interaction Effect between Weight Perception and Comorbidities on Weight Control Behavior in Overweight and Obese Adults: Is There a Sex Difference? Journal of Korean medical science. 2015; 30:1017–1024. [PubMed: 26240477]
6. Novotny JA, Rumpler WV, Riddick H, Hebert JR, Rhodes D, Judd JT, et al. Personality characteristics as predictors of underreporting of energy intake on 24-hour dietary recall interviews. Journal of the American Dietetic Association. 2003; 103:1146–1151. [PubMed: 12963942]
7. Sutin AR, Terracciano A. Body weight misperception in adolescence and incident obesity in young adulthood. Psychological science. 2015; 26:507–511. [PubMed: 25749701]
8. Sonneville KR, Thurston IB, Milliren CE, Kamody RC, Gooding HC, Richmond TK. Helpful or harmful? Prospective association between weight misperception and weight gain among overweight and obese adolescents and young adults. International journal of obesity. 2016; 40:328–332. [PubMed: 26303350]
9. Robinson E, Hunger JM, Daly M. Perceived weight status and risk of weight gain across life in US and UK adults. Int J Obes (Lond). 2015; 39:1721–1726. [PubMed: 26248659]

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10. Sonneville KR, Thurston IB, Milliren CE, Gooding HC, Richmond TK. Weight misperception among young adults with overweight/obesity associated with disordered eating behaviors. The International journal of eating disorders. 2016
11. Jáuregui-Lobera I, Ezquerra-Cabrera M, Carbonero-Carreño R, Ruiz-Prieto I. Weight Misperception, Self-Reported Physical Fitness, Dieting and Some Psychological Variables as Risk Factors for Eating Disorders. Nutrients. 2013; 5:4486–4502. [PubMed: 24232917]
12. Austin SB, Spadano-Gasbarro J, Greaney ML, Richmond TK, Feldman HA, Osganian SK, et al. Disordered weight control behaviors in early adolescent boys and girls of color: an under-recognized factor in the epidemic of childhood overweight. The Journal of adolescent health: official publication of the Society for Adolescent Medicine. 2011; 48:109–112. [PubMed: 21185534]
13. Steenhuis IH, Bos AE, Mayer B. (Mis)interpretation of body weight in adult women and men. Journal of human nutrition and dietetics: the official journal of the British Dietetic Association. 2006; 19:219–228. [PubMed: 16756537]
14. Tyrovolas S, Koyanagi A, Stickley A, Haro JM. Weight Perception, Satisfaction, Control, and Low Energy Dietary Reporting in the US Adult Population: Results from the National Health and Nutrition Examination Survey 2007–2012. J Acad Nutr Diet. 2015
15. Sallis, JF.; Owen, N.; Fisher, EB. Ecological models of health behavior. In: Glanz, K.; Rimer, BK.; Viswanath, K., editors. Health Behavior and Health Education Theory, Research, and Practice. Jossey-Bass; San Francisco, CA: 2008.
16. Lemon SC, Wang ML, Wedick NM, Estabrook B, Druker S, Schneider KL, et al. Weight gain prevention in the school worksite setting: Results of a multi-level cluster randomized trial. Preventive medicine. 2013
17. Duncan DT, Wolin KY, Scharoun-Lee M, Ding EL, Warner ET, Bennett GG. Does perception equal reality? Weight misperception in relation to weight-related attitudes and behaviors among overweight and obese US adults. The international journal of behavioral nutrition and physical activity. 2011; 8:20. [PubMed: 21426567]
18. Yaemsiri S, Slining MM, Agarwal SK. Perceived weight status, overweight diagnosis, and weight control among US adults: the NHANES 2003–2008 Study. International journal of obesity. 2011; 35:1063–1070. [PubMed: 21042327]
19. Lemon SC, Rosal MC, Zapka J, Borg A, Andersen V. Contributions of weight perceptions to weight loss attempts: differences by body mass index and gender. Body image. 2009; 6:90–96. [PubMed: 19188102]
20. Lynch E, Liu K, Wei GS, Spring B, Kiefe C, Greenland P. The relation between body size perception and change in body mass index over 13 years: the Coronary Artery Risk Development in Young Adults (CARDIA) study. American journal of epidemiology. 2009; 169:857–866. [PubMed: 19221119]
21. Pasch KE, Klein EG, Laska MN, Velazquez CE, Moe SG, Lytle LA. Weight misperception and health risk behaviors among early adolescents. American journal of health behavior. 2011; 35:797–806. [PubMed: 22251770]
22. ter Bogt TF, van Dorsselaer SA, Monshouwer K, Verdurmen JE, Engels RC, Vollebergh WA. Body mass index and body weight perception as risk factors for internalizing and externalizing problem behavior among adolescents. The Journal of adolescent health: official publication of the Society for Adolescent Medicine. 2006; 39:27–34. [PubMed: 16781958]
23. Kuk JL, Ardern CI, Church TS, Hebert JR, Sui X, Blair SN. Ideal weight and weight satisfaction: association with health practices. American journal of epidemiology. 2009; 170:456–463. [PubMed: 19546153]
24. Neumark-Sztainer D, Paxton SJ, Hannan PJ, Haines J, Story M. Does body satisfaction matter? Five-year longitudinal associations between body satisfaction and health behaviors in adolescent females and males. The Journal of adolescent health: official publication of the Society for Adolescent Medicine. 2006; 39:244–251. [PubMed: 16857537]
25. von Lengerke T, Mielck A, Group KS. Body weight dissatisfaction by socioeconomic status among obese, preobese and normal weight women and men: results of the cross-sectional KORA Augsburg S4 population survey. BMC public health. 2012; 12:342. [PubMed: 22571239]

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26. Macmillan R, Duke N, Oakes JM, Liao W. Trends in the association of obesity and self-reported overall health in 30 years of the Integrated Health Interview Series. Obesity (Silver Spring, Md). 2011; 19:1103–1105.

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What is already known about this subject?

- Psychosocial factors such as weight status perceptions may be crucial for informing behavioral weight loss/management programs.
- Inaccurate weight status perception may have protective or adverse associations on weight gain depending on weight status.
- Recent research has indicated a positive correlation between perceived overweight status and subsequent weight gain.

What does this study add?

- No study has explored bi-directionality between weight perception and weight among adults; this study examined bi-directional associations between weight perception and weight change over time among a sample of U.S. adults.
- Inaccurate weight perception was not associated with weight change.
- Findings do not support bi-directional causality between weight perception and weight change in an adult sample.

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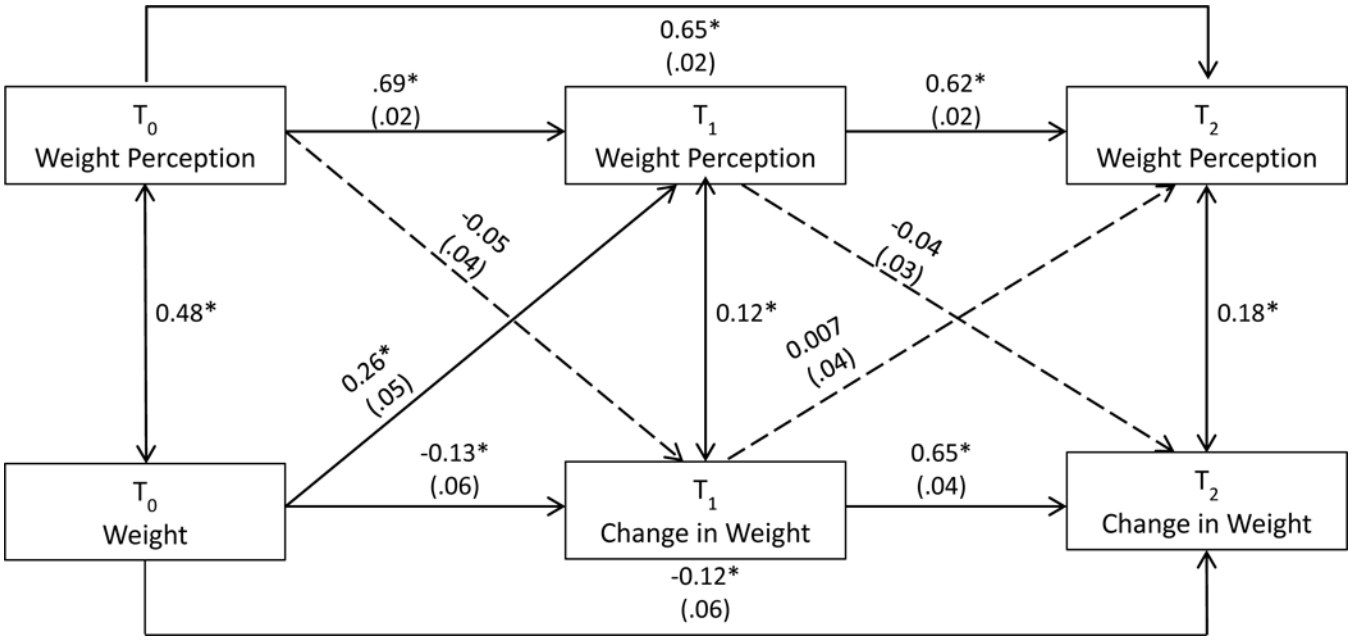

Figure 1. Results† from Structural Equation Models Examining Bi-directional Associations of Weight Perception and Weight Change Over Time among School Employees (N=623) Participating in a Weight Gain Prevention Intervention (2010–2012)

†Values represent effect estimates from structural equation models with corresponding standard deviations represented in parentheses underneath. Solid lines represent significant associations; dotted lines represent null associations. Vertical lines indicate correlation coefficients; horizontal and diagonal lines indicate standardized coefficients from the path analysis. Models adjusted for study condition, gender, age, race/ethnicity, education, and weight perception or weight status at the previously measured timepoint. Robust standard errors were calculated using the generalized Huber/White/sandwich estimator to account for clustering of participants within schools.

*level of significance set at $p < .05$

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Table 1

Baseline Characteristics of School Employees (N=623) Participating in a Weight Gain Prevention Intervention (2010–2012)

Characteristic	**N (%)**
Gender	
Male	218 (35.0%)
Female	405 (65.0%)
White or Caucasian	
No	25 (4.0%)
Yes	598 (96.0%)
Education level	
High school graduate or less	59 (9.5%)
Post high school/trade school/some college	75 (12%)
College graduate/some graduate work	156 (25%)
Post graduate degree	333 (53.5%)
Body mass index (BMI) based weight status	
<25.0 kg/m^2	211 (33.9%)
25.0–29.9 kg/m^2	242 (38.8%)
≥ 30.0 kg/m^2	170 (27.3%)
Age (years)	44.6 (11.3)
Weight (kg)	79.1 (18.2)
BMI (kg/m^2)	27.8 (5.5)

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Table 2

Weight Perception* by Timepoint among School Employees (N=623) Participating in a Weight Gain Prevention Intervention (2010–2012)

	Baseline	12 months	24 months
Weight perception	**N(%)**	**N(%)**	**N(%)**
Very/Somewhat underweight	17 (2.7%)	22 (3.5%)	12 (1.9%)
Just right	158 (25.3%)	171 (27.4%)	200 (32.1%)
Somewhat overweight	364 (58.5%)	357 (57.3%)	346 (55.6%)
Very overweight	84 (13.3%)	73 (11.6%)	65 (10.3%)

* Proportions adjusted for study condition

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Table 3

Partial Correlations (Adjusting for Study Condition) between Weight Perception and Weight Change at 12 and 24 months follow-up among School Employees (N=623) Participating in a Weight Gain Prevention Intervention (2010–2012)

Characteristic	Pearson Correlation Coefficient	P-value
Baseline Weight Perception		
Baseline Weight	.48	<.001
Change in Weight at 12 Months	−.10	.014
Change in Weight at 24 Months	−.13	.002
Weight Perception at 12 Months		
Change in Weight at 12 Months	.12	.002
Change in Weight at 24 Months	.02	.69
Weight Perception at 24 Months		
Change in Weight at 24 Months	.18	<.001