



The relationship between weight stigma and eating behavior is explained by weight bias internalization and psychological distress

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ARTICLE INFO

Article history:

Received 14 September 2015

Received in revised form

14 February 2016

Accepted 16 February 2016

Available online 18 February 2016

Keywords:

Weight stigma

Psychological distress

Obesity

Eating

Weight bias internalization

ABSTRACT

Weight stigma is associated with a range of negative outcomes, including disordered eating, but the psychological mechanisms underlying these associations are not well understood. The present study tested whether the association between weight stigma experiences and disordered eating behaviors (emotional eating, uncontrolled eating, and loss-of-control eating) are mediated by weight bias internalization and psychological distress. Six-hundred and thirty-four undergraduate university students completed an online survey assessing weight stigma, weight bias internalization, psychological distress, disordered eating, along with demographic characteristics (i.e., age, gender, weight status). Statistical analyses found that weight stigma was significantly associated with all measures of disordered eating, and with weight bias internalization and psychological distress. In regression and mediation analyses accounting for age, gender and weight status, weight bias internalization and psychological distress mediated the relationship between weight stigma and disordered eating behavior. Thus, weight bias internalization and psychological distress appear to be important factors underpinning the relationship between weight stigma and disordered eating behaviors, and could be targets for interventions, such as, psychological acceptance and mindfulness therapy, which have been shown to reduce the impact of weight stigma. The evidence for the health consequences resulting from weight stigma is becoming clear. It is important that health and social policy makers are informed of this literature and encouraged develop anti-weight stigma policies for school, work, and medical settings.

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1. Introduction

The past two decades have seen rapid growth in research detailing the extent and nature of prejudice and discrimination based on weight (Puhl & Heuer, 2009). Much of this work has focused on antipathy toward, and negative stereotyping of, overweight and obesity, which appears to have increased over time (Danielsdottir, O'Brien, & Ciao, 2010; Latner, Ebner, & O'Brien, 2012; Latner & Stunkard, 2003; O'Brien et al., 2013). There have also been a number of studies documenting the extent of weight-related teasing and bullying, particularly among young people

(Bucchianeri, Eisenberg, Wall, Piran, & Neumark-Sztainer, 2014; King, Puhl, Luedicke, & Peterson, 2013). Although weight stigma is more prevalent among individuals with overweight or obesity, there is evidence that weight stigma occurs across most weight categories (Puhl, Peterson, & Luedicke, 2013; Vartanian & Shaprow, 2008). For example, Puhl and Luedicke (2012) found that 29% of adolescents reported weight victimization, of which a substantial proportion (65%) had a body mass index (BMI) in the normal-weight range.

Experiences of weight stigma are associated with a range of negative behavioral and psychological consequences, such as binge eating, emotional eating, and psychological distress (Ashmore, Friedman, Reichmann, & Musante, 2008; Papadopoulous & Brennan, 2015; Puhl & Suh, 2015; Salwen, Hymowitz, Bannon, & O'Leary, 2015; Schvey, Puhl, & Brownell, 2011). Furthermore,

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weight bias internalization, or the tendency to accept and blame oneself for negative weight-based stereotypes and commentary (e.g., teasing) from others, has also been found to be associated with increased psychological distress, including stress, depression, anxiety, and disordered eating behaviors (Durso & Latner, 2008; Pearl & Puhl, 2014; Pearl, White, & Grilo, 2014; Schvey & White, 2015). Although there is a good evidence base linking weight stigma to a host of negative psychological and behavioral consequences, the evidence is less clear on who is most affected by weight stigma, and through what mechanisms weight stigma exerts its negative consequences.

Research is mixed on whether the rates and consequences (e.g., psychological distress, disordered eating behaviors) of weight-based stigma differ by gender (Gan, MohdNasir, Zalilah, & Hazizi, 2011; Puhl & Luedicke, 2012; Salwen et al., 2015; Vartanian, 2015). For example, Salwen et al. (2015) found no significant gender differences in weight-related abuse, binge eating, night eating, or unhealthy weight control. Vartanian (2015) also found no gender differences in rates of weight-stigma experiences, or in the associations between those stigma experiences and bulimic symptoms for men and women. In contrast, Puhl and Luedicke (2012) found that frequency and location (i.e., class vs. gym) of weight-based teaching affected girls and boys differently; boys were only affected by classroom-based teasing, whereas girls were affected by teasing in the classroom and the gym. Despite increasing evidence and concern about the extent and negative impact of weight stigma, particularly in populations with higher BMI's, there is a noted paucity of empirical research examining the relationships between weight stigma, weight bias internalization, psychological distress, and eating behavior (Papadopoulous & Brennan, 2015; Ratcliffe & Ellison, 2015).

Tomiyama (2014) recently proposed a Cyclic Obesity/Weight-Based Stigma (COBWEBS) model for explaining the link between weight stigma and eating behavior. The COBWEBS model proposes that weight stigma produces stress and accompanying responses (i.e., emotional, cognitive and physiological), which in turn lead to increased emotional eating and weight gain/obesity, which in turn increases vulnerability to weight stigma. Three studies lend tentative support to the COBWEBS model. Ashmore et al. (2008) found that weight stigma, disordered eating behavior, and psychological distress were all strongly correlated, and in particular noted that the relationship between weight stigma and disordered eating behavior was mediated by the amount of psychological distress resulting from the stigma. Similarly, Salwen et al. (2015) found that emotional responses to weight stigma fully mediated the relationships between weight stigma and disordered eating behaviors, which included emotional eating, binge eating, and night eating. Finally, Gan et al. (2011) examined the relationships between weight teasing, psychological distress and disordered eating, and found that weight teasing had a significant direct and indirect (through psychological distress) relationship with disordered eating for both males and females.

The COBWEBS model did not specifically include weight bias internalization, but internalization may also be important to consider in understanding the negative effects of weight stigma. Ratcliffe and Ellison (2015) proposed that the weight stigmatizing environment leads to and maintains internalized weight stigma. Weight bias internalization may in turn be associated with psychological distress (i.e., anxiety, depression, mood), eating and weight-related behaviors, and other social and attitudinal outcomes. There is some research in support of Ratcliffe and Ellison (2015) model (e.g., Hilbert, Braehler, Haeuser, & Zenger, 2014; Pearl et al., 2014; Carels et al., 2010). For example, Durso and Latner (2008) found that weight bias internalization was strongly associated with psychological distress and frequency of binge

eating in the past 3 and 6 months. To our knowledge, no published research has empirically assessed the relationships among weight stigma, weight bias internalization, psychological distress and disordered eating behavior. Understanding the impact of stigma and its inter-relationships with psychological and physical health is important for the development of social policy aimed at preventing stigma; and/or the development of interventions for building resilience and thus reducing the impact of weight-stigma on psychological and physical health.

The present study seeks to address an important gap in the literature by examining relationships among weight stigma, eating behavior, weight bias internalization, and psychological distress. In doing so, we build on previous evidence by combining and testing posited mechanisms from two newly proposed models (Ratcliffe & Ellison, 2015; Tomiyama, 2014). Based on previous research in individuals across the weight-spectrum, it was hypothesized that weight stigma, weight bias internalization, and psychological distress would be related to disordered eating behavior. Further, we hypothesized that the relationship between weight stigma and eating behaviors would be explained by weight bias internalization and psychological distress (see Fig. 1), after accounting for other confounds (e.g., weight status, gender).

2. Material and methods

2.1. Participants

Undergraduate university students from Monash University in Australia were invited to participate in this study in exchange for course credit. Monash University is the largest university in Australia with an overall enrollment of approximately 62,000. Data collection took place across the months of March and April 2015. Of 695 students invited to participate in the study, 634 gave consent and subsequently provided answers to an online questionnaire hosted by Qualtrics.com (response rate = 91.2%; 168 males, 26.6%). The mean age was 19.7 years ($SD = 3.07$), and mean BMI, based on self-reported height and weight, was 22.4 kg/m^2 ($SD = 4.14$). For BMI categories, 9.1% were underweight ($BMI < 18.5$), 71.9% were normal weight ($BMI 18.5\text{--}24.9$), 14% overweight ($BMI 25\text{--}29.9$), and 4.1% obese ($BMI \geq 30$; Center of Disease Control). Three participants did not provide height and/or weight information. Sixty percent of the participants identified as White, 37% were Asian or Pacific Islander, and 3% identified as Black. This study was approved by the university's ethics committee.

2.2. Measures

To assess weight stigma, we used five modified items from the weight teasing subscale of the Perception of Teasing Scale (POTS), a reliable and valid measure of weight-related teasing experiences (Thompson, Cattarin, Fowler, & Fisher, 1995). The POTS has two components that assess 1) the frequency of weight stigma, and 2) the extent to which stigmatising events upset the individual. We slightly modified the weight stigma frequency items to be relevant to participants across weight categories, rather than to overweight or heaviness specifically (e.g., 'People made fun of you because of your weight' was used instead of 'People made fun of you because you were heavy'). Additionally, we took two items related to sibling and parent teasing, respectively, and created a single item assessing family weight stigma (i.e., *A family member (sibling or parent) makes fun of your weight*). Participants indicated the frequency with which they experience stigma events using a scale ranging from 1 = never to 5 = very often; and, if they had experienced such events, how upset that made them (upset scoring ranged from 0 = never teased so no upset to 5 = very upset). Cronbach's alpha for the stigma

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