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Article

"I Don't Approve of a Fat Person…": A Cross-Sectional Survey Exploring the Perceptions of health, Weight and Obesity

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Abstract: Despite being acknowledged as a complex and multi-faceted condition, the prevailing view within society is that obesity is result of individual choices and can be reversed simply by "eating less and moving more". This is oversimplistic and leads to the view that obesity is the individual's fault and is therefore their responsibility to remedy. These views are grounded in individuals' beliefs around health and contribute to weight bias and stigma. In the present study, participants (n = 143) completed a cross-sectional survey which explored views around weight and health, and whether weight bias or stigma differ based on demographic characteristics, weight status, and prior experience of weight stigma. Results indicate differences in the way individuals living with overweight and obesity are viewed in comparison with those of healthy weight, with the former viewed in a more negative light. Interestingly, while females presented with higher weight bias scores ($p = 0.036$), males scored higher for externalised weight stigma ($p = 0.001$). Weight status was seen as an important factor contributing to overall health. These results demonstrate that weight bias and stigma are prevalent and highlight the need for further measures to reduce stigmatising views of people living with overweight and obesity.

Keywords: weight bias; weight stigma; thin ideal; muscular ideal

1. Introduction

Officially recognised as a major public health challenge and a global epidemic in 1997 [1], the prevalence of obesity has since continued to rise with global estimates of overweight and obesity circa 2.5 billion adults [2]. Despite obesity being acknowledged and well documented as a complex and multi-faceted condition [3,4], the prevailing view within society is that obesity is result of individual choices and can be reversed through decisions to reduce dietary intake and increase physical activity [5]. This oversimplifies the factors contributing to increased weight status and leads to the view that obesity is the individual's fault and is therefore their responsibility to remedy [6]. These assumptions impact societal views of individuals living with obesity, who are widely perceived as lacking willpower, being lazy, greedy or selfish, and draining healthcare resources [7–9].

These views are grounded in individuals' beliefs about the impact of individual behaviours on health [10]. Health is a relative state which is often perceived differently between individuals depending on their personal associations with and expectations of what contributes towards being healthy [11]. Societal perception of health status is often closely linked to physical appearance and weight status [12]. While there are links with higher weight status and disease prevalence, Ortega et al. [13] argue that weight should not be used as the sole criterion for establishing health status and instead cardiorespiratory fitness is a more valid metric. Still, despite not being included in any definition of health [14–16], being "healthy" is associated with adherence to the thin and muscular

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ideals [17,18]. This focus on physical appearance has given rise to body dissatisfaction and body image disorders [19,20], and individuals who do not adhere with societal views of health (i.e., the thin and muscular ideals) often experience weight-based bias and stigmatisation [21,22].

Weight bias refers to the negative attitudes, beliefs, assumptions and judgements held about those living with obesity, and can take the form of explicit (i.e., overtly negative attitudes towards people in larger bodies), implicit (i.e., unconscious negative attitudes towards people in larger bodies) and internalised bias (i.e., extent to which negative beliefs are endorsed by individuals) [5]. Weight stigma is the manifestation of weight bias through harmful social stereotypes associated with the 'ideal' body shape and/or size. The stigmatisation of individuals living with obesity is pervasive in current society [5,23]. Indeed, individuals living with obesity are nearly nine times more likely to suffer from weight-based discrimination compared to those who are classed as healthy weight [24].

Experiences of weight bias and stigma are prevalent across the lifecycle and in a range of settings, including within the home, in social settings, in the workplace, and when accessing healthcare [23,25–27]. In a recent survey by Puhl et al. [27], 58% of participants reported experiencing weight stigma at some point during their life and more than half reported being teased about their weight. It has been proposed that weight bias and stigma are routes through which to motivate weight loss [28]; i.e., if it were suitably distasteful to be obese, then individuals living with obesity would be motivated to alter their behaviours and lose weight [29]. However, there is no empirical evidence to support this and instead this appears to create the opposite reaction [30]. Experiencing weight-based stigma can negatively impact body image and mental health and wellbeing, with internalised weight bias associated with weight gain, weight cycling, perceived stress and eating to cope [31–34]. Interestingly, experiencing stigma has been shown to predict weight gain, regardless of age, baseline weight status, race, ethnicity and socioeconomic factors [5,27,33,35]. What is particularly important to note is that stigmatising views and assumptions around weight and obesity mislead public health policies, confuse messages in popular media, undermine access to evidence-based treatments, and compromise advances in research [5].

Exploring views and perceptions of weight and health across populations is important for identifying those who are more likely to express stigmatising views in order to develop targeted approaches to reduce stigmatising views and bias. This project looked to further explore the perceptions of and link between health and weight, and assess whether the perception of weight, and particularly weight bias or stigma, differ based on demographic characteristics, weight status, and prior experience of weight bias and/or stigma.

2. Materials and Methods

2.1. Study Design

This study involved a cross-sectional online survey completed through Qualtrics. Participants were self-identified in response to study advertisements. The study was shared via social media and word-of-mouth, with interested individuals directed to the online survey where they could review a participant information sheet. All individuals provided informed consent prior to their participation. Procedures were independently reviewed and approved by the Sheffield Hallam University Research Ethics Committee (project ID: ER42086514, approved 12 April 2022). Given the sensitive nature of the survey, participants were directed to self-help resources should they be worried about their weight or wider health and wellbeing.

This article is an expanded version of a paper entitled 'Exploring the perceptions of health, weight and obesity', which was presented at the UK Congress on Obesity at Queen's University, Belfast on 14 September 2023 [36].

2.2. Participants

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The survey was open to adults (18 years of age or older) who were free-living (i.e., non-clinical populations). The study aimed to recruit a minimum target sample size of 133 individuals, in line with other similar studies [37–39].

2.3. Materials

2.3.1. Participant Demographics

Participants self-reported their age, gender, ethnicity, highest level of attained education, current student status and perceived weight status (underweight, healthy weight, overweight or obese). Body image was determined using the scale produced by Stunkard et al. [40]; participants selected a silhouette drawing ranging from one (leanest silhouette) to nine (largest silhouette) that best matched how they viewed their body size. Level of physical activity was measured using the International Physical Activity Questionnaire (IPAQ) [41], capturing levels of activity over the previous seven days and providing an indication of habitual level of activity and categorised as low, moderate or high.

2.3.2. Weight Bias

Weight bias was measured using the Attitudes Towards Obese Persons Scale (ATOPS) and the Beliefs About Obese Persons Scale (BAOPS) [42]. The ATOPS is a 20-item questionnaire measuring attitudes and perceptions about individuals living with obesity. Participants respond to statements over a six-point Likert scale, with scores ranging from -3 (I strongly disagree) to +3 (I strongly agree). Scores are totalled and summed with 60, with total score ranging from 0 to 120; scores below 60 indicate more negative attitudes towards individuals living with obesity whereas scores greater than 60 correspond with more positive attitudes towards individuals living with obesity. Similarly, the BAOPS is an eight-item scale assessing beliefs about the causes of obesity and is completed over the same six-point Likert scale. Item scores are totalled and summed with 24 to produce a total score. Scores less than 24 highlight the belief that obesity is under the individual's control, whereas scores greater than 24 highlight the belief that obesity is not controlled by the individual. Both the ATOPS (Cronbach's $\alpha = 0.80$ to 0.84) and BAOPS (Cronbach's $\alpha = 0.65$ to 0.82) have good internal consistency [42].

2.3.3. Weight Stigma

Internalised weight stigma was measured using the 12-item Weight Self-Stigma Questionnaire (WSSQ) [43]. This questionnaire views weight stigma as a construct with two distinct factors, self-devaluation and fear of enacted stigma. Participants respond to statements over a five-point Likert scale (completely disagree to completely agree) and responses are summed, ranging from 12 to 60 for the total scale and 6 to 30 for individual factors. Higher scores indicate the participant experiences greater shame related to their weight or body shape. The WSSQ has good internal consistency for total scale (Cronbach's $\alpha = 0.88$), and self-devaluation (Cronbach's $\alpha = 0.81$) and fear of enacted stigma (Cronbach's $\alpha = 0.87$) sub-scales [43].

The Universal Measures of Bias-Fat (UMB-FAT) [44] was used to measure externalised weight stigma (Cronbach's $\alpha = 0.87$). Participants respond to 20 items over a seven-point Likert scale, ranging from strongly agree through strongly disagree. Scores are totalled and provide individual item scores for Adverse Judgement, Social Distance, Attraction, and Equal Rights. Individual item scores range from 5 to 35, with higher scores indicating greater stigmatising views of those living with obesity.

Experience of weight-based stigma was measured using the Stigmatising Situations Inventory-Brief (SSI-B) [32], a 10-item questionnaire where participants report the frequency (from never to daily) in which they experience stigma relating to their weight from various sources (e.g., family members, healthcare professionals, members of the public). Scores are totalled and range from 0 to 90; higher scores demonstrate greater experiences of weight-based stigma. The SSI-B has high internal consistency (Cronbach's $\alpha = 0.95$) [32].

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2.3.4. Perceptions of Health and Weight

Participants were shown eight images depicting 'healthy'/non-stigmatising (eating a balanced meal, taking part in physical activity) and 'unhealthy'/stigmatising (eating junk food, sedentarism) behaviours conducted by individuals of a healthy weight and individuals living with obesity. The content of each image was matched across weight status groups (e.g., showing the same physical activity in the same environment). Non-stigmatising images of individuals living with obesity were selected from Obesity Canada's image bank, other images were found via internet image search. Participants were shown each image in a random order and asked to describe what the image depicted. Finally, participants were asked to list the individual behaviours, characteristics, traits, or other factors they believe contribute to good and poor health, the societal or environmental factors they believe contribute to good and poor health, and to describe an individual they would consider to be in good and poor health.

2.4. Data Analysis

Questionnaires were scored in line with instructions provided in the validation papers (as described above). Normality of data was determined using a Shapiro-Wilks test. For normally distributed data, means were compared using independent-samples t-tests or one-way analysis of variance (ANOVA) as appropriate for the comparison. Where data were not normally distributed, Mann-Whitney U and Kruskal-Wallis tests were used. Spearman's correlation coefficient was used to determine correlation between measures of weight bias and stigma. As the WSSQ is only validated for use in individuals with overweight and obesity, analyses were restricted to those participants self-reporting as overweight or obese. Analyses were completed using Statistical Package for the Social Sciences (SPSS) version 29 (IBM, New York, USA). Data are presented as mean and standard deviation (SD), or median and interquartile range (IQR), as appropriate to an alpha level of 0.05.

Qualitative data on factors contributing to good and poor health were analysed through inductive thematic analysis [45] by two authors independently (J.D.B. and B.O.). Initial codes were developed and used to inform themes, which were then defined and agreed. Themes are presented below with illustrative quotes. Qualitative data in response to images were analysed through sentiment analysis and coded as 'positive', 'neutral' or 'negative' by two authors (J.D.B. and B.O.). Prior to coding, authors agreed criteria for coding, which differed based on image type (i.e., whether the picture depicted eating or exercise). To improve clarity of reporting, where appropriate quantitative and qualitative data will be discussed concurrently. Data and associated study files are available via the Open Science Framework: https://doi.org/10.17605/OSF.IO/KZ4VJ.

3. Results

A total of 143 participants completed the survey. Participants were between 21 and 70 years of age (35.1 ± 12.0 years; n = 105) and were predominantly white, female, non-students and well educated, with 79% being educated to undergraduate degree level or higher (Table 1). Seventy-six percent (n = 109) self-reported having healthy weight with 22.4% (n = 32) of participants self-reported living with overweight or obesity. Body image scores ranged from 1 to 7 (median 4.0 arbitrary units [AU], IQR 2.0 AU). Only 7.8% (n = 23) of participants reported they did not use any method to help manage their weight (Table 2). There were no differences across characteristics when comparing by gender ($p \geq 0.213$) or level of education ($p \geq 0.146$). Physical activity level differed when comparing across ethnicity, with those of Asian or Asian British ethnicity having lower levels of activity ($\chi^2_{(3)} = 20.082$, $p < 0.001$). Similarly, those with higher body image scores reported lower levels of physical activity ($\chi^2_{(2)} = 13.938$, $p < 0.001$). Both higher age ($\chi^2_{(2)} = 6.899$, $p = 0.032$) and body image scores ($\chi^2_{(3)} = 56.060$, $p < 0.001$) were associated with higher weight status, whereas individuals self-identifying as living with overweight or obesity had lower levels of physical activity compared to those with healthy weight ($\chi^2_{(3)} = 8.576$, $p = 0.035$). Interestingly, perceived struggle to maintain a healthy weight

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was associated with lower weight status (U = 1224.500, p < 0.001), lower body image scores (U = 1153.50, p < 0.001), and lower age (U = 859.00, p = 0.010).

Table 1. Participant characteristics (n = 143).

		n	%
Gender	Female (including transgender female)	104	72.7
	Male (including transgender male)	38	26.6
	Prefer not to state	1	0.7
Ethnicity	White	121	84.6
	Asian or Asian British	13	9.1
	Mixed or multiple ethnic group	5	3.5
	Black, African, Caribbean or Black British	4	2.8
Education	Undergraduate degree	64	44.8
	Postgraduate taught degree	36	25.2
	Further education (e.g., A-level)	25	17.5
	Doctorate or other postgraduate research degree	13	9.2
	Secondary education (e.g., GCSE)	4	2.8
	Prefer not to state	1	0.7
Student status	No	101	70.6
	Yes	42	29.4
Perceived weight status	Healthy weight	109	76.2
	Overweight	31	21.7
	Underweight	2	1.4
	Obese	1	0.7
Struggle to maintain healthy weight	No	93	65.0
	Yes	50	35.0
Physical activity level	High	123	86.0
	Moderate	16	11.2
	Low	4	2.8

Table 2. Methods used to support weight management (n = 143).

	n reported	% reported
Weight-loss diet	15	5.1
Skip meals	28	9.5
Avoid certain foods/food groups	47	16.0
Avoid certain eating practices (e.g., snacking)	42	14.3
Meal replacement products (e.g., shakes, bars)	7	2.4
Meal planning	1	0.3
Calorie tracking apps	25	8.5
Weight loss clubs or groups	5	1.7
Exercise/Physical activity	99	33.7
Slimming or diet products (e.g., pills, medications)	2	0.7
I do not use any method to manage my weight	23	7.8

3.1. Weight Bias

All participants reported more negative attitudes towards individuals living with obesity (39.3 ± 9.0 AU). While there appeared to be no difference in views based on age ($r_{(106)}$ = −0.014, p = 0.885), females (38.4 ± 9.1 AU) held more negative attitudes than males (41.9 ± 8.3 AU) ($t_{(141)}$ = 2.114, p = 0.036). Median ATOPS scores did not differ based on perceived weight status ($\chi^2_{(3)}$ = 4.868, p = 0.182), ethnicity ($\chi^2_{(3)}$ = 2.223, p = 0.527), level of education ($\chi^2_{(6)}$ = 4.560, p = 0.601), physical activity level ($\chi^2_{(2)}$ = 1.275, p = 0.529), or use of weight management techniques (z = −0.388, p = 0.698).

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ATOPS scores were positively correlated with BOAPS scores ($r_{s(144)} = 0.282$, $p < 0.001$) (Table 3). This suggests while views were negative, participants still appreciated that obesity was beyond an individual's control. In line with this, median BOAPS scores were 26.0 AU (IQR 6.0 AU). There was no difference in BAOPS score when comparing age ($r_{s(106)} = 0.014$, $p = 0.883$), gender (female: median 26.0 AU, IQR 7.0 AU; male: median 26.0 AU, IQR 5.0 AU; $z = -0.476$m $p = 0.634$), ethnicity ($\chi^2_{(3)} = 1.092$, $p = 0.779$), perceived weight status (healthy weight: median 26.0 AU, IQR 6.0 AU; overweight or obesity: median 26.0 AU, IQR 6.0 AU; $z = -0.31$, $p = 0.756$), level of education ($\chi^2_{(6)} = 5.279$, $p = 0.509$), physical activity level ($\chi^2_{(2)} = 5.850$, $p = 0.054$), or use of weight management techniques (techniques used: median 26.0 AU, IQR 6.0 AU; techniques not used: median 26.0 AU, IQR 6.0 AU; $z = -0.745$, $p = 0.456$).

Table 3. Spearman's correlation coefficient for measures of weight bias and stigma (n = 143).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. ATOPS		0.282‡	0.021	0.265‡	0.340‡	0.146	0.230†	0.246†	−0.094	−0.112	−0.063
2. BAOPS	0.282‡		0.048	0.352‡	0.264‡	0.171*	0.439‡	0.185*	−0.085	−0.073	−0.099
3. SSI-B	0.021	0.048		−0.007	−0.009	−0.083	−0.078	−0.074	−0.360‡	−0.324‡	−0.310‡
4. UMB-FAT (total)	0.265‡	0.352‡	−0.007		0.550‡	0.657‡	0.744‡	0.824‡	0.083	0.060	0.088
5. UMB-FAT (adverse judgement)	0.340‡	0.264‡	−0.009	0.550‡		0.325‡	0.489‡	0.516‡	0.026	−0.006	0.041
6. UMB-FAT (social distance)	0.146	0.171*	−0.083	0.657‡	0.325‡		0.318‡	0.498‡	0.094	0.059	0.149
7. UMB-FAT (attraction)	0.230†	0.439‡	−0.078	0.744‡	0.489‡	0.318‡		0.387‡	0.029	0.056	−0.026
8. UMB-FAT (equal rights)	0.246†	0.185*	0.074	0.824‡	0.516‡	0.498‡	0.387‡		0.019	−0.029	0.068
9. WSSQ (total)	−0.094	−0.085	−0.360‡	0.083	0.026	0.094	0.029	0.019		0.876‡	0.856‡
10. WSSQ (self-devaluation)	−0.112	−0.073	−0.324‡	0.060	−0.006	0.059	0.056	−0.029	0.876‡		0.567‡
11. WSSQ (fear of enacted stigma)	−0.063	−0.099	−0.310‡	0.088	0.041	0.149	−0.026	0.068	0.856‡	0.567‡	

* $p \leq 0.05$, † $p \leq 0.01$, *** $p \leq 0.001$.

3.2. Weight Stigma

Individuals who self-reported as having overweight or obesity experienced greater stigma (4.0 AU, IQR 9.0 AU) than healthy or underweight participants (1.0 AU, IQR 6.0 AU) ($U = 1{,}124.0$, $p < 0.001$). Whilst externalised stigma was more prevalent in males (3.8 AU, IQR 0.5 AU) than females (3.6 AU, IQR 0.3 AU) ($t = 3.32$, $p = 0.001$), and specifically for negative judgement of individuals living with obesity ($z = -2.90$, $p = 0.004$), males scored higher for attraction to individuals living with obesity (5.2 AU, IQR 2.0 AU) than females (4.1 AU, IQR 2.0 AU) ($z = -2.90$, $p = 0.004$). Support for equal rights for people living with obesity was also greater among males (median 2.2 AU, IQR 2.8 AU) than females (1.6 AU, IQR 1.4 AU) ($z = -2.69$, $p = 0.007$). There was no difference in reported internalised stigma (males: 36 AU, 7 AU; females: 36 AU, 9 AU; $z = -0.23$, $p = 0.824$) or experience of weight stigma between males (11.0 AU, IQR 6.0 AU) and females (12.0 AU, IQR 8.0 AU) ($U = 1{,}891.5$, $p = 0.523$).

3.3. Perceptions of Health and Weight

When asked to describe an individual of good health, participants commented primarily on the need for physical activity (n = 67, 21.5%), a healthy diet (n = 54, 17.4%), low weight status (n = 28, 9.0%), and good mental health (n = 26, 8.4%). In comparison, descriptions of an individual of poor health focussed on poor diet (n = 55, 18.0%), lack of physical activity (n = 51, 16.7%), high weight status (n = 39, 12.7%) and personal attributes (n = 29, 9.5%). This is reflected in the individual, societal and environmental factors participants associated with good and poor health (Table 4).

Table 4. Thematic codes outlining the individual, societal and environmental factors associated with good and poor health (n [%]).

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Factors contributing to good health				Factors contributing to poor health			
Individual		Societal and Environmental		Individual		Societal and Environmental	
Physical activity	78 (24.9%)	Social health	51 (19.2%)	Diet	58 (18.5%)	Resource	55 (21.7%)
Diet	73 (23.3%)	Environment	44 (16.5%)	Personal attributes	54 (17.3%)	Environment	50 (19.7%)
Personal attributes	60 (19.2%)	Resource	43 (16.2%)	Physical activity	47 (15%)	Social health	33 (13%)
Mental health	20 (6.4%)	Education	26 (9.8%)	Mental health	41 (13.1%)	Education	19 (7.5%)
Education	17 (5.4%)	Physical activity	20 (7.5%)	Resource	17 (5.4%)	Mental health	16 (6.3%)
Sleep	14 (4.5%)	Personal attributes	16 (6%)	Substances	16 (5.1%)	Employment	13 (5.1%)
Social health	14 (4.5%)	Diet	13 (4.9%)	Education	14 (4.5%)	Personal attributes	13 (5.1%)
Environment	7 (2.2%)	Mental health	10 (3.8%)	Social health	14 (4.5%)	Diet	9 (3.5%)
Resource	7 (2.2%)	Employment	7 (2.6%)	Sleep	10 (3.2%)	Marketing	9 (3.5%)
Genetics	5 (1.6%)	Healthcare	6 (2.3%)	Upbringing	9 (2.9%)	Healthcare	7 (2.8%)
Substances	4 (1.3%)	Marketing	6 (2.3%)	Environment	7 (2.2%)	Upbringing	7 (2.8%)
Physical health	3 (1.0%)	Upbringing	6 (2.3%)	Genetics	7 (2.2%)	Work/life balance	6 (2.4%)
Work/life balance	3 (1.0%)	Work/life balance	5 (1.9%)	Physical health	6 (1.9%)	Physical activity	5 (2%)
Hobbies	2 (0.6%)	Lifestyle	3 (1.1%)	Work/life balance	4 (1.3%)	Lifestyle	4 (1.6%)
Lifestyle	2 (0.6%)	Genetics	2 (0.8%)	Lifestyle	3 (1.0%)	Social media	3 (1.2%)
Economy	1 (0.3%)	Government	2 (0.8%)	Social media	2 (0.6%)	Substances	2 (0.8%)
Employment	1 (0.3%)	Social media	2 (0.8%)	Economy	1 (0.3%)	Demographics	1 (0.4%)
Support	1 (0.3%)	Society	2 (0.8%)	Marketing	2 (0.6%)	Physical health	1 (0.4%)
Upbringing	1 (0.3%)	Psychology	1 (0.4%)	Personal attributes	1 (0.3%)	Society	1 (0.4%)
		Substances	1 (0.4%)				

Qualitative comments in response to images were consistently more negative if an image depicted an individual living with obesity versus healthy weight, regardless of the activity type or whether the image was stigmatising or non-stigmatising (Table 5). When exploring the comments, there is a clear distinction in participants' focus. For images depicting activities involving food/eating, those images including individuals with healthy weight often focussed on the activity and setting (e.g., *"This is a group of friends enjoying some pizza and socialising with each other. They all look happy and like they're enjoying themselves."*, *"Friends out for dinner having fun"*). In comparison, where these images included an individual living with obesity, comments focussed primarily on the individuals' physical appearance (e.g., *"First thought was "ew" looks sort of slobbish and unappealing"*, *"Sedentary and overweight"*, *"I'm very sad that a young guy in his prime of life has let himself get like that"*) or assumed individual behaviours, characteristics or background (e.g., *"Lazy, poorly motivated, lacking in healthy role models"*, *"Out of control, lazy, negative feeling"*, *"Lazy inactive person, not aspiring for good things"*).

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Table 5. Positive, neutral and negative comments (n [%]) in response to images depicting stigmatising and non-stigmatising activities of individuals with healthy weight and obesity (n = 143).

Weight Status	Activity	Positive	Neutral	Negative	
Obesity	Consuming unhealthy food (stigmatising)	2 (1.4)	70 (49.0)	71 (49.7)	$z = -8.618$, $p < 0.001$
Healthy	Consuming unhealthy food (stigmatising)	69 (48.3)	64 (44.8)	10 (7.0)	
Obesity	Consuming balanced meal (non-stigmatising)	52 (36.4)	60 (42.0)	31 (21.7)	$z = -7.119$, $p < 0.001$
Healthy	Consuming balanced meal (non-stigmatising)	89 (62.2)	52 (36.4)	2 (1.4)	
Obesity	Being sedentary (stigmatising)	3 (2.1)	40 (28.0)	100 (69.9)	$z = -5.851$, $p < 0.001$
Healthy	Being sedentary (stigmatising)	5 (3.5)	105 (73.4)	33 (23.1)	
Obesity	Being physically active (non-stigmatising)	39 (27.8)	87 (60.8)	17 (11.9)	$z = -5.601$, $p < 0.001$
Healthy	Being physically active (non-stigmatising)	88 (61.5)	54 (37.8)	1 (0.7)	

Similarly, descriptions of images depicting sedentary behaviour versus physical activity were generally negative and judgemental (e.g., *"Overweight person"*, *"I can't tell where the person starts and the sofa ends. Clearly the bloke is eating more than he needs..."*), focussing on appearance (e.g., *"Looks sort of slobbish and unappealing"*), or their personal attributes (e.g., *"Lazy poorly motivated lacking in healthy role models"*, *"Unhappy, unhealthy, lonely"*). In comparison, images of those with healthy weight focussed more on rest and relaxation for sedentary behaviours (e.g., *"Looks like he's earned a nice nap, although should probably have gone to bed a little earlier"*, *"He looks exhausted and tired out, maybe he is having a relaxed day or has just completed a task. He looks quite relaxed and that he is happy"*) or health/aspirational goals for physical activity (e.g., *"Looks healthy, actively trying to better herself"*, *"A woman exercising and trying to live a healthy lifestyle - she may be doing this to lose weight or get in better shape, but if she isn't, that's fine"*).

4. Discussion

This work looked to explore the perceptions held by participants around health, weight and obesity, particularly where weight-based bias and stigma were prevalent. The findings suggest that there are differences in the way individuals living with overweight and obesity are viewed in comparison with those of healthy weight, with the former viewed in a more negative light. Weight status was seen as an important factor contributing to both good health (i.e., maintaining a 'healthy' weight status) and poor health (i.e., living with overweight or obesity).

While weight may be associated with health, health is complex and a 'one size fits all' approach cannot be applied to the concept of 'being healthy' [46,47]. Historically, being healthy was considered as to be free of illness or disease [14]. Today health is seen more as a holistic concept, incorporating physical, mental and social wellbeing and not just the absence of disease or infirmity, with some definitions associating health primarily with good fitness [48]. Our findings support this connection, with comments in response to those of healthy weight focussing on physical, mental and social wellbeing. However, this was not observed for those living with obesity who were described with more stigmatising language. Individuals with overweight or obesity are at increased risk of experiencing weight-based stigmatisation compared with their healthy weight counterparts [24,49].

The comments made by participants in the present work align with those observed in other studies, perceiving individuals of higher weight status as 'lazy' or 'weak-willed' and making

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assumptions about behaviours and lifestyle (e.g., lack of participation in physical activity) [8,50,51]. The overwhelmingly negative views held about those living with obesity in the present sample may be surprising given their higher educational status. Education is generally associated with greater tolerance and decreased prejudice [52]. However, more recent research has shown that where views are more ideological (e.g., aligned with political beliefs), this tolerance flips and people with higher educational status exhibit greater intolerance and higher prejudice [53]. This could suggest that beliefs about those living with obesity may be linked to ideology. Replication of the present work in a less educated sample may provide further information on this.

Weight stigma is considered the last acceptable form of discrimination [54–56]. The prevalence of stigmatising views around weight has given rise to approaches such as Health at Every Size® [57] and the Fat but Fit Paradox [13]. These acknowledge that weight status is not an appropriate proxy for health status, with disease prevalent across weight categories. Indeed, weight status should not be used as the sole determinant of health as it provides no conclusive indication of health status given individuals can be metabolically unhealthy at a healthy weight and metabolically healthy at a higher weight [58–60]. An individual's metabolic health is associated with disease development and progression [60–62]. While the risk for disease development cannot exclude body weight and adipose distribution completely, it is important to consider other factors such as the social and commercial determinants of health [63–65]. Recognising this will help address weight-based stereotypes, prejudice, discrimination and unfair treatment experienced by individuals living with obesity across multiple facets of everyday life [34,66], and observed in the present work.

The present work observed significantly higher weight bias in females, compared with males. Given the increased societal pressures placed on appearance in females [67,68], and the need to adhere with the 'thin ideal' [17,18], it is unsurprising such bias exists and is observed in the present sample. In addition, females are more vulnerable to weight stigma [69–71], as are those with higher weight status [24,49,72]. Individuals who more frequently experience weight stigma are more likely to internalise such stigma, endorsing the negative stereotypes and attributing them to themselves [73,74].

Both diet and physical activity were deemed as important contributors to health – contributing to both good and poor health. Dryer and Ware [75] observed 'eating more food than you need', 'eating the wrong types of food' and 'not enough physical activity' as factors contributing to weight gain. This, again, demonstrates the parallels drawn between weight and health. Experience of weight-based stigma is associated with weight gain, weight cycling, perceived stress and eating to cope [31–34]. Importantly, higher incidence of weight stigma is a precursor of psychological disorders (e.g., disordered eating, anxiety, depression, suicidal ideation) [31,76,77]. Stigma is experienced throughout a range of societal settings, for example healthcare [78], education [21], employment [79], and the media [80], contributing to significant psychological harm, discrimination and social inequalities.

While this study has identified a number of interesting findings in relation to weight bias and stigmatising views, and captured these through validated questionnaires and qualitative questions, the study is not without limitations. While the study has captured views around health and weight, it was outside the aim of this project to capture the factors contributing to these views. In addition, the cross-sectional nature of the project did not allow for in-depth exploration of these views beyond simple qualitative questions. Such detailed exploration would have provided an opportunity to explore nuances in perceptions and understanding of weight and health. Finally, while the sample size was modest in comparison to other published work, the sample was not representative and therefore the views expressed here are likely limited to a white, female, well-educated and healthy weight demographic.

5. Conclusions

This study identified prevalent stigmatising view of those living with overweight and obesity across validated measures and in response to images depicting individuals with healthy weight and

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obesity. These findings agree with prior literature and demonstrate that weight bias and stigma are prevalent in a sample of highly educated adults. These findings highlight the need for further measures to reduce stigmatising views.

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Abbreviations

The following abbreviations are used in this manuscript:

ANOVA	Analysis of variance
ATOPS	Attitudes Towards Obese Persons Scale
AU	Arbitrary units
BAOPS	Beliefs About Obese Persons Scale
IPAQ	International Physical Activity Questionnaire
IQR	Interquartile range
SD	Standard deviation
SPSS	Statistical Package for the Social Sciences
SSI-B	Stigmatising Situations Inventory-Brief
UMB-FAT	Universal Measures of Bias-Fat
WSSQ	Weight Self-Stigma Questionnaire

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