

„To Tip the Scale“-Weight-related Discrimination and Consequences on the Treatment of
Obesity.

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Glossary of Terms

BMI	Body Mass Index
CVD	Cardiovascular Disease
DSM	Diagnostic and Statistical Manual of Mental Disorders
e.g.	exempli gratia [for example]
GP	General Practitioner
HCP	Health Care Professional
HPA	Hypothalamic-pituitary-adrenal
i.e.	id est
OW	Overweight
USA	United States of America
WHO	World Health Organization
WLS	Weight loss surgery

Bibliographic Description

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Abstract

The constantly rising prevalence of overweight and obesity requires intensive research not only in terms of physiological and medicinal aspects but also with regard to psychological factors that increase the burden associated with obesity and can hinder health maintenance or health improvements as suggested by previous studies. Work on weight discrimination among dietitians and nutritionists towards individuals with obesity and overweight was reviewed showing that, despite having knowledge about causation and consequences of obesity, health care professionals are not free of having negative attitudes towards individuals with obesity. Findings of empirical analyses revealed the impact of weight discrimination by general practitioners or internists while recommending bariatric surgery or referring patients with obesity to a surgeon, lowering the possibility for patients with obesity and associated comorbidities of gaining adequate health care services and sufficient obesity treatment. In a second study, the impact of weight discrimination on the desire to lose weight was investigated, demonstrating the pervasive effects of weight stigma on possible treatment outcomes or decision making with regard to obesity treatment.

In conclusion, weight discrimination and stigmatization can be seen as having detrimental effects on individuals and therefore bias should be addressed especially within the health care setting to reduce stigma as being a barrier towards health and well-being. This work aims to reveal the consequences of weight-based stigmatization on the treatment of obesity from two different angles: the patient and the health care professional.

1. Introduction

1.1 The Psychosocial Side of Obesity

According to the World Health Organization (WHO), overweight and obesity have become a tremendous threat to the general population worldwide. Besides having negative physiological consequences on well-being and health (1), this issue also transcends to the social level.

Body Mass Index (BMI) is calculated by dividing weight (in kg) by height² (m²) and is categorized into four categories: underweight (<18.5kg/m²), normal-weight (18.5-24.9kg/m²), overweight (25.0-29.9kg/m²) and obesity (≥30kg/m²), which is further subdivided into specific obesity-subclasses (2). A very recent study which analyzed the disease burden of obesity (3), points out that the prevalence of obesity has doubled in more than 70 countries (between 1980 and 2015), whereas the global rate of death due to BMI has in fact increased by 28.3% (3). The same study has found that an increased BMI is the reason for 4.0 million deaths, of which 2.7 million deaths were attributed to cardiovascular disease (CVD), the main leading cause of BMI-related deaths according to this study. This goes align with studies showing that overweight and obesity is linked to several health issues and mortality, such as CVD (4), osteoarthritis (5), cancer (6) and diabetes (4). Much research has been done to investigate the mechanisms that underlie the development and progression of obesity, linking obesity and overweight to poor health. However, most research has focused on biological processes such as insulin resistance, cardiovascular impairment or lipid metabolism, with regard to positive energy balance or genetics as well as the influence of obesity-related hormones such as leptin and ghrelin which in turn can activate appetite and negatively influence blood sugar regulation (reviewed, (7)).

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Apart from that, obesity can also impact health on a psychosocial level, especially when those affected suffer social consequences in terms of stigmatization and weight discrimination which has been found to perpetuate obesity in some (8). It has been shown that weight-related discrimination and stigma can also mediate some of the poor health outcomes mentioned above that are connected to increased BMI. Therefore, in order to decrease the burden of obesity, psychosocial aspects such as weight discrimination should be addressed to overcome stigmatization as being a barrier to health.

1.2 Weight-based Stigmatization and Discrimination

Weight stigma refers to „negative weight-related attitudes and beliefs that are manifested by stereotypes, rejection and prejudice towards individuals because they are overweight or obese“ ((9), p.347). Stigma is further specified by the following definition: “stigma exists when elements of labelling, stereotyping, separation, status loss, and discrimination occur together in a power situation that allows them” ((10), p.377). According to this theoretical framework, discrimination is part of the behavioral component of this stigma construct. By definition, “discrimination is generally understood as biased behaviour, which includes not only actions that directly harm or disadvantage another group, but those that unfairly favour one's own group (creating a relative disadvantage for other groups)” ((11), p.9). Moreover, “discrimination may involve actively negative behavior toward a member of a group or, toward an ingroup member in comparable circumstances” ((11), p.8-9).

There are many different ways and occasions where weight stigma and discrimination has been reported or observed directly or indirectly, verbally or non-verbally. Typical examples of weight-related stigmatization include attitudes or attributions

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such as being lazy, slow or having no willpower (12–14). Those attributions are not only seen as typical characteristics of individuals with obesity, but also appear to describe their actions when it comes to self-care, health maintenance and weight management. According to the literature, stigma in general (15) and weight stigma in particular (16) can be experienced at many different domains or levels: internalized (e.g. personal beliefs and attitudes), interpersonal (negative comments from the social surrounding such as friends, family members, peers or colleagues) or societal (e.g. working environment or public policies).

Weight stigma was first described generally in the 1960s (17–19). During this time, several studies were initiated, in which children and adults rated overweight individuals less likable compared to normal-weight individuals. However, this was only at the start of obesity research. A lot of insights in terms of development of obesity and correlated problems that show that obesity is not a pure lack of willpower or controllability have been gained in the following years. Yet, not all questions are answered to fully understand the grounds of this condition. On the basis of these first insights from the 1960s, a book called *The pain of obesity* which was published in 1976 by Albert Stunkard (20) who was the first in recognizing that obesity-associated stigma does exist and that it can have negative effects on well-being of those affected by it.

The origin of weight-based stigmatization and discrimination

One theoretical explanation of weight stigmatization was given by Weiner and colleagues almost 30 years ago (21) who investigated perceived controllability of different types of social stigma, depending on whether those types of stigma were based physically (e.g. related to heart disease or cancer) or mental-behaviorally (e.g. related to obesity or drug abuse), favoring an attributional theoretical approach to understand the origin of stigma in

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general. In this context, results of this study demonstrate that individuals with mental-behavioral stigma such as obesity are seen as being responsible for their condition, were less liked, evoked less pity but relatively high anger and would receive less assistance compared to physical stigma types. In other words, the underlying reasoning for stigma of obesity can be found in the assumption that overweight can be personally controlled and therefore those affected by overweight are responsible for themselves and their medical (self-) care (22–25). In this context, it has been shown that giving information on individual behavior (i.e. by exposing individual behavior as a result of obesity), emphasizes the personal responsibility of those affected by overweight and increases negative stereotypes and prejudice towards individuals with obesity (26). On the other hand, providing information that accentuates the complex development of this condition improves attitudes and reduces prejudice (27, 28). Given the background, there seems to exist a broad range of misunderstandings on the development of obesity as well as the treatment for it that are linked to the negative attributions people make about individuals with overweight or obesity. Additionally, the belief exist that distress expressed by stigma and discrimination might even be beneficial because it may serve as an incentive or a motivator that drives the willingness to lose weight, for instance in conjunction with body image dissatisfaction that may arise from stigmatization (29, 30). This again is founded on the assumption that obesity can easily be controlled or regulated by the individuals themselves. Given that weight stigma and discrimination is rather harmful, this approach appears questionable and has not been evidenced by research.

Although weight stigma has been investigated for so many years, it still appears to be a topic with wide-ranging consequences. The prevalence of obesity is steadily rising and research confirms that weight stigma can still be found in many areas of everyday life. The topic of weight-related discrimination and bias should be taken serious and supplement the

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medical research that aims to understand the emergence and treatment of obesity. It seems that society has not yet accepted that obesity is a disease and that it should be treated like that by shifting the controllability and responsibility away from the patient towards society.

The prevalence of weight-based stigmatization and discrimination

Weight stigmatization and associated exclusion processes have been found to increase rapidly in society during the last years and consequences appear to be wide-ranging (31, 32). Hence, the investigation of the causes of weight-related stigma is very important, in order to understand how prejudice related to obesity may arise and how it can be overcome.

Weight stigmatization and discrimination is very common among the general population (22). According to a recent meta-analysis (33), perceptions of weight discrimination have been reported by 19.2% of individuals with obesity class I compared to 41.8% of individuals with obesity class III (BMI > 35 kg m²). It has been known that the prevalence of discrimination increases with BMI (34). While keeping in mind that medical consequences such as comorbidities also increase as BMI rises, health care professionals should be aware of this double burden when caring for patients with obesity.

Experiences of weight stigmatization are reported by different age-groups in many domains of life (16). It starts during early kindergarten days and often lasts through the entire lifespan. There is research showing that even children as young as 3 years old report being discriminated due to their weight (35, 36). Similarly, children report being discriminated in school - not only by their classmates and peers, but also by their teachers or supervisors (37, 38). Even later on, discrimination due to one's body weight does not seem to stop, as it for instance continues to a variety of job settings: individuals with

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obesity are less likely to be hired (39, 40), are paid less (41) and in terms of health care arrangements within the workplace setting „have been perceived as a liability when it comes to providing health care insurance“ (42, 43). Normal-weight colleagues report less desire to work with a person with obesity or overweight (44) and are less likely to recommend someone with obesity or overweight for a job (45).

Stigma can have many adverse consequences in many different life domains, such as educational attainment, social relationships, leisure time or health care facilities. Apart from that, it has been shown that weight-related stigma is a serious issue, affecting the patients' physical health, but also their mental health (46, 47). Weight stigmatization and discrimination have also been found to be a predictor of unhealthy eating (48) and a lack of physical activity (49, 50). About 80 % of participants (men and women) reported “eating” as a coping strategy in response to weight-related stigma and approximately three-quarters of them reported “refusing to diet” in order to cope with it (48). In terms of psychological consequences, stigma has been shown to result in psychological stress, being a risk factor for depression (51, 52), lowered self-esteem or being dissatisfied with their own body image or body appearance (53, 54). A recent study by Spahlholz et al. (33), found a link between weight-stigmatization and mental disorders such as depression, however, the link is related to the type of coping style an individual with obesity is adopting in order to cope with experiences of discrimination.

There is a lot of evidence showing that perception of weight discrimination can have pathophysiological consequences that are associated with obesity due to a variety of adverse biochemical changes that occur if weight-related stigma is frequently experienced (55). Negative consequences of obesity can get worse due to chronic stress, states of anxiety or generally negative mood or tension, activating physiological mechanisms that contribute to weight gain by increasing appetite and food intake or disturbing the satiety

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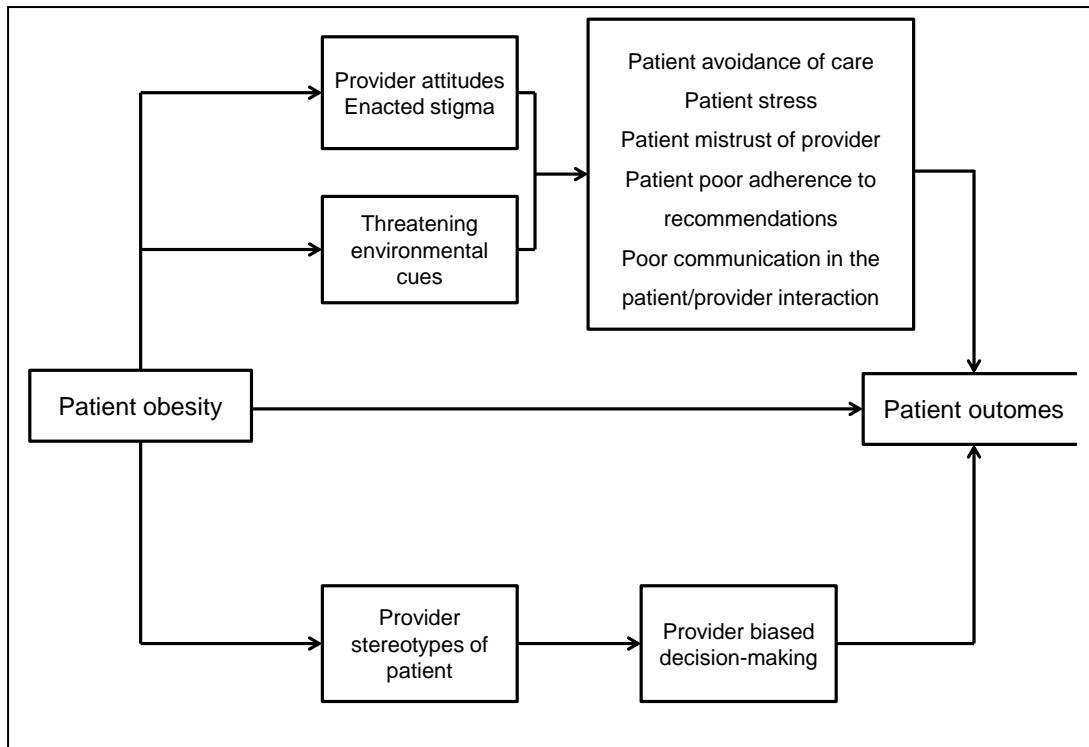
system in the brain (56). One theoretical model by Tomiyama (57) assumes the existence of a vicious cycle that links weight-related stigma and weight gain via cortisol levels that increase in response to high degree of psychological stress due to stigmatization. In this model, weight-related stigmatization can be seen as a chronic stressor, resulting in weight gain due to HPA-axis dysregulation (58) and high cortisol responsiveness (59), which in turn provokes more stigma and teasing.

In some cases, devaluation and prejudice can result in negative self-perception or self-direction of negative attitudes or stereotypes (60), mostly due to the presence of societal or interpersonal weight stigma levels (16). This is known as internalized weight stigma. According to the formulation model by Ratcliffe and Ellison (61) there are several factors that may impact or preserve internalized stigma. As already described, weight stigma can lead to psychological distress, depression and anxiety as well as disordered eating behavior, which in turn can lower mood and self-esteem and multiply how weight bias is experienced and intrinsically manifested. Another important factor in this model is the presence of safety and avoidance seeking behaviors which trigger maintenance of negative self-evaluation and beliefs of being eyed up by others. One example from everyday life could be avoidance behavior within the health care setting (e.g. missing appointments) for fear of being blamed by the health provider can that can accentuate effects of weight stigma (32, 62). In other words, how individuals with obesity see themselves and how they process themselves as being discriminated has an impact on the emergence of internalized stigma (61). Therefore, when dealing with (external) weight stigma, internalization should not be overlooked as it can give grounds to several psychological difficulties associated with obesity and overweight and may hinder successful treatment and health maintenance for individuals with increased BMIs.

1.3 Obesity and Stigma within Health Care Settings

Surprisingly, one of the biggest sources of weight-related stigma can be observed in health care areas (63). Previous studies indicate that health care professionals (HCPs) such as doctors, nurses and psychologists show generic prejudice towards obesity (64–66), holding the view that the reason for extreme overweight is due to personal misconduct (12, 67). From the patient’s perspective, physicians have been found to be the most frequent source of stigma for women and the second most frequent source of stigma for men (48). Weight stigmatization in health care can result in impaired outcomes for patients with obesity. Some studies have linked a high BMI to avoidance of health care prevention services or cancellation of appointments due to weight concerns (e.g. (62, 68–71). Especially women seem to be prone to this kind of treatment avoidance due to concerns about being stigmatized because of their weight (62). Delaying necessary prevention checkups and treatment may contribute to the negative health outcomes seen in individuals with obesity (32). Phelan et al. (65) concluded a conceptual model that illustrates the link between obesity and health outcomes (Figure 1). According to this model, patients with obesity are often confronted with HCP’s negative attitudes, opinions or stereotypes, which might in turn evoke feelings of being disrespected or even unwanted. As a result, the authors differentiate between several ways that negatively impact the patient’s outcome (i.e. their health) either on the provider-level due to prejudiced decision-making or more intrinsically by increasing patient’s distrust and decreasing patient’s compliance.

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Source: Phelan et al. (65), p.320

Figure 1: Pathway-model of the association between obesity and health care

When asked about their experiences within the field of obesity care management, HCPs often report feeling unprepared or not fully equipped to offer sufficient care to their patients. They also seem to be unsure regarding possible referral sources or sufficient knowledge on treatment and causation of obesity (72–74). As in the case with medical students (75), many professionals or trainees are not aware of being biased as well as the consequences of their negative attitudes- whether expressed directly or indirectly. Even if most research has been conducted in the USA, similar results have been found in Germany (76).

Interestingly, with regard to the practitioner's own BMI, mixed results have been reported. Whereas lower levels of implicit bias have been associated with higher weight HCPs (66), the opposite also seems to be applicable, as patients report an increase in stigma

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perceptions with increasing BMI of their physician or therapist (77, 78). In sum, these negative consequences might explain why weight-related stigmatization makes it difficult for those affected to improve their health condition and receive adequate treatment for obesity- or non-obesity-related conditions.

On these grounds, the present doctoral dissertation addresses the effect of weight-based stigmatization on the treatment of obesity. In a first step, a systematic literature review was conducted in order to identify the current state of research on weight-related discrimination within the health care setting, by giving a specific example of setting where patients with obesity who seek treatment and professional help are confronted with negative attitudes (Chapter 2). This was followed by empirical studies in general populations (Chapter 3): First, with regard to the physician's perspective (Chapter 3.1), and second, by investigating this issue from the patient's perspective (Chapter 3.2). The first empirical analysis on weight-related discrimination examined the impact on treatment by investigating the attitudes of a representative sample of general practitioners and internists in Germany towards patients with obesity in general and bariatric surgery in particular. The second empirical analysis investigated the consequences of stigma on treatment goals by patients with obesity.

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The treatment of obesity and overweight is often characterized by conservative methods which include increasing physical activity or changing eating habits into healthy eating behavior. When conservative methods have not revealed satisfying results, bariatric surgery is often seen as a final option. However, even in this case, dietary advice is still an important aspect, before, during and after surgery, which means that individuals with obesity and overweight are constantly in touch with dieticians or nutritionists, and rely on their advice and support independent on the treatment method. Therefore, this occupational group plays a very important role in the management of obesity. However, as mentioned before, many HCPs express negative attitudes towards individuals with obesity and research has shown that even dieticians and nutritionists are not free of prejudice. According to research, dietitians tend to hold negative attitudes towards individuals with obesity, believing that those affected have low self-esteem, are less attractive and less healthy (79, 80). Besides, frustration has been reported when dieticians were asked about their work with patients with obesity (81). This is often reinforced by other negative stereotypes, such as having unrealistic weight loss expectations, showing poor compliance, motivation and commitment during weight loss therapy (81). Since weight-related bias may be detectable even in dietetic students and trainees, it is important to include this occupational group into weight stigmatization research. As systematic investigations that includes studies assessing the dietician's causal belief with regard to overweight and obesity are lacking. Therefore, this review aimed to fully determine the prevalence of stigmatization in dietitians and in addition to it, investigated dietitians' beliefs about causes or controllability of obesity.

2.1 Dietitians and Nutritionists: Stigma in the Context of Obesity – A Systematic Review

Jung, F.U.C.E.; Luck-Sikorski, C.; Wiemers, N.; Riedel-Heller, S.G. (2015). Dietitians and Nutritionists: Stigma in the Context of Obesity. A Systematic Review. PLoSOne, 10(10), e0140276

Abstract

Negative attitudes towards people with obesity are common even in health care settings. So far, the attitudes and causal beliefs of dietitians and nutritionists have not been investigated systematically. The aim of this article was to review the current state of quantitative research on weight-related stigma by dietitians and nutritionists. A systematic literature review was conducted in 2014 using PubMed, PsycINFO, Web of Science and Cochrane Library. 8 studies were found that differ in regard to study characteristics, instruments and the origin of the sample. 6 out of 8 studies reported weight stigma expressed by dietitians and nutritionists. Their believed causes of obesity indicated a defined preference for internal factors rather than genetics or biology. Results of studies were not homogenous. The degree of negative attitudes by dietitians and nutritionists towards people with obesity appeared to be slightly less pronounced compared to the general public and other health care professionals. Stigma and its consequences should be included into educational programs to optimally prepare dietitians and nutritionists.

For full text see page 13.

RESEARCH ARTICLE

Dietitians and Nutritionists: Stigma in the Context of Obesity. A Systematic Review

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Abstract

Aim

Negative attitudes towards people with obesity are common even in health care settings. So far, the attitudes and causal beliefs of dietitians and nutritionists have not been investigated systematically. The aim of this article was to review the current state of quantitative research on weight-related stigma by dietitians and nutritionists.

Method

A systematic literature review was conducted in 2014 using PubMed, PsycINFO, Web of Science and Cochrane Library.

Results

Eight studies were found that differ in regard to study characteristics, instruments and the origin of the sample. Six out of eight studies reported weight stigma expressed by dietitians and nutritionists. Their believed causes of obesity indicated a defined preference for internal factors rather than genetics or biology.

Discussion

Results of studies were not homogenous. The degree of negative attitudes by dietitians and nutritionists towards people with obesity appeared to be slightly less pronounced compared to the general public and other health care professionals. Stigma and its consequences should be included into educational programs to optimally prepare dietitians and nutritionists.

Introduction

According to the World Health Organization (WHO), overweight and obesity have become a tremendous threat to the general population worldwide. Overweight and obesity are

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multifactorial conditions, which can be linked to a variety of genetic, hormonal or environmental causes. Many factors, such as socio-cultural (e.g. food environment, walkability), biophysical (e.g. genetics and neuroendocrinology), psychological (e.g. depression and stress) and medication-related factors can contribute to an increased energy intake and a lowered energy expenditure [1]. Besides having negative physiological consequences on well-being and health [2], this issue also transcends to the social level.

Weight stigmatization and exclusion processes have been found to increase rapidly during the last years [3]. Negative stereotypes such as laziness, not being motivated or a lack of self-discipline are often associated with people with overweight or obesity [4]. One reason for stigma of obesity can be found in the assumption that overweight can be personally controlled and therefore those affected by overweight are responsible themselves [5–7]. By neglecting biological, genetic as well as environmental causes of obesity, blame is increased on those affected, leading to negative attitudes towards individuals with overweight and obesity. Hence, the investigation of the causes of weight-related stigma is very important, in order to understand how prejudice related to obesity arise and how they can be overcome.

Weight stigmatization is very common among the general population [5]. Additionally, it has been shown that weight-related stigma is a serious issue, affecting the patients' physical health, but also their mental health [8, 9]. Weight stigmatization has also been found to be a predictor of unhealthy eating [10] and a lack of physical activity [11, 12]. About 80% of participants (men and women) reported "eating" as a coping strategy in response to weight-related stigma and approximately three-quarters of them reported "refusing to diet" in order to cope with stigma [10]. A feedback loop model described by Tomiyama [13] aims to illustrate how stigma can lead to the undesirable effect of putting on weight. In this model, weight-related stigmatization can be seen as a stressor, which leads to increased cortisol levels and increased eating, hence resulting in weight gain, which in turn provokes more stigma and teasing.

Surprisingly, one of the biggest sources of weight-related stigma can be observed in health care areas [14, 15]. Previous studies indicated that health care professionals such as doctors, nurses and psychologists showed generic prejudice towards obesity, holding the view that the reason for extreme overweight was due to personal misconduct [16, 17]. From the patient's perspective, physicians have been found to be the most frequent source of stigma for women and the second most frequent source of stigma for men [10]. This study also states that 37% of patients experienced weight bias by dietitians and nutritionists. Even if this is less compared to weight bias by doctors (69%), it confirms that weight stigma among this group exists and should not be undermined.

Weight stigmatization in health care can result in impaired outcomes for patients with obesity. Some studies have linked a high BMI to avoidance of health care prevention services or cancellation of appointments due to weight concerns (e.g. [18–22]). Especially women seemed to be prone to this kind of treatment avoidance due to concerns of being stigmatized due to their weight [21, 23]. Delaying necessary prevention checkups and treatment may contribute to the negative health outcomes we see in individuals with obesity [24].

There is additional empirical evidence, that weight-related bias can also negatively affect treatment seeking in terms of weight reduction [25, 26]. Patients who expect stigmatization from their health care provider may delay or even cancel attempts to seek help for weight reduction. Taken together, these negative consequences might explain why weight-related stigmatization makes it even harder for those affected to reduce weight and improve their health condition.

Apart from physicians, psychologists and nurses, another occupational category, which is intensively in contact with patients with overweight or obesity, has been rarely looked at in the past. Dietitians spend a lot of time with people with obesity or overweight and play a very

important role in the management of obesity. Dietitians see themselves as the specialist contact person in the field of obesity management [27], which again expressively underlines the significance of this topic.

A previous review [4] reviewed stigmatization of individuals with obesity in great detail; however, the authors were only able to summarize a small number of studies addressing dietitians in particular, and were not able to include studies that assessed the dietitians' belief of causes of obesity. Therefore, this review aims to complete and extend the current state of knowledge by (a) determining the magnitude of stigmatization of patients with obesity among dietitians and (b) summarizing causal beliefs of dietitians.

Method

Search Strategy

A systematic search of the literature on attitude of dietitians towards adiposity was conducted using four electronic databases: PubMed, PsycINFO, Web of Science and Cochrane Library. This review followed the Prisma Guidelines [28].

The following key words "obes" or adiposity or overweight or over-weight or fat; attitude or belief or prejudice or stigma or perception; as well as health care professionals or dietitian or dietitian or nutritionist" were used. Due to a very high number of results, the search was limited to title and abstract of the publications and only work published in English or German was included. The search was also limited to "human" studies and language was restricted to either "German" or "English". No restriction regarding the year of publication or publication status was imposed. In order to overcome publication bias, all relevant studies that covered the topic under investigation were included as well as grey literature. This approach follows recommendation by the PRISMA Guidelines [28] and recommendations stated in the Cochrane Handbook for Systematic Reviews of Interventions [29]. Further details are given in S1 Table. The possibility of publication bias was additionally assessed by following the advice given by HLWIKI Canada [30] using the search engine *Google* in order to search for any grey literature such as dissertations or unpublished material that is related to the research question in accordance with the specific exclusion criteria described below. Neither Google web search (1100 results) nor Google Scholar (30 results) was useful to obtain unpublished material that was suitable for inclusion.

Data extraction

In 2014, two reviewers conducted the search independently using a data extraction sheet as recommended in the literature [31]. Titles and abstract were assessed for eligibility and full papers were obtained. Out of 1,090 publications, 1,000 studies were excluded according to title and abstract. All abstracts with disagreement between the reviewers were re-visited again and agreement was found by discussion and consensus, screening articles in more detail in case there was uncertainty. In addition to the remaining 90 articles, two additional studies were chosen from the reference list of other articles. Overall, 92 studies were screened in full text using the following exclusion criteria: (i) other professions such as physicians, nurses or psychologists; (ii) studies that investigated stigma from the patient perspective; (iii) studies that were interested in more general opinions by dietitians, e.g. about treatment success and (iv) reviews or qualitative studies. In summary, 32 studies were excluded because their scientific focus did not fit into the exclusion criteria matrix, 34 studies included HCPs in general or did not explicitly differentiate between dietitians and other HCPs. Five studies were excluded because they were only interested in the patients' perspective. In terms of methodological content, one study was excluded due to their method of analysis, seven studies were excluded because they were using

2. Stigmatization in Health Care - A Literature-Based Analysis

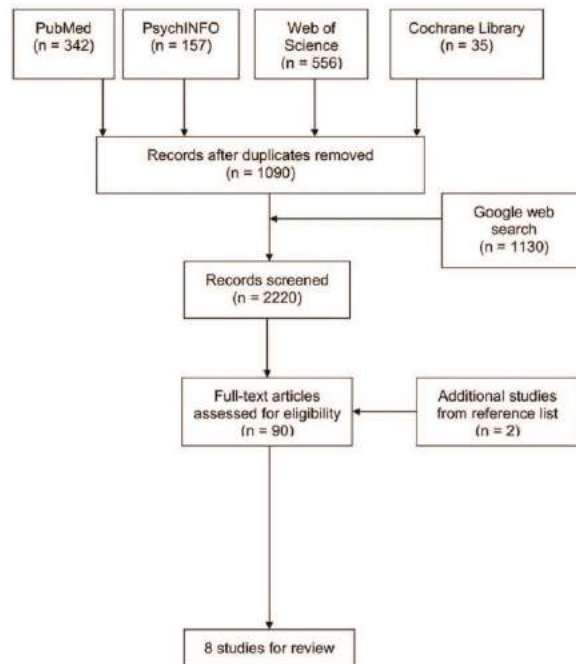


Fig 1. The different phases of the systematic review. ¹HCP = Health Care Professionals.

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qualitative methods and five studies were excluded because they were categorized as reviews. The different stages of this literature search are provided in [S1 Fig](#).

After applying these criteria, eight studies were identified and be considered of importance in order to outline the current stage of research that has been done to investigate the topic up to now ([Fig 1](#)). Methodical data on sampling, design of the study, constructs under investigation as well as outcome criteria (measures of attitudes of dietitians and nutritionists) were extracted systematically by one reviewer and checked by a second reviewer independently. The remaining studies that were found to be eligible for detailed analysis were then tabulated according to the following characteristics: origin of the sample (Country); size of the sample (N); levels of qualification of participants under investigation (Sample); measuring scale (Instruments- explicit or implicit); as well as summary of results and connotation of attitudes ([Table 1](#)).

Results

Study characteristics

The methodological characteristics of the eight studies are summarized in [Table 1](#).

Five out of eight studies were based on an American sample, whereas two studies came from Great Britain [[34](#), [39](#)] and only one study was based on a German sample [[35](#)]. Sample size varied between 49 [[35](#)] and 1,130 participants [[39](#)].

Table 1. Summary of methodological differences of all eight studies.

Author/ Country	N	Sample	Data Collection	Instrument	Results	Conclusion of attitudes
Berryman, Duabie, Manchester, Mittelstaedt (2006), USA [32]	76	36 female dietetic students (2 age 21.2 years) and 36 female students from other departments (2 age 21.4 years), studying at the University of Ohio	Experimental control group design: Explicit measures by use of questionnaires	Fat Phobia Scale	Explicit attitude: overall no significant difference between groups, dietetics students showed negative attitude towards obesity (2 FPS = 3.66, ranging from 2.0 to 5.0), approx. 16.0% from both groups adopted strong negative attitude (2 FPS > 4.4), 13.0% of dietetics majors showed neutral, slightly positive attitude (FPS < 2.5)	Negative
Edelstein, Silva & Mancini (2009), USA [33]	123	Registered dietitians of the American Dietetic Association: Gender: 89.0% female, Work experience: 5 years: 81.0%; 2-5 years: 30.0%; <1 year: 9.0%	Implicit measures	Fat People-Thin People Implicit Association Test	Implicit attitude: 76.0% of dietitians showed a strong to moderate preference for thin people compared to obese people. Their own weight, age and origin did not have an impact on implicit attitude towards people with obesity.	Negative
Harvey, Summerville, Kirk & Hill (2002), UK [34]	187	Randomly selected dietitians of the British Dietetic Association*	Independent Measures Survey: Explicit measures by use of questionnaires	Questionnaire on Obesity and Overweight for obesity (Harvey & Hill, 2001) 2. Attitude towards obesity (Harvey & Hill, 2001; Allison's Attitude Towards Obese People, ATOP) 3. attribution of responsibility (Harvey & Hill, 2001)	1. Causes: generally no difference between Obesity and Overweight questionnaire, physical inactivity, caloric intake of unhealthy food to high, higher caloric intake due to mood changes, weight changes due to repetition of dieting, interpersonal factors. 2. Explicit attitude: overall neutral to positive; obese (BMI > 30.0) people were rated more negative in comparison to overweight (BMI 25.0-30.0) people; obese people were thought to be less successfully working, negatives attitude relate to an adipose negative self-esteem, low sexual attractiveness and poorer health. 3. responsibility: overweight and (especially) obese people were seen as being responsible for their excess weight	Positive
Hellbardt, Riedel-Heller & Sikorski (2014), GER [35]	49	Randomly selected dietitians, participating at a congress on nutrition	Explicit measures by use of questionnaires	Vignette-based approach (two vignettes: 42-year-old woman, either normal weight or over-weight) and the Fat Phobia Scale (14 pairs of adjectives)	Explicit attitude: statistical more negative evaluation of the vignette "over-weight", especially for the following pairs: "shapeless-shapely", "secure-insecure" and "poor self-esteem-self-esteem", FPS = 3.35 (normal weight), compared to FPS = 2.61 (overweight). Causes: most agreement towards internal causes of over-weight (e.g. lack of physical activity or overeating) compared to other reasons (genetic factors, condition related reasons)	Negative

(Continued)

Table 1. (Continued)

Author/ Country	N	Sample	Data Collection	Instrument	Results	Connotation of attitudes
McArthur & Ross (1997); USA [36]	411	Registered dietitians of the "Presidents of State Dietetic Associations" (overall 430, 411 dietitians counsel overweight patients)	Explicit measures using questionnaire, contact via email	1.15 "attitude statements" about own weight 2.37 "attitude statements" about overweight (Men: BMI>26.4 and women: BMI>25.8) clients (rating scale from "strong agreement", "neither nor" to "strong disagreement")	Explicit attitude: Dietitians with self-perceived obesity showed negative attitude towards themselves (feel physical unattractive, blamed themselves for being obese). However, positive attitude related to own goal setting, presentation of weight, and power-self-stigmatization. Ambivalent attitude towards obese clients. Attribution: Reasons: Emotional problems; unrealistic goal setting. Feelings of ambivalence in relation to obese people's discipline to hang on a diet	Neutral
Obermader, Walker, Monroe & Adyanju (1995); USA [37]	298	64 students studying Nutrition Science (Kansas State University); 234 registered dietitians (members of the Kansas Dietetic Association)	Explicit measures by use of questionnaires (send by post)	Bray Attitude Towards Obesity Scale, 47 items including a four-point Likert Scale. Range: positive attitude: 0.0 to 93.0; negative attitude: 94.0 to 188.0	Explicit attitude: Registered dietitians as well as students demonstrated negative attitude towards people with obesity (men: BMI>27.3 and women: BMI>27.8), participants with a self-reported healthy weight had a slightly more negative attitude compared to overweight participants. Students: BATOS = 101.94 Dietitians: BATOS = 103.71	Negative
Puhl, Wharton & Heuer (2009); USA [38]	182	182 students studying nutrition science. Age: 1923.1 years, degree program: since 17.7 years; gender: 92.0% female; weight (BMI): 80.0% normal weight (18.5–24.9), 5.0% underweight (<18.5), 14.0% overweight (25.0–29.9), 1.5% obese (30.0–35.0)	Randomized Experimental Study, Between-Subjects Design, questionnaire includes four different conditions/ patient profiles: 1. non-obese, female patient 2. non-obese, male patient 3. obese, female patient 4. obese, male patient	1. Fat Phobia Scale and 2. perception of the patient depending on test condition: How receptive is the patient in terms of dietary advice for treatment? Does he/she understand it? Compliances? Motivations? Patient's ability to change or maintain weight? How much pleasure would it give me to work with this patient?	Explicit attitude: 1. Fat Phobia Scale: no differences between groups, all students showed moderate extent of fat phobia (FPS = 3.7), similar to the general population. 2. obese people were attributed less compliances than non-obese patients; quality of diet and medical condition of obese patients was rated poorer compared to people with normal weight	Negative
Swift, Hanton, El, Redy, Puhl & Gloaguen (2013); UK [39]	1130	Students: "Master of Nutrition", "Nursing", B.Sc. in Nursing, B.Sc. in Medical Sciences, B.Sc. in Nutrition and Food Sciences, University of Nottingham	Explicit measures by the use of questionnaires	1. Fat Phobia Scale: individual adjectives not given. 2. Beliefs about Obese People: six-point scale, scores range from 0 to 58, the higher the score the greater the belief that obesity cannot be personally controlled.	Explicit attitude: 1. FPS = 23.8; 1.4% showed positive or neutral attitude; 10.5% showed more distinct signs of fat phobia. Signs of less marked fat phobia: a) higher BMI; b) B.Sc. in Nursing; c) a sponsor; belief that obesity can be personally controlled. 2. BAOP = 213.4	Negative

Note: Negative = demonstrates negative attitude towards adiposity; Positive = positive or neutral attitude towards adiposity; Neutral = ambivalent attitude or ambiguous findings; N = sample size; FPS = Fat Phobia Scale; IAT = Implicit Association Test; BATOS = Bray Attitude towards Obesity Scale; BAOP = Beliefs About Obese People

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The studies also varied among the participants' level of qualification. Four studies included practicing or registered dietitians who already gained work experiences, three studies surveyed participants studying dietetics or nutritional science and one study included both, students and practicing dietitians.

Women as well as men were equally considered in the majority of studies; however, more women were included in the samples. The study by Berryman et al. [32] should be named as an exception, investigating only female participants.

Instruments

Seven studies overall examined dietitians' attitude concerning obesity, using questionnaires as an explicit measurement. The study by Edelstein and colleagues [33] measured weight stigma on an implicit level using the Implicit Association Test (IAT).

Further differences between the studies could be found by looking at the type of explicit questionnaires and scales, measuring (over)weight-based attitude and prejudice. Seven studies used Adjective Check Lists, such as the Fat Phobia Scale (FPS) with five-point rating scale questions (four studies) or a semantic differential with characteristics and a seven-point rating scale [33]. The Fat phobia scale scores can range between 1 and 5 (1 = positive attitudes, 5 = negative attitudes). A score of 3.6 can be seen as moderately fat phobic and a score greater than 4.4 indicates high levels of fat phobia [6, 40]. It has been shown that a score of 3.62 is common for the general population [6], whereas a score of 3.59 was observed in the health care sector [41].

Oberrieder and colleagues [37] used the Bray Attitude Towards Obesity Scale (BATOS). For the BATOS, a score above 94 suggests negative prejudices towards obesity [42]. McArthur and Ross [36]; and Harvey et al. [34] used scales which included Likert-Scales to determine their level of agreement or disagreement regarding relevant statements (sample item: "Obese people are just as self-confident as other people" using a six-point Likert-Scale, ranging from 1 = "strongly disagree" to 6 = "strongly agree").

In addition to prejudice and attitude, some studies also investigated information about perceived causes of adiposity. While Harvey et al. [34] directly asked participants what they believe is the reason for overweight and obesity using ten internal (e.g. "lack of willpower") or external (e.g. "metabolic defects") items, McArthur and Ross [36] indirectly examined dietitians' beliefs by asking them about their own weight-related attitudes (e.g. "I attribute my excess weight to emotional problems" or "I am to blame for my excess weight").

The study by Swift et al. [39] gathered data regarding participants' estimation on how much adiposity is personally controllable or patients with obesity are responsible for it by using the BAOP scale (eight-items on a 6-point scale, scores range between 0 and 48, higher scores are an indicator of a strong agreement that obesity is not under an individual's control).

Stigmatizing Attitudes—explicit measures

Six out of seven studies showed significant weight-related prejudice by dietitians (students or professionals) towards obesity (Table 1). Studies by Berryman et al. [32], Puhl et al. [38], Hellbardt [35] and Swift et al. [39] used the FPS, reporting an average degree of fat phobia ranging between 3.35 and 3.8 (Table 2).

Table 2 includes an attempt to compare our results to results of the general population and other health care professionals. Since a substantial number of studies used the Fat Phobia Scale as the main outcome measure, it is possible to compare FPS scores in different study populations. FPS scores ranged between 3.59 (HCPs) and 3.65 (general public) [6, 40], indicating slightly lower negative attitudes in dietitians and nutritionists in these particular German samples. However, conclusions from this review are mixed, since some studies showed higher FPS

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Table 2. Average FPS-Scores.

Study	Mean FPS-Score
Berryman et al. (2006) [32]	3.7
Heilbardt et al. (2014) [35]	3.35
Puhl et al. (2009) [38]	3.7
Swift et al. (2013) [39]	3.8
Sikorski et al. (2012) [6]	3.6
Sikorski et al. (2013) [41]	3.56

Note: FPS = Fat Phobia Scale

^a for reference: average FPS of the study representing the German general population [6]; and health care professionals [41, 43]

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scores. In comparison to other HCPs, a study on attitudes of HCPs in general [43] found a mean FPS score of 3.16, suggesting that the studies that were summarized here (Table 2) show considerable weight stigma in dietitians and nutritionists. Berryman et al. [32] indicated that 16.0% of dietitians have strong negative attitude (FPS score: ≥ 4.4) and 13.0% have neutral, slightly positive attitude towards obesity (FPS score: ≤ 2.5). Similar results can be found in the study by Swift et al. [39], where 11.0% showed characteristics of fat phobia on a high scale, whereas only about 1.0% of all participants have a neutral to slightly positive attitude.

Table 3 summarizes specific characteristics and their prevalence.

Table 3. Systematic outline of studies summarizing characteristics attributed to individuals with obesity.

Attribution pair	Berryman et al. 2006 ^a [32]	Puhl et al. 2009 ^a [38]	McArthur & Ross 1997 ^a [36]	Heilbardt et al. 2014 ^b [35]
Lazy/ motivated	52.6%	41.0%		2.71 (n.s.)
bad / good				
No willpower/willpower	47.4%	41.0%		3.17 (***)
Unattractive/ attractive	47.4%	54.0%	18.5%	3.20 (***)
Poor self-control/discipline	60.5%	65.0%	42.6%	3.25 (**)
Insecure/secure	65.8%	80.0%		3.61 (***)
Poor self- esteem/self esteem	63.2%	75.0%	16.7%	3.63 (***)
Likes Food/dislikes food	89.5%	80.0%		3.67 (***)
Self-indulgent/ self-sacrificing	52.4%	47.0%		3.06 (**)
Overeats/undereats	81.6%	81.0%		3.51 (***)
Slow/fast	73.7%	68.0%		3.50 (***)
Inactive/active	71.1%	77.0%		3.47 (***)
Shapeless/shapely	68.4%	36.0%		3.56 (***)
no endurance/having endurance	63.2%	72.0%		3.50 (***)
Weak/ strong	36.8%	31.0%		3.02 (*)

Note: Vignette describing an overweight woman: 1 = positive attribute to 5 = negative attribute;

significance levels refer to the difference between the overweight vignette and a normal-weight vignette):

*p < .05,

**p < .01,

***p < .001

^aagreement rate of characteristics about obesity is illustrated by percentages.

^bmean scores for attribution of pairs of adjectives assigned to a

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Items related to food (e.g. “likes food”) or physical activity (e.g. “inactive”/ “slow”) as well as “poor self-esteem” were found to have the greatest rate of agreement [32, 38] (Table 3).

Hellbardt et al. [35] found very negative scores for the following three pairs: “shapely/shapeless”, “insecure/secure” and “poor self-esteem/self-esteem”. Interestingly, they reported an overall FPS score of 3.35 using vignettes. The FPS score of a normal-weight vignette in this study was 2.61, being significantly more positive than the score of the obese vignette. Therefore, the authors found a negative evaluation of the obese vignette. Neutral to slightly positive views were reported by Harvey [34]. McArthur and Ross [36] reported that participants’ attitudes expressed towards individuals with overweight or obesity were rather ambivalent.

Stigmatizing Attitudes—implicit measures

Edelstein and colleagues [33] investigated implicit prejudice towards obesity by using Implicit Association Testing, including the words “bad vs. good” as well as “motivated vs. lazy”. Implicit prejudice by dietitians towards obesity can be observed significantly (Table 1).

According to this study, 76.0% of dietitians under investigation had strong to moderate preferences for people without obesity or overweight compared to people with obesity. Interestingly, age seemed to have an effect on the results, as 87.0% participants aged 20-to-29-years and 80.0% of participants aged 30-to-39-years had strong to moderate preference for thin individuals, whereas out of the study group aged 40 or older, only 67.3% exhibited the same preference. Moreover, 85.2% of dietitians with an undergraduate degree and 75.0% of dietitians with a doctorate showed strong to moderate preference for thin individuals, compared to 67.2% of dietitians with a postgraduate degree.

Causes and Attributions

Besides the aforementioned stigma and attitudes of dietitians, some studies also revealed presumed causes of obesity and indicated to what extent controllability and responsibility for obesity can be attributed. Table 4 summarizes the results of these studies.

As reported by Harvey et al. [34] physical inactivity and increased caloric intake due to unhealthy food are primarily named as underlying causes of obesity. Additionally, lack of willpower was thought to be rather important in causing obesity. On the other hand, reasons such as metabolic or genetic factors were undervalued. Interestingly, metabolic changes were

Table 4. Summary of studies examining the dietitians’ beliefs about causes or controllability of obesity.

Study	Causes/Patient-blaming	Result
Harvey et al., 2002 [34]	positive	Physical inactivity most important, followed by mood, eating too much of the wrong food, continuously dieting and interpersonal factors
Berryman et al., 2006[32]	(positive)	81.6% reported that “overeating” can be linked to obesity and overweight
Puhl et al., 2009[38]	(positive)	81.0% reported that “overeating” can be linked to obesity and overweight > according to the authors, the results suggest that participants tended to believe automatically that obesity is due to poorer diets and generally worse health (even when provided with information about individuals’ healthy lifestyle)
Swift et al., 2013 [39]	positive	The belief that obesity is not under the individuals’ control was perceived stronger by students studying nursing compared to students studying Dietetics (the overall BAOP score including all students, was 13.4)
Hellbardt et al. 2014 [35]	positive	Internal causes (e.g. overeating or lack of willpower and physical inactivity) were seen as more important than genetic factors or illness-related causes

Note: positive = patient is directly blamed as being responsible or having control over his/her weight; (positive) = patient is indirectly blamed as being responsible because the perceived causes of obesity are patient-centered.

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assumed to be least relevant. The results obtained by McArthur and Ross [36] indicated that half of the dietitians base obesity on emotional problems and unrealistic goal setting by those affected. Although, dietitians did not show clear negative attitude in relation to people with obesity, in terms of their own weight, dietitians saw themselves as being responsible for it and, as the case may be, blamed themselves.

Hellbardt and colleagues [35] revealed that participants seemed to assess individuals as being responsible for their obesity ("lack of physical activity", "overeating" and "lack of will-power"). Other factors, such as genetic reasons or illness-related factors (e.g. "metabolic disorder") were seen as less relevant, which confirmed the opinion that obesity is a question of self-control only. Even if causes of obesity were not directly captured, Berryman et al. [32] and Puhl et al. [38] demonstrated similar reference to believed reasons within the Fat Phobia Scale, indicating that participants believed that the reason for obesity lies within the individuals' area of control.

Swift et al. [39] applied the Beliefs about Obese People Scale) in order to determine to what extent students believe obesity as controllable. The analysis revealed that students studying dietetics are more likely to believe that obesity can be controlled by the person itself. The assumption that obesity is not under an individuals' control was predicted by a smaller magnitude of fat phobia.

Discussion

Summary of Findings

The aim of this article was to review existing literature reporting the prevalence of weight-related stigma by dietitians and nutritionists (registered dietitians or students) towards people with overweight or obesity. Six out of eight studies under investigation reported prejudice by dietitians towards people with obesity, either on an explicit or an implicit level. Four studies that looked at attributions showed that overweight was seen as being manageable and that people with obesity were seen as being responsible for their excess weight and associated health conditions.

Methodological Comparison

In terms of explicit prejudice the examined studies used questionnaires that differed in sensitivity, response modality, standardization, overall scores and quality criteria. McArthur and Ross [36] and Harvey et al. [34] developed a questionnaire that consisted of statements, which had to be classified as agreement or disagreement (on a scale), whereas others used standardized questionnaires such as Fat Phobia Scale in order to capture attitudes by using a list or pairs of adjectives. Furthermore, Hellbardt and colleagues [35] used two "weight-vignettes" in addition to the Fat Phobia Scale. However, the type of instrument used (standardized vs. self-constructed questionnaire) did not lead to different results.

Most studies in this review used explicit measurements only. Teachman and Brownell [44] also investigated whether health care professionals show weight stigma. They argued that the mere measurement of explicit prejudice was not sufficient due to their findings of greater variance in the explicit measurements compared to their implicit measurements. In terms of explicit attitudes, people with overweight were seen as not "bad", but "less motivated" than thin people, whereas for implicit measures negative attitudes were assigned to people with overweight in both cases equally. People might not be aware of their prejudice or they tried to be extensively fair and tolerant (social desirability) and therefore biased the overall results. The important effect of social desirability has been recently shown in a study by Azevedo et al. [45]. They found that perceived external (society-driven) pressure to act without prejudice was

higher if participants knew about a hormonal disease as being the cause of obesity or overweight compared to a condition in which the reason for obesity was unknown. However, the internal motivation to act without prejudice towards obesity was not significantly different between the two groups.

Therefore, studies might be more reliable and valid, if they include both measurements. Despite the susceptibility of explicit measures, this review, however, demonstrated negative attitudes across most studies.

Effects on Treatment

Previous literature on the prevalence of weight-related stigma in the health care sector has shown that it does not only affect physicians or therapists (e.g. [41, 46]), but also affects professionals that aim to treat or counsel patients with overweight or obesity. In summary, our findings suggest that even dietitians and nutritionists, who play a very important role in obesity management, may be prone to weight-related stigma. This can have reverse or negative effects on the treatment outcome and on the patient's general physical and mental health (e.g. [4, 47]) leading to bad eating habits and reduced exercising [48].

Additionally, attitudes and beliefs could have affected practice choices made by dietitians [34]. They might for instance give advice on or focus on specific diets that include eating less only, ignoring other causes of obesity, such as genetic factors, failing to include systematic aetiology in their weight reduction strategy. In terms of motivation, weight-related stigma could also reduce encouragement and endurance of patients who try to lose weight. So clearly, if dietitians believe that their patients are just lazy, unmotivated or not able to set realistic goals, it will be difficult for them to plan strategies for their patients' weight loss, provide enough support, have sufficient counseling skills, sympathy and caring attitude [36]. Seeing patients with obesity as competent and having positive attributes might do them good in terms of treatment seeking by having a beneficial effect on their self-image and hence in their weight reduction endeavors [26]. On the other hand, negative attitudes could be converted into negative treatment as suggested by another study [48] that shows that dietitians evolved positive feelings if their patients felt responsible for not being able to lose weight while dieting, compared to obese patients who blamed others for their failure, which in turn triggered adverse feelings. As a result, the researchers discovered 3 types of behavioral discrimination: instrumental avoidance (e.g. shorter meetings), professional avoidance (e.g. less effort) and interpersonal avoidance (e.g. negative tone or language). Patients who were perceived more positive for instance (because they blame themselves for their failed weight loss behavior) were allocated more time with their dietitian compared to patients who were perceived more negatively.

Determinants of weight stigma

A direct relationship between attitude and blame could not be found among all eight studies. On the one hand, three studies [35, 36, 38] tended to imply a link between ambivalent to negative attitudes and internally believed causes. Moreover, Swift et al. [39] showed negative attitudes in addition to the belief that overweight and obesity can be personally controlled. However, participants that were asked by Harvey et al. [34] believed that overweight and obesity was due to internal factors and can be controlled by the individual despite having neutral to positive explicit attitude. Therefore, there seemed to be no consistency between weight bias and allocation of blame towards the individual with obesity or overweight. Again, this question might need further investigation since it was hard to compare these studies that have not only been using different instruments and scales but also lacked measurements to reveal believed causes and controllability. The question still remains what the reasons behind weight stigma by

dietitians and nutritionist are. Two other important determinants in this issue could be the amount of work experience gained in the field of treating obesity and overweight on the one hand, and the age of the professional on the other hand.

Interestingly, Puhl et al. [49] found that age as well as amount of experience might play an important role, since it was shown that older professionals with more experience in treating obesity expressed less weight bias- compared to, for instance, young professionals. According to Schwartz et al. [50] young adults were more affected by the societal pressure to be “in shape”, which increased during the last decades. Additionally, they argued that more negative prejudice toward individuals with obesity was a result of immaturity and lack of life experience. The same findings have been confirmed by three of the studies that have been discussed in this review [33, 35, 39]. However, some studies did reproduce neither the effect of age on bias [36] nor the effect of work experience or education on bias [33, 36, 37]. Another interesting factor, which might play a role in developing negative attitudes towards people with obesity or overweight, might be the professionals' own weight. Two studies out of this review [37, 39] confirmed the assumption that a greater (self-reported) BMI is linked to less negative attitudes or lower fat phobia. Conversely, participants with a rather healthful weight tended to show more negative attitudes towards people with obesity and overweight. It could be argued that a deeper understanding of what it means to be overweight or obese due to personal experiences (with weight reduction attempts or even weight bias), might lower these negative attitudes. Moreover, personal BMI has been found to be one determinant of negative attitudes elsewhere [6].

Further research is needed to clarify this issue, including explicit as well as implicit measurements of weight-related stigma and a representative sample of dietitians and nutritionists with different sociodemographic backgrounds (e.g. age, work experience, BMI). In addition to that, it should be further investigated how perceived stigma might affect patients with obesity in general as well as their treatment outcomes. As mentioned above, weight bias in health care settings can result in impaired outcomes for patients with obesity and overweight, however, to our best knowledge this has not been investigated with regard to dietitians and nutritionists specifically.

The origin of weight bias—a controversial issue

Most studies that were included in this review, argued that the first step should be to provide educational programs and interventions for those who want to professionalize in occupations aiming to help and support people with over-weight and obesity [36–39]. Moreover, weight stigmatization has been found to be directly linked to the belief, that obesity is due to behavioral factors rather than physiological or environmental causes in the general public as well [49]. Sikorski and colleagues [6] found evidence that believing in biological causes of obesity can be linked to lower negative prejudice towards these individuals. In other words, the knowledge of what causes overweight and obesity seems to be rather insufficient among the general public, but also among health care professionals [41]. Therefore, intervention programs that do not only focus on obesity management but additionally explain the aetiology behind overweight and obesity might improve attitudes by expanding the knowledge and expertise. Taking into account genetic or biological factors as causes of obesity might sensitize dietitians and nutritionists and enhance their understanding of their clients' situation.

According to a review by Daniélsdóttir et al. [51], studies that tried to change prejudice and beliefs about reasons for obesity and whether it can be controlled by an individual, hence, reduce weight stigmatization, have been rather unsatisfying. It could be that stereotyping in relation to weight is firmly anchored -not only in adults, but also in children. Instead of reducing anti-fat bias (for instance by using intervention programs), medical explanations seem to

amplify prejudice by provoking the need to avoid infection or disease. People might lack the understanding of the disease model of obesity, or might be negatively influenced by the overexposure to information provided by the media or other societal sources. Additionally, Tomiyama et al. [52] compared two sets of data from 2001 and 2013 and found reduced levels of implicit negative attitudes by health care professionals (including dietitians), but also revealed greater levels of explicit bias towards obesity. They debated that etiological knowledge about obesity was not conveyed into reduced weight stigmatization but rather increased explicit negative bias. This is in line with findings by Azevedo and colleagues [45], who based their results on fMRI-data in addition to explicit and implicit behavior measures. They found that stigma was more distinctive when participants knew about the aetiology of obesity (a hormonal disease) expressed by higher IAT scores and neuronal responses.

Conclusions

So far, there seems to be a lack of sufficient evidence for reasonable approaches to reduce explicit as well as implicit negative attitudes towards obesity and overweight in society. To investigate if and why assumptions about causes of obesity and overweight might arise or change, could be the key to prevent weight-related stigma by dietitians and improve the health care condition for those that are stigmatized due to weight. It might be difficult to change society's way of thinking about people with overweight or obesity but it could be a first step to start with the occupational group whose responsibility it is to treat them with understanding and respect in order to help them reduce any health risk that is related to their body weight. One way could be to include the issue of weight stigmatization (and its consequences for those affected) as part of the academic syllabus for students being educated in dietetics and nutrition as well as other related working areas. Intervention programs should not only focus on theory and scientific knowledge, but also call attention for discrimination and stereotyping. It might make them more sensible for this issue and therefore lower or efface their negative attitudes towards people with overweight or obesity. In addition to that it might help them prepare their patients in order to deal with weight bias in everyday life situations. Students as well as professionals should be made aware that mistreatment in terms of handling clients or patients as well as misunderstanding in regard of the aetiology of obesity can have negative effects on a physical or mental health level. Although there is mixed evidence whether intervention programs that aim to clarify the aetiology of obesity are helpful in reducing stigma, this component will need to be investigated more thoroughly in the future.

Weight stigmatization could negatively affect treatment outcomes or keep the patient from seeking medical advice. Patient-centered care does not only include functional skills and theoretical expertise- it is also about interaction and communication, motivation and patience, and probably most of all compassion and kindness.

Supporting Information

S1 Fig. PRISMA Flowchart. This flowchart summarizes why and how many studies have been excluded or included for further analysis.

(PDF)

S1 Table. PRISMA 2009 Checklist. This checklist summarizes details about the methodological strategies that have been used to include or eliminate studies under review, for instance in order to overcome bias.

(PDF)

Author Contributions

Conceived and designed the experiments: FUCEJ NW CLS. Performed the experiments: FUCEJ. Analyzed the data: FUCEJ NW. Contributed reagents/materials/analysis tools: FUCEJ. Wrote the paper: FUCEJ. Revision of the manuscript for important intellectual content: CLS NW SRH.

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3. Quantitative Analyses based on the Current State of Research

The questions remains, how weight bias or stigmatization might impact the quality (and type) of care a patient is offered in the health care system. Recent literature suggests a negative impact indicating that HCPs may not be giving enough support to those suffering from obesity (82, 83).

Weight stigmatization and discrimination can hinder successful weight loss as well as health maintenance in many different ways. In general, weight stigma has been shown to be linked to the type of weight loss treatment an individual with obesity has chosen to reach a better health status, resulting in more riskier decisions (84). Moreover, empirical studies have given evidence that choosing weight loss surgery compared to conservative methods, such as changing eating habits or increasing physical activity, has an influence on how individuals are seen by the general public, exacerbating negative attitudes and prejudice (85). In the eyes of the general public, weight loss surgery is perceived as something that one is not actively involved in. Several misunderstandings exist, incorrectly pointing out that weight loss surgery does not involve any effort or physical labour. Surgery is sometimes labelled or seen as the „easy way out“ or a “quick fix” (86) of obesity. Surprisingly, this opinion is also shared by health care professionals who work in the field of obesity management despite evidence of the amount of effort patients put into getting surgery (e.g. pre-operative assessments), the surgery precautions as well as the strenuousness associated with post-operative care, possible side-effects of surgery and undoubtable weight-regain after the *honeymoon-phase* (87). Previous studies have shown that patients who choose bariatric surgery, are less likely to be hired compared to patients with conservative methods (88). Those patients are evaluated more negatively, are seen as being less responsible for their weight reduction and are seen as less attractive (89), more

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lazy and were attributed a less healthier eating behavior (85, 90) compared to individuals who decided for conservative treatment methods.

Conceptualizing obesity and overweight as a behavioral problem that is associated with individual characteristics of the patient only (e.g. having no willpower or being lazy) leads to the issue of undermining outcomes of obesity treatment as less promising compared to treatment for other health conditions, that are referred as being chronic (67). Keeping in the mind the low number of bariatric surgeries performed in Germany as well as aforementioned research regarding physician's attitudes towards obesity treatment, the aim of the following study was to investigate whether stigmatization has an effect on recommendation of surgery and (subsequent) referral behavior by general practitioners (GPs) and internists.

3.1 Weight-related Stigmatization as Determinant of Recommendation and Referral Behavior of Physicians

Jung, F.U.C.E., Luck-Sikorski, C., König, H.-H., & Riedel-Heller, S.G. (2016). Stigma and Knowledge as Determinants of Recommendation and Referral Behavior of General Practitioners and Internists. *Obesity Surgery*, DOI 10.1007/s11695-016-2104-5.

Abstract

Background: Despite reported effectiveness, weight loss surgery (WLS) still remains one of the last preferred options for outpatient providers, especially in Germany. The aim of this study was to examine the effect of stigma and knowledge on recommendation of WLS and referral to a surgeon by general practitioners (GPs) and internists.

Methods: The sample consists of 201 GPs and internists from Germany. The questionnaire included questions on the perceived effectiveness of WLS, the frequency of recommendation of WLS, and the frequency of referral to WLS. Stigma as well as knowledge was also assessed in this context. Linear and logistic regression models were conducted. A mediation analysis was carried out within post hoc analysis.

Results: Knowledge ($b=0.258$, $p < 0.001$) and stigma towards surgery ($b = -0.129$, $p = 0.013$) were related to the frequency of recommendation of WLS. Additionally, respondents, who were more likely to express negative attitudes towards WLS, were less likely to recommend WLS and thus refer patients to WLS ($b = -0.107$, $p < 0.05$). Furthermore, respondents with more expertise on WLS were more likely to recommend and thus refer patients to WLS ($b=0.026$, $p<0.05$).

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Conclusions: This study showed that stigma plays a role when it comes to defining treatment pathways for patients with obesity. The question remains how this might influence the patients and their decision regarding their treatment selection. Interventions are required to make treatment decisions by physicians or patients independent of social pressure due to stigma.

For full text see page 33.



Stigma and Knowledge as Determinants of Recommendation and Referral Behavior of General Practitioners and Internists

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Abstract

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Keywords Stigma · Obesity · Weight loss surgery · General practitioners · Internists

Introduction

Outpatient providers play a very important role in terms of counseling or discussion about treatment for obesity. Generally, about 36.6 % of patients who seek help from a general practitioner (GP) for several reasons are overweight and 22.8 % are obese [1]. Especially GPs and internists are often faced with the decision to refer their patients to a specialist, being considered gate keepers in the health care system [2]. Their patients rely on their expertise and their advice when choosing specific treatment pathways [2, 3]. In this context, the discussion about a suitable treatment method such as bariatric surgery, hence recommending it to the patient, provides the basis for later referral to a surgeon.

With regard to treatment options, conservative methods such as dietary changes, increases in physical activity, or pharmacological interventions, for example, are seen most effective and therefore recommended far more often by GPs or health care professionals (HCPs). Besides conservative methods, weight loss surgery (WLS) has developed to be an acknowledged alternative for patients with severe obesity [1,

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4–8]. Compared to other countries worldwide, however, the number of bariatric surgeries that are performed in Germany is very low [7]. Apart from financial or economic controversies, WLS still does not seem to be fully accepted. Even if people in the general public perceive WLS as effective, they are also hesitant to recommend this kind of treatment to people with obesity [9]. The same skepticism can be observed in health care professionals, and there seems to be a discrepancy between perceptions of effectiveness and actual recommendation or referral. The discrepancy between perceived success and actual recommendation of WLS is particularly high for GPs (42.3 %) and internists (31.8 %) compared to other professionals, indicating that high perceptions of effectiveness surprisingly do not result in corresponding number of surgeries prescribed [10]. On the contrary, in the USA, where surgery rates are much higher, a study found that 79.6 % of physicians feel positive about bariatric surgery as an option to treat obesity. In terms of recommendation, they would recommend surgery to a patient with obesity (79.4 %) or type 2 diabetes (81.8 %) [11]. However, at the same time, only 64.9 % of the providers were willing to refer a patient with type 2 diabetes and a BMI over 35 kg/m² as the guidelines would propose [11]. Recommendation and referral behavior of HCPs may therefore be an additional driver for the low rate of patients that actually undergo weight loss surgery, even in the USA [12]. Previous research revealed that certain physician's characteristics were indeed associated with a willingness to refer patients to WLS [13] and HCPs of different specialty areas show a lack of knowledge of guidelines [9, 10, 14]. A lack of knowledge regarding WLS among physicians, especially among the non-referrers, is clearly recognizable [13]. For instance, about 38 % of physicians believe that weight regain was less than 5 kg only [13]. As a result, knowledge or expertise on WLS still seems to be insufficient, having an effect on referral behavior of general practitioners and internists. This in turn might have an impact on the perception of the general public and patients themselves. Out of the group of patients eligible for surgery, half of the patients would consider WLS as a treatment option if it had been recommended by their physician, but only 20 % stated that they have actually been recommended for WLS by their physician [15]. In addition, when asking physicians whether they would advise a patient who meets criteria for WLS to see a surgeon, only 23.8 % would recommend this [16]. These studies provide evidence for the influence of the physician on the patient's decision-making, and in turn on low surgery rates.

The physicians' attitude might therefore play a role when treating patients with obesity. Two thirds of patients report that their primary care physicians "don't understand how difficult it is to be overweight" and about one third agrees on the statement "doctors don't believe me when I tell them that I don't eat that much" [17]. Pejorative attitudes (e.g., stigmatization, among health care professionals towards patients with

obesity) seem to be an ubiquitous problem that can be allocated to many domains of health care [18]. Even primary care physicians assign negative stereotypes to patients with obesity [18] and prospective WLS-patients report weight-related stigmatization by their physicians [19]. Stigmatization is often accompanied by the view that patients with obesity or overweight are lazy and lack willpower to lose weight, having an influence on the kind of treatment that patients with obesity receive [19–21]. Moreover, individuals that have been known to have had WLS are not seen as being responsible or actively involved in the process of weight reduction by providers [18], indicating the false belief that WLS does not include effort or difficulty for the patient. Weight-related bias therefore has to be considered another influencing factor. One might think that more negative attitudes may result in higher referral rates of WLS because HCPs may assume that their patients lack the willpower and endurance to lose weight with conservative treatment methods solely and thus are in need of a more radical treatment method such as surgery.

The question remains whether there is a so-called surgery-related type of stigmatization towards patients with obesity among health care professionals that influences the aforementioned treatment pathways.

Studies that investigated the willingness of general practitioners and HCPs in terms of recommending surgery and referring to a surgeon have been limited to small samples and specific patient groups (such as patient with type 2 diabetes) [10, 12]. Therefore, the aim of this study was to determine and explain referral behavior by general practitioners and internists. Additionally, recommendation of WLS is tested with regard to its potential mediating role in explaining the association between stigma or knowledge and referral to WLS. We hypothesized that the willingness to advise patients to undergo weight loss surgery and the willingness to refer patients to a surgeon are dependent on two major factors: knowledge about weight loss surgery and stigma towards patients with obesity and WLS. It is expected that higher knowledge, endorsing individual-based causes for obesity, and lower stigmatizing attitudes are associated with a higher probability to suggest WLS to patients, and also to refer them to a surgeon.

Methods

Participants

The sample consisted of general practitioners as well as internists ($n=201$, response rate 16.3 %, originally 1236 physicians have been contacted). They received questionnaires by mail. Participants were chosen by randomly selecting different regions in Germany. For each region, all physicians that could be tracked down using the telephone directory received the letter and questionnaire and a stamped addressed return

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envelope. Informed consent was obtained from all subjects. Approval from the Ethics Committee of the University of Leipzig was obtained.

Procedure

Measures

Socio-Demographics and Other Measures Participants were asked about their gender, age, their specific occupational working area as well as their body weight and height in order to calculate their BMI (in kg/m^2).

Stigmatizing Attitudes

In order to investigate weight-related stigmatizing behavior, the short form of the Fat Phobia Scale [19] was used. The Fat Phobia Scale (FPS) has been used widely to test stigmatizing attitudes among health care professionals especially due to its good psychometric properties [20], making it possible to classify and compare the score to other scores which can be found in the literature. Calculations of Cronbach's alpha indicated good reliabilities ($\alpha=0.79$). Contrary to other explicit measures of weight stigma, such as the Anti-Fat Attitude Test [21], the FPS provides a more subtle evaluation by providing the respondent with a semantic differential. Additionally, it is possible to also examine attitudes towards a normal weight person which can be compared to the person with obesity. Two vignettes (written description of two women, one being obese and the other one being normal-weight) were presented and placed separately within the questionnaire to avoid bias. Participants were asked to rate these women using 14 opposite adjective pairs (e.g., 1 = "lazy" and 5 = "industrious"). A mean score was calculated over all 14 adjectives. The greater the score of the Fat Phobia Scale, the more likely is this person to show negative attitudes towards people with overweight or obesity [19, 22].

Secondly, perceived causes of obesity were also examined. Participants were asked about the importance of "having no willpower" as a reason for the patients' excess weight on a five-point-scale (1 = not important at all; 5 = exceptionally important).

Stigmatizing Attitudes Towards Weight Loss Surgery

In addition, participants were asked whether they agree with the statement "I find it too easy, if an individual with obesity can reach normal-weight through bariatric surgery," on a five-point-scale (1 = I do not agree at all; 5 = I completely agree). In terms of known side effects and substantial changes associated with weight loss surgery, we argue that understating surgery as being "too easy" in terms of personal

effort for weight change can be considered as an indicator for negative attitudes towards WLS and subsequently towards people with obesity.

Knowledge About Weight Loss Surgery

In this section, participants were asked about their general knowledge on weight loss surgery on a five-point-scale (1 = I do not know anything about it; 5 = I know a lot about it). In addition to that, participants were asked to rate the effectiveness of WLS by indicating it as being "useful" or "not useful at all." In order to assess the perceived efficiency, participants were then asked to rate the amount of weight (in %) a patient with obesity can lose within 1 year after WLS was performed.

Dependent Variables: Recommending WLS and Referral to a Surgeon

Participants were asked whether or not they refer patients with obesity to other specialists and health care professionals (answer format: yes/no). If this was the case, an open question followed to state the type of specialist they refer their patients to.

Additionally, respondents were asked to indicate how often they recommended WLS to their patients. The answer format was a five-point Likert scale from 1 = never to 5 = very often.

Data Analysis

All calculations were performed by using STATA 13.1, for Windows (18). The frequency of recommending weight loss surgery was used as the dependent variable in a linear regression model. Beta-coefficients as well as p values are reported in the context of the research question. The model contained the following independent variables: personal knowledge about WLS, whether it was rated as useful, participants' BMI, their belief about the amount of weight one can lose after WLS, their stigmatizing attitudes (FPS score overweight vignette), endorsement for a lack of willpower as a major cause of obesity, whether they think it is too easy to lose weight with WLS, and their age and gender. BMI categories were determined according to WHO conventions [23].

A logistic regression model was used to investigate determinants of referral behavior. We subdivided the dependent variable to indicate either "referral to a surgeon" or "referral to other specialties and no referral to a surgeon." In addition to recommendation frequency, the same independent variables (age, gender, BMI) as in the linear model were introduced. Odds ratios are reported for this model.

To further investigate mediation effects, a mediation analysis was performed using the STATA 13.1 [24] command *medeff* to detect direct effects, indirect effects, and the overall effect. Two mediation models were run, using

knowledge and stigma as separate independent variables, recommendation frequency as the mediating variable, and referral behavior as the outcome variable. Adjustments were made for age, gender, and BMI of the participants.

Results

Table 1 describes the general characteristics of the sample. The mean age was approximately 53.3 years and 45.8 % of the participants were female. The majority in this sample were general practitioners (80.0 %), 35.5 % were overweight and only 7.6 % can be classified as being obese. For gender and age, this sample replicated current distributions of general practitioners and internists in Germany [25, 26].

The participants state that they sometimes (48.0 %) or rarely (34.3 %) recommended WLS to their patients. Similar patterns were found by looking at the number of physicians, who refer their patients to a surgeon (17.8 %), to other weight loss treatments (38.4 %), and not at all (43.8 %). Information on knowledge about weight loss surgery reveals that more than 70 % rated their own knowledge as moderate to good, and 56.4 % found WLS as being useful to reduce body weight. According to the participants, the mean percentage of body weight that can be lost with WLS is 21.2 % (overall range 0.0 to 80.0 %). For stigma-related variables, the mean fat phobia score of this sample was 3.4, indicating a slightly negative attitude towards people with obesity or overweight. One in three respondents agreed with the statement that weight loss through WLS is a too easy option for the patients. With regard to perceived causes of obesity, more than half of the participants (58.3 %, including category 5 and 4) believed that "having no willpower" is the main reason for excess weight, whereas only 13.3 % (including category 1 and 2) did not or only slightly agree with this statement.

In addition, Table 2 shows the results of the linear regression model with the item "How often do you recommend WLS?" as the dependent variable ($F(9152) = 9.36$, $p < 0.001$; $R^2 = 0.3565$). In general, it was found that all knowledge variables were associated with the frequency of recommendations of WLS. The more respondents knew about WLS, the greater the frequency of recommending it to their patients ($b = 0.258$; $p < 0.001$). However, if they perceived WLS as not useful, recommendations decreased ($b = -0.616$; $p < 0.001$). Recommendations were linked to the percentage of body weight loss, which participants thought could be managed with WLS: physicians, who rated the loss as being greater, recommended WLS more often ($b = 0.014$; $p = 0.03$) than physicians who believed that only smaller amount of body weight could be lost with WLS. Results for the stigma towards individuals with obesity, the FPS, as well as the question for perceived causes of obesity (no willpower) were not

significant; however, results from the stigma towards WLS revealed a relation between stigma in physicians and the frequency of recommendation of WLS. If physicians believed that it is too easy to lose weight with WLS, they were less likely to recommend WLS to their patients ($b = -0.129$; $p = 0.013$).

Table 3 summarizes the results of the logistic regression model with "referral to a surgeon vs. no referral or referral to other treatment" as the dependent variable. This model demonstrates that neither stigma towards WLS nor knowledge of WLS significantly influenced the physicians' decision to refer patients to a surgeon. The only significant predictor was the frequency of recommendations, which increased the likelihood of referral to a surgeon by $OR = 2.169$ ($p = 0.043$). The effect of stigmatizing attitudes towards WLS on referral behavior vanished after introducing the frequency of recommending WLS.

A mediation analysis (Fig. 1) was performed to investigate effects of stigma towards WLS and knowledge on referral behavior, and whether these effects were mediated by recommendation. For recommendation, a significant direct effect ($b = -0.107$, $p < 0.05$) of stigma on referral behavior was observed, but also a significant mediated effect ($b = -0.263$, % of total effect through mediation = 43.68 %) of stigma through recommendation on referral behavior (a). Participants, who reported more negative attitudes towards WLS, responded with fewer recommendations and hence fewer referral to a surgeon. Furthermore, we noted a significant direct effect ($b = 0.026$, $p < 0.05$) of knowledge on referral behavior but also a significant mediated effect ($b = 0.373$, % of total effect through mediation = 71.1 %) of knowledge through recommendation on referral behavior (b). Participants, who expressed more knowledge of WLS, responded with more recommendations and hence were more likely to refer patients to a surgeon.

Discussion

The results indicate that knowledge about, as well as stigma towards WLS was related to the frequency of recommendations for WLS. The more practitioners subjectively knew about WLS and the more they believed that it is an effective method, the more likely they were giving recommendations for WLS. In terms of stigma towards WLS, it was found that these physicians tended to recommend WLS less often, if they believed that it was too easy to lose weight with WLS. In terms of mediation pathways, surgery-related stigmatization as well as knowledge at least partly explained the association of recommendation and referral behavior. Additionally, the proportion of providers that recommended surgery or referred to surgery was comparably low when assuming that our participants mainly thought about obesity class I patients as in

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Table 1 Summary of sociodemographic information and distribution of variables under investigation

Variables	Mean	Number	Percentage (%)
Sociodemographics			
Age	53.30	196	
Gender			
Male		109	54.23
Female		92	45.77
Profession			
General practitioner		161	80.01
Internist		40	19.90
BMI	25.08 kg/m ²	197	
Normal weight		112	56.85
Overweight		70	35.53
Obesity		15	7.63
Recommendation and referral			
Frequency of recommending surgery	2.60	198	
Never (1)		16	8.08
Rarely (2)		68	34.34
Sometimes (3)		95	47.98
Often (4)		17	8.59
Very often (5)		2	1.01
Referral to other health care professionals?		185	
Yes, to a surgeon		33	17.84
Yes, but not to a surgeon		71	38.38
No		81	43.78
Knowledge			
Perceived expertise	3.20	196	
I have no knowledge at all		8	4.08
2		36	18.37
3		74	37.76
4		65	33.16
I know a lot about WLS		13	6.63
Effectiveness rating		197	
I find it useful		111	56.35
I do not find it useful	1.17	86	43.65
Estimated amount of body reduction within 1 year (in %, range 0.0–45.0 %)	21.22 %	195	
Stigma			
Fat phobia score (1–5)	3.44	183	
Reason for being obese: no willpower	3.98	698	
Not important at all 1		10	1.43
2		83	11.89
3		198	28.37
4		215	30.80
Exceptionally important 5		192	27.51
Attitude towards WLS—an easy way out?	2.80	199	
Total disagreement 1		35	17.59
2		41	20.60
3		67	33.67
4		41	20.60
Total agreement 5		15	7.54

WLS weight loss surgery, BMI body mass index

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Table 2 Linear regression model with “How often do you recommend surgery?” as the dependent variable

Independent variables	Univariate analysis		Multivariate analysis	
	Beta-coefficients	<i>p</i> value	Beta-coefficients	<i>p</i> values
Sociodemographics				
Age	0.004	0.519	0.004	0.497
Male	0.047	0.683	-0.058	0.601
BMI	0.001	0.956	0.006	0.682
Knowledge				
Perceived expertise (range 1–5)	0.380	<0.001	0.258	<0.001
Effectiveness rating (ref. useful)	-0.902	<0.001	0.616	<0.001
Estimated amount of body reduction (%)	0.023	<0.001	0.014	0.03
Stigma				
Fat phobia score (range 1–5)	-0.186	0.222	-0.082	0.541
Attitude towards WLS (range 1–5)	-0.234	<0.001	-0.129	0.013
Reason for being obese (no willpower)	-0.098	0.074	-0.057	0.273

F (9152) = 9.36, $p < 0.001$; $R^2 = 0.3565$; WLS weight loss surgery, BMI body mass index

comparable studies [11]. In light of tendencies among surgical colleagues to offer surgery not only to those with a BMI over 40 kg/m² or diabetic patients with obesity class 2, but also to patients with lower BMIs and severe co-morbidities [27], our findings have great implications for clinical practice. It seems essential to intervene in order to reduce surgery-related stigma and in order to increase knowledge about surgery in outpatient providers as they are central in the care for patients with obesity.

Many physicians still believe that obesity is controllable, self-inflicted and the patients themselves are responsible for it; hence, weight could easily be reduced by dieting and exercise

instead of concentrating on the benefits of WLS [18, 28, 29]. Again, there are calls to move away from making unsuccessful pre-operation dieting a prerequisite for candidacy for surgery [27], but rather to make a decision for or against surgery based on the patients' weight history and well-being. Instead of focusing on losing weight or concentrating on numbers, the fact that WLS has been shown to help treating obesity-related comorbidities such as T2D or cardiovascular diseases should be taken into account. When WLS is considered as a treatment method, health care professionals ought to look at the whole picture and determine the severity of obesity on an individual level, for instance by using the Edmonton Staging System of

Table 3 Logistic regression model with “Referral to a surgeon or not” as the dependent variable

Independent variables	Univariate analysis		Multivariate analysis	
	Odds ratios	<i>p</i> value	Odds ratios	<i>p</i> value
Sociodemographics				
Age	0.974	0.243	0.964	0.216
Male (ref. female)	1.346	0.448	1.365	0.559
BMI	0.963	0.509	1.033	0.688
Referral				
Frequency of recommendations	2.601	0.001	2.169	0.043
Knowledge				
Perceived expertise (range 1–5)	1.797	0.011	1.603	0.151
Effectiveness rating (not useful-useful)	0.132	0.051	(Omitted)	
Estimated amount of body weight reduction (%)	1.023	0.270	0.996	0.878
Stigma				
Fat phobia score (range 1–5)	0.820	0.706	0.715	0.608
Attitudes towards WLS (range 1–5)	0.595	0.004	0.807	0.384
Reason for being obese (no willpower)	0.004	0.888	1.267	0.353

Variable omitted due to missing variance according to outcome variable
WLS weight loss surgery, BMI body mass index

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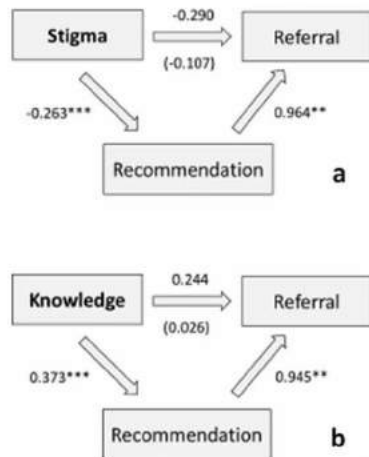


Fig. 1 Mediation models. Stigma, recommendation, and referral behavior (a). Knowledge, recommendation, and referral behavior (b)

Obesity [30, 31]. A lack of knowledge about surgery and its prerequisites should not act as a barrier to successful treatment of obesity-related comorbidities. This is undermined by findings from the USA, where only two thirds of providers caring for T2D patients declare that they follow the guidelines for surgery entry and only 20 % acknowledge the possible need for patients with lower BMI but comorbid T2D [11]. Current views increasingly suggest bariatric surgery as being beneficial to treat diabetic patients, which implies that candidacy for surgery ought to rather be based on the presence of comorbidities, rather than BMI alone [32, 33]. In other words, no patient should be prohibited from taking the chance of reaching a satisfactory health status if he or she is applicable for WLS according to medical diagnosis and criteria.

It remains unknown, what kind of role patients play in this context and whether they have an influence on the referral behavior of the physician. Because stigma and knowledge only have an impact on the utterance of a recommendation and not elicit factual transfer, one could conclude that it may additionally depend on the patient whether there is a referral or not. Furthermore, the impact that surgery-related stigma might have on the patient's decision in addition to the physician's decision on the treatment pathway should also be part of future investigations. Our findings indicate that this reluctance in referral behavior may in part be due to stigmatizing attitudes and a lack of knowledge in practitioners. This might also have a major impact on the patients themselves. Interestingly, about 43.3 % of prospective surgery patients reported feelings of being treated disrespectfully by a HCP because of their weight, compared to 21.6 % of non-surgery patients [34]. As a result, patients may feel stigmatized and internalize the

physician's attitude towards WLS, who might consider WLS as being too easy and "over-utilized" to reduce excess body weight [35]. Previous research suggests that stigma does not stop after those affected by it have lost weight. Weight-related bias rather continues independent of the weight loss method [18], but seems to be more pronounced when patients lost weight by the help of surgery. In the same study, most negative attitudes were shown towards people who lost weight with surgery, hence put in less effort compared to dieting or exercising [18]. Surgery-related stigma might result in patients being fearful of surgery, simply because they do not want to be stigmatized for choosing WLS, remaining a target for weight teasing despite having lost weight. On the other hand, signaling that WLS is like "losing weight simply overnight" and without any endeavor could foster unrealistic weight loss goals or expectations. Therefore, the patient's perspective should also be a focus of future investigations covering this area of research to fully understand stigma in the context of weight loss surgery.

One limitation of this study is the low response rate. However, compared to other related studies, the size of the sample is very similar [2, 11, 13, 35, 36]. Nevertheless, a larger sample might—for instance by having incentives—make it possible to look at the mediation pathways in greater detail. Moreover, referral behavior to WLS was assessed using an open question. It might therefore be possible that respondents did not state "weight loss surgery" as an option because it did not cross their minds immediately. It has been argued that one possible explanation for the results stated above might be the patient's choice against WLS. This could have been assessed by asking about the actual percentage of patients that underwent weight loss surgery in response to their physician's referral. With regard to the measurements used to determine the level of stigma in this sample, a scale which investigates implicit weight stigmatization could be added in addition to the Fat Phobia Scale. As has been argued in the literature, this might help to detect the presence of automatic, unconscious prejudice otherwise hidden by social desirability. Moreover, the short version of the FPS has been used for economic reasons, because it is less timely and easily applicable. However, a more comprehensive and up-to-date measurement should be the focus of future studies in this context.

Conclusion

Because WLS is a good method for patients with severe obesity, it is of great importance to inform the medical staff, clear up misunderstandings, and reduce stigma towards WLS. Family doctors and internists should be free of prejudice against overweight and obesity and sufficiently inform the patient objectively or give them advice on suitable weight reduction methods. The decision for, or against a specific

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weight loss strategy, should be made self-contained and without any social pressure. Future research should evaluate whether weight-related stigma not only affects recommendations but also how stigma in general might influence the quality of counseling (e.g., informed consent about possible risk related to surgery) or follow-up examinations by the physician. Possible intervention such as the “5As” of obesity should aim to inform HCPs with different backgrounds about bariatric surgery as a part of obesity management and to improve physician-patient-interaction in order to assure integrated treatment and counseling [37–39].

Compliance with Ethical Standards

Conflict of Interest FUCEJ, CLS, HHK, SRH declare to have no conflict of interest. CLS has received speaker honoraria from Johnson & Johnson Medical.

Statement of Informed Consent Informed consent was obtained from all individual participants included in the study. Participants were informed about the study on the first page of the questionnaire and they were instructed that upon returning the filled out questionnaire, their data would be used for scientific publications.

Statement of Human Rights This study has been approved by the ethics committee of the University of Leipzig and has been performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

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3.2 Weight-related discrimination and desired body weight.

As previously mentioned, weight stigma, as well as internalized stigmatization, can have several psychological consequences, which in turn can also (negatively) affect treatment decision and outcome. Instead of motivating the patient, stigmatization is rather seen as a threat for treatment. This is particularly true, when it comes to making decisions with regard to the treatment process. Having a certain goal in mind is an important factor of self-regulation and motivation (91) and therefore important for the success of an obesity management intervention. According to guidelines and evidence-based knowledge, a weight loss of approximately ten percent is typical for most behavioral or pharmacological treatments (92–94). Obese patients report weight loss that exceeds 25% of initial weight as acceptable (95, 96), whereas physicians report weight loss outcomes of 14% as appropriate (67). This suggests that unrealistic weight loss goals and expectations expressed by the patient with obesity and overweight may not be induced by the HCP. Research suggests that wanting to lose large amount of body weight as well as overestimating the effects of interventions on weight loss might be manifested psychologically or be connected to experiencing social pressure due to ones excess weight.

In the following section, results of a study on consequences of experiences of weight discrimination and internalized stigma are presented. In an empirical analysis, consequences on weight loss desires or goals which can be a part of decision making processes within the treatment of obesity were investigated.

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Jung, F.U.C.E.; Spahlholz, J., Hilbert, A., Luck-Sikorski, C.*, & Riedel-Heller, S.G.* (2017). Impact of Weight-Related Discrimination, Body Dissatisfaction and Self-Stigma on the Desire to Weigh Less.

Abstract

Background: Currently, health care professionals plead for stabilization of weight and improving health conditions rather than focusing on weight loss only. Individuals with obesity have been shown to report weight loss goals that are much higher than what has been suggested by guidelines. The aim was to determine whether weight discrimination and body dissatisfaction have an impact on how much weight an individual with obesity wants to lose.

Methods: In this representative survey, n=878 participants with obesity were asked about their experiences with weight stigma, their body image concerns and about the amount of weight they would like to weigh.

Results: Regression analysis reveals, that being female, having a higher BMI, being younger and trying to lose weight was related to a greater discrepancy between current weight and desired weight. The discrepancy between current weight and desired weight was greater when participants reported discrimination due to their weight as well as internalized stigma and body image concerns.

Conclusions: Independent on the weight loss method, treating obesity should include realistic weight loss goals without being affected by social pressure or weight stigma, especially since stigma can result in further weight gain and decline health issues related to obesity and overweight.

For full text see page 44.

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Original Article

Impact of Weight-Related Discrimination, Body Dissatisfaction and Self-Stigma on the Desire to Weigh Less

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Key Words

Weight loss goals · Obesity · Stigma · Body dissatisfaction · Desired weight

Abstract

Aim: Currently, health care professionals plead for stabilization of weight and improving health conditions rather than focusing on weight loss only. Individuals with obesity have been shown to report weight loss goals that are much higher than what has been suggested by guidelines. The aim was to determine whether weight discrimination and body dissatisfaction have an impact on how much weight an individual with obesity wants to lose. **Methods:** In this representative telephone survey, 878 participants with obesity were asked about their experiences with weight stigma, their body image concerns, and about the amount of weight they would like to weigh using random digital dialing and Kish selection grid to ensure random selection of participants. **Results:** Regression analysis reveals that being female, having a higher BMI, being younger, and trying to lose weight was related to a greater discrepancy between current weight and desired weight. The discrepancy between current weight and desired weight was greater when participants reported discrimination due to their weight as well as internalized stigma and body image concerns. **Conclusion:** Independent on the weight loss method, treating obesity should include realistic weight loss goals without being affected by social pressure or weight stigma, especially since stigma can result in further weight gain and decline health issues related to obesity and overweight.

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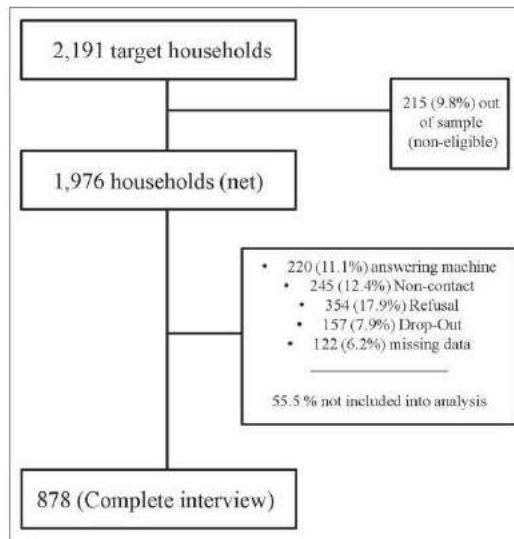
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Introduction

Effective and evidence-based obesity treatment options that work for every patient on a long-term basis are scarce. Clinical guidelines [1, 2] recommend a weight loss of 5–10%. This allows individuals to adapt during the process of weight loss as well as afterwards since weight loss is associated with changes in one's body appearance and body image, but also affects mobility and comorbidity. Weight loss within this range can reduce the presence of cardiometabolic risk factors [3] and improve glucose metabolism [4]. By emphasizing modest weight loss, the guidelines try to shift the focus away from cosmetic reasons towards improving overall health. Even though research suggests that the focus should not be put on weight loss per se or rather plead in favor of a 'health-at-every-size' [5] or 'weight-inclusive' approach [6], patients as well as health care professionals still give priority to losing large amounts of weight or tend to overestimate the effect of lifestyle interventions, leading to unrealistically high weight loss goals and expectations. In one study, physicians rated a weight loss of 10.6% as 'disappointing' and a weight loss of 21.5% with a lifestyle-based intervention as 'acceptable' [7]. Patients suffering from excess weight have been shown to report weight loss goals that deviate tremendously from what has been suggested by guidelines [8–11]. For instance, in one study that included a large sample of (nonbariatric) participants seeking dietary advice or treatment, about 49% of all participants reported unrealistic weight loss goals [12]. Even though it has recently been shown that there is no association between weight loss outcomes and realistic weight loss goals compared to unrealistic ambitions [13], unsuccessful weight loss attempts have been shown to predict future weight gain and unhealthy weight cycling [14–16]. Having more modest weight loss goals that can realistically be reached might on the contrary be beneficial for losing weight in the long term, because 'reaching one's goal weight' is one of the main factors that can positively contribute to weight loss maintenance [13, 14]. Unrealistic goals on the other hand can serve as a basis for disappointment and failure to reach these self-set goals and lead to several negative consequences. Indeed, greater desired weight loss strongly predicted the frequency of mentally and physically unhealthy days [17]. Most previous research on body dissatisfaction and weight loss has focused on individuals with normal weight or on adolescents, but not on adults with obesity. However, there is evidence that improving body image or body appearance (rather than health) may be an influential factor for weight loss desire [19, 20], since higher weight loss goals result from greater body image concerns among obese individuals in general, and among women with obesity in particular [21]. The perceived need of losing weight and the wish to achieve greater body weight reductions might be linked to anxiety about body image concerns [20, 23], resulting in disordered health behavior [22]. The question remains whether body image concerns are grounded on social or cultural floors, especially since higher levels of body dissatisfaction have been shown to be associated with social pressure to be slim [24]. In individuals with overweight or obesity, there seems to be a link between social unacceptability and weight stigma on the one hand and body image concerns on the other hand that may result in unhealthy desires to lose a lot of body weight [25, 26] due to maladaptive eating habits. Moreover, weight stigma can sometimes be self-directed by adopting negative weight-based attitudes or stereotypes [27]. Individuals who tend to internalize weight stigma often perceive their bodies as unattractive and in need of appearance modification to change their body size [28]. Previous studies [29–31] suggested that highly internalized weight bias can be associated with greater body image concern, anti-fat attitudes, depressive symptoms, stress, and reduced self-esteem. In Western societies for instance, individuals with obesity are often categorized as being lazy, unmotivated, or lacking willpower [32, 33]. Overweight or obesity is viewed as being controllable through willpower and effort. If these negative attitudes are internalized by those affected, it could give grounds to the belief that it might

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Fig. 1. Detailed analysis of the response rate of the telephone interview. Note: Refusal: participant verbally refuses to give the interview or does not want to take part; Dropout: participant drops out during the interview; Answering machine: automatic machinery response; Non-contact: participant does not answer the phone despite free line signal.



therefore be easily manageable to lose a lot of weight by putting in tremendous amounts of effort and pressure, hence resulting in unrealistic high weight loss goals. Instead of being motivated to achieve health and well-being, social pressure or social weight stigma can therefore result in a variety of negative health outcomes [34–36].

The question remains whether higher drive for thinness translates to a larger discrepancy between current and desired weight. This weight discrepancy can be considered as a proxy for weight loss goals and body dissatisfaction that arises from socially desired body shape standards and stems from experiences or internalization of weight bias. Therefore, the aim of this study was to determine whether internalized weight stigma, perceived discrimination, and negative body image can be linked to the discrepancy between current and desired weight. We hypothesize that people who feel discriminated because of their weight report a larger weight discrepancy and hence more extreme weight loss goals. Additionally, we hypothesize that individuals who appear to be dissatisfied with their body tend to wish for greater weight reductions compared to people who are more satisfied with their appearance.

Material and Methods

Overall, 2,191 target households were randomly selected from all German states. Respondents were verbally interviewed by FORSA, an independent institute for social research and statistical analysis, using computer-assisted telephone interviews (CATI) between January and February 2015. Participants were selected using random digital dialing and Kish selection grid when choosing the person in the household to carry out the survey with. The use of this method as well as standardization of the interview process ensured random selection of participants. Demographic weighing was applied by age, gender, and education to ensure representability of the general public. BMI screening was based on self-reported weight and height and calculated using the standard formula. In order to avoid missing values, participants who refused to provide infor-

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Table 1. Descriptive statistics of the original sample and the study sample

	Original sample (n = 1,000)	Study sample (n = 878)	p values (χ^2 , t-test)
Mean age, years	56.43 ± 14.82	56.46 ± 14.47	0.965
Gender			0.830
Women	448 (44.80%)	389 (44.3%)	
Men	552 (55.20%)	489 (55.7%)	
Weight (BMI), kg/m ²			0.828
Women	34.31 ± 3.98	34.35 ± 3.98	
BMI 30.0–34.9	34.56 ± 4.24	34.59 ± 4.25	
BMI 35.0–39.9	269 (64.06%)	249 (64.01%)	
BMI ≥ 40.0	116 (25.72%)	99 (25.45%)	
BMI ≥ 40.0	46 (10.20%)	41 (10.54%)	
Men	34.11 ± 3.74	34.13 ± 3.74	
BMI 30.0–34.9	375 (68.30%)	338 (69.12%)	
BMI 35.0–39.9	132 (24.04%)	116 (23.72%)	
BMI ≥ 40.0	41 (7.47%)	35 (7.16%)	
Education			0.777
<12 years	824 (82.73%)	722 (82.23%)	
>12 years	172 (12.27%)	156 (17.77%)	
Mean discrepancy between actual weight and comfortable weight	18.52 ± 9.24	18.76 ± 9.40	0.577
Mean discrepancy in % (women)	20.73 ± 9.31	18.71 ± 9.29	0.002
Mean discrepancy in % (men)	16.73 ± 8.79	18.57 ± 9.34	0.001
Are you currently trying to lose weight?			0.569
Yes	605 (60.50%)	543 (61.85%)	
No	394 (39.40%)	335 (38.15%)	
WBIS ($\alpha = 0.8251$) (n = 988)			0.780
Overall score range 0–60	17.29 ± 11.89	17.44 ± 11.80	
Lifetime discrimination ($\alpha = 0.5407$)			0.858
0 (= no discrimination)	602 (60.20%)	525 (59.79%)	
1 (= experiences of discrimination)	398 (39.80%)	353 (40.21%)	
Daily discrimination ($\alpha = 0.8382$) (n = 988)			0.901
Overall score range 2–36	10.85 ± 3.48	10.83 ± 3.44	
MBSRQ-AS ($\alpha = 0.6452$) (n = 988)			0.869
Overall score range 7–36	23.93 ± 3.92	23.90 ± 3.90	

WBIS = Weight Bias Internalization Scale; MBSRQ-AS = Multidimensional Body Self-Relations Questionnaire-Appearance Scale.

mation on weight were given a specific weight range, being able to assign them to one of the BMI categories [37]. Overall, n = 1,000 individuals participated in the assessment, corresponding to a response rate of 50.6% (fig. 1). Only participants with a BMI greater than 30 kg/m² were included in this study. Of the n = 1,000 assessments, 122 (12.2%) were excluded from the detailed analyses due to missing data. Therefore, the following analyses were conducted with a representative sample of n = 878 participants who were interviewed regarding their experiences with weight-related stigma. In terms of sample characteristics, there was no difference between the main sample (n = 1,000) and the study sample (n = 878) as can be seen in table 1. The method of this study was approved by the Ethics Committee of the University of Leipzig (Approval No 206-14-14042014).

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Instruments

Covariates

Sociodemographic and other measures such as gender, age, education, monthly income, weight, and height were included as confounders in all analyses. Information on self-reported weight and height was used to calculate the participants' BMI (in kg/m²). Additionally, participants were asked whether they are currently trying to lose weight (yes/no).

Independent Variables: Stigma- and Body Image-Related scales

Three scales were used to investigate whether or how the participants feel their excess body weight affects their life. The Weight Bias Internalization Scale (WBIS), was used to determine the level of internalized weight stigma by asking to what extent respondents apply negative stereotypes and self-statements about individuals with obesity to themselves [30]. The original WBIS scale includes 11 items on a 7-point rating-scale (1 = strongly disagree, 7 = strongly agree). A German translation of all items has been published showing good psychometric properties [38, 39]; however, as suggested by the literature [38, 39], one item was excluded from analysis due to its negative correlation. Higher scores represent more internalization of stigma.

In addition, questions from the National Survey of Midlife Development in the US (MIDUS) on self-perceived discriminatory experiences were included to determine how often participants have been confronted with discrimination in everyday life [40–42]. The Lifetime Discrimination Scale (taken from the first survey wave) asked 'In each of the following, have you ever been discriminated because of your body weight?'. For instance, one of the following items was 'You were not hired for a job'. In addition, three more items were added to the original scale [40] to specifically focus on weight-related discrimination which is underrepresented in the original scale targeting all types of discrimination. These three items were generated through extensive qualitative research prior to the survey. In-depth interviews were conducted with people with obesity, summarizing occasions of discrimination (unpublished results from personal interviews, n = 6). From these interviews, the most prevalent occasions were selected and included in the adapted Lifetime Discrimination Scale [43]. These items were: 'You received inappropriate comments from your family or friends', 'You were prevented from leisure activities because of your weight', and 'You were prevented from everyday activities or leisure activities because of physical barriers in your environment'. The response format included yes or no and the scale consisted of 11 items overall. The Daily Discrimination Scale (taken from the second MIDUS survey wave) included 9 items with a 4-point-scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often), asking 'How often on a day-to-day basis do you experience each of the following types of discrimination?'. As an example, one of the items was 'You are treated with less respect than other people'. Both scales were translated from English to German and controlled back by three researchers independently. Higher scores represent greater perception of weight discrimination.

Body image was measured using the Appearance Evaluation Subscale (containing 7 items) from the Multidimensional Body-Self-Relations Questionnaire-Appearance Scale (MBSRQ-AS) [44, 45]. As an example, one of the items was 'I feel physically unattractive'. The answering format includes a 5-point-scale (1 = not at all, 5 = entirely). A validated German translation of this scale was obtained from the literature [46, 47]. Higher scores represent higher levels of body satisfaction. All independent variables were checked for multicollinearity after the regression analysis. The variance of inflation factors (VIFs) were all small enough to exclude intercorrelations.

Dependent Variable: Weight Discrepancy

In addition to self-reported weight and height, participants were also asked for their personal weight they would feel comfortable with. Weight discrepancy can be defined as the difference between the current weight and the weight they would desire to feel comfortable with.

Data Analysis

All calculations were performed by using STATA 13.1. for Windows [StataCorp LLC, College Station, TX, USA] [48]. The data were weighted by age, gender, and education to match the German general public.

The dependent variable was the amount of weight discrepancy (difference between current weight and desired weight). Participants who wanted to weigh more or gave inconsistent answers (i.e., participants indicating that they were trying to lose weight but simultaneously wanted to weigh more) were excluded from the final analysis ($n = 3$). The discrepancy between current weight and desired weight was calculated in kilograms and also in percentage from current weight. Data from the Lifetime Discrimination Scale were dichotomized ('no discrimination' or 'experiences of discrimination') due to the distribution of answers (only a few participants reported more than one case of lifetime discrimination). For the Appearance Evaluation Subscale, the WBIS and the Daily Discrimination Scale sum scores were calculated. Weight discrepancy in percent was used as the predictor variable in a linear regression model as a continuous variable. The model contained the following covariates: whether participants were currently trying to lose weight (yes/no), net household income, educational background (' ≥ 12 years' or '<12 years'), BMI, and participants' age and gender. BMI categories were determined according to WHO conventions [49]. The three stigma-related scales and the body image scale were introduced as the independent variables of interest in four separate models. In addition to statistical significance (p values), effect sizes (η^2) of the confounding variables and the independent variables have also been calculated from F -test statistics, as suggested by Smithson [50]. The effect size measured in η^2 gives the proportion of variance associated with the main effect (i.e., each independent variable under consideration) and varies from small ($\eta^2 \geq 0.01$) to large ($\eta^2 \geq 0.14$), according to rules of thumb given in the literature [51, 52]. A logistic regression analysis was conducted to further examine the adherence to the aforementioned guidelines (e.g., whether their desired goal weight exceeds the recommended weight loss goal of 10%). The amount of weight discrepancy was dichotomized to indicate either 'recommended weight loss' (discrepancy between current weight and desired weight = 0–9.99%) and 'not recommended weight loss' (discrepancy between current weight and desired weight $\geq 10.0\%$).

Results

Demographic Information and Prevalence of Discrimination

Sample characteristics can be found in **table 1**. The mean age of the participants was 56.5 years, and 44.3% were female. On average, the mean BMI in this sample was 34.4 kg/m². The participants' desired weight was on average 18.8% lower than their current weight. In other words, participants in this study desired to lose 19 kg on average (SD 11.1 kg). Almost two-thirds of participants in this sample (approximately 62%) were currently trying to lose weight. **Table 1** also summarizes mean scores for the four scales under investigation (WBIS, Lifetime Discrimination Scale, Daily Discrimination Scale, MBSRQ-AS). About 40% of all participants stated that they have been discriminated due to their weight at least once in their lives.

Linear Regression Analysis

In addition, **table 2** shows the results of the linear regression analysis with weight discrepancy as the outcome variable and internalized stigma (WBIS), Lifetime Discrimination, Daily Discrimination as well as appearance evaluation (MBSRQ-AS) as the four predictor variables. Effect sizes can be found in **table 2** accordingly. Gender, BMI, age as well as current weight loss efforts significantly contributed to all four models. In other words, being female, having a higher BMI, being younger, and trying to lose weight were related to a greater discrepancy between current weight and desired weight. Regression diagnostics revealed that WBIS, Lifetime Discrimination, Daily Discrimination as well as MBSRQ-AS scores were significantly associated with this discrepancy. The more stigma has been internalized by an individual (Model 1a: $F(7,870) = 49.15, p < 0.001, \text{adjusted } R^2 = 0.2508$), the greater the discrepancy between current weight and desired weight. Similarly, a higher prevalence of being discriminated due to body weight (Model 2a: $F(7,870) = 46.65, p < 0.001, \text{adjusted } R^2 = 0.2385$, and

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Table 2. Coefficients, effect sizes (η^2) and p values for the regression analysis with discrepancy between current weight and desired weight as the dependent variable (n= 878), separated into Model 1a (WBIS), Model 2a (Lifetime discrimination), Model 3a (daily discrimination) and Model 4a (MBSRQ-AS)

Independent variable	Model 1a (effect size)	Model 2a (effect size)	Model 3a (effect size)	Model 4a (effect size)
Gender (ref = male)	0.228 *** [0.111]	0.253 *** [0.073]	0.249 *** [0.120]	0.234 *** [0.098]
BMI	0.059 *** [0.186]	0.058 *** [0.138]	0.061 *** [0.178]	0.058 *** [0.160]
Age	-0.007 *** [0.048]	-0.007 *** [0.016]	-0.008 *** [0.072]	-0.008 *** [0.041]
Currently trying to lose weight (ref = yes)	-0.184 *** [0.043]	-0.231 *** [0.030]	-0.237 *** [0.026]	-0.230 *** [0.034]
Income	0.001 [0.040]	-0.002 [0.003]	-0.002 [0.055]	-0.002 [0.027]
Education (ref = less than 12 years)	-0.065 [0.040]	-0.081 [0.003]	-0.074 [0.052]	-0.073 [0.028]
WBIS	0.010 *** [0.027]			
Lifetime discrimination		0.131 ** (0.009)		
Daily discrimination			0.011* (0.006)	
MBSRQ-AS				-0.018 *** (0.015)

ref = Reference variable for regression analysis; WBIS= Weight Bias Internalization Scale; MBSRQ-AS = Multidimensional Body Self-Relations Questionnaire-Appearance Scale.

The dependent variable was logarithmized as it followed approximately a log-normal distribution.

*p < 0.05; **p < 0.01; ***p < 0.001.

Model 3a: $F(7,870) = 44.30$, $p < 0.001$, adjusted $R^2 = 0.2338$, was associated with a higher discrepancy between current weight and desired weight. Finally, the more uncomfortable individuals feel with their body (Model 4a: $F(7,870) = 42.75$, $p < 0.001$, adjusted $R^2 = 0.2425$), the greater the discrepancy between current weight and desired weight.

With regard to correlations between dependent variables and covariates, small correlations have been found between BMI and all four dependent variables (WBIS: $r = 0.1594$; lifetime discrimination: $r_{pbis} = 0.2698$; daily discrimination: $r = 0.1648$; MBSRQ-AS: $r = -0.2197$) as well as between 'currently trying to lose weight' and all four dependent variables (WBIS: $r_{pbis} = -0.2336$; lifetime discrimination: $\chi^2 = 12.4288$; daily discrimination: $r_{pbis} = -0.0503$; MBSRQ-AS: $r_{pbis} = 0.0708$).

Logistic Regression Analysis

With regard to the logistic regression analysis with the categorized discrepancy as the outcome variable, results are summarized in table 3. The results show that gender, BMI, and age significantly influence the categorized discrepancy between current weight and desired weight in Model 1b ($\chi^2(7) = 103.94$, $p < 0.001$, WBIS), Model 2b ($\chi^2(7) = 97.18$, $p < 0.001$; Lifetime Discrimination), Model 3b ($\chi^2(7) = 88.03$, $p < 0.001$; Daily Discrimination) and Model 4b ($\chi^2(7) = 94.11$, $p < 0.001$; MBSRQ-AS).

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Table 3. Odds ratios, confidence intervals (95%) and p values for logistic regression analysis with the categorized discrepancy between current weight and desired weight as the dependent variable (n=878), separated into Model 1b (WBIS), Model 2b (Lifetime Discrimination), Model 3b (Daily Discrimination) and Model 4b (MBSRQ-AS)

Independent variable	Model 1b OR, p-value (lower; upper)	Model 2b OR, p-value (lower; upper)	Model 3b OR, p-value (lower; upper)	Model 4b OR, p-value (lower; upper)
Gender (ref = male)	2.560 *** (1.747; 3.751)	2.742 *** (1.876; 4.006)	2.682 *** (1.838; 3.913)	2.574 *** (1.759; 3.766)
BMI	1.323 *** (1.221; 1.433)	1.312 *** (1.211; 1.421)	1.324 *** (1.223; 1.432)	1.310 *** (1.210; 1.417)
Age	0.971 ** (0.958; 0.985)	0.972 ** (0.958; 0.986)	0.970 *** (0.956; 0.984)	0.969 *** (0.956; 0.983)
Currently trying to lose weight (ref = yes)	0.802 (0.556; 1.157)	0.710 * (0.497; 1.014)	0.681 * (0.478; 0.970)	0.695 * (0.487; 0.991)
Income	0.932 (0.859; 1.010)	0.932 (0.860; 1.011)	0.925 (0.853; 1.003)	0.926 (0.855; 1.003)
Education (ref = less than 12 years)	1.050 (0.651; 1.695)	0.974 (0.604; 1.569)	0.991 (0.617; 1.592)	1.012 (0.628; 1.630)
WBIS	1.039 *** (1.016; 1.061)			
Lifetime Discrimination		1.698 * (1.144; 2.519)		
Daily Discrimination			1.013 (0.945; 1.084)	
MBSRQ-AS				0.957 * (0.919; 0.997)

OR = odds ratio; ref = reference variable for logistic regression analysis; WBIS = Weight Bias Internalization Scale; MBSRQ-AS = Multidimensional Body Self-Relations Questionnaire-Appearance Scale.

Discrepancy between current weight and desired weight was categorized into two categories (0 = recommended weight loss, lower than 10%; 1 = not recommended weight loss, greater than 10%)

*p < 0.05; **p < 0.01; ***p < 0.001.

In terms of stigma and appearance evaluation, only three variables were significantly associated with the categorized discrepancy between current weight and desired weight. The more stigma was internalized (p < 0.001, WBIS, Model 1b), the higher perceptions of discrimination at least once in their lives (p = 0.009, Lifetime Discrimination, Model 2b), and the greater individuals were unsatisfied with their appearance (p = 0.004, MBSRQ-AS, Model 4b), the greater the weight discrepancy. In terms of Daily Discrimination (p = 0.722, n.s., Model 3b), no significant relationship was found. In order to investigate possible interaction effects, it was tested whether adding MBSRQ-AS as a moderator variable (i.e., weight bias internalization × body appearance) to the effect of stigmatization and discrimination had an influence on this regression analysis. The same was tested using the discrimination scale as the moderator variable. However, no significant results could be obtained.

Discussion

The intention of this study was to investigate whether stigmatization, internalization, and body image have an influence on weight discrepancy. In terms of weight discrimination, 40% of all participants in our sample stated that they have been discriminated due to their

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weight at least once in their lives. This goes align with recent findings from a meta-analysis on obesity and discrimination [53]. Our results reveal that female participants, younger participants, and participants with higher BMIs wanted to lose more weight than their counterparts, going align with the literature [12, 18, 23]. The discrepancy between current weight and desired weight was greater when participants reported discrimination due to their weight as well as internalized stigma. The same was true when participants reported body image concern: being unsatisfied with one self's body image due to being obese resulted in greater weight loss desires. Hence, we identified several variables associated with non-recommended weight goals, among them the perception of social exclusion and societal influences. This goes align with research from a different population [54] showing that individuals assume that one's body can be reshaped on command and that effects of dieting (or weight loss) exceed that of weight loss per se, leading to increased attractiveness, health and popularity, hence giving grounds to setting unrealistic weight loss goals. Dieters often believe that weight loss will change their image from 'lazy' to 'self-controlled, ambitious or successful' [55]. In this context, several models might explain these associations: the cognitive-behavioral model and the dual pathway model. The first one argues that dissatisfaction with one's current shape or body weight fosters dieting behaviors and related cognitions in order to change one's appearance [56], which in turn could lead to binge eating when dieting efforts are disturbed [57]. The second model proposes that both body dissatisfaction and negative affect encourage eating disorders [58]. Becoming aware of sociocultural pressure to meet expectations of being thin might therefore promote body image concerns. As reviewed recently [8], focusing on weight reductions as the predominant goal ('weight-normative approach') is linked to weight discrimination and internalized weight stigma and might lead to weight regain, weight cycling, and negative psychological outcomes such as developing eating disorders due to failed weight loss attempts. Perceived and internalized weight stigma negatively influence eating behavior, resulting in a greater drive for thinness [24, 31], higher body dissatisfaction [31] as well as increased presence of binge eating episodes [24]. Internalized stigma has been shown to be stressful, and it may contribute to negative physical [59] and psychological health issues [62]. One very recent study has shown that it mediates the relationship between weight stigma and disordered eating behavior, indicating that it is important to address this issue in a clinical setting or as part of obesity care management [60]. The fact that self-directed weight stigma is related to increased presence of binge eating disorders [29, 58, 61] elucidates one of the findings of the current study that higher levels of self-directed weight stigma make individuals with obesity want to lose much more weight as has been recommended by health professionals and guidelines.

The topic is of particular clinical relevance since having unrealistic weight loss goals can have negative consequences on treatment success as well as the overall health of the obese individual. These consequences are not only related to (unhealthy) dieting behavior. Individuals might be prone to make more risky treatment decisions [63, 64] or fall for potentially harmful commercial dietary medications that lack evidence of effectiveness [65]. Unrealistic goals might also lead to disappointments when goals cannot be reached, and, in the worst case, this could provoke weight regain due to maladaptive eating patterns or eating disorders that arise from frustration and psychological distress [66] resulting in even more negative psychological consequences [67]. Moreover, research has shown that even weight reduction methods that can lead to greater weight loss, such as bariatric or metabolic surgery, can bring out stigmatization in response to choosing this particular method [68–70]. One possible psychological effect of not meeting one's (unrealistic) goals or expectations might be that it is interpreted as failure by the patients themselves, doubling the internalized stigma, such as 'I never put in enough effort'. Even if some research suggests that high weight loss goals can act as a successful motivator for individuals who are trying to lose weight, it remains clear that optimism might

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be linked to positive outcomes; however, whenever optimistic goals turn out to be unachievable, it can be costly [71]. Based on self-determination theory, it may make a difference whether the drive to lose weight comes from intrinsic motivation (i.e., improving health, feeling more comfortable) or in reaction to social pressure (i.e., perceived discrimination) and whether this pressure is related to losing weight and maintaining health or tied to achieving certain objective indicators of weight loss success ('a specific number on a scale') [72]. As some research suggests, perceived pressure to lose weight is related social physique anxiety which in turn is negatively related to quality of life [73]. In this context, studies investigating the motivational framework of weight loss goals and possible negative long-term effects in terms of psychological outcomes such as the development of disordered eating behaviors as a result of social pressure are still lacking. Future studies could therefore include motivations or drive for weight reduction in order to assess how these might affect weight loss goals and desires. Prospective research could also focus on investigating whether stigma and body image concerns impact decision making in terms of treatment for weight loss. Improving body image and self-esteem may be a target point for intervention as both have been shown to positively affect weight maintenance of weight loss [74]. Although the predictive value of unrealistic weight loss goals on actual weight loss is low [13], developing realistic weight loss goals is part of obesity treatment simply based on the fact that realistic weight loss goals can be specifically targeted for treatment. Therefore, patients and health care provider should agree on realistic and sustainable goals beforehand [75, 76]. In particular, weight loss goals that are determined by discrimination and social distress might be harmful for those who suffer from obesity and related comorbidities. Interventions then could include coping strategies to help patients to deal with weight discrimination and provoke intentional and healthy weight loss rather than following stigma-induced and unmindful treatment decisions. These interventions could for example include acceptance- and mindfulness-based strategies that have already been shown to be effective in reducing weight bias that patients direct at themselves [77]. Similarly, obesity treatment should also focus on body dissatisfaction, resulting in successful weight change due to positive influences on psychological correlates of healthy eating and physical activity [78].

Limitations

In our study, the discrepancy between current weight and desired weight loss is not extreme on average. It might therefore be useful to conduct a post-hoc analysis and include only participants with weight loss goals greater than what has been suggested by the guidelines. Moreover, even though results of this study were significant in terms of p values, the effect sizes of the scales under investigation are relatively small. Due to the mentioned literature, we decided to focus on effect sizes only, as it measures the proportion of variance associated with the effects itself. One explanation could be that – because differences found to be significant are very small – they might only affect a certain group of patients with obesity. There could be another mediating factor (i.e., weight loss history) which influences the link between weight loss goals and weight discrimination and has not been part of this study but could be considered in future studies. Since η^2 is influenced by significance and the number of effects in the model [79], one way to overcome this bias in future could be to increase the sample size. Another limitation in this context is the use of self-reported weight and height. It has been reported that individuals tend to underestimate their own weight status [80, 81]. However, if this was true, our results would be even more concise because the discrepancy between current weight and desired weight would be greater than reported, leading to more extreme weight loss goals. Additionally, only few participants in our sample report more than one event of weight-based discrimination.

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Conclusion

In summary, weight reduction should be free of stigmatization or social pressure and occur in a healthy and realistic way – depending on the patients' health condition (such as comorbidities), personality, and individual needs. Instead of looking for ways of losing extreme amounts of weight within a short period of time, the focus should be put on life-long weight management and prevention of overweight and obesity.

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Disclosure Statement

The authors declare to have no conflict of interest.

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4. Discussion

Obesity has been classified as a chronic disease by several national associations such as the American Medical Association (1), or the German Association for the Study of Obesity (97). There is empirical evidence showing that obesity is based and influenced by genetic factors (98) and that the causation as well as treatment is very complex and still not fully understood (99). Despite this, stigmatization and discrimination of individuals with obesity and overweight is rising in its prevalence and potency (31, 33). Considering the rising prevalence of obesity worldwide, the psychological side of obesity which may hinder successful therapy and overall health, quality of life and well-being, should not be overlooked. Obesity has been associated with poor health and shorter life expectancy not only due to comorbidities such as cancer or diabetes, but also due to weight discrimination, which has been linked to an elevated risk of mortality of almost 60% (100).

The results presented here highlight the importance of investigations on weight stigmatization and related consequences among obesity care. The three articles demonstrate that weight bias is present within the health care system and that it affects individuals with obesity from different angles, and with wide-ranging outcomes for health and well-being. The systematic review revealed that even dietitians and nutritionists are prejudiced and negatively-thinking despite having knowledge on causation of obesity on the one hand and being in close contact with patients, recognizing their struggle and complaints on the other side. The effects on the individual or patient become apparent in the findings of the first empirical studies which do not only give evidence for weight stigma as a barrier to treatment in terms of treatment recommendation and referral by a physician (Chapter 3.1.) but also confirm previously published results that this

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stigmatization is not only related to the disease itself, but might also be directed towards the type of obesity intervention. The second empirical study (Chapter 3.2) reveals how the patient or individual might react and is influenced in treatment-related decision making processes by social pressure in terms of weight bias. It does not depend on whether weight bias is experienced within the health care setting or outside the hospital, as it can also be experienced in everyday life situations. As a result, the findings highlight the importance of establishing comprehensive interventions, which aim to reduce or eliminate weight-related stigmatization within health care and beyond.

4.1 Connecting Existing Literature to the Empirical Results

Previous studies already demonstrate a link between weight discrimination and the progression of obesity. One study (101) shows that – independent on the BMI at baseline – the probability to become or stay obese is 2.5-3.0 times higher if one experiences weight discrimination (compared to other forms of discrimination or no discrimination experiences at all). In terms of treatment, negative attitudes and prejudice by physicians and other HCPs have been shown to result in less empathetic or patient-centred communication (102), spending less clinical contact time (103), showing less respect for their obese patients (103, 104) and giving less provision of medical information (105). Our research results demonstrate that effects of weight bias or negative attitudes by HCPs can go beyond these results and even impact recommendation and referral. In other words, the more likely a physician is to think of weight loss surgery (WLS) as being too easy to lose weight (compared to conservative treatment methods), the lower the possibility that he or she recommends this treatment or refers their patient to surgeon in order to conduct WLS. Contrary, the fact that patients are not given enough information, e.g. on surgical

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procedures, might lead to a decision against surgery, hence leading to non-referral. Considering, that especially GPs and internists have a very important gate keeping-function within the (German) healthcare system and act as the first medical person to contact, this can have very pervasive consequences for their patients who rely on their advice and support. Moreover, it could be one of the reasons why, despite having the equipment, facilities and expertise, the number of bariatric surgeries performed in Germany is relatively low compared to other economically comparable countries (106). Moreover, results presented above mirror the belief that there is a certain kind of stigma attached to bariatric surgery, which undermines the effort and complexity linked to undergoing surgery, thinking of it as “the easy way out” or something the patient itself is not actively involved in. In light of the fact, that HCPs should be familiar with the procedure of WLS, as well as precautions that have to be addressed by the patient pre- and post-operatively, they should be making their decision based on what is best for their patients and with regard to their patient’s medical eligibility described in specific evidence-based guidelines.

Another aspect that has been covered by the empirical analysis is the link between weight stigmatization (perceived and internalized) and treatment-related effects on the patient, in this case: the desire to lose weight (Chapter 3.2). Wanting to lose more weight than recommended by guidelines or HCPs has been observed very often, especially in individuals with obesity and overweight (95, 96, 107, 108). It is undeniable that this desire is often linked to the wish to escape from pain or physical impairments due to comorbidities and negatively impacts well-being and quality of life. However, research has shown that this desire is also linked to social pressure and societal norms, further expressed by weight bias and fat-shaming. Having an ideal body weight or body shape in order to be

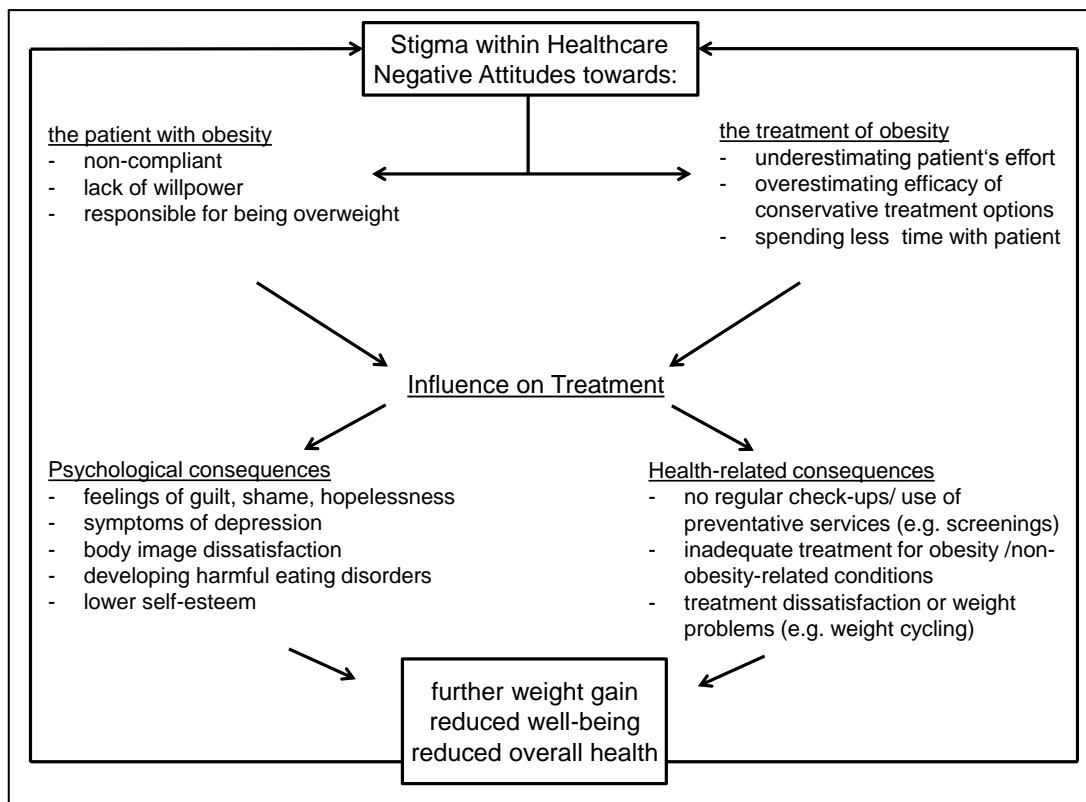
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successful and well-liked or even accepted, seems to be imposed upon, and whereas being healthy- mentally and physically, is rather fading into the background.

The results mentioned in Chapter 3.2. point out that individuals with obesity, who have had experiences of weight discrimination in several everyday life scenarios, may want to lose more weight than individuals who have not experienced being stigmatized due to their weight. Similar results were obtained for individuals who internalized weight stigmatization, making them more vulnerable to unrealistic weight loss goals. Being not able to reach the (unrealistic) goals, could foster psychological distress and frustration leading to dropping out of treatment ahead of schedule, developing maladaptive eating patterns and eating disorders (109) or gaining weight as a result of stress (57). In the worst case, not being able to reach one's (unrealistic) goals might double the internalized stigmatization by mistakenly emphasizing the stereotypes of obesity such as "being lazy" or "not putting in enough effort" because they did not manage to reach those unrealistic goals. Therefore, apart from psychological consequences that arise from weight stigma, discrimination and teasing can also have an effect on weight management.

In order to maintain or improve a good health status, interventions should be considered that aim to stabilize, rather than reduce body weight and treat obesity-associated comorbidities. In this context, Figure 2 summarizes the psychological as well as health-related consequences of weight stigmatization and discrimination on treatment and well-being. On the basis of literature mentioned before, stigmatization and discrimination within healthcare settings can have many pervasive impacts on individuals with obesity and overweight, especially in the long-term. This in turn may give grounds to a *circulus vitiosus* of constantly recurring experiences of stigmatization, as described in Figure 2.

4. Discussion



Illustrated by the author

Figure 2: Possible consequences of stigmatization and discrimination within the context of health

Professionals and researchers plead to move away from weight loss per se, especially since a variety of studies have recently shown that the weight loss that can be achieved with conservative methods or weight loss medications, does not exceed a weight loss of ten percent on average (110–112). Instead of aiming for ideal body weight (or shape) health care professionals that work in the field of obesity management should advise patients with obesity or overweight to set realistic long-term goals. These goals may not be “fixed to numbers on a scale” but rather focus on improving patient’s health and hence overall quality of life (113)- in dependence of the obesity intervention under consideration.

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A body weight reduction of ten percent may imply that some individuals with obesity are still obese and might therefore still be vulnerable to weight discrimination. Additionally, episodic variation in body weight followed by a weight-loss treatment is not unusual. In some cases, weight cycling leads to gaining even more body weight than before the reduction (114, 115), indicating that losing weight as well as stabilizing weight can be extremely challenging (116). Patients should be psychologically prepared for these challenges and should receive help in order to use strategies based on coping, resilience or acceptance in order to improve stress management and eliminate or reduce feelings of guilt and shame that may hinder successful treatment (117). Therefore, the results of the two empirical studies described and summarized above, confirm the significance of understanding of as well as identifying sources and consequences of weight bias within health care.

4.2 Future Research on Weight Stigma and possible Implications

Although weight stigmatization has been studied in many different situations for many years and in different countries, there are still gaps that need to be filled by research. We have just started to understand the relationship between experiencing weight bias as a psychological issue that affects treatment of obesity as well as the psychopathology of obesity. Still, a lot of questions need to be answered, for example in terms of the origin of weight stigma as well as possible intervention that a) reduce occurrence of weight bias and b) help individuals with obesity who suffer from discrimination and weight stigma to find a suitable coping strategy and prevent bias from having a negative effect on their psychological and overall well-being. The lack of empirical evidence with regard to intervention that aim to reduce weight bias among HCP has been reviewed and confirmed

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recently (118). The obstacle that is linked to developing effective and well-designed strategies against weight bias probably lies within general social norms and approaches that need to be changed in the first place. In addition, research suggests that stereotyping cannot fully be overcome (by increasing empathy and confidence in being able to treat) if attitudes or beliefs are mainly shaped by experiences with patients in the health care setting (119). With regard to HCPs, it is questionable how stressful situations might influence the attitudes towards obesity. In terms of racial bias, there has been a study recently that describes a link between cognitive stress (such as patient load and overcrowding within the medical setting) and implicit racial bias (120). In general, implicit bias rather happens automatically and stress might increase stereotyping. If situations are stressful, physicians might oversimplify as the brain increasingly relies on heuristics (121). However, whether this has an effect on the treatment remains currently uninvestigated.

Another interesting assumption argues, whether fully acknowledging obesity as a disease might decrease weight stigmatization, because obesity is then seen as a condition and not an attribute, a choice or a characteristic. On the other hand, it might stigmatize individuals even more, by giving them a label even if they are healthy, as being obese does not always imply suffering from physical impairments or comorbidities. One recent study (122) has shown that it does make a difference whether the message is based on decreasing blame or focusing on entity beliefs, which could rather exacerbate anti fat-attitudes instead of reducing them. In other words, this study assumes that public health messages should decrease blame of having an increased BMI and concurrently focus on the changeable nature of weight in order to decrease weight bias and stigmatization. Interventions to decrease weight stigma should imply health promotion and positivity in terms of weight management and still conserve the belief that weight is malleable (incremental theory of weight) to encourage healthy behavior and self-regulation (122).

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Additionally, helping patients to adopt coping strategies in order to deal with weight discrimination that they face in everyday life or in health care settings is important for obesity prevention and treatment. Professionals who work with individuals with obesity should be trained in detecting high-risk groups, which are affected by weight stigma in a more pervasive way and might for instance respond to it by pursuing unrealistic weight loss goals that may hinder successful treatment, lead to weight cycling or weight regain, or make psychopathological conditions linked to obesity worse. In this context, more empirical research is needed to implement interventions that help patients to respond to chronic stress evoked by discrimination, as part of psychotherapy and in addition to a comprehensive obesity care management program.

4.3 Conclusion

Weight bias and stigmatization remain an ongoing issue for individuals with obesity. Considering the social and economic burden the health care system is confronted with, obesity research should also focus on psychosocial aspects that can have pervasive ramifications on those affected by it. The results presented here underline this importance and give new insights on how individuals with an increased BMI are affected in their psychosocial functioning and with regard to treatment. Making a decision on treatment or simply taking care of your health should be free of social pressure or prejudice. Health care professionals of all fields and qualifications should behave non-stigmatizing and supportive, and condition their recommendations regarding treatment options on medical and patient-individualized requirements instead of personal attitudes and prejudice.

Summary

Cumulative Doctoral Dissertation submitted in fulfilment of the requirements for the academic degree Dr. rer. nat.

„To Tip the Scale“-Weight-related Discrimination and Consequences on the Treatment of Obesity.

submitted by Franziska Ulrike Christine Else Jung
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Institute of Social Medicine, Occupational Health and Public Health
as well as
Integrated Research and Treatment Center (IFB) AdiposityDiseases
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Prof. Dr. rer. med. Claudia Luck-Sikorski
Oktober 2017

The prevalence of obesity is constantly rising, making it a worldwide problem with wide-ranging consequences not only for those affected by obesity but also for the health care system in general. Apart from physical impairments or medical comorbidities, pervasive issues such as weight discrimination and stigmatization additionally impinge individuals with obesity in several ways. As a result, elaborate research is needed in order to detect sources of weight discrimination and reveal reasons why stigmatization might interfere with successful treatment of obesity. Previous research indicates that weight discrimination acts as an additional burden to those affected by obesity and overweight, affecting their health not only directly (e.g. due to stress and psychological issues such as eating disorders and depression) but also in a more indirectly or silent way (e.g. low adherence, patient distrust or avoidance of care). Therefore, the aim of the present work was to explore and analyze the effects of weight discrimination that can be found within obesity care management.

Summary

The first study, therefore, served as a systematic review to gain insights on weight discrimination by a specific type of health care professionals that work closely with individuals with obesity and overweight. Relevant research articles were identified by a systematic literature search subject to all exclusion criteria. Six out of eight studies under review reported negative attitudes among dietitians and nutritionists towards people with obesity, either explicitly or implicitly. In terms of causation, four studies that looked at attributions revealed that obesity was seen as being controllable and that individuals with obesity are seen as being responsible for their excess weight and associated conditions.

The impact of weight bias on referral and recommendation behavior by general practitioners (GPs) and internists was investigated in the first empirical study. According to the results, knowledge about weight loss surgery (WLS), as well as stigma towards WLS were related to the frequency of recommendations for as well as referral to WLS. In summary, physicians tended to recommend WLS less often, if they believed that it was too easy to lose weight with WLS, therefore giving an indication of WLS-based stigmatization.

The second empirical study investigated one possible consequence of weight discrimination that may impact not only the outcome of treating obesity or obesity care management in general, but also has several psychosocial effects on those people affected. The results show that female participants, younger participants, and participants with higher BMIs wanted to lose more weight than their counterparts, going align with previous published studies on this topic. The discrepancy between current weight and desired weight was greater when participants reported discrimination due to their weight. This discrepancy was also depended on internalization. In other words, the greater participants tend to internalize weight stigmatization, the greater this discrepancy, hence the more weight they want to lose.

Summary

In sum, the findings suggest that weight bias and discrimination can impact treatment pathways or outcomes of individuals with obesity in various ways.

List of Publications in the Cumulative Doctoral Dissertation

1. Jung FUCE, Spahlholz J, Hilbert A, Riedel-Heller SG, Luck-Sikorski C (2017). Impact of Weight-related Discrimination, Body Dissatisfaction and Self-Stigma on the Desire to Weigh Less. *Obesity Facts*, 10(2). DOI:10.1159/000468154. (IF: 2.25)
2. Jung FUCE, Luck-Sikorski C, König H-H, Riedel-Heller SG.(2016). Stigma and Knowledge as Determinants of Recommendation and Referral Behavior of General Practitioners and Internists. *Obesity Surgery*, 26 (10). DOI 10.1007/s11695-016-2104-5. (IF: 3.947)
3. Jung FUCE, Luck-Sikorski C, Wiemers N, Riedel-Heller SG. (2015). Dietitians and Nutritionists: Stigma in the Context of Obesity. A Systematic Review. *PLoS One*, 10(10):e0140276. doi: 10.1371/journal.pone.0140276. eCollection 2015. (IF:3.5)

Summary

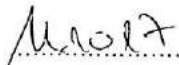
Specific Contribution

Darstellung des eigenen Beitrages


1. Publikation (Review)

Jung F., Luck-Sikorski, C., Wiemers, N., Riedel-Heller, S.G. (2015). Dietitians and Nutritionists: Stigma in the Context of Obesity. A Systematic Review. PLoS One, 10(10):e0140276. doi: 10.1371/journal.pone.0140276. eCollection 2015.

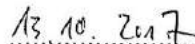
Beitrag Doktorand: Maßgeblicher Anteil bei der Skizzierung, Spezifikation und Formulierung der Forschungsfragen, sowie bei der Strukturierung des Reviews. Des Weiteren beinhaltet der Beitrag die Literaturrecherche, die Sichtung aller relevanten Titel, Abstracts und Volltexte sowie deren Beurteilung und die Erstellung und Überarbeitung des Reviews.




Datum



Prof. Dr. rer. med.-C. Luck-Sikorski



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Prof. Dr. med. S.G. Riedel-Heller, MPH

Summary

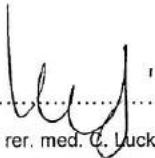
2. Publikation

Jung F., Luck-Sikorski, C., König, H.-H., Riedel-Heller, S.G.(2016). Stigma and Knowledge as Determinants of Recommendation and Referral Behavior of General Practitioners and Internists. *Obesity Surgery*, 26 (10). DOI 10.1007/s11695-016-2104-5

Beitrag Doktorand: Maßgeblicher Anteil bei der Skizzierung, Spezifikation und Formulierung der Forschungsfrage, der Datenanalyse und Auswertung, sowie der Erstellung des Manuskripts.

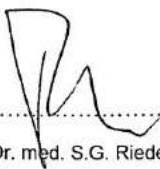
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Prof. Dr. rer. med. C. Luck-Sikorski

13.10.2017

Datum


Prof. Dr. med. S.G. Riedel-Heller, MPH

3. Publikation

Jung F., Spahlholz, J., Hilbert, A., Riedel-Heller, S.G., Luck-Sikorski, C. (2017). Impact of Weight-related Discrimination, Body Dissatisfaction and Self-Stigma on the Desire to Weigh Less. *Obesity Facts*, 10(2). DOI:10.1159/000468154

Beitrag Doktorand: Beteiligung an der Datenerhebung und Entwurf des Studiendesigns. Maßgeblicher Anteil bei der Skizzierung, Spezifikation und Formulierung der Forschungsfrage, der Datenanalyse und Auswertung, sowie der Erstellung des Manuskripts.

19.10.2017

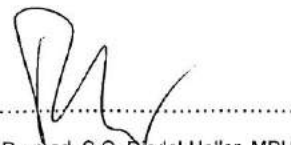
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Prof. Dr. rer. nat. A. Hilbert

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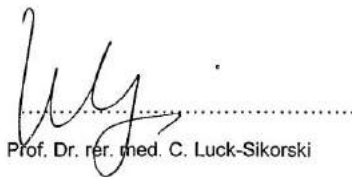
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Prof. Dr. med. S.G. Riedel-Heller, MPH

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Prof. Dr. rer. med. C. Luck-Sikorski

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Appendix

Appendix A - Declaration

Erklärung über die eigenständige Abfassung der Arbeit

Hiermit erkläre ich, dass ich die vorliegende Arbeit selbstständig und ohne unzulässige Hilfe oder Benutzung anderer als der angegebenen Hilfsmittel angefertigt habe. Ich versichere, dass Dritte von mir weder unmittelbar noch mittelbar eine Vergütung oder geldwerte Leistungen für Arbeiten erhalten haben, die im Zusammenhang mit dem Inhalt der vorgelegten Dissertation stehen, und dass die vorgelegte Arbeit weder im Inland noch im Ausland in gleicher oder ähnlicher Form einer anderen Prüfungsbehörde zum Zweck einer Promotion oder eines anderen Prüfungsverfahrens vorgelegt wurde. Alles aus anderen Quellen und von anderen Personen übernommene Material, das in der Arbeit verwendet wurde oder auf das direkt Bezug genommen wird, wurde als solches kenntlich gemacht. Insbesondere wurden alle Personen genannt, die direkt an der Entstehung der vorliegenden Arbeit beteiligt waren. Die aktuellen gesetzlichen Vorgaben in Bezug auf die Zulassung der klinischen Studien, die Bestimmungen des Tierschutzgesetzes, die Bestimmungen des Gentechnikgesetzes und die allgemeinen Datenschutzbestimmungen wurden eingehalten. Ich versichere, dass ich die Regelungen der Satzung der Universität Leipzig zur Sicherung guter wissenschaftlicher Praxis kenne und eingehalten habe.

27.10.2017

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Franziska Jung