

Non-stigmatising alternatives to anti-obesity public health messages: Consequences for health behaviour and well-being

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Abstract

This project investigated how alternative non-stigmatising public health messages influence people's health behaviours and well-being, relative to traditional stigmatising weight-loss messages. We conducted three experimental studies (total $N=1281$) that compared traditional weight-loss messages to weight-neutral messages (Study 1), weight-inclusive messages (Study 2) and size acceptance messages (Study 3). Results revealed that public health messages have differential effects on health behaviours and well-being, depending on the audience's BMI or perceived weight. However, campaigns that challenge weight stigma and promote body positivity have positive effects on some psychological indicators of health and well-being for people of all body sizes.

Keywords

public health messages, health behaviour, eating behaviour, obesity, weight stigma

Despite countless public health initiatives, global rates of obesity have almost tripled in the last 45 years (World Health Organization, 2018). This suggests that past public health strategies aimed at reducing obesity rates may have been ineffective, insufficient or unable to overcome important barriers. The current research aims to investigate how the efficacy of public health initiatives may be improved, with a focus on one common public health strategy: using campaign messaging to motivate behaviour change.

One factor that is increasingly being recognised as an important predictor of behaviour and health – and one that may (partly) explain the relationship between weight and health – is weight-based stigma (Daly et al., 2019; British Psychological Society, 2019). Higher-weight

individuals are regularly subjected to stigma and discrimination because of their weight (Diedrichs and Puhl, 2016). Public health campaigns are often a source of weight stigma (Hunger et al., 2020); a recent study found that over 40% of campaigns targeting obesity in the U.S. included stigmatising content (Turner et al., 2020).

There are a number of common assumptions about weight and its relationship to health that

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fuel weight stigma. First, weight is often taken to be a reliable indicator of health, with higher-weight individuals seen as being by definition less healthy than average weight individuals (e.g. Mulherin et al., 2013). This assumption fuels weight stigma because good health is highly valued by society and is often seen through a moral lens (Jutel, 2005). That is, being a higher weight, and therefore presumably unhealthy, is seen as a moral failing that is deserving of stigma and discrimination.

Second, weight is perceived to be largely within individual control. Consequently, higher-weight individuals are stereotyped as having poor self-control, being lazy, unintelligent, incompetent and overindulgent (Diedrichs and Puhl, 2016). In particular, there is a common belief that individuals can manage their weight effectively by exercising regularly and primarily eating healthy foods (Foster et al., 2003). While these health behaviours are beneficial (regardless of weight), the evidence suggests that discretionary choices regarding diet and physical activity are not the only contributors to obesity. Instead, obesity is caused by a complex interaction between biological, psychological, social and environmental factors, many of which cannot be controlled at the individual level (or at all; British Psychological Society, 2019).

Third, stigma is often believed to be an effective tool for encouraging positive behaviour change (Puhl and Heuer, 2010). Public health campaigns have regularly utilised stigmatising messages in an attempt to motivate people to engage in health behaviours and to (ultimately) lose weight (e.g. Turner et al., 2020). Indeed, the evidence from campaigns for smoking cessation would tend to suggest that depicting unhealthy behaviours as stigmatised or counter-normative might motivate behaviour change (Brennan et al., 2015). However, previous research suggests that this may not be the case for weight-based stigma (e.g. Major et al., 2020).

While little research has directly evaluated the effectiveness of a comparable approach in the context of weight, the evidence suggests that public health messages containing weight-stigmatising content may backfire. Specifically,

exposure to weight stigma has been found to have serious consequences for physiological and psychological health and well-being, including increased stress, depression, anxiety and disordered eating; reduced self-esteem and body satisfaction (for a recent review see Wu and Berry, 2018). In addition, weight stigma lowers a person's confidence in their ability to manage their weight, and their motivation to exercise and maintain a healthy balanced diet (e.g. Major et al., 2014). In sum, the questionable effectiveness of weight stigma-based health messages, and the substantial evidence supporting the negative impact of weight stigma on physiological and psychological health, indicates a need for a new public health approach.

An alternative non-stigmatising approach

Health professionals and academics are increasingly calling for alternative non-stigmatising strategies to be developed that are weight-neutral (Hunger et al., 2020) or weight-inclusive (e.g. Health at Every Size® [HAES]; Bombak, 2014). These approaches focus on promoting physical activity and healthy eating without explicitly advocating for weight-loss (also see Robinson, 2010), and (in the case of weight-inclusive approaches) challenge weight stigma. Recent evidence suggests these alternative approaches to health promotion may be associated with positive health outcomes, such as improved self-esteem and reduced disordered eating behaviour (Clifford et al., 2015). Initial public health research has also found that weight-neutral health messages are seen as less stigmatising than anti-obesity messages, and may increase feelings of self-efficacy and motivation to make positive lifestyle changes (Puhl et al., 2013a, 2013b).

While this preliminary evidence is encouraging, it remains unclear whether different forms of non-stigmatising messages – weight-neutral, weight-inclusive or those that actively challenge weight stigma – influence health behaviour and well-being differently; and *how* they might achieve these outcomes. Identifying

these psychological mechanisms is crucial to understanding (1) why differently framed health messages may have differential effects on health behaviour and well-being; and (2) how best to maximise the effectiveness of future public health messages.

Previous research has found that concern about being subjected to weight stigma is associated with poorer self-reported physical and psychological health (e.g. Hunger and Major, 2015); and may explain why weight-based discrimination increases disordered eating (Hunger et al., 2018). We propose that public health messages with different weight-related frames will vary in the degree to which they elicit weight stigma; with weight-loss messages being more stigmatising than weight-neutral or weight-inclusive messages. As a result, weight-neutral or weight-inclusive messages may have a more desirable impact on health behaviour and well-being. This research aimed to conduct a controlled test to examine the following questions: (1) does the weight-related framing of public health messages affect people's health behaviours and well-being? and (2) do perceptions of weight stigma mediate these effects?

Three experimental studies were conducted with British adults, comparing the effect of typical weight-loss messages to three alternatively framed health messages: weight-neutral (Study 1), weight-inclusive (Study 2) and size acceptance (Study 3). Across all three studies we hypothesised (H1) that, relative to traditional weight-loss messages, these alternatively framed health messages would be associated with: (1) lower perceived weight stigma; (2) greater positive effects on health behaviour motivation (operationalised as greater motivation to engage in healthy behaviours and lower motivation to engage in unhealthy weight control behaviours); and (3) improved well-being (operationalised as greater self-esteem and body satisfaction).¹ We also hypothesised (H2) that the positive effects of these alternatively framed campaigns on health behaviour motivation and well-being would be mediated by the reduction in perceived weight stigma.

Given that such campaigns often target people who are a higher weight, we might expect higher-weight individuals to react more strongly to weight-related message framing. Indeed, Puhl et al. (2013b) found that participants with an obese BMI rated health messages as significantly more stigmatising and less motivating than participants with an average or overweight BMI. In addition, previous research has found that perceived weight status may be more predictive than BMI when it comes to perceptions of and responses to weight stigma (e.g. Robinson et al., 2015). Therefore, BMI and perceived weight were examined as potential moderators of the hypothesised effects.

The hypotheses, experimental design, measures and analytic approach received human research ethics approval and were pre-registered on the Open Science Framework (OSF) prior to data collection, and all studies were well-powered to detect small effect sizes.

Study 1

Study 1 investigated the effect of a weight-neutral health message relative to a weight-loss health message and no health message (control). To test H1 and H2, comparisons were made between the weight-neutral and weight-loss messages. The control condition was included to provide additional insights into the effect of the weight-neutral message relative to no message. Exploratory analyses were conducted to examine whether the effects of the messages were moderated by participant BMI and perceived weight.

Method

Participants

A British adult community sample ($N=304$) were recruited online through Prolific Academic for 'A [10 minute] study to understand how people perceive information' and were paid £0.85 each. All respondents provided written informed consent. Forty-eight respondents were excluded from analyses because they: (1)

failed the manipulation and/or attention checks; (2) did not report height and weight; (3) their BMI was below 15 or above 60.² This resulted in a final sample of $N=256$: 75% female, 97% Caucasian/White European, aged 18–74 ($M=37.70$, $SD=12.28$), BMI 17.27–56.22 ($M=27.01$, $SD=6.11$). Perceived weight was measured using a seven-point Likert scale (1=very underweight, 7=very overweight; Major et al., 2020); responses ranged from 2 to 7 ($M=4.95$, $SD=1.05$) and positively correlated with BMI, $r(254)=0.63$, $p<0.001$.

Design and procedure

This study utilised a between-participants experimental design with random assignment to one of three conditions: weight-neutral message, weight-loss message or control. Randomisation to condition was successful (i.e. no significant differences in participant BMI or perceived weight were found between conditions). After 30–60 seconds of observing the health message,³ participants completed the questionnaires below.⁴

Materials

The weight-neutral and weight-loss messages were designed for this study by adapting content from existing public health messages. The weight-neutral message advocated for engagement in health behaviours to improve health without mentioning weight (e.g. ‘eat fruit and vegetables – they are full of nutrients!’). In contrast, the weight-loss message advocated for engagement in health behaviours to lose weight (e.g. ‘eat fruit and vegetables – they are low in calories!’). These materials were pilot tested (full details provided in the supplementary materials). In the control condition, participants observed a world map in place of a health message.

Measures

Perceived stigma. The five-item Weight Stigma Concerns scale (e.g. ‘I am afraid that others will reject me because of my weight’; Hunger and

Major, 2015) assessed the degree to which participants perceived that they were subject to weight stigma. Responses were recorded on a seven-point Likert scale (1=strongly disagree, 7=strongly agree), $\alpha=0.96$.

Health behaviour motivation. Motivation to engage in *unhealthy weight control behaviours* was measured using the eight-item Unhealthy Weight Control Behaviour (UWCB) scale (e.g. ‘skip meals’; Major et al., 2020), $\alpha=0.66$. Motivation to engage in *healthy behaviours* (e.g. ‘eat more fruits and vegetables’) was measured using eight items adapted from the UWCB scale for the purpose of this study and based on current dietary guidelines (National Health and Medical Research Council, 2013), $\alpha=0.85$. For both measures, participants indicated how motivated they felt to engage in each behaviour on a seven-point Likert scale (1=not at all motivated, 7=extremely motivated).

An exploratory factor analysis confirmed that the author-developed scale assessing motivation to engage in healthy behaviours could be treated as a unitary construct prior to hypothesis testing (full results reported in the supplementary materials).

Well-being. The seven-item State Self-esteem Social subscale assessed *self-esteem* (e.g. ‘I feel inferior to others at this moment’; Heatherton and Polivy, 1991), with responses recorded on a five-point Likert scale (1=not at all, 5=extremely); all items reverse scored, $\alpha=0.93$.

The six-item Body Image State Scale assessed *body satisfaction* (Cash et al., 2002). Participants responded to each item on a nine-point Likert scale, with response options semantically anchored at each point (e.g. ‘Right now I feel [extremely dissatisfied (1) to extremely satisfied (9)] with my weight’); two items reverse scored, $\alpha=0.88$.

Data analysis

To test H1, a series of one-way analysis of variance (ANOVA) tests were conducted. Provided a significant effect of the weight-neutral message (relative to the weight-inclusive message and/or

control) on perceived stigma was found, H2 was tested using the Hayes (2018) PROCESS macro Model 4 with 10,000 bootstrapping samples.

Exploratory linear regression analyses were conducted to investigate BMI and perceived weight as moderators. Contrast variables were created to compare the effect of the weight-neutral message to the weight-loss message (C1) and the control (C2) and were added to the model at Step 1 (H1). BMI and perceived weight were alternatively added at Step 2; the contrast variables $\times$ BMI and contrast variables $\times$ perceived weight interactions were added at Step 3 (H3). Significant interactions were probed using moderated mediation (H2; Hayes, 2018).

Data sharing statement

For all three studies, the experimental and supplementary materials, non-identified data, analysis code and output for all reported analyses are available on OSF and Figshare.

Results

Confirmatory analyses

ANOVA tests revealed no omnibus effect of condition on perceived stigma, motivation for healthy behaviours or unhealthy weight control behaviours, self-esteem or body satisfaction ($ps > 0.05$; full results reported in Supplemental Table S1⁵). Therefore, H1 was not supported and a confirmatory test of H2 was not conducted.

Exploratory analyses

Results found no evidence to support perceived weight as a moderator ($ps > 0.05$). However, BMI was a significant moderator; significant results relevant to H1 and H2 with BMI as a moderator are described below (full results reported in Supplemental Table S2).

Direct effects (H1)

Perceived stigma. Step 2 revealed a significant omnibus effect of BMI, $F_{\text{ch.}}(1,252)=33.29$, $R^2_{\text{ch.}}=0.12$, $\beta=0.34$, $p<0.001$: having a higher

BMI was associated with greater perceived stigma. The condition $\times$ BMI interaction vectors were significant at Step 3, $F_{\text{ch.}}(2,250)=10.03$, $R^2_{\text{ch.}}=0.07$, $p<0.001$ (see Supplemental Figure S1). The C1 $\times$ BMI interaction vector was significant, $\beta=0.25$, $p<0.001$, $\text{sr}^2=0.06$. In the weight-neutral condition, perceived stigma was significantly lower for participants with a lower BMI, relative to participants with a higher BMI. Perceived stigma did not differ between lower versus higher BMI participants in the weight-loss condition.

Health behaviour motivation. Step 3 was marginally significant for healthy behaviours, $F_{\text{ch.}}(2,250)=2.86$, $R^2_{\text{ch.}}=0.02$, $p=0.059$ (see Supplemental Figure S2). The C2 $\times$ BMI interaction vector was significant, $\beta=-0.14$, $p=0.030$, $\text{sr}^2=0.02$. Participants with a lower BMI reported greater motivation to engage in healthy behaviours in the weight-neutral condition, compared to the control. This positive effect of the weight-neutral message was not observed among participants with a higher BMI.

Step 3 was significant for unhealthy weight control behaviours, $F_{\text{ch.}}(2,250)=4.00$, $R^2_{\text{ch.}}=0.03$, $p=0.020$. However, follow-up analyses indicated that neither of the interaction vectors alone were significant (C1 $\times$ BMI, $\beta=0.11$, $p=0.077$, $\text{sr}^2=0.01$; C2 $\times$ BMI, $\beta=-0.08$, $p=0.201$, $\text{sr}^2=0.01$).

Well-being. Step 2 revealed a significant main effect of BMI on body satisfaction, $F_{\text{ch.}}(1,252)=24.82$, $R^2_{\text{ch.}}=0.09$, $\beta=-0.30$, $p<0.001$: having a higher BMI was associated with lower body satisfaction. The model was significant at Step 3, $F_{\text{ch.}}(2,250)=10.09$, $R^2_{\text{ch.}}=0.07$, $p<0.001$; the C1 $\times$ BMI interaction vector was significant, $\beta=-0.26$, $p<0.001$, $\text{sr}^2=0.07$ (see Supplemental Figure S3). Among participants with a lower BMI, the weight-neutral (versus weight-loss) message predicted higher body satisfaction. By contrast, the weight-neutral (versus weight-loss) message predicted lower body satisfaction among participants with a higher BMI. Results revealed no significant omnibus effects for self-esteem.

Indirect effects via perceived stigma (H2)

Health behaviour motivation. The index of moderated mediation for the indirect effect of the $C1 \times BMI$ interaction vector on unhealthy weight control behaviours via perceived stigma was significant, $IE=0.01$, $SE<0.01$, 95% CI [<0.01 , 0.02]. For participants with a lower BMI, the weight-neutral (versus weight-loss) message was negatively associated with perceived stigma, $b=-0.69$, $p<0.001$, which in turn was associated with reduced motivation for unhealthy weight control behaviours, $b=0.14$, $p<0.001$, $IE=-0.10$, $SE=0.03$, 95% CI [-0.16 , -0.04]. The indirect effect was not significant among participants with a higher BMI. Results revealed no significant index of moderated mediation for the indirect effect of the $C1 \times BMI$ interaction vector on healthy behaviours via perceived stigma.

Well-being. The index of moderated mediation for the indirect effect of the $C1 \times BMI$ interaction vector on self-esteem, $IE=-0.04$, $SE=0.01$, 95% CI [-0.06 , -0.01], and body satisfaction, $IE=-0.05$, $SE=0.02$, 95% CI [-0.07 , -0.01], via perceived stigma was significant. Among participants with a lower BMI, the weight-neutral (versus weight-loss) message negatively predicted perceived stigma, which was in turn correlated with higher self-esteem, $b=-0.37$, $p<0.001$, $IE=0.26$, $SE=0.07$, 95% CI [0.11 , 0.40], and body satisfaction, $b=-0.50$, $p<0.001$, $IE=0.34$, $SE=0.10$, 95% CI [0.14 , 0.53]. The indirect effect was not significant among participants with a higher BMI.

Discussion

The purpose of Study 1 was to examine the effect of a weight-neutral health message, relative to a weight-loss message and no message, on perceived weight stigma, motivation for health behaviours and well-being. The results provided support for the hypotheses, but only among participants with a lower BMI. For these participants, the weight-neutral message, relative to the weight-loss message, reduced their perceptions of weight stigma. As a result, these participants

reported less motivation to engage in unhealthy weight control behaviours, and had higher levels of self-esteem and body satisfaction. They also reported more motivation to engage in healthy behaviours when exposed to the weight-neutral message, relative to no health message. However, these positive effects were not experienced by participants with a higher BMI. Unexpectedly, participants with a higher BMI who saw the weight-neutral message, relative to the weight-loss message, reported an increase in perceived weight stigma and a decrease in body satisfaction. However, the increase in perceived stigma did not explain the decrease in body satisfaction, nor did it lead to any significant changes in health behaviours or self-esteem.

The findings from Study 1 suggest that, for people who are typically considered to have a 'healthy' weight, weight-neutral health messages may have a more positive effect on health behaviours and well-being, relative to weight-loss messages. However, for those who are a higher weight, weight-neutral health messages seem to be as (in) effective at influencing health behaviours as weight-loss messages (or indeed, no message at all), and may even be *more* harmful to well-being.

A closer examination of the messages may provide a possible explanation for these diverging effects. The weight-loss message encourages *weight* management via maintaining a balanced diet and exercising. In comparison, the weight-neutral message emphasises *health* management, but via those same weight management-related behaviours. Without explicitly removing weight-loss as the mechanism through which health is improved, we propose that weight-neutral messages may still communicate the assumption that weight management is an integral part of health management, thus providing cues to weight stigma. However, given the exploratory nature of these results, this explanation should be treated with caution.

Study 2

The purpose of Study 2 was to investigate whether framing health messages as explicitly weight-inclusive may have a positive effect on perceived weight stigma, health behaviours and well-being

for all individuals, including those who are a higher-weight, relative to weight-loss framing. Unlike weight-neutral messages, weight-inclusive messages emphasise that good health and well-being can be achieved by everyone, irrespective of their weight (Tylka et al., 2014). Similar to Study 1, it was hypothesised that a weight-inclusive message, relative to a weight-loss message, would lead to reduced perceptions of weight stigma and motivation for unhealthy weight control behaviours, and increased motivation for healthy behaviours, self-esteem and body satisfaction (H1). It was also hypothesised that the positive effects of the weight-inclusive campaign would be mediated by the reduction in perceived weight stigma (H2). Additionally, building on Study 1, we hypothesised that the impact of the weight-inclusive campaign may differ based on participants' BMI (H3); perceived weight was retained as a potential alternative moderator.

Method

Participants

A British adult community sample ($N=616$) were recruited using the same method as Study 1. Of these, 139 respondents were excluded from analyses based on the criteria used in Study 1. The final sample was $N=477$: 68% female, 92% Caucasian/White European, aged 18–69 ($M=38.06$, $SD=11.78$), BMI 15.20–54.04 ($M=26.69$, $SD=5.97$). Perceived weight ranged from 1 to 7 ($M=4.85$, $SD=1.09$) and positively correlated with BMI, $r(475)=0.73$, $p<0.001$.

Design and procedure

Study 2 used the same design and procedure as Study 1, with the exception that participants were randomly assigned to view either a weight-loss message or a weight-inclusive message. Successful randomisation was achieved.

Materials

The weight-neutral message from Study 1 was adapted to be weight-inclusive. The same health behaviours were retained but the message stated

that people 'of ALL body shapes and sizes can achieve good health' and included an image of people doing yoga who were diverse in body size, ethnicity and gender. The weight-loss message from Study 1 was adapted to include an image of people running who were all slim but diverse in ethnicity and gender.

Measures

Perceived stigma ($\alpha=0.97$), motivation to engage in healthy behaviours ($\alpha=0.88$)⁶ and unhealthy weight control behaviours ($\alpha=0.76$), self-esteem ($\alpha=0.93$) and body satisfaction ($\alpha=0.89$) were measured.

Data analysis

The analysis plan was the same as the exploratory analysis plan used in Study 1, although contrast variables were not required.

Results

Confirmatory analyses

Results revealed no significant omnibus effect of condition on any variables ($ps>0.05$). In assessing H3, BMI was not found to significantly interact with condition ($ps>0.05$). However, perceived weight was found to interact with condition and significant results from these analyses are described below (full results reported in Supplemental Table S3). All reported effects also remained significant after controlling for BMI.

Exploratory analyses

Direct effects (H1 and H3)

Perceived stigma. Step 2 revealed a significant main effect of perceived weight, $F_{ch.}(1,474)=142.01$, $R^2_{ch.}=0.23$, $\beta=0.48$, $p<0.001$. Higher perceived weight was significantly associated with greater weight stigma. Step 3 revealed no significant condition $\times$ perceived weight interaction, $F_{ch.}(1,473)=0.13$, $R^2_{ch.}=0.00$, $\beta=-0.08$, $p=0.720$; H2 was not assessed further.

Health behaviour motivation. Step 2 indicated a significant main effect of perceived weight on healthy behaviours, $F_{\text{ch.}}(1,474)=6.57$, $R^2_{\text{ch.}}=0.01$, $\beta=-0.12$, $p=0.011$. Perceiving one's weight to be higher was associated with lower motivation for healthy behaviours. Step 3 revealed a significant condition $\times$ perceived weight interaction on healthy behaviours, $F_{\text{ch.}}(1,473)=6.43$, $R^2_{\text{ch.}}=0.01$, $\beta=0.62$, $p=0.012$ (see Supplemental Figure S4). Among participants with a lower perceived weight, condition did not influence motivation for healthy behaviours. However, among participants with a higher perceived weight, the weight-inclusive (versus weight-loss) message increased motivation for healthy behaviours. Results revealed no omnibus effect of condition or condition $\times$ perceived weight on motivations for unhealthy weight control behaviours.

Well-being. A significant main effect of perceived weight at Step 2 was found for self-esteem, $F_{\text{ch.}}(1,474)=7.20$, $R^2_{\text{ch.}}=0.02$, $\beta=-0.12$, $p=0.008$, and body satisfaction, $F_{\text{ch.}}(1,474)=245.46$, $R^2_{\text{ch.}}=0.34$, $\beta=-0.59$, $p<0.001$. Perceiving one's weight to be higher was associated with lower self-esteem and body satisfaction. Step 3 revealed a significant condition $\times$ perceived weight interaction for body satisfaction, $F_{\text{ch.}}(1,473)=5.15$, $R^2_{\text{ch.}}=.01$, $\beta=.45$, $p=0.024$: the weight-inclusive (versus weight-loss) message *reduced* body satisfaction among participants with a lower perceived weight, but did not significantly affect body satisfaction among those with a higher perceived weight (see Supplemental Figure S5).

Discussion

Study 2 aimed to investigate the impact of weight-inclusive health messages on perceived weight stigma, health behaviours and well-being. Findings did not provide support for the hypotheses: relative to the weight-loss message, the weight-inclusive message did not have a positive main effect on perceived weight stigma, health behaviours or well-being (H1 and H2). Although analyses revealed that the effect of weight-inclusive and weight-loss messages was not influenced

by BMI (H3), it was affected by participants' *perceptions* of their weight. Specifically, the weight-inclusive (versus weight-loss) message increased motivation to engage in healthy behaviours among participants who perceived their weight to be higher. However, for participants who perceived their weight to be lower, exposure to the weight-inclusive (versus weight-loss) message had no effect on motivation for healthy behaviours and reduced body satisfaction. These findings suggest that, regardless of BMI, weight-inclusive health messages may be effective in motivating people with a perceived higher weight to engage in healthy behaviours; but may be harmful to the body satisfaction of those with a perceived lower weight.

Study 3

The findings from the first two studies suggest that, relative to traditional weight-loss messages: (1) *weight-neutral* messages may have positive effects on perceived weight stigma, health behaviours and well-being among people who are a lower weight; (2) *weight-inclusive* messages may have a positive effect on motivation for healthy behaviours among people who perceive themselves to be a higher weight; and thus (3) both BMI and perceptions of weight are important factors to consider when investigating the impact of health messages. In line with the weight-inclusive approach, HAES® is gaining support among health professionals as a stigma-challenging approach that encourages engagement in health behaviours without emphasising weight (loss); and promotes body positivity and size acceptance (Bombak, 2014). In doing so, existing weight-inclusive messages like those communicated in the HAES® campaigns tend to have a strong social justice component to their messaging; often explicitly challenging weight stigma, only including images of higher-weight people, and varying in the degree to which they advocate for engagement in health behaviours. When health behaviours are encouraged, it is typically for the purpose of health and happiness, rather than weight-loss.

The messages used in Studies 1 and 2 were highly controlled, using only those elements specific to a weight-loss, weight-neutral or weight-inclusive message. However, this means that these messages were less representative of actual campaign messages that are disseminated in the real world, which may have weakened their effectiveness. In addition, public health campaigns typically involve the dissemination of multiple versions of the public health message. Therefore, Study 3 investigated whether exposure to a series of *actual* weight-inclusive messages that actively challenge weight stigma and include strong social justice messaging – referred to here as *size acceptance* messages – have a positive effect on perceived weight stigma, health behaviours and well-being, relative to a series of *actual* weight-loss messages that stigmatise higher-weight people – referred to here as *anti-obesity* messages. We hypothesised that size acceptance messages would be associated with lower perceived weight stigma and motivation for unhealthy weight control behaviours, and greater motivation for healthy behaviours, self-esteem and body satisfaction (H1). From a psychological perspective, and consistent with the findings in Study 2, perceived weight may be an important moderator to consider when assessing the effects of size acceptance messages. Therefore, we also hypothesised that the positive effects of the size acceptance messages would be mediated by perceived weight stigma (H2); and that these effects would differ based on perceived weight (H3).⁷

Method

Participants

A British adult community sample ($N=610$) were recruited online using the same method as in Study 1 and 2. Of these, 62 respondents were excluded from analyses based on the exclusion criteria used in Study 1 and 2. The final sample was $N=548$: 66% female, 89% Caucasian/White European, aged 18–79 years ($M=37.69$, $SD=13.48$), BMI 15.82–59.35 ($M=26.50$, $SD=6.56$). Perceived weight ranged from 1 to 7

($M=4.80$, $SD=1.14$) and positively correlated with BMI, $r(546)=0.77$, $p<0.001$.

Design and procedure

Participants were randomly assigned to one of two conditions: anti-obesity or size acceptance. They were shown a slideshow of 10 existing anti-obesity or size acceptance messages, respectively, with each message presented for 10 seconds. Successful randomisation was achieved.

Materials

Existing anti-obesity and size acceptance messages were sourced from the public domain. The anti-obesity messages all focused on weight loss, framed obesity as an undesirable choice and associated excess weight with poor health (e.g. ‘Guess what is the biggest preventable cause of cancer after smoking. OBESITY’). The size acceptance messages all focused on promoting body positivity, size acceptance and health regardless of body size (e.g. ‘I stand for joyful activity for all, free from shame. Stop weight bigotry’).

Measures

Perceived stigma ($\alpha=0.96$), motivation for healthy behaviours ($\alpha=0.90$) and unhealthy weight control behaviours ($\alpha=0.76$), self-esteem ($\alpha=0.93$) and body satisfaction ($\alpha=0.89$) were measured.

Results

Confirmatory analyses

The same analysis strategy was used in Study 3 as in Study 2; only significant results are reported (full results reported in Supplemental Tables S4 and S5).

Direct effects (H1 and H3)

Perceived stigma. Step 1 and 2 found a significant main effect of condition, $F(1,546)=6.79$, $R^2=0.01$, $\beta=-0.11$, $p=0.009$, and perceived

weight, $F_{\text{ch.}}(1,545)=184.97$, $R^2_{\text{ch.}}=0.25$, $\beta=0.50$, $p<0.001$, respectively. Size acceptance (versus anti-obesity) messages significantly reduced perceived stigma. Participants who perceived their weight to be higher also perceived greater weight stigma.

Health behaviour motivation. Step 1 revealed a significant main effect of condition on healthy behaviours, $F(1,546)=40.72$, $R^2=0.07$, $\beta=-0.26$, $p<0.001$, and unhealthy weight control behaviours, $F(1,546)=24.92$, $R^2=0.04$, $\beta=-0.21$, $p<0.001$. Size acceptance (versus anti-obesity) messages predicted lower motivation for both healthy and unhealthy behaviours.

Well-being. Step 2 revealed a significant main effect of perceived weight on self-esteem, $F_{\text{ch.}}(1,545)=6.87$, $R^2_{\text{ch.}}=0.01$, $\beta=-0.11$, $p=0.009$, and body satisfaction, $F_{\text{ch.}}(1,545)=268.03$, $R^2_{\text{ch.}}=0.33$, $\beta=-0.57$, $p<0.001$. Higher perceived weight was associated with lower self-esteem and body satisfaction. Step 3 was significant for body satisfaction, $F_{\text{ch.}}(1,544)=12.68$, $R^2_{\text{ch.}}=.02$, $\beta=0.64$, $p<0.001$. The size acceptance (versus anti-obesity) messages *reduced* body satisfaction among participants with a lower perceived weight, but increased body satisfaction among participants with a higher perceived weight.

Indirect effects via perceived stigma (H2)

Health behaviour motivation. Analyses revealed a significant indirect effect of condition on unhealthy weight control behaviours via perceived stigma, $IE=-0.04$, $SE=0.04$, 95% CI $[-0.08, -.01]$ (Figure 1a). Size acceptance (versus anti-obesity) messages led to a reduction in perceived stigma, which was in turn associated with a decrease in motivation for unhealthy weight control behaviours. No significant indirect effect of condition on healthy behaviours via perceived stigma was found.

Well-being. Perceived stigma mediated the effect of condition on self-esteem, $IE=0.12$,

$SE=0.05$, 95% CI $[0.03, 0.21]$ (Figure 1b), and the condition $\times$ perceived weight interaction on body satisfaction, $IE=0.15$, $SE=0.06$, 95% CI $[0.04, 0.27]$ (Figure 1c). Size acceptance (versus anti-obesity) messages reduced perceived stigma, which was in turn correlated with an increase in self-esteem and body satisfaction.

Discussion

The purpose of Study 3 was to investigate whether size acceptance messages have a positive effect on perceived weight stigma, health behaviours and well-being, relative to anti-obesity messages. Results supported H1 and H2 for all dependent variables except motivation for healthy behaviours. Specifically, compared with anti-obesity messages, size acceptance messages reduced perceived weight stigma. This was in turn associated with decreased motivation to engage in unhealthy weight control behaviours; increased self-esteem and body satisfaction. Participants in the size acceptance condition also had reduced motivation to engage in healthy behaviours, although findings suggest that perceptions of weight stigma were not the mechanism through which this occurred. H3 was supported for body satisfaction. That is, the positive effects of the size acceptance messages on body satisfaction were only experienced by participants who perceived themselves to be a higher weight. For those who perceived their weight to be lower, size acceptance messages actually *decreased* body satisfaction.

Taken together, the findings from Study 3 indicate that, relative to existing anti-obesity messages, size acceptance messages have a predominantly positive effect on indicators of psychological well-being (including motivation to engage in unhealthy behaviours associated with disordered eating)— particularly among those who perceive themselves to be a higher weight. However, size acceptance messages may be less beneficial for the body satisfaction of those who perceive themselves to be a lower weight. In addition, these messages may also reduce motivation to engage in healthy behaviours associated with weight control. This may occur because

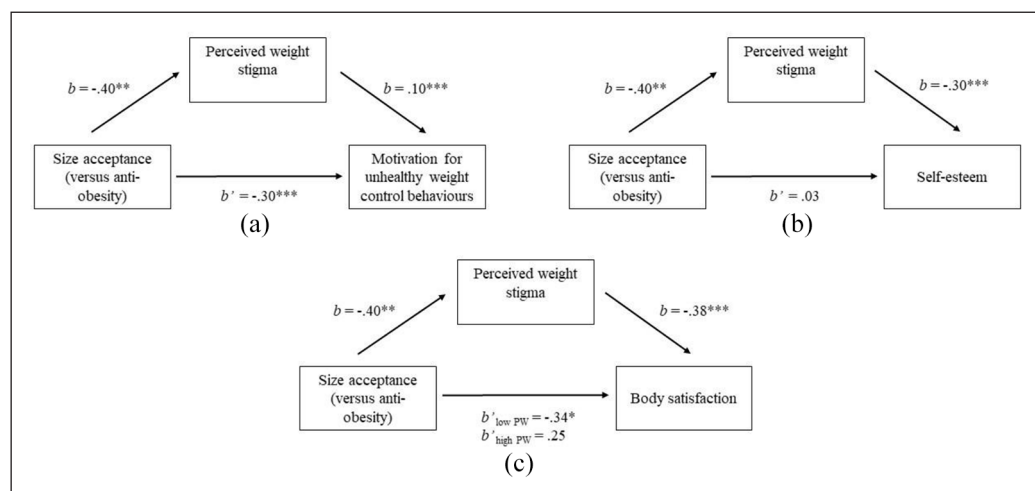


Figure 1. Mediation effect of the experimental condition on motivation to engage in unhealthy weight control behaviours (a), self-esteem (b) and body satisfaction (c), via perceived weight stigma found in Study 3. Note that, for body satisfaction (only), perceived weight moderated the direct effect of condition.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

size acceptance messages focus on social determinants (i.e. weight stigma), rather than individual responsibility. In doing so, these messages may lead people to believe that their own behaviour (healthy or unhealthy) will do little to influence their weight or health.

General discussion

The current project consisted of over a thousand participants across three experimental studies investigating (1) how the weight-related framing of public health messages influences health behaviours and well-being; and (2) whether differences in perceptions of weight stigma may explain (at least in part) why some message frames may have a more positive impact than others. All three studies revealed that the weight-related framing of health messages does not affect all people equally, but is interpreted differently depending on the actual and perceived weight of the audience. Framing health messages as weight-neutral appeared to be the most beneficial for people with a lower weight (based on BMI), reducing perceptions of weight stigma and, as a result, reducing their motivation to engage in unhealthy weight control behaviours and increasing their

well-being. However, this positive effect of weight-neutral messages was not experienced by higher-weight people, who reported an increase in their perceptions of weight stigma and a reduction in body satisfaction.

In contrast, Study 2 found that, relative to weight-loss messages, weight-inclusive messages increased healthy behaviour motivations among people who perceived themselves to be a higher weight. On the other hand, they also reduced body satisfaction among those who perceived themselves to be a lower weight. Together, these findings suggest that simply removing weight from the *content* of the message may not change the audience's *interpretation* of the message, particularly among those who are (or see themselves as) a higher weight. Against a backdrop of pervasive weight-loss focused messaging that reinforces the assumed link between weight and health, higher-weight individuals may still interpret weight-neutral messages as weight-loss messages because they do not explicitly challenge the assumption that weight-loss is the mechanism through which good health is achieved.

This would also explain why weight-neutral messages may be beneficial for those who are a

lower weight, as these campaigns may be interpreted as truly weight-neutral by lower-weight individuals who are not targeted in weight-loss interventions. Moreover, the weight-inclusive messages of Study 2, that explicitly challenge the idea that weight-loss is necessary for higher-weight people to improve their health, may empower higher-weight individuals to engage in healthy behaviours. However, such messaging simultaneously reduced body satisfaction among lower weight individuals, who may have inferred that they can no longer rely on their body size as an indication of how healthy or socially desirable their bodies are.

Findings from Study 3 suggested that, compared to anti-obesity messages, size acceptance messages that promote body positivity and challenge weight stigma may have positive effects on psychological indicators of health and well-being for people of *all body sizes*; reducing perceptions of weight stigma and motivations for unhealthy weight control behaviours, and increasing self-esteem. The finding that size acceptance messages may reduce unhealthy weight control behaviours is particularly promising, as these behaviours are associated with the onset and maintenance of eating disorders (Neumark-Sztainer et al., 2006).

However, size acceptance messages did not influence all indicators of well-being equally for people with different perceived weights. Similar to weight-inclusive messages, size acceptance messages increased body satisfaction among those who perceived their weight to be higher, but decreased body satisfaction among those who perceived their weight to be lower. Size acceptance messages also appeared to reduce motivation to engage in healthy behaviours, suggesting that messages that promote size acceptance may reduce motivation for any behaviour associated with weight management (healthy or unhealthy).

The overall findings suggest that perceptions of weight stigma may explain the *positive* effects of non-stigmatising health messages on psychological indicators of health and well-being. That is, the improvements in motivation to engage in unhealthy weight control behaviours, self-esteem

and body satisfaction observed in Studies 1 and 3 occurred because these messages reduced perceptions of weight stigma. However, perceived weight stigma did not explain why non-stigmatising messages had *negative* effects on these same psychological indicators for particular groups; or influenced healthy behaviours. Further research is required to investigate alternative mechanisms, such as perceptions of individual responsibility or control.

Implications, strengths and limitations

Health and health behaviours encompass more than eating a balanced diet and being physically active. While these behaviours are certainly important, other health and well-being indicators should also be considered when developing public health campaigns, including perceptions of stigma, disordered eating, self-esteem and body satisfaction. Furthermore, the diverging effects of public health messages based on BMI and perceived weight found in all three studies suggests that public health initiatives cannot rely on a one-size-fits-all approach, but instead need to be aware of the potential differential impacts they may have on people with different (actual or perceived) body sizes.

The present research was the first to investigate the impact of weight-inclusive and size acceptance public health messages on health behaviours and well-being; and the role of perceived weight stigma as one possible mechanism through which these effects may occur. In addition, the first two studies utilised a high level of experimental control to examine how removing mention of weight from public health messages (weight-neutral) or explicating targeting people of all body weights (weight-inclusive), influenced health behaviours and well-being. While the current research examined the impact of weight-related message frames on health behaviour motivations, actual behaviour was not measured. Consequently, it remains for future studies to establish whether the positive impact of these weight-related message frames on motivation leads to positive behaviour change.

Conclusions

The primary purpose of public health campaigns is to encourage and facilitate engagement in health behaviours, and discourage engagement in unhealthy behaviours. However, when it comes to health behaviours associated with weight management, previous public health campaign messages have tended to focus narrowly on encouraging weight loss – a strategy that risks promoting weight stigma and, consequently, may backfire. Our research sheds light on the potential benefits and pitfalls of alternative non-stigmatising framing in public health messages; and suggests that these messages do not impact people of different body weights equally. If public health messages are to achieve their primary goal of improving the health and well-being of the community, it is imperative that careful consideration is given to the weight-related framing of these messages, based on their goals and target audience.

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Supplemental material

Supplemental material for this article is available online.

Notes

1. Perceived control over health (Studies 1–3) and negative affect (Studies 2 and 3) were also tested as potential outcome variables. Full results reported in the supplementary materials.
2. Self-reported BMI below 15 and above 60 were considered outliers due to reporting error or represent a population that was not the target of this study (i.e. severely underweight or severely obese).
3. Exposure time in all three studies was controlled to ensure that results were due to the message content. We considered a brief window of exposure (10–60 seconds) to closely resemble how people typically interact with public health messages, although it was beyond the scope of this research to directly test the effect of exposure time.
4. Additional measures were included for exploratory purposes and are not reported here but can be found in the pre-registration documents.
5. Table and figure number prefixed with an 'S' are reported in the supplementary materials.
6. Confirmatory factor analysis with principle axis factoring and examination of Kaiser criterion and scree plot again confirmed a one-factor solution, which accounted for 55% of the variance in scores (eigenvalue for first factor=4.40).
7. BMI was also tested as a hypothesised moderator; full results reported in Supplemental Table S4.

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