

BMJ Open Social deprivation, gender and obesity: multiple stigma? Results of a population survey from Germany

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ABSTRACT

Objectives Individuals with obesity are subject to stigmatisation, resulting in discrimination. Studies focusing on obesity stigma often do not account for social conditions that also may be associated with stigmatisation. Following an intersectional approach, social categories such as gender and socioeconomic status (SES) can interact and form a basis for multiple stigma. The present study analyses differences in public obesity stigma depending on gender and SES, as well as possible interdependencies between these social categories.

Design Representative cross-sectional telephone survey.

Participants 692 randomly selected adults (≥ 18 years) in Germany.

Methods Different vignettes were presented, depicting a lawyer (male/female) or a janitor/cleaner (male/female) with obesity. Following the vignette, different components of stigma were assessed: (1) fat phobia, (2) emotional reactions to a person with obesity and (3) desire for social distance. Associations between gender, SES and stigma components were tested in multiple linear regression analyses.

Results A low SES in the obesity vignette (janitor/cleaner) was significantly associated with higher fat phobia scores as well as desire for social distance, compared with the vignette with a person with obesity and a high SES (lawyer). Being a male with obesity was significantly associated with more pronounced negative emotional reactions and greater desire for social distance. There were no significant interaction effects between gender and SES.

Conclusions Results support the hypothesis of multiple stigma. Being male or of low SES was significantly associated with more pronounced negative attitudes in the German public. Following the concept of intersectionality, our findings indicate that obesity stigma can exacerbate pre-existing inequalities. This needs to be considered in development and implementation of prevention and anti-stigma measures.

INTRODUCTION

The proportion of people who are overweight or live with obesity has increased continuously over the past decades.¹ In Germany, the current Health Interview and Examination Survey for Adults reports a prevalence rate of obesity (defined as body mass index,

Strengths and limitations of this study

- This is the first study analysing socioeconomic status (SES) and gender in the context of public obesity stigma.
- Analyses are based on a national telephone survey not only relying on landline but also including mobile-only users all over Germany.
- Prerecorded audio vignettes were used to identify additional stigma effects. To test for a separation of obesity stigma from the stigma associated with gender and SES, a neutral control vignette would have been necessary.
- Although vignettes are a frequently used method in stigma research, they need to be short and bear the risk of not conveying a holistic picture of an individual with obesity and different social characteristics.

BMI ≥30 kg/m²) of approximately 24%.² The aetiology of obesity is multifaceted, different factors such as behavioural, biological, psychosocial, context-related or prenatal conditions concur.³ However, poor diet and sedentary behaviour are often erroneously seen as the primary reason for overweight.⁴ This, in turn, lays the focus on individual responsibility and fosters public stereotypes of laziness and weak will. According to attribution theory, believing the condition to be under a person's control determines greater stigmatising reactions.⁵ The public misconception of causes of overweight and obesity is common and contributes to the expression of obesity stigma.⁶ Individuals with overweight or obesity display a physical 'mark' that sets them apart from others. Link and Phelan⁷ have provided a process model, in which stigma is conceptualised as several distinct, but interrelated steps: differences between social groups are distinguished and labelled. These labels are linked to *stereotypes* (undesired characteristics) that form the basis of a *separation* of 'us' and 'them'. Thusly labelled individuals experience *status loss* and *discrimination* in a context in which power is exercised.

There is a public recognition of obesity as a chronic condition and it is a classified disease in some countries (but not Germany).⁸ Nevertheless, individuals with obesity experience discrimination in daily life, which, in turn, reinforces negative stereotypes and stigmatising processes.⁷ Ascribing negative attributes, such as unintelligent, lack of self-discipline or emotionally unstable^{9 10} to persons who are obese, activates processes that result in discrimination in different settings. This could be shown for the education and employment sector as well as personal relationships.¹⁰ Furthermore, stigmatising attitudes and discrimination are present in the health-care sector, possibly leading to the avoidance of necessary treatment.¹¹ The adverse health consequences of obesity stigma have been shown on psychological (eg, depression, self-esteem) and physical (eating behaviour, physical activity, cardiovascular health outcomes) levels.¹⁰

One German study found that about one-fourth of the general public displays stigmatising attitudes regarding the 'Weight Control/Blame' subscale from the Antifat Attitudes Test.¹² High levels of responsibility for becoming obese are attributed to the individual, which is associated with the belief that the individual should be liable for treatment costs to a great extent.¹³ Sikorski *et al* examined emotional reactions and social distance towards individuals with obesity and found that the most rejected domains were personal ability as well as social interaction.¹⁴

In terms of gender differences, studies reported higher weight bias internalisation¹⁵ and greater risk for weight/height discrimination¹⁶ among women. In children and adolescents, girls with overweight have been found to be subject to teasing and social marginalisation.^{17 18} Similar results are presented by Fikkan and Rothblum,¹⁹ who found women with obesity to be more stigmatised in education and employment sectors than men. However, gender differences in obesity stigma have rarely been examined, and results are not consistent.²⁰

In recent years, stigma research has paid increased attention to multiple social identities and their interaction to influence stigmatisation. This intersectional approach allows examining how multiple social categories, for example, being categorised as 'female', 'black' or both, interact to produce or protect against health risks or discrimination.¹⁵ This may be referred to as 'multiple stigma'²¹ or 'double disadvantage'.²² These concepts suggest that a person can belong to different, possibly stigmatised social groups which exerts cumulative effects.²³ When it comes to obesity stigma at the intersection of gender and race, few studies have been conducted and results were inconsistent. Himmelstein *et al*¹⁵ found no divergences in obesity stigma according to race or gender, whereas Puhl *et al* found that African-American females with obesity evoked higher ratings of dislike and social distance than Caucasian females with obesity.²⁴ It has been postulated by Grey that severe and extreme obesity compounds pre-existing socioeconomic inequalities in context of vulnerability.²⁵

However, to date, no study has focused on the possible additive or multiple effects of gender and socioeconomic status (SES) in the context of obesity stigma. This is astonishing, as there are socioeconomic inequalities in the prevalence of obesity.²⁶ This also holds true for Germany, where obesity is more common among children and adults who are of low SES. Women in this group appear to be excessively affected by obesity.²⁷

Against this background, we analyse differences in public stigma towards low versus high SES persons as well as female versus male persons with obesity. By incorporating the interaction of gender \times SES, we additionally examine possible interdependencies and their associations with obesity stigma.

METHODS

Study design and sample

Analyses are based on a national telephone survey (computer-assisted telephone interview), conducted between March and April 2017. The sampling was based on data of the Association of German Market and Social Research, which includes registered as well as nonregistered telephone numbers via random digital dialling. Already in 2010, around 13% of adults (age 16 years and older) in Germany did not have access to landline and solely used a mobile phone.²⁸ As this proportion has increased since 2010 and in order to increase the probability to reach persons who are rarely at home, a share of 30% mobile numbers was incorporated in the initial sample. To ensure a sample representative of the German population, all regions in Germany were included.

Regarding mobile numbers, target persons were the owner or main user of the mobile phone. The connection was considered a neutral drop out if the respondent was younger than 18 years. In households that were contacted via landline, the Kish-Selection-Grid²⁹ was applied to randomly select a person from this household. The interviewer collected the age and gender of everyone in the household that was eligible for the survey and then randomly selected one person from that list. At the start of the interview, respondents were informed that the survey's focus was on nutrition, health and well-being.

The overall sample of this study consisted of 1401 persons. To obtain this number, 2849 people were randomly selected (net sample). Of these, 862 persons (30.25%) refused to participate in the interview. Further, 586 persons (20.57%) could not be reached. This led to a total response rate of 49.18%. Previous telephone interview studies have reached similar rates^{30 31} and the response can be regarded satisfactory for telephone surveys in Germany.³² In the study, eight different vignettes were used. The present analyses focus on four vignettes depicting a lawyer (male/female) or a janitor/cleaner (male/female) with obesity, resulting in a subsample of $n=692$ under study.

Table 1 Sample characteristics (n=627–692)

Gender (female)	48.9%
Mean age (SD)	50.9 (18.0)
Age groups	
18 to ≤24 years	8.1%
25 to ≤39 years	20.0%
40 to ≤59 years	35.1%
60 to ≤ 64 years	12.6%
≥65 years	24.2%
Occupational position (ISCO-08)	
Skill level 1: Simple/routine physical or manual tasks	7.0%
Skill level 2: Operating machinery and electronic equipment	45.5%
Skill level 3: Complex technical and practical tasks	27.1%
Skill level 4: Complex problem-solving, decision-making, creativity	20.3%
Weight status according to BMI	
Underweight (≤18.49)	2.1%
Normal weight (18.50–24.99)	42.5%
Overweight (25.00–29.99)	34.2%
Obese (≥30.00)	21.2%
Contact to someone who is overweight (yes)	84.4%
Obesity stigma scales, mean (SD), median [IQR]	
Fat Phobia Scale*	3.34 (0.49), 3.29 [3–3.64]
Negative emotional reactions scale†	10.29 (3.17), 10 [8–12]
Positive emotional reactions scale‡	6.91 (1.86), 7 [6–8]
Desire for social distance scale§	12.72 (1.86), 13 [9–15]

*Fat phobia scale comprised of 14 items, ranging from 1 to 5, values >2.50 indicate fat phobia.

†Negative emotional reaction scale comprised of six items; sum scale ranging from 6 to 24.

‡Positive emotional reaction scale comprised of three items; sum scale ranging from 3 to 12.

§Desire for social distance scale comprised of 7 items, sum scale ranging from 7 to 28.

BMI, body mass index; ISCO-08, International Standard Classification of Occupation 08.

The Ethics Commission of the Medical Association in Hamburg approved this study (No. PV5421). Since the interviews were telephone based, the respondents were verbally informed about the study and asked for consent to participate. Participants' consent and refusal were documented. As we used data from a population survey, patients were not involved in the development and design of the research question and the study.

Instruments

Vignette manipulation

Vignettes have been frequently applied in the social sciences to investigate attitudes or intended behaviour.³³ In stigma research, they have been used to convey realistic pictures of an individual, for example, with depression, schizophrenia or obesity.^{34 35}

In the present study, all prerecorded audio vignettes conveyed the same information while two characteristics were varied: gender (female/male) and occupational position as an indicator of SES (low = janitor or cleaner/high = lawyer). This resulted in four different case stories that described an individual with obesity (please see online appendix). One vignette was randomly assigned to each respondent, resulting in about 175 respondents per vignette. Weight and height were stated, yielding a BMI of approximately 32 kg/m². This was further emphasised by the comment that the person 'is severely overweight'. A trained speaker audio-recorded the case stories. To neutralise possible interviewer effects, the files were directly played to the respondents from the computer via telephone line. Preceding the presentation of the vignette, there was a set of questions related to respondents' own experience with overweight. This was self-reported weight and height, if the respondent has ever been overweight, tried to lose weight or has personal contact to persons with obesity.

Obesity stigma

To assess stigmatising attitudes towards the person described in the vignette, the short form of the *Fat Phobia Scale (FPS)* by Bacon *et al*³⁶ was used. This comprised 14 items of the original 50-item scale.³⁷ The short version demonstrated excellent reliability and was strongly correlated with the long form. Moreover, the 14-item scale accounted for the largest amount of variance in factor analysis.³⁶ On a five-point semantic differential scale, 14 pairs of adjectives are introduced that capture common beliefs about people who are obese. The FPS short form has been translated and applied in German by Luck-Sikorski and colleagues.³⁵ Principal component analysis with varimax rotation yielded a four-factorial solution, with the eigenvalue of the fourth factor barely exceeding 1. Similar to a validation study for the German short version of the FPS, the first factor explained the greatest share of variation (25.58%, second factor; 10.80%, third factor; 8.19%, fourth factor 7.31%) which is why a one-factorial solution is supported.³⁸ Following Bacon *et al*,³⁶ some items were inverted where necessary so that a higher score indicates greater fat phobia. The sum score was divided by the number of items so that the score ranges from 1 to 5. Values <2.5 indicate positive attitudes and values ≥2.5 represent negative attitudes towards a person with obesity.³⁹ Cronbach's α for the FPS was 0.77.

Emotional reactions were assessed by nine items representing different ways of emotionally responding to the person described in the vignette. Six items were derived from a scale used in studies on mental illness stigma⁴⁰

Table 2 Fat Phobia Scale (single items and scale): differences according to gender and SES in the vignette (mean values, SD)

Pair of adjectives	Gender			SES		
	Female (n=337–348)	Male (n=306–316)	P value*	Low janitor/cleaner (n=317–327)	High lawyer (n=326–337)	P value*
Industrious–lazy†	2.55 (0.92)	2.83 (0.81)	<0.001	2.68 (0.87)	2.69 (0.89)	0.667
Has willpower–no willpower†	3.28 (0.97)	3.21 (1.04)	0.602	3.48 (0.98)	3.03 (0.97)	<0.001
Attractive–unattractive†	3.33 (1.00)	3.42 (0.94)	0.160	3.43 (1.05)	3.32 (0.90)	0.149
Good self-control–poor self-control†	3.10 (1.03)	3.17 (0.98)	0.440	3.30 (0.99)	2.97 (1.00)	<0.001
Fast–slow†	3.25 (1.01)	3.47 (0.99)	0.002	3.32 (1.06)	3.39 (0.96)	0.592
Having endurance–having no endurance†	3.41 (1.13)	3.37 (1.04)	0.297	3.39 (1.10)	3.40 (1.07)	0.688
Active–inactive†	3.36 (0.98)	3.38 (1.06)	0.328	3.38 (1.06)	3.35 (0.97)	0.650
Strong–weak†	3.15 (0.99)	3.18 (1.02)	0.914	3.33 (1.03)	3.01 (0.94)	<0.001
Self-sacrificing–self-indulgent†	3.19 (0.91)	3.41 (0.86)	<0.001	3.32 (0.90)	3.28 (0.89)	0.375
Dislikes food–likes food	4.05 (0.88)	4.15 (0.90)	0.093	4.08 (0.90)	4.12 (0.88)	0.584
Shapely–shapeless†	3.41 (1.15)	3.21 (1.17)	0.098	3.40 (1.16)	3.31 (1.17)	0.753
Undereats–overeats†	3.87 (0.91)	3.95 (0.90)	0.306	3.91 (0.93)	3.90 (0.89)	0.883
Secure–insecure†	3.01 (1.06)	2.81 (1.03)	0.027	3.24 (1.02)	2.61 (0.98)	<0.001
High self-esteem–low self-esteem†	3.10 (1.05)	2.83 (1.05)	<0.001	3.28 (1.00)	2.67 (1.02)	<0.001
Fat Phobia Scale†	3.31 (0.48)	3.32 (0.50)	0.995	3.40 (0.51)	3.22 (0.46)	<0.001

*Mann-Whitney U test

†Semantic differential scales and mean FPS ranging from 1 to 5, values >2.50 indicate fat phobia.

SES, socioeconomic status.

while three items were developed based on common stereotypes of obesity. The items were coded from 1 ‘completely disagree’ to 4 ‘completely agree’. A principal component analysis with varimax rotation yielded two different factors. The first factor, termed *negative emotional reactions*, was comprised of the following six items: ‘I react angrily’, ‘I feel annoyed’, ‘This triggers incomprehension with me’, ‘I feel repelled’, ‘I feel disgust’ and ‘I think this is unaesthetic’. The items ‘I feel pity’, ‘I feel sympathy’ and ‘I want to help’ loaded on the second factor of *positive emotional reactions*. Together, the two factors accounted for 50.9% of variance. Two sum scores were computed, Cronbach’s α was 0.78 for negative (six items), and 0.47 for positive emotional reactions (three items).

Desire for social distance was assessed by a scale developed by Link *et al.*⁴¹ a modified version of the Bogardus *Social Distance Scale*.⁴² The instrument contains seven items that represent different social relationships (eg, neighbour, colleague or childcarer). On a four-point Likert-scale, respondents were asked to indicate to what extent they would accept the person described in the vignette. A principal component analysis with varimax rotation was carried out, yielding a single factor that explained 55.1% of variance. Cronbach’s α was 0.86. Again, a sum score was computed, with higher scores indicating greater desire for social distance. The distribution of the stigma sum scales across the sample is shown in [table 1](#).

Statistical analyses

The analyses were performed using SPSS V.22.⁴³ To test for significant mean differences between groups regarding single items and scales, Mann-Whitney U tests were applied. This nonparametric test was conducted, since Kolmogorow-Smirnow tests revealed that responses to the stigma items did not follow a normal distribution. Determinants of stigmatising attitudes were introduced into multiple linear regression models. We analysed two main effects presented in the vignette: SES (janitor or cleaner/lawyer) and gender (female/male). To take into account possible interdependencies, the interaction effect of SES \times gender was also introduced into the models. All models were controlled for respondents’ characteristics. Age and BMI were entered as continuous variables. The respondents’ occupational position was expressed in skill levels according to the International Standard Classification of Occupation (ISCO-08).⁴⁴ Other variables were the respondents’ gender and personal contact to individuals who are obese.

In all analyses, the response options ‘prefer not to say’ and ‘don’t know’ were treated as missing values. Exact p values are reported. In view of the number of tests, values of $p < 0.01$ were regarded as statistically significant.

Patient involvement

No patients were involved in this study.

Table 3 Emotional reactions (single items and scales): differences according to gender and SES in the vignette (mean values, SD)

	Gender			SES		
	Female (n=327–350)	Male (n=293–315)	P value*	Low janitor/cleaner (n=299–326)	High lawyer (n=321–338)	P value*
Annoyed†	1.56 (0.72)	1.59 (0.70)	0.290	1.65 (0.79)	1.50 (0.62)	0.056
Angry†	1.36 (0.64)	1.55 (0.71)	<0.001	1.52 (0.71)	1.38 (0.64)	0.005
Incomprehension†	1.88 (0.89)	2.04 (0.83)	0.006	2.05 (0.87)	1.87 (0.85)	0.012
Revolted†	1.46 (0.69)	1.67 (0.75)	<0.001	1.62 (0.78)	1.50 (0.67)	0.114
Disgust†	1.41 (0.66)	1.53 (0.66)	0.002	1.51 (0.69)	1.42 (0.94)	0.078
Unaesthetic†	2.01 (0.94)	2.15 (0.87)	0.022	2.08 (0.87)	2.07 (0.95)	0.919
Negative emotional reactions scale‡	9.67 (3.06)	10.54 (3.24)	0.001	10.43 (3.23)	9.74 (3.05)	0.012
Sympathy†	2.58 (0.81)	2.53 (0.78)	0.769	2.54 (0.82)	2.57 (0.77)	0.884
Pity†	2.24 (0.94)	2.09 (0.90)	0.020	2.23 (0.92)	2.11 (0.92)	0.034
Want to help†	2.20 (0.93)	2.26 (0.86)	0.414	2.34 (0.93)	2.12 (0.85)	0.011
Positive emotional reactions scale§	6.97 (1.96)	6.86 (1.74)	0.692	7.08 (2.01)	6.97 (1.96)	0.004

*Mann-Whitney U test

†Single items ranging from 1 to 4.

‡Negative emotional reaction scales comprised of six items; sum scale ranging from 6 to 24.

§Positive emotional reaction scale comprised of three items; sum scale ranging from 3 to 12.

SES, socioeconomic status.

RESULTS

Sociodemographic characteristics of the analysed sample are briefly presented in table 1. The male:female ratio is relatively even, which is similar to the general adult population in Germany according to the official statistics.⁴⁵ In terms of age, people aged 25–39 years are under-represented and people aged 60–64 years are over-represented in the sample compared with the distribution in the official statistics.⁴⁶ Almost half of the respondents work in

occupational positions that are regarded skill level 2 when referring to ISCO.⁴⁴ Regarding weight status, more than 50% of the respondents reported overweight or obesity. The share of those with overweight/obesity corresponds to numbers obtained by other representative studies in Germany.² The vast majority (84.4%) has or had personal contact to someone who is overweight.

In tables 2–4, differences in the mean stigma values depending on SES and gender presented in the vignette

Table 4 Desire for social distance (single items and scale): differences according to gender and SES in the vignette (mean values, SD)

	Gender			SES		
	Female (n=332–350)	Male (n=292–312)	P value*	Low janitor/cleaner (n=307–324)	High lawyer (317–338)	P value*
Tenant†	1.71 (0.92)	1.96 (0.86)	<0.001	1.98 (0.98)	1.68 (0.78)	0.001
Colleague†	1.39 (0.57)	1.48 (0.61)	0.012	1.43 (0.54)	1.42 (0.63)	0.546
Neighbour†	1.52 (0.74)	1.56 (0.69)	0.155	1.54 (0.71)	1.54 (0.72)	0.649
Childcare†	1.70 (0.75)	1.95 (0.91)	<0.001	1.98 (0.90)	1.66 (0.74)	<0.001
In-law†	1.79 (0.90)	1.90 (0.79)	0.003	1.98 (0.89)	1.71 (0.78)	<0.001
Introduce friend†	1.74 (0.82)	2.25 (0.95)	<0.001	2.08 (0.92)	1.88 (0.90)	0.008
Recommend for job†	1.83 (0.84)	2.04 (0.81)	<0.001	2.03 (0.83)	1.83 (0.82)	0.011
Desire for social distance scale‡	11.66 (4.12)	13.15 (4.00)	<0.001	13.03 (4.14)	11.72 (4.03)	<0.001

*Mann Whitney U test

†Single items ranging from 1 to 4.

‡Desire for social distance scale comprised of 7 items, sum scale ranging from 7 to 28.

SES, socioeconomic status.

are reported. Regarding the fat phobia items, the adjective low self-esteem was ascribed to the female vignette significantly more often (respective means were 3.10 for the female vignette and 2.83 for the male vignette, table 2). In contrast, lazy, slow and self-indulgent were significantly more often attributed to the male vignette. Comparing low and high SES, a homogeneous picture emerged. A low SES was significantly associated with greater negative attitudes, expressing individual responsibility (no will-power, poor self-control, weak) as well as insecurity and low self-esteem when compared with high SES.

Regarding emotional reactions (table 3), the comparison of gender in the vignette showed that males with obesity evoked significantly more negative emotional reactions on four out of six items as well as on the subscale for negative emotions (respective means were 9.67 for the female vignette and 10.54 for the male vignette). In terms of SES, a cleaner/janitor with obesity evoked significantly more feelings of anger but also more positive emotional reactions, compared with a lawyer with obesity.

A consistent picture emerged when comparing desire for social distance according to the person's gender in the vignette (table 4). Males with obesity were met with significantly greater levels of rejection in most aspects of social distance. Gender difference was also significant for the desire for social distance scale (13.15 for males and 11.66 for females). Similarly, a person with obesity and a low SES evoked greater desire for social distance concerning four of seven items. Also, the desire for social distance scale significantly differed between the SES vignettes (13.03 for low SES and 11.72 for high SES).

The results of multiple linear regression analyses are reported in table 5. While controlling for respondents' characteristics, a significant main effect of SES emerged regarding fat phobia ($\beta = 0.173$). Being a janitor or cleaner with obesity was associated with significantly increased fat phobia compared with lawyers. Regarding positive emotional reactions, there were no significant associations with either gender or SES. However, male persons with obesity were confronted with more negative emotional reactions than females ($\beta = -0.151$). In terms of desire for social distance, both main effects were statistically significant. Being either a male or a janitor/cleaner with obesity was significantly associated with greater desire for social distance. In none of the models did the interaction effect of gender \times SES attain statistical significance (table 5).

DISCUSSION

The concept of multiple stigma suggests that a person can belong to different potentially stigmatised groups, experiencing an aggregation of disadvantages and discrimination.²³ Applying this approach to the present study, this would mean that because of their group affiliation (eg, being female and of low SES), individuals suffer multiple stigma when confronted with the burden of obesity.

Table 5 Linear regression analyses: associations between stigma components and SES and gender presented in the vignette

	Fat Phobia Scale (n=561)			Positive emotional reactions (n=607)			Negative emotional reactions (n=614)			Social distance (n=608)		
	B	β	95% CI	B	β	95% CI	B	β	95% CI	B	β	95% CI
Low SES vignette (ref. lawyer)	0.171	0.173	0.052 to 0.287*	0.035	0.010	-0.393 to 0.464	0.304	0.047	-0.405 to 1.014	1.122	0.135	0.217 to 2.026*
Female gender in vignette (ref. male)	-0.002	-0.002	-0.115 to 0.112	-0.146	-0.039	-0.556 to 0.264	-0.977	-0.151	-1.655 to -0.299*	-1.201	-0.145	-2.068 to -0.334*
Interaction gender* SES in vignette	-0.021	-0.019	-0.182 to 0.139	0.539	0.126	-0.048 to 1.125	0.238	0.032	-0.730 to 1.205	-0.215	-0.023	-1.451 to 1.021

* $p < 0.01$; the model is adjusted for respondents' gender, age, BMI, occupational position as well as contact to an individual with obesity. SES, socioeconomic status.

Similarly, the framework of intersectionality describes the interdependent relationship between different social identities and structural inequities.⁴⁷ Multiple social categories interact and produce or protect against discrimination. In light of this, obesity stigma can reinforce pre-existing inequalities because of SES and/or gender.

The present study is the first to analyse the possible multiple stigma of gender, SES and obesity. Following an intersectional approach, it was analysed whether main effects or the interaction of social categories possibly reinforce obesity stigma, implying a double or multiple disadvantage for certain individuals. While there were no statistically significant interaction effects of categories, we found distinct differences in obesity stigma dependent on gender with regard to different stigma components. Males with obesity were met with more negative emotional reactions and social distance. This contradicts some previous studies that found (young) women with overweight or obesity to be met with greater stigmatisation than men.^{15–19} The predominance of overly thin women in the media and the promotion of a slim beauty ideal for females can have different effects on the stigmatisation of women and men with obesity.²⁰ Nevertheless, over the past decade, a trim and muscular male body image has come to the fore in most Western societies, shaping a new perspective on body image dissatisfaction and obesity stigma also among men.^{48 49} Men have been found to be similarly stigmatised as women for being heavy,²⁰ and the concern about body image is associated with increased eating pathology in both men and women.⁵⁰

Regarding SES and obesity, the study revealed significant differences in public attitudes in several stigma components under study. Those of low SES were rated less favourably with regard to fat phobia and desire for social distance when compared with persons with high SES. On the other hand, individuals with low SES were also met with significantly greater prosocial feelings. It is possible that, next to obesity, the status of a cleaner/janitor is linked to characteristics (eg, economic hardship) that evoke pity among respondents. After the adjustment of respondents' characteristics in the multivariate analyses (gender, age, BMI, occupational position as well as contact to an individual with obesity), however, only the associations with fat phobia and social distance were found to be significant.

Following the concept of intersectionality, and against the background of a disproportionate distribution of obesity (higher prevalence among females of low SES), one could have expected significant interaction effects in multivariate analyses. We were not able to verify this assumption. However, significant main effects of gender and SES indicate a double stigma to the disadvantage of males as well as individuals with a low SES who suffer from obesity.

Some limitations need to be mentioned and discussed when evaluating our findings. More than half of the individuals eligible for the study were not available or refused to participate. Although

participation rates around 50% can be regarded satisfactory for telephone surveys,³² we cannot rule out selection bias due to nonresponse. With respect to internal consistency, Cronbach's α for most scales was good or acceptable. Only the subscale of positive emotional reactions exhibited limited reliability, which could be due to the relatively small number of items. In this case, it is recommended to use the mean inter-item correlation as an indicator for acceptability, which was 0.22 in the present sample. A satisfactory range is said to be 0.2–0.4.⁵¹ Furthermore, no conclusions on causal relationships can be drawn as our data are based on a cross-sectional design. Similar to other studies in stigma research, we used vignettes to explore possible multiple stigma of obesity. On the one hand, these should not be too long. On the other hand, only varying one sentence to express different social conditions might have been too short to convey a holistic picture of the individual, or to be kept in mind throughout the whole interview. Also, vignettes had to be understandable for the general population. Therefore, we decided not to report the BMI and not to use the term 'obese'. In this regard, it can be considered a limitation that the vignettes lack medical accuracy. Moreover, due to time constraints, every respondent only received one vignette. The lack of a neutral control condition impedes the interpretation of results. For example, it remains unclear whether respondents associate adjectives such as low self-esteem or insecurity with the fact that the individual in the vignette presented with obesity or pursues the profession of a janitor when compared with a lawyer. This is a limitation that has to be considered when interpreting our findings as an indication of multiple or double stigma. Finally, sample size may have been too small to detect significant interaction effects.

Differences in stigma based on gender and SES indicate that obesity can exacerbate pre-existing inequalities. The presence of obesity stigma could be shown in many domains of daily life, for example, education, work, personal and healthcare.^{10 11} Stigmatisation is a risk factor for physical and psychological health problems such as depression, body dissatisfaction and low self-esteem. Instead of motivating individuals to lose weight, stigma is associated with additional weight gain⁶ and underutilisation of healthcare.¹¹ This implies a vicious circle of mutually reinforcing negative conditions. The manifold effects of obesity stigma require actions in all kinds of professional disciplines, for example, among physicians, dieticians and scientists in various fields. To counteract stigma, the topic should be the subject of discussion in obesity intervention measures, and anti-stigma messages have to be incorporated into obesity prevention campaigns. Our results underline the need to consider the social dimension of obesity stigma. In acknowledging the interrelation of social conditions and existing structures, future research should derive tailored measures

to encounter obesity stigma and its related adverse physical and psychological health outcomes.

Contributors ACM undertook the statistical analyses and wrote the first draft of the manuscript. OvdK conceived the study design and contributed to the manuscript. TJK and CLS contributed to the questionnaire and critically revised the manuscript.

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