



DIETETIC AND PROFESSIONAL PRACTICE

Weight bias among UK trainee dietitians, doctors, nurses and nutritionists

J. A. Swift,* S. Hanlon,* L. El-Redy,* R. M. Puhl† & C. Glazebrook‡

*Division of Nutritional Sciences, School of Biosciences, The University of Nottingham, Leicestershire, UK

†Rudd Center for Food Policy & Obesity, Yale University, New Haven, CT, USA

‡Behavioural Sciences, Division of Psychiatry, School of Community Health Sciences, The University of Nottingham, Queen's Medical Centre, Nottingham, UK

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Correspondence

J. A. Swift, Division of Nutritional Sciences, School of Biosciences, The University of Nottingham, Sutton Bonington Campus, Loughborough, Leicestershire LE12 5RD, UK.
Tel.: +44 (0)115 95 16178
Fax: +44 (0)115 95 16122
E-mail: judy.swift@nottingham.ac.uk

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Abstract

Background: Trainee dietitians, nutritionists, nurses and doctors will direct the future of obesity treatment and prevention. To do so effectively, they must be willing and able to engage empathically with overweight and obese people. The present study aimed to assess weight bias among UK trainee healthcare professionals and to investigate the factors predicting weight bias, both static and potentially modifiable.

Methods: A self-completed questionnaire collected data on demographics, weight and height, the Fat Phobia Scale (F-scale), and the Beliefs about Obese People (BOAP) scale from 1130 students.

Results: Overall, participants demonstrated significant levels of fat phobia [F-scale score mean (SD) = 3.8 (0.5)]. Only 1.4% of participants could be said to have expressed 'positive or neutral attitudes' (i.e. achieved a F-scale score \leq 2.5). Hierarchical multiple regression revealed that lower fat phobia (as measured by the F-scale) was uniquely predicted by a higher self-reported body mass index, being on the Nursing BSc course and a stronger perception that obesity is not under a person's control (as measured by the BOAP scale).

Conclusions: There are unacceptable levels of weight bias among UK students training to become nurses, doctors, nutritionists and dietitians. The results of the present study suggest that a promising approach for future interventions would be the provision of balanced education about the controllability of obesity, focusing upon genetic and environmental factors, as well as diet and exercise.

Introduction

In England, just over one-quarter of adults (26%) were obese in 2010 (The Health & Social Care Information Centre, 2012) and, by 2025, it is estimated that 47% of men and 36% of women will have a body mass index (BMI) \geq 30 kg m⁻² (Foresight, 2007). The prevention and management of obesity is considered to be a priority for all healthcare professionals (National Institute for Health & Clinical Excellence, 2006) and, in the future, will be directed by students currently training to become nurses, doctors and dietitians. To do so effectively, they

must deliver care with empathy, respect and compassion (Department of Health, 2010).

It is well established that obese people are subject to prejudice and bias as a consequence of their bodyweight (Puhl & Brownell, 2001; Puhl & Heuer, 2009). Patients have detected anti-fat attitudes¹ in their healthcare

¹Anti-fat attitude, weight stigma, weight bias and anti-fat prejudice are terms referred to in the literature that describe a negative attitude toward (dislike of), belief about (stereotype) or behaviour against (discrimination) people perceived as being 'fat' (Danielsdóttir *et al.*, 2010).

professionals (Puhl & Brownell, 2006; Friedman *et al.*, 2008). Dietitians, nutritionists, nurses and doctors themselves have all reported negative attitudes (e.g. Maiman *et al.*, 1979; McArthur & Ross, 1997; Campbell & Crawford, 2000; Hebl & Xu, 2001; Harvey *et al.*, 2002; Foster *et al.*, 2003; Brown, 2006), even those specialising in obesity (Teachman & Brownell, 2001; Schwartz *et al.*, 2003). Not only do these negative attitudes conflict with best practice guidelines (Department of Health, 2010), but they may also have serious consequences for the clinical treatment of obese patients (Amy *et al.*, 2006; Puhl *et al.*, 2007) and the effectiveness of public health interventions (Puhl & Heuer, 2010). A recent research synthesis highlighted a number of important ways in which healthcare professionals' attitudes can impact on the care that obese patients receive. Healthcare professionals have been found to spend less time with obese patients and there is evidence of discrimination in terms of treatment options and access to treatment, including preventive medicine. Negative attitudes can also impact on communications around obesity and patients' willingness to engage in weight management (Mold & Forbes, 2011).

Negative perceptions concerning obese people are also evident in trainee healthcare professionals in the USA (Wiese *et al.*, 1992; Oberrieder *et al.*, 1995; Culbertson & Smolen, 1999; Berryman *et al.*, 2006; Puhl *et al.*, 2009), Australia (O'Brien *et al.*, 2010) and Hong Kong (Poon & Tarrant, 2009). This appears to suggest that a bias against obese patients develops early and is not driven by clinical experience with managing obese patients. However, nothing is known about the attitudes of trainee healthcare professionals in the UK towards obese people and little is known about what factors influence weight bias. Determining the extent of bias against people who are obese and predictors of negative attitudes in UK trainee healthcare professionals would help to inform the development of anti-stigma interventions and to target those interventions at students who would benefit most. The present study aimed to assess weight bias among UK trainee nurses, doctors, dietitians and nutritionists. To date, studies have employed a wide range of measures to assess obesity-related attitudes. Many of these measures have poorly defined psychometric properties, thus resulting in a fragmented literature and a lack of meaningful comparisons between studies. The present study employs reliable and valid instruments that have been used with trainee healthcare professionals in other countries to investigate factors predicting weight bias, both static and potentially modifiable.

One possible factor for intervention that might predict fat phobia is belief about the causes of obesity. Attribution theory suggests that strongly believing that obesity is the result of a lack of personal control (i.e. is potentially controllable) would result in weight bias (Crandall &

Reser, 2005). Indeed, prejudice and negative attitudes have been linked to attributions of controllability across a wide range of domains, such as individuals with alcohol dependence, HIV/AIDS, depression and other mental illness (Crandall & Reser, 2005). Furthermore, previous research has demonstrated that exposure to science-based information emphasising the controllability of obesity increases anti-fat prejudice (Teachman *et al.*, 2003), while O'Brien *et al.* (2010) recently demonstrated that anti-fat prejudice in health promotion and public health students could be reduced by providing information on the uncontrollable causes of obesity.

Another potentially modifiable factor that might predict fat phobia is previous contact with obese people. Although research has suggested that contact with obese people is not effective in evoking empathy or changing negative attitudes (Blumberg & Mellis, 1980), patient contact has been shown to improve medical students' attitudes towards mental illness (Corrigan & Penn, 1999). If factors such as previous contact with an obese person and beliefs about the causes of obesity are predictive of weight bias, future intervention efforts might aim to increase students' contact with obese people during clinical placements and/or provide balanced education about the controllability of obesity (i.e. genetics and environment as well diet and exercise).

Aims

- To determine the extent of weight bias among UK trainee healthcare professionals (nurses, doctors, and dietitians and nutritionists).
- To investigate factors predicting weight bias among UK trainee healthcare professionals.

Materials and methods

Study design

The present study comprised a cross-sectional survey aiming to assess trainee healthcare professionals' attitudes towards obese people.

Sampling

All students registered on the Master of Nutrition (Dietetic), Master of Nursing Science (Nursing MNurSci), Bachelor of Science in Nursing (Nursing BSc), Bachelor of Medical Sciences (Medicine) and Bachelor of Science in Nutrition/Nutrition and Food Sciences (Nutrition) programmes at the University of Nottingham, who were attending selected teaching sessions in October to December 2010, were invited to participate in the study.

Questionnaire

In the first section, participants were invited to complete the 14-item Fat Phobia Scale (F-scale; Bacon *et al.*, 2001) and the eight-item Beliefs about Obese People (BOAP) scale (Allison *et al.*, 1991). In the F-scale, 14 pairs of adjectives are used to describe obese people (e.g. 'lazy' versus 'industrious') and respondents are invited to indicate, on a scale from 1 to 5, which adjective they feel best describes their beliefs about obese people. Responses were scored according to the instructions published by Bacon *et al.* (2001) to give a possible score between 1 and 5, where higher scores indicate greater fat phobia. Based upon the scale design, a score of 2.5 indicates a neutral attitude, a score below 2.5 indicates a positive attitude and a score above 2.5 indicates a negative attitude (Berryman *et al.*, 2006; Puhl *et al.*, 2009). A large general population study found a mean score of 3.6 and a score above 4.4 (the 90th centile) was considered to reflect a 'high' level of fat phobia (Bacon *et al.*, 2001). In previous studies, the F-scale produced a Cronbach's α of 0.87–0.91 (Bacon *et al.*, 2001), 0.82 (Poon & Tarrant, 2009) and 0.81 (Puhl *et al.*, 2009). In the present study, Cronbach's α was 0.86, which meets the requirements for internal consistency ($\alpha \geq 0.7$) and therefore reliability (Kline, 2000). The BOAP scale measures beliefs about the controllability of obesity and items are rated on a six-point scale ($-3 =$ I strongly disagree, $+3 =$ I strongly agree). Responses were scored according to the instructions reported by Allison *et al.* (1991) to give a possible range between 0 and 48, where higher scores indicate a stronger belief that obesity is *not* under an obese person's control. In previous studies, the BOAP scale produced a Cronbach's α of 0.65–0.82 (Allison *et al.*, 1991) and 0.82–0.84 (O'Brien *et al.*, 2010). In the present study, Cronbach's α was 0.66, indicating reliability (Kline, 2000).

In the second section, participants were asked to record their degree (programme of study), year of study, gender, age, weight and height. Participants were not asked any information regarding their ethnic background because previous research involving trainee healthcare professionals studying at The University of Nottingham demonstrated little variance (Swift *et al.*, 2007; Humfrey, 2008). Finally, participants were asked 'How much contact have you had with obese people (either during your studies or in your personal life)?' and invited to respond using one of four options: 1 = a lot of contact, 2 = some contact, 3 = hardly any contact, 4 = no contact at all [question adapted from Kerby *et al.* (2008)].

Procedure

Recruitment and data collection took place during a single selected teaching session for each year group on each

programme. Mandatory teaching sessions were selected wherever possible to improve the representativeness of the sample. Before the distribution of the questionnaire, an information sheet and a short verbal explanation of the study were presented to potential participants. As with previous studies of this nature (Puhl *et al.*, 2009), the purpose of the study was withheld from participants to reduce possible social desirability bias. The present study was therefore described to potential participants as a project investigating student healthcare professionals' views about obesity management.

Ethical considerations

The present study received approval from the Nottingham University Medical School Ethics Committee. All responses were anonymous. Participants were considered to have consented to taking part in the study if they completed and returned a questionnaire. By way of a small token of appreciation, participants were offered the opportunity to enter a prize draw to win one of three £50 book vouchers.

Statistical analysis

Data entry was conducted by three members of the research team. A randomly selected 10% sample of each member's data was checked by an independent researcher for accuracy of entry and revealed an error rate of <1%, which is below the threshold considered to have any significant effect on the data analysis (Day *et al.*, 1998). All data analyses were conducted using SPSS, version 19 (SPSS Inc., Chicago, IL, USA). Normality of continuous variables was assessed using the Kolmogorov–Smirnov test and appropriate parametric and nonparametric statistics were then used to describe the sample. $P < 0.05$ was considered statistically significant, except for the post-hoc comparisons where a Bonferroni adjusted α level was employed. A three-step hierarchical multiple regression was then employed to determine the amount of variance in weight bias (F-scale score; the dependent variable) predicted by: (1) year of study, age, gender and BMI; (2) student group at the same time as controlling for the independent variables entered in step 1; and (3) previous contact with an obese person and BOAP scale score at the same time as controlling for the independent variables entered into steps 1 and 2.

Results

Response rate

Of the 2286 students registered on the target programmes, 1409 were invited to participate (sampling fraction = 61.6%). Of these, 1130 responded giving an

overall response rate of 80.2%. There were no significant differences between study programmes in terms of response rates.

Demographics

Participants were predominately female ($n = 895$; 79.2%) and were, on average, aged 20.3 years [median (interquartile range; IQR) = 20.3 (2.17) years]. Average BMI was in the healthy weight range [median (IQR) = 21.5 (3.93) kg m^{-2}], although 7.9% of participants could be considered to be underweight (BMI < 18.5 kg m^{-2}) and 15.2% as overweight or obese (BMI ≥ 25 kg m^{-2}). There was a significant effect of study programme on gender, age and BMI ($P < 0.001$), namely significantly more males in the medical student group compared to other study programmes ($P < 0.01$), whereas the Nursing BSc students were more likely to be older and have higher BMI than other student groups ($P < 0.01$).

Previous contact with obese people

Participants predominately reported having had 'a lot' or 'some' contact with obese people ($n = 839$; 74.2%). Univariate analysis revealed a significant effect of study programme on the extent of previous contact of participants with obese people ($\chi^2 = 16.96$; d.f. = 4, $P < 0.01$). Post-hoc chi-squared tests showed that students registered on the Dietetics and Nursing BSc courses were significantly more likely to have had 'a lot' or 'some' contact compared to students registered on Medicine and Nutrition ($P < 0.01$).

Beliefs about obese people

Participants achieved a mean (SD) BOAP scale score of 13.4 (5.4) (median = 13.0, IQR = 6.0). Univariate analysis revealed a significant effect of study programme on BOAP scale scores ($\chi^2 = 42.08$; d.f. = 4, $P < 0.001$). Post-hoc Mann-Whitney *U*-tests showed that students registered on

the Nursing BSc believed that obesity was less under a person's control compared to students registered on Dietetics, Medicine and Nursing MNursSci ($P < 0.01$).

Fat phobia

Participants achieved a mean (SD) F-scale score of 3.8 (0.5) (median = 3.8, IQR = 0.7). Only 1.4% of participants could be said to have expressed 'positive or neutral attitudes' (i.e. achieved a F-scale score ≤ 2.5), whereas 10.5% demonstrated 'high' levels of fat phobia (i.e. achieved a F-scale score ≥ 4.4) (Table 1).

Univariate analysis revealed a significant effect of study programme on F-scale scores ($\chi^2 = 46.44$; d.f. = 4, $P < 0.001$). Post-hoc Mann-Whitney *U*-tests showed that significantly lower F-scale scores were achieved by students registered on the Nursing BSc course compared to students registered on Dietetics, Nutrition, Medicine and Nursing MNursSci ($P < 0.01$).

Among first-year students, there were no significant differences in F-scale scores between student groups. However, significantly different F-scale scores by year of study were found for the dietetic and Nursing BSc student groups. Final-year dietetic and Nursing BSc students demonstrated lower F-scale scores than first-year dietetic (median score = 3.6 versus 4.1; $Z = -2.25$) and Nursing BSc students (median score = 3.6 versus 3.8; $Z = -2.55$) ($P < 0.05$). Furthermore, F-scale scores were significantly associated with age ($r_s = -0.07$; $P < 0.05$) and BMI ($r_s = -0.07$; $P < 0.05$) but not gender ($P = 0.06$).

As suggested by the univariate analyses, gender, age, year of study and self-reported BMI were considered to be potentially confounding factors of any relationship between F-scale score and student group. To control for the effects of these potentially confounding factors, a hierarchical multiple regression analysis was performed using F-scale scores as the dependent variable, with gender, age, year of study and BMI entered as independent variables in step 1 followed by four dummy variables for student group in step 2.

Table 1 Fat phobia scale (F-scale) scores

Student group*	Minimum–maximum	Mean (SD)	Median (IQR) [†]	Score ≤ 2.5 (%)	Score ≥ 4.4 (%)
Dietetics	2.7–4.8	3.8 (0.4)	–	0	6.7
Nutrition	2.5–5.0	3.9 (0.5)	–	1.1	12.8
Medicine	1.9–5.0	3.8 (0.5)	3.9 (0.6)	2.1	11.9
Nursing MNurSci	2.2–4.9	3.8 (0.5)	3.8 (0.6)	1.5	10.2
Nursing BSc	2.1–5.0	3.6 (0.5)	3.6 (0.8)	0.7	8.7
Total	1.9–5.0	3.8 (0.5)	3.8 (0.7)	1.4	10.5

*Missing data for Dietetics ($n = 4$), Medicine ($n = 7$), Nursing BSc ($n = 5$).

[†]Median [interquartile range (IQR)] recorded for non-Gaussian distributions only.

A third step was also employed to determine whether any further variance in F-scale scores was determined by the potentially modifiable factors of previous contact with an obese person and BOAP scale score. This three-step hierarchical multiple regression model, conducted on 1032 participants with complete data on all variables, revealed that gender, age and BMI explained only 1.6% of the variance in F-scale scores (Table 2). The partial regression coefficient was only statistically significant for BMI ($B = -0.014$, $t_{1026} = -3.138$, $P < 0.01$). When entered in step 2, the dummy variables for student group explained a further 2.0% of the variance, although the partial regression coefficient was only statistically significant for the dummy variable (DV4) relating to registration on the Nursing BSc course ($B = -0.182$, $t_{1022} = -4.131$, $P < 0.001$). When entered in step 3, previous contact with obese people and BOAP scale scores explained an additional 13.9% of the variance in F-scale scores although the partial regression coefficient was only statistically significant for BOAP scale score ($B = -0.035$, $t_{1020} = -12.912$, $P < 0.001$). Multivariate analysis, therefore, revealed that lower fat phobia was uniquely predicted by higher self-reported BMI, being on the Nursing BSc course and a stronger perception that obesity is not under a person's control.

Discussion

The present study reveals that UK students training to become nurses, doctors, nutritionists and dietitians had, on average, negative attitudes towards obese people. For dietetic students, the level of weight bias observed in the present study was comparable to that reported in the USA (mean = 3.7; Berryman *et al.*, 2006; Puhl *et al.*, 2009), while undergraduate nursing students demonstrated similar levels of weight bias compared to trainee nurses in Hong Kong (mean = 3.5; Poon & Tarrant, 2009). Of particular concern are the 10.5% of the current sample who demonstrated 'high' levels of fat phobia. These negative attitudes may have serious consequences for obese patients when they qualify and enter professional roles (Mold & Forbes, 2011).

The hierarchical multiple regression model revealed that being on the Nursing BSc course was predictive of lower fat phobia, but the amount of variance explained was very low. In addition, there is some evidence from the univariate analyses that weight bias moderately improves on courses such as Dietetics and Nursing BSc, but these associations were not supported in the multivariate analysis that controlled for potentially confounding factors. Although these findings do not suggest that healthcare education is promoting prejudicial attitudes, it does suggest that, in this educational setting, current curricula are not adequately dispelling negative attitudes. Clearly, more needs to be done within higher education to ensure that healthcare professionals of the future are fit to handle the responsibility of directing the future management of obesity.

The results of this present study revealed that lower fat phobia was uniquely, albeit mildly, predicted by higher self-reported BMI, which is a finding that is in accordance with previous research (Schwartz *et al.*, 2003). Trainee healthcare professionals who themselves are overweight may have a greater understanding of the reality of being obese and be less likely to have attitudes motivated by ego-defensive functions (i.e. attitudes that protect our self-concepts by maintaining a superiority over others) (Katz, 1960). Taken with the observation that previous contact with obese people was not uniquely predictive of weight bias, this suggests that future interventions to change negative attitudes to obesity would need to do more than merely increase the students' contact with obese people but also promote empathy. Such an approach is supported by obese people themselves who, when asked for suggestions for stigma-reduction strategies, called for interventions that increase sensitivity, weight tolerance and empathy (Puhl *et al.*, 2008).

It is, however, important to recognise that the amount of variance in F-scale score predicted by self-reported BMI was very small and that empathy was not directly investigated in the present study. By contrast, BOAP scale scores uniquely predicted 9% of the variance in weight bias. A more promising target for future intervention suggested by the present study is therefore the provision of

Table 2 F-scale predictive variables*

Step	Predictors	r^2	Adjusted r^2	r^2 change	F	d.f. = 1	d.f. = 2	P
1	Gender, age, year of study, BMI	0.016	0.012	0.016	4.167	4	1027	<0.01
2	DV1, DV2, DV3, DV4	0.036	0.028	0.020	4.713	4	1027	<0.001
3	Previous contact, BOAP scale scores	0.175	0.167	0.139	21.603	2	1021	<0.001

*Hierarchical multiple regression; F-scale score as dependent variable; gender, age, year of study and body mass index (BMI) requested to enter as independent variables at step 1, student group dummy variables (DV1: 1 = Dietetics, 0 = otherwise; DV2: 1 = Nutrition, 0 = otherwise; DV3: 1 = Nursing MNurSci, 0 = otherwise; DV4: 1 = Nursing BSc, 0 = otherwise) requested to enter at step 2, previous contact with obese people and Beliefs about Obese People scale scores requested to enter as independent variables at step 3.

balanced education about the controllability of obesity that focuses upon genetic and environmental factors as well as diet and exercise. This approach has recently been used successfully by O'Brien *et al.* (2010) among health promotion and public health students, although further research is required to develop less labour-intensive interventions.

Strengths and limitations

The response rate for students invited to participate was excellent and the overall response rate compares favourably with a survey of a similar population using online data collection (Swift *et al.*, 2007). However, it is possible that students attending selected teaching sessions and participating in the study were more committed to their chosen career and therefore more engaged in issues such as obesity. There is, however, no reason to suggest that this would have affected any one student or year group more than another. Future research would usefully investigate weight bias more widely in the UK.

The use of hierarchical multiple regression analysis and reporting of partial correlations to control for potentially confounding factors is a very conservative approach because it reports the variance in F-scale scores explained *uniquely* by the independent variables. Despite this, it is clear that the majority of the variance is not explained by the independent variables investigated. In the present study, the dependent and continuous independent variables were non-Gaussian but were not transformed because the potential impact was unlikely to be noticeable (as suggested by the calculation of the ratio of the variable's mean to its SD) (Hair *et al.*, 2006). Although the normality assumption has been violated, regression analysis has been shown to be quite robust to this (Hair *et al.*, 2006). Another potential issue in the multiple regression analysis is the measurement error of the variables. Although the F-Scale and BOAP scale have good psychometric properties, the single 'previous contact with obese people' item is likely to be associated with significant error. In addition, self-reported BMI is problematic. Although young people, particularly those with higher educational levels, are generally quite capable of reporting their own height and weight with good accuracy, using self-reported anthropometric values to determine BMI category can lead to an underestimation of overweight and obesity and overestimation of underweight (De Vriendt *et al.*, 2009). The results are also limited by the cross-sectional design of the study. Longitudinal studies or a randomised trial of an intervention to change negative attitudes to obesity people would help to establish causal links between beliefs about controllability and weight bias.

Self-reported (or explicit) attitudes are notoriously affected by social desirability bias (Oppenheim, 1992) and so assessment of unconscious, or implicit, attitudes is often considered to be superior because it is considered to reflect evaluations that people are either unwilling or unable to report (Greenwald & Banaji, 1995). Both the F-scale and the BOAP scale employed in the present study assess explicit weight-bias. However, social desirability bias would act to *underestimate* weight bias and there is no reason to suggest that it would have affected any one student or year group more than another.

Conclusions

There are unacceptable levels of weight bias among some UK students training to become nurses, doctors, nutritionists and dietitians. Although there is some evidence that weight bias moderately improves on courses such as Dietetics and Nursing BSc, clearly more needs to be done to ensure that healthcare professionals of the future are fit for practice. The results of this study suggest that a promising approach for future interventions would be the provision of balanced education about the controllability of obesity that focused upon genetic and environmental factors, as well as diet and exercise.

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Conflict of interest, source of funding and authorship

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