Research Article

Body Mass Index and Weight Loss in Overweight and Obese Korean Women: The Mediating Role of Body Weight Perception

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Purpose: This study were to assess the relationships among BMI, body weight perception, and efforts to lose weight in a public sample of Korean women who are overweight and obese and to examine the mediating role of body weight perception on the relationship between BMI and weight loss efforts.

Methods: This cross-sectional study used data from the 2008 Korea National Health and Nutrition Examination Survey. The sample was 1,739 Korean women 20 years old or older with body mass index (BMI) ≥ 23 kg/m². Bivariate relationships among variables of interests were assessed. Three separate regressions were used to test the mediating role of body weight perception on the relationship between BMI and weight loss efforts.

Results: BMI and body weight perception were significant correlates of weight loss efforts. BMI was significantly associated with weight perception, but a large proportion of women underestimated their weight. Weight perception partially mediated the relationship between BMI and weight loss efforts in Korean women.

Conclusion: In light of the high prevalence of overweight or obesity and the many health consequences associated with obesity, Korean women should be aware of a healthy body weight and try to achieve that weight. Nursing interventions should consider body weight perception to effectively motivate overweight and obese Korean women to lose weight, as necessary.

Introduction

Over the past several decades, Korea has experienced rapid economic growth, resulting in unhealthy changes in lifestyle and diet that have led to significant increases in obesity (Yoon et al., 2006). A recently published study using nationally representative data showed that one in two Korean women aged 20 or older is overweight or obese, while more than 60% of women aged 50 or older are considered overweight or obese (Boo & Froelicher, 2012a). Excess weight is a risk factor for numerous chronic conditions, including diabetes mellitus and cardiovascular disease (Must et al., 1999). Weight loss can favorably reduce the risk for such diseases (Hamman et al., 2006; Pi-Sunyer et al., 2007). Therefore, overweight or obese individuals need to be counseled and encouraged to embark on efforts to lose weight.

Research has shown that trying to lose weight is related to the level of overweight (Andreyeva, Long, Henderson, & Grode, 2010; Bersamin, Hanni, & Winkleby, 2010; Bish et al., 2005; Koo & Park, 2011), but not everyone who is overweight or obese tries to lose weight (Andreyeva et al.; Bersamin et al.; Bish et al.; Koo & Park). A study by Koo and Park showed that only 23.5% of overweight and 17.2% of obese middle-aged Korean women are trying to control weight. This may be an indicator of a low level of readiness for weight loss in overweight or obese individuals. Thus, an important opportunity exists for the success of weight loss interventions. Sociodemographic factors such as age, race, education level, income, and smoking status are also related to trying to lose weight (Anderson, Eyler, Galuska, Brown, & Brownson, 2002; Bersamin et al.; Bish et al.; Lee et al., 2005). Although these factors are useful in deciding where to direct weight loss interventions, they may not be helpful in designing more effective or appropriate weight loss interventions. A better understanding about what motivates overweight or obese individuals to try to lose weight might help in designing more effective weight loss interventions.

Motivation for weight loss in women can include body weight perception, which is the subjective evaluation of one’s body weight and is related to weight loss concerns or health behaviors (Clarke, 2002; Putterman & Linden, 2004). Studies from the United States have demonstrated that dissatisfaction with weight is a strong
predictor of trying to lose weight in women (Anderson et al., 2002; Lemon, Rosal, Zapka, Borg, & Andersen; 2009). Other studies have found complex relationships among body mass index (BMI), weight perception, and weight loss efforts in African Americans (Lee et al., 2005; Wang, Liang, & Chen, 2009). It has been suggested that associations between BMI and weight loss efforts may be mediated by body weight perception (Lee et al.). If such effects exist in the general population of Korean women who are overweight or obese, we can enhance our understanding of the complex relationships among actual weight, weight perception, and weight loss efforts. The finding will also provide insights in designing more effective weight loss interventions for Korean women who are overweight or obese.

However, most previous studies about body weight perception in Korea have generally focused on adolescents or college students in very narrow geographic areas or have examined issues related to eating disorders (Kim, 2012; Kim, Kim, Cho, & Cho, 2008; Lee & Oh, 2004). Relatively little is known about perceived body weight in adult Korean women who are overweight or obese in terms of BMI and trying to lose weight. Previous studies only bivariately analyzed the relationships among them (Kim, Jeong, Kim, & Park, 2004; Koo & Park, 2011). In addition, body weight perception is likely to be influenced by cultural factors so that the evidence from Western countries may not be appropriate for Koreans. Therefore, the purposes of this study are to systematically assess the relationships among BMI, weight perception, and weight loss efforts in a nationally representative sample of Korean women who are overweight or obese and to examine the plausibility of the mediating effect of body weight perception on the relationship between level of obesity and weight loss efforts. Figure 1 shows the conceptual framework of this study. It is hypothesized that (a) women who are overweight or obese are more likely to try losing weight, and (b) excess body weight leads to self-perceived overweight or obesity, which (c) in turn results in the efforts to lose weight (This study does not aim to evaluate the impact of the covariates).

Methods

Study design

This is a cross-sectional secondary data analysis. Data from the 2008 Korea National Health and Nutrition Examination Survey IV (KNHANES IV) by the Korea Centers for Disease Control and Prevention (KCDC) were used. KNHANES IV used a stratified, multi-stage probability sampling design. Details of the sampling design and survey procedures of the original study are provided elsewhere (Boo & Froelicher, 2012a, 2012b).

Setting and sample

The sample for this study was limited to women who were aged 20 or older, completed the survey, and were overweight or obese (BMI ≥ 23 kg/m²). Women who were pregnant or breast-feeding were excluded because pregnancy or lactation may influence BMI and weight control behavior. Of the 5,374 women participants in the original KNHANES IV survey, 3,814 women were aged 20 or older and completed the survey. Among them, 1,879 women had a BMI greater than 23 kg/m²; 33 of these women were pregnant and 22 women were breast-feeding. Thus, 1,824 women were eligible for the analysis of this study. Among them, those with missing data on demographic characteristics (n = 77), on body weight perception (n = 7), and on whether they were trying to lose weight or not (n = 1) were excluded, yielding a final sample of 1,739 women for the analysis of this study.

Ethical consideration

The original survey, KNHANES IV, was approved by the KCDC Institutional Review Board. Informed consent was obtained from each KNHANES participant. This study used only de-identified existing data with no subject contact. The SPSS data set and the data directory were downloaded directly from the KCDC website (http://knhanes.cdc.go.kr/); the downloaded electronic data were protected with a password.

Data collection and measurements

Face-to-face interviews and physical examinations were performed in a mobile examination center or in public health centers. Variables were defined as follows:

Overweight and obesity

Overweight and obesity are based on BMI. BMI, defined as weight in kilograms divided by height in meters squared (kg/m²), was calculated using measured height and weight. Overweight and obesity in this study were defined as 23 kg/m² < BMI < 25 kg/m² and BMI ≥ 25 kg/m², respectively, based on the Asian-Pacific region of the World Health Organization (WHO) data (WHO, 2000).

Body weight perception

Weight perception was assessed using responses to the following survey question: Do you consider yourself now to be very underweight, slightly underweight, about the right weight, overweight, or obese? Because few women reported themselves to be very underweight, those who reported themselves as very underweight or slightly underweight were collapsed into a single category for this study. Thus, the variable used in the analyses of this study included four categories: underweight, about right, overweight, and obese.

Weight loss efforts

Attempts to lose weight were assessed with the following question: During the past 12 months, what have you been trying to do about your body weight? Response choices were “gain weight”, “lose weight”, “stay the same”, and “nothing”. These responses were dichotomized for this study: Women who answered that they were trying to lose any amount of weight were identified as those trying to lose weight (yes/no).
Bivariate Relationships among BMI, Body Weight Perception, and Weight Loss Efforts (N = 1,739)

<table>
<thead>
<tr>
<th>Variables</th>
<th>BMI, % (SE)</th>
<th>p</th>
<th>Body weight perception, % (SE)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overweight¹</td>
<td>Obesity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight loss efforts (yes)</td>
<td>55.4 (2.06)</td>
<td>62.7 (1.83)</td>
<td></td>
<td>.004</td>
</tr>
<tr>
<td>Body weight perception</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>6.6 (0.86)</td>
<td></td>
<td>55.5 (1.47)</td>
<td></td>
</tr>
<tr>
<td>About right</td>
<td>56.3 (1.23)</td>
<td></td>
<td>55.5 (1.47)</td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>66.1 (1.19)</td>
<td></td>
<td>55.5 (1.47)</td>
<td></td>
</tr>
</tbody>
</table>

Note: BMI = body mass index; SE = standard error.
¹ Overweight = BMI ≥ 23 kg/m²; obesity = BMI ≥ 25 kg/m².

Table 1 shows the characteristics of participants of Korean women with BMI ≥ 23 kg/m². The mean age was 49.79 years. More than half (54.1%) were between 41 and 65 years old. About 70% of the women were married and living with their spouses. The majority (82.3%) of them had an education level of high school or less. Less than half (45.8%) were employed, and 25.4% of the women would be considered as having low incomes below the poverty level as defined by the PIR. The rate of current smokers was 6.6%. Approximately 45% were classified as overweight and 55% as obese, although significantly less (16.8%) perceived themselves as obese, and 56.3% perceived themselves as overweight and 25.2% as underweight or about right. Overall, two out of every five women reported that they were trying to lose weight.

Bivariate relationships among BMI, weight perception, and weight loss efforts are presented in Table 2. Three variables were significantly associated with each other. Obese women are more likely to report that they were trying to lose weight (62.7%) compared to overweight women (55.4%, p = .004). Among overweight women, 36.5% reported themselves as underweight or about right, 58.3% as overweight, and 5.3% as obese. Among obese

See the full text for more details.
women, 29.2% perceived their body weight status correctly; 54.7% perceived themselves to be overweight and 16.1% as underweight or about right. The proportion of women trying to lose weight differed significantly by body weight perception (p < .001). Women who reported higher perceived weight were more likely to report that they were trying to lose weight.

Table 3 shows the results of Spearman’s correlations among study variables. Dependent variable, weight loss efforts, was negatively related with age, marital status, education and poverty level. Weight perception was positively related with age, education, and poverty level. Significant covariates were entered into the following regression models to control for their effects.

Table 4 displays the results of the ordered logistic regression with body weight perception as an ordered, four-category response variable (underweight, about right, overweight, & obese). Obese women were 5.47 times more likely to report one unit heavier on the level of weight perception compared to overweight women (odds ratio [OR] = 5.47, 95% CI: 4.46, 6.69), when all other variables in the model were held constant. This result supports the first condition of mediation. The results of multiple logistic regression analyses performed to examine the second (model 1) and third conditions (model 2) of mediation are presented in Table 5. Obese women were 1.82 times more likely to be trying to lose weight than overweight women were, after controlling for all other variables in model 1 (OR = 1.82, 95% CI: 1.48, 2.24). However, the associations between BMI and weight loss efforts became weaker when body weight perception was added into the model (model 2: OR = 1.31, 95% CI: 1.11, 1.71), and weight perception was independently and positively associated with trying to lose weight. Women who reported themselves to be overweight in comparison to women who reported themselves as underweight were 2.83 times more likely to be trying to lose weight (OR = 2.83, 95% CI: 1.65, 4.84), controlling for all other variables in the model. Women who reported themselves to be obese in comparison to women who reported themselves to be underweight were 3.39 times more likely to be trying to lose weight (OR = 3.39, 95% CI: 1.87, 6.17) after controlling for covariates.

Discussion

This study attempted to enhance our understanding of the relationships among actual body weight, weight perception, and weight loss efforts as well as to test the plausibility of the mediating role of body weight perception on the relationship between actual body weight and weight loss efforts in a national sample of Korean women who are overweight or obese. A mediator is a third variable that comes between the independent and dependent variables. Researchers are interested in investigating mediators when they want to explain “how” and “why” the relationships between the independent and dependent variables occur, especially when a significant relationship exists between the two variables (Baron & Kenny, 1986). The mediation models presented in this study were found to be a plausible explanation of the relationships among variables of interest. Similar to previous reports (Andreyeva et al., 2010; Bersamin et al., 2010; Bish et al., 2005; Koo & Park, 2011), the level of overweight measured by BMI is a significant correlate of weight loss efforts. In addition, the relationship between BMI and weight loss efforts was partially mediated through body weight perception. The findings of this study suggest that promoting weight loss interventions in Korean women who are overweight or obese should take into consideration their weight perception.

The overall prevalence of weight loss efforts in this national sample of Korean women was 59.5%. The rate was higher in obese women (62.7%) than that in overweight women (55.4%). The strong linear relationship between the level of overweight and weight loss efforts found in this study was consistent with those of previous studies conducted with other samples (Andreyeva et al., 2010; Bish et al., 2005). However, the prevalence of weight loss efforts in this study was somewhat lower than those in studies by Bish et al. and Andreyeva et al., who both analyzed national samples of American women and reported that 60% of overweight and 70% or more of obese American women were trying to lose weight. One reason for the relatively lower rate of weight loss efforts in Korean women may be due to the different BMI cut-points for overweight and obesity used in this study. Asians such as Koreans have a higher percentage of body fat and more centralized fat distribution compared to Caucasians of the same sex, age, and BMI. Thus, their risk for obesity-associated diseases is high even at a lower BMI (WHO Expert Consultation, 2004). Korean women with a BMI of 23 kg/m² already have a three-fold increased risk for having three or more cardiovascular risk factors compared to those with a BMI < 21 kg/m² (Park, Yun, Park, Kim, & Choi, 2003). Thus, for Koreans, overweight is defined as 23 kg/m² ≤ BMI ≤ 25 kg/m² and obesity is BMI ≥ 25 kg/m² (WHO, 2000). Korean women should be informed about the specific cut-points for overweight and obesity in Koreans. They should be aware that their risk for obesity-

**Table 3** Spearman’s Correlations between Study Variables

| Variables                  | Weight loss efforts | BMI | Body weight perception | Age | Marital status | Education | Below poverty | Work status | Current smoker |
|----------------------------|---------------------|-----|------------------------|-----|---------------|-----------|---------------|-------------|-------------|---------------|
| Weight loss efforts        | 1.000               | 0.118** | .288**                | –.289** | –.090**        | –.142**   | –.161**       | .039        | .032         |
| BMI                        | 1.000               | 0.439** |                        | –.378** | –.086**        | –.158**   | –.109**       | .020        | .040         |
| Body weight perception     | 1.000               | .072*  |                        | .040   | .078*          | .099*     | .013          | .081        | .001         |
| Age                        | 1.000               | 0.285** | .425**                 | .310** | .162**         | .087**    |               |             |              |
| Marital status             | 1.000               | .076**  | .157**                 | .110** | .067*          |           |               |             |              |
| Education                  | 1.000               | .201**  | .030                   | .015   |               |           |               |             |              |
| Below poverty              | 1.000               | .029    | .002                   | .028   |               |           |               |             |              |
| Work status                | 1.000               | .029    | .002                   | .028   |               |           |               |             |              |
| Current smoker             | 1.000               | .029    | .002                   | .028   |               |           |               |             |              |

Note. BMI = body mass index.

*p < .01,*p < .001.

**Table 4** Ordered Logistic Regression Analysis That Predicts Body Weight Perception in Korean Women with BMI ≥ 23 kg/m² in 2008 KNHANES IV (N = 1,739)

<table>
<thead>
<tr>
<th>Variables</th>
<th>OR</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td>5.47</td>
<td>(4.46, 6.69)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Age</td>
<td>0.93</td>
<td>(0.92, 0.94)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Married &amp; living together</td>
<td>1.02</td>
<td>(0.94, 1.11)</td>
<td>.907</td>
</tr>
<tr>
<td>High school or less</td>
<td>0.97</td>
<td>(0.72, 1.02)</td>
<td>.860</td>
</tr>
<tr>
<td>Below poverty level</td>
<td>0.92</td>
<td>(0.74, 1.13)</td>
<td>.517</td>
</tr>
</tbody>
</table>

Note. BMI = body mass index; KNHANES = Korea National Health and Nutrition Examination Survey; OR = odds ratio; CI = confidence interval.

* Overweight = 23 kg/m² ≤ BMI ≤ 25 kg/m²; obesity = BMI ≥ 25 kg/m².
associated disease is high even though they may look thinner than Caucasians. If there is a discrepancy between the actual level of obesity and perceived body weight, the gap should be closed in order to optimize health.

In this study, the relationship between BMI and body weight perception was assessed. Previously, few investigations have examined this relationship in adult Korean women. Although BMI was significantly associated with weight perception before and after controlling for covariates in this study sample, a large proportion of overweight or obese women perceived themselves inaccurately. The majority of women thought they weighed less than they really did. The heavier they were, the more likely they were to underestimate their weight (Table 2). Overall 58.3% of overweight and 29.2% of obese women correctly identified their weight status, compared to 68.3% of overweight and 44.1% of obese women who correctly identified their weight status. This result might be partially attributable to the difference in age of the study samples. Approximately 18% of the sample in the current study were women aged 66 or older, which could have affected the results. The role of age in the relationships among BMI, body weight perception, and weight loss behaviors in Korean women may be an area in need of additional study.

The final logistic regression model (Table 5, model 2) in this study revealed that level of overweight and body weight perception were significant correlates of weight loss efforts. In this public sample of Korean women, weight perception was a better correlate of weight loss efforts than BMI. Perceiving themselves to be overweight or obese, compared to perceiving themselves to be underweight, was strongly related with weight loss efforts. Previous studies have demonstrated that perceptions of overweight or obesity increased the likelihood of trying to lose weight (Kim et al., 2005; Wang et al., 2008). Another study reported that perceptions of overweight or obesity—individuals of BMI in Korean middle-aged women—were related to increased use of undesirable weight-control behaviors, such as skipping meals or taking laxatives (Kim et al., 2008). Weight loss nursing interventions should consider strategies that have the potential to promote accurate weight perception as well as desirable weight control behaviors. Current guidelines recommend that all overweight or obese individuals trying to lose weight use increased physical activity and reduced caloric intake (Korean Endocrine Society and Korean Society for the Study of Obesity, 2010; National Heart, Lung, and Blood Institute, 1998). This study made no attempts to evaluate actual weight control behaviors, relying on self-reporting of weight loss efforts. Further research is warranted to examine whether self-reporting of weight loss efforts is a reliable estimate of actual weight loss behaviors in Korean women and whether efforts to lose weight involve desirable or undesirable behaviors.

Following the statistical framework proposed by Baron and Kenny (1986), this study revealed that, among Korean women classified as overweight and obese, the association between BMI and weight loss efforts is mediated by weight perception. Given that women’s age affects weight perception and weight loss efforts (Tables 4 and 5) and this study includes women in a wide age range, subgroup analyses with three age groups (age <40 years, 41–65 years, & ≥66 years) were performed to see if such a mediating relationship was still effective regardless of age (the result was not included here). As a result, weight perception mediated the relationship between BMI and weight loss efforts in all age groups, even though the extent of effect was slightly different by group. Therefore weight perception is a very important and modifiable factor in controlling body weight for Korean women. This finding is similar to Lee et al.’s (2005) findings. Although they did not aim to examine the mediating role of body weight perception, in their regression model, BMI was not a significant correlate of weight loss efforts when BMI and body weight perception were entered in the regression model at the same time (Lee et al.). In the current study, the odds ratio of BMI on weight loss efforts decreased from 1.8 to 1.3 when body weight perception was considered. The decreased odds ratio confirms that body weight perception mediates the association between BMI and weight loss efforts in this study sample. In addition, BMI was still a significant correlate of weight loss

Table 5 Multiple Logistic Regression Analysis That Predicts Weight Loss Efforts in Korean Women with BMI ≥ 23 kg/m² in 2008 KNHANES IV (N = 1,739)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td>1.82</td>
<td>(1.48, 2.24)</td>
</tr>
<tr>
<td>Body weight perception</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>About right</td>
<td>1.24</td>
<td>(0.71, 2.14)</td>
</tr>
<tr>
<td>Overweight</td>
<td>2.83</td>
<td>(1.65, 4.84)</td>
</tr>
<tr>
<td>Obese</td>
<td>3.39</td>
<td>(1.87, 6.17)</td>
</tr>
<tr>
<td>Age</td>
<td>0.92</td>
<td>(0.90, 0.97)</td>
</tr>
<tr>
<td>Married &amp; living together</td>
<td>1.00</td>
<td>(0.91, 1.09)</td>
</tr>
<tr>
<td>High school or less</td>
<td>0.85</td>
<td>(0.61, 1.18)</td>
</tr>
<tr>
<td>Below poverty level</td>
<td>0.66</td>
<td>(0.52, 0.83)</td>
</tr>
</tbody>
</table>

Note. BMI = body mass index; KNHANES = Korea National Health and Nutrition Examination Survey; OR = odds ratio; CI = confidence interval.

* Overweight = ≤ BMI < 25 kg/m²; obesity = BMI ≥ 25 kg/m².
efforts after body weight perception was controlled for, indicating partial mediation (Baron & Kenny). The findings of this study suggest that Korean women who are overweight or obese but who fail to perceive themselves as such are less likely to try to lose weight. Nurses designing weight loss interventions should consider not only the actual level of overweight, but also weight perceptions. The rising obesity epidemic in Korean women can be controlled by initiating appropriate weight loss efforts in the early stages of overweight and maintaining them thereafter. Body weight perception can be used as a motivator for self-initiated weight loss efforts in Korean women. In particular, for those who inaccurately perceive their weight, providing healthy weight ranges for each height could be a good way to foster accurate weight perception and assist in setting weight loss goals.

This study has several limitations that must be acknowledged. First, this study relied on self-reports of trying to lose weight as an estimate of actual weight loss behaviors. Further research is warranted to examine whether self-reported weight loss efforts are a reliable estimate of actual weight loss behaviors in Korean women and whether their behaviors involve desirable or undesirable efforts. Second, body weight perception is likely a multi-dimensional concept that captures several elements. It may also be influenced by others or the dominant culture. The KNHANES provides a single assessment of weight perception; a stronger assessment of weight perception could produce different results. Third, this is a cross-sectional study. As such, causality should not be implied. For example, this study demonstrated that perception of obesity is related to increased likelihood of trying to lose weight. Reasonably, perceived obesity could motivate individuals to lose weight, but it is also possible that those trying to lose weight might think they are obese. However, the greatest strength of this study is the use of a nationally representative sample of Korean women rather than selected overweight or obese women. Data were also weighted to incorporate sampling designs into the analyses. Thus, this study produces an appropriate population level of estimates. In addition, this study systematically followed the statistical steps developed by Baron and Kenny (1986). As such, nursing researchers interested in investigating mediators can use this study as an example.

Conclusion

This study found complex relationships among BMI, body weight perception, and weight loss efforts in Korean women with overweight or obesity. BMI and body weight perception were significant correlates of weight loss efforts. BMI was significantly associated with weight perception, but a large proportion of Korean women underestimated their weight. Korean women who are overweight or obese but fail to perceive themselves as such are less likely to try to lose weight. Those who underestimate their weight need to be informed regarding the definition of healthy body weight. In testing for mediation, weight perception did perform as a partial mediator in the relationship between BMI and weight loss efforts in Korean women. In addition to BMI, appropriate body weight perceptions could therefore be crucial points of focus for the design and implementation of nursing weight loss interventions. The rising obesity epidemic in Korean women might be controlled through self-initiated appropriate weight loss efforts. Body weight perception can be used as a motivator in such efforts. In addition, other mediators such as age need to be identified and tested so that the relationship among BMI, body weight perception, and weight loss efforts can be further developed.

Conflict of interest

The author declares no conflict of interest.

Acknowledgment

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References


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