

Weight Bias in the Workplace: A Literature Review

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Abstract

The prevalence of obesity continues to increase in today's society. Individuals who are overweight or obese appear to be less accepted and are targets for discrimination. The aim of this paper is to review and evaluate what constitutes obesity stigma in the workplace, what societal attitudes are present regarding obesity in the workplace and what interventions exist to reduce and eliminate weight bias in the workplace. A review was conducted using keyword searches. Results revealed that overweight individuals face weight bias and discrimination at every stage of the employment cycle and the presence of negative perceptions and stigmatization in the workplace concerning individuals with obesity. Intervention strategies have included individual based strategies as well as social change models that include both environmental and population strategies. Legal cases for weight-related discrimination in the workplace have been met with mixed results. Recommendations are provided to foster a healthier work environment that is inclusive of all workers and one that supports a higher quality of work in organizations.

Keywords: Obesity; Weight; Meta-analysis

Introduction

In 2005, over two million Canadian employees between the ages of 18 and 64 were found to have a body mass index (BMI) classified as obese. Based on self-assessment reports, the obesity rate among Canadian employees has been steadily increasing from 12.5% in the mid-1990s to 15.7% in 2005 [1]. In the year 2000, almost two thirds of US adults were considered overweight and nearly a third were considered obese [2,3]. Although the prevalence of obesity continues to increase in today's society, individuals who are overweight or obese appear to be less accepted and are targets for discrimination [4].

Individuals with obesity frequently experience bias, stigmatization and discrimination due to weight [4,5]. Weight bias refers to the tendency to make unreasonable judgments based on a person's weight. [6] Stigmatization refers to a generalized devaluation and social exclusion of individuals as a result of deviance in particular attributes, like being overweight [7]. The term discrimination refers to unjust or prejudicial behaviours towards an individual or group of people based on specific characteristics or on affiliation to a certain groups [6,7]. These experiences have been noted to have serious consequences for the personal and social health of obese individuals [5]. A growing body of evidence indicates that weight bias, stigmatization, and discrimination are prevalent in the workplace [4,5,8]. Given the steady increase in obesity rates in today's society, work-related weight bias needs to be viewed as a serious problem [7].

The purpose of this study was to conduct a literature review of the issue of obesity stigma in the workplace as well as to identify gaps in the research on the topic. The aim of this paper is to review and evaluate what constitutes obesity stigma in the workplace. Furthermore, we will examine societal attitudes regarding obesity in the workplace and what interventions exist to reduce and eliminate weight bias in the workplace.

Methods

Data was collected using the PubMed, OVID and the Google scholar databases. Searches were conducted using the keywords: obese, obesity, overweight, bias, weight bias, stigma, stigmatization, discrimination, stereotypes, workplace, work setting, employment,

job performance, hiring, selection, evaluation, promotion, evaluation outcomes, perceptions, attitudes, policy, public policy, intervention and weight management programs. A 'snowballing' technique was also used to collect data. This technique used the reference lists of the articles found above to identify articles that were relevant to types of weight bias in the workplace and perceptions of obesity in society.

Types of weight bias in the workplace

Qualitative reviews have concluded that individuals who are overweight face weight bias and discrimination at every stage of the employment cycle [4,7,8]. These reviews have identified evidence for weight bias across a variety of evaluative outcomes, including selection, placement, compensation, assignments, promotions, assessments, discipline and termination [4,7-9] (Table 1).

A review by Giel et al. examined weight bias in five aspects of work life and work settings. The authors executed a literature search in the scientific databases PubMed and PsycINFO. They found evidence for stereotypical beliefs across a number of work-related abilities. Some of these stereotypes included lower job performance, lacking interpersonal skills, lacking motivation and lacking self-control. They also found that obesity is a general barrier to being hired in the first place and a barrier to certain professions such as managerial and technical professions as well as occupations that involve high public contact (e.g., sales jobs). Obesity was also found to be a barrier to professional success since individuals who are obese were less likely to

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Title	Purpose	Methods	Results	Conclusion
Weight Bias in Work Settings—a Qualitative Review (Giel et al., [7])	To examine the specific kind, context and extent of a weight bias in work settings.	A literature search was performed in the scientific databases PubMed and PsychINFO to identify studies which have investigated aspects of a potential weight bias in the occupational context. Participants were asked to rate fictional employees that were given fictional body weights through a series of photographs and videos.	There is evidence from self-report data, surveys, and laboratory research for a weight bias in five aspects of work life. Evidence shows that obesity is a general barrier to employment, certain professions and professional success. Obese individuals are at higher risk of encountering stereotypes concerning their work-related qualities and for general unequal treatment in the work place.	Current evidence reveals a weight bias in several areas in the work place. The ecological validity of results is limited due to the predominant reliance on laboratory studies with student samples. Field studies are needed to examine weight-based discrimination in actual work environments as well as to uncover underlying mechanisms.
A meta-analysis of empirical studies of weight-based bias in the workplace (Rudolph et al., [11])	To perform a meta-analysis of literature that focuses on weight bias across workplace assessments (ex. deciding who gets hired, and assessing performance) along with testing mediators of the relationships in evaluative workplace outcomes.	Searches conducted in databases (PSYCHInfo, Proquest, ERIC) using relative keywords. Snowballing effect was also used to gather studies. 59 studies were included. The focus of the studies was limited to performance assessments as dependent variable and a manipulative independent variable (weight).	$d = -.52$ mean effect size which is inside the 95% confidence interval (-.56, -.48) shows that effect size is significant and weight bias is relevant to evaluative workplace practices. There is a significant overall negative effect of weight based bias across workplace assessment results. Job type wasn't significant in weight based bias, since small number of studies examined it. For hiring procedures, weight bias was not moderated by job type.	Bodyweight across workplace outcome was medium. Hiring had high variability and performance had low variability. Body weight had negative indications for weight based bias within evaluative workplace outcomes. Job type being moderator of weight based bias is not true. Effect of weight strongest for hiring, less for performance, and least for promotions. Over weight individuals are discriminated compared to their normal weight coworkers. Weight bias was not varying across job types. Weight based bias was strongest for hiring outcomes and less strong for promotion outcomes.
Bias, discrimination, and obesity (Puhl and Brownell, [4])	To examine the existing literature on the topic of discriminatory attitudes and behaviours against obese individuals and to evaluate whether systematic discrimination occurs.	The authors chose to simply document whether bias and discriminatory attitudes and behaviours occur. A systematic review was not performed.	The authors found that the literature contained evidence that bias and discriminatory attitudes and behaviours exist across several societal areas including employment, education and medical and health care. The authors also found documentation that these attitudes and behaviours in both public and legal settings.	There is clear and consistent findings in scientific literature that bias and discrimination against obese individuals exists in society. These attitudes and behaviours could have a very a very negative and powerful impact on health, wellbeing and several areas of living for individuals who are obese. The authors suggest that this topic be treated more aggressively in terms of research, and both legal and real life settings.
Weight based discrimination in employment: psychological and legal aspects (Roehling, [8])	To examine the discrimination against overweight individuals in the work force using research papers from various perspective including psychology, sociology, law, etc.	Lab Setting: Individuals are experimentally manipulated in terms of weight. The participants are required to look over various types of stimuli showing a potential employee and make a decision (ex. hiring or promotion) based on their profile. The employee's weight is presented to the participants directly (verbally) or indirectly (in terms of a circumstance)Field Setting: survey data.	Significant discrimination against overweight employees. The discrimination is found in hiring processes, placement, compensation, promotion, discipline, and discharge. The evidence is found in both field and lab settings.	Weight discrimination is consistent which suggests that they are held in the workplace environment, even if the idea is stereotypical which a result of limited information to the workplace is usually. Overweight women are evaluated more negatively in comparison to overweight men. Overweight qualified were considered over normal weight under qualified, so the qualifications masked the idea of an individual being obese or not.
A meta-analysis of empirical studies of weight-based bias in the workplace (Rudolph et al., [8])	To conduct a meta-analysis of the extant literature concerning the effects of weight-based bias across various evaluative workplace outcomes. To test moderators of the weight-based bias-evaluative workplace outcome relationship.	A series of searches were conducted in PsychINFO, Proquest and ERIC using the keywords <i>obese, obesity, overweight and fat</i> , combined with such keywords as <i>selection, evaluation, promotion, workplace, managerial, applicant and performance evaluation</i> . A "snowballing" technique was used to identify relevant articles and review them. A total of 59 studies were identified for potential inclusion in the meta-analysis.	A significant overall negative effect of weight-based bias was found across evaluative workplace outcomes. The overall mean effect size was $d = -.52$ with a 95% confidence interval.	There is an overall medium effect of weight-based bias across the evaluative workplace outcomes studied to date.
Stigmatization of obese individuals by human resource professionals: an experimental study (Giel et al., [12])	To ensure validity of the current weight discrimination evidence from surveys and lab studies and present updated information on weight bias in the workplace.	Individuals had to be working in HR and make regular employment decisions to participate in the study. 12 photographs (2M and 2FM were obese) of people aged 40-50 with higher education were presented to HR participants.	127 HR participants met inclusion criteria and participated. 42% of HRs disqualified obese females. Weight produced largest inequality in selection when choosing an individual for a supervisory position.	HR professionals showed prestige normal weight individuals compared to individuals who are overweight. 19% disqualified obese males and 42% disqualified obese females. 6% considered obese females as fit for supervising position.Data suggests strong evidence of stigmatization affecting work related aspects. This suggests that individuals who are overweight have a disadvantage in advancement in work force. This should be dealt with because it could cause a problem for the individual and the society.

Table 1: Summaries of articles reviewing the types of weight discrimination in the workplace.

be successful and be commended in challenging work environments and had fewer prospects for promotions. Lastly, the review identified obesity as a risk factor for unequal treatment in the workplace. These inequities included inequity in pay, unequal treatment by superiors, and lower social acceptance in the workplace [7].

A major limitation noted by the authors for this review is that it may not represent realistic situations, as the majority of the data is derived from experimentally manipulated conditions and survey data that is self-reported or collected based on fictional obese individuals. The use of experimental designs is limiting because it is difficult to create an experiment that is high in both internal and external validity [10]. Experimental designs tend to be high in internal validity but lower in external validity. This lack of external validity translates to lack of generalizability and therefore the results cannot necessarily translate to a larger population. Although the results from these studies are compelling, having a greater number of field research studies available in the literature would allow for more concrete and generalizable results. Research conducted in real work environments may also uncover some underlying mechanisms of weight bias and help with external validity [7].

Another limitation is the lack of investigation done on the link between stereotypical beliefs and either actual bias or discrimination. This gap indicates that there is no evidence that these beliefs have a direct effect on workplace treatment and behaviour. Future research should investigate whether these beliefs and stereotypes have a causal relationship on treatment and the strength of this relationship. Moreover, investigators ought to examine the effects of weight bias across diverse and specified work environments and whether the effects found in this study would translate to different work settings and environments.

In a meta-analysis by Rudolph, Wells, Weller, and Baltes, the relationships between body weight and hiring, and performance and evaluative workplace outcomes were investigated. The authors chose to conduct this study in order to quantify the negative impact weight has on workplace outcomes. Studies were included in the meta-analysis if they included at least one overweight target group, at least one comparison group and at least one of the dependent variables was an evaluative workplace outcome (e.g. hiring decisions, promotion decisions, etc.). Across 25 studies, they found that body weight had negative implications for evaluative workplace outcomes including hiring, performance, and promotion decisions. These findings are consistent with previous findings that weight bias exists at every stage of the employment process [4,8]. However, the study did not find any significant differences in the level of weight bias across job types (high public contact versus low public contact). This finding is contrary to those of prior studies [11]. The negative effect sizes of weight-based bias were found to be strongest for hiring outcomes ($d=-0.70$), less so for performance outcomes ($d=-0.23$), and least for promotion outcomes ($d=-0.07$). The results of this article may indicate a diminishing impact of weight-based bias for these outcomes.

This meta-analysis is limited in that it used 25 studies in the investigation [11]. The authors identified 59 studies using digital academic databases and then eliminated studies using two inclusion criteria. The first criterion was that weight needed to be a manipulated variable (consisting of at least one overweight group and a non-overweight comparison group) and the second was that at least one of the dependent variables had to be a rating of an evaluative workplace outcome. Therefore, it is possible that the information is not representative of the actual weight bias situation in society since so few

studies were used in the investigation. Secondly, most of the articles used in the meta-analysis were laboratory-based designs as opposed to field studies. As a corollary, it is difficult to determine whether the same effects would be found in actual workplace settings and whether direct contact between individuals would differently affect the weight-based bias seen in laboratories. The finding that no significant differences in weight bias exist across job types must be investigated further. Past studies found significant differences for jobs that involve more public contact thus the issue must be investigated with more established parameters in order to find clearer conclusions about the real-life workplace situation. Studies on weight stigma should also target possible mechanisms of this phenomenon. Some of the mechanisms that should be investigated include how bias has developed, what associations are made with obesity to create these biases, and what other factors are associated with this bias. These investigations could be very valuable for developing and creating effective strategies to prevent and manage weight-related stigmatization.

A cross-sectional, computer based experimental study was conducted by Giel et al. to investigate weight bias in workplace settings using a sample of human resource (HR) professionals who regularly evaluate and make career decisions about other people in real-life employment settings. In the study, HR professionals were asked to evaluate individuals regarding hiring, work-related prestige and achievements based on standardized photographs. The individuals in the standardized photographs differed in terms of gender, ethnicity and BMI. The authors found that the HR professionals showed strong weight stigmatization in terms of hiring. They also found that "participants underestimated the occupational prestige of obese individuals and overestimated it for normal-weight individuals" [12]. Individuals who were categorized as obese were also less often nominated for supervisory positions. Lastly, they found that weight-related stigmatization was most prominent towards obese females [12]. Findings from this study support previous findings that weight-related stigmatization and discrimination exist in hiring and evaluative outcomes in the workplace.

A major strength of this study is its use of real-life HR professionals as opposed to self-reported weight bias or fictitious experimental designs. This study exemplifies how weight bias affects the attitudes and behaviours of HR professionals. A limitation of this study is that data was not collected regarding the perceptions the HR professionals had of the individuals in the photographs. These perceptions could also potentially help identify some of the underlying mechanisms of weight bias. This study of weight bias has given some insight into what the real-life situation looks like and shows that an underlying mechanism of weight bias exists. Future research should investigate more real-life work settings and environments.

Perceptions of obesity in society

Studies have consistently shown that North Americans hold negative perceptions and prejudicial views of obese individuals [4,5]. Unlike most discrimination, these perceptions are both accepted and encouraged [13]. On a societal level, unflattering portrayals of obese individuals are prevalent in popular culture, often representing stereotypes such as being underemployed, gluttonous and incapable of healthy relationships [4,5,14].

On a personal level, there are numerous accounts of public ridicule and discrimination in social settings, schools, in interactions with healthcare professionals and in the workplace [4,8,15]. A literature review performed by Roehling found that employees who are

overweight are viewed by their peers and superiors as lacking self-discipline, lazy, less conscientious, less competent, less healthy, more likely to be absent, disagreeable and less likely to be accepted by others (Table 2). These types of stereotypes have been shown to negatively affect employment for obese individuals [4,8,15]. These negative perceptions are not reserved for non-obese individuals. Studies have shown that obese individuals internalize weight stigmatization, which could have significant psychological consequences [4,8].

Wang et al. measured implicit and explicit attitudes about people who belong to the obese range to investigate the internalization of weight bias among adults who are overweight. All participants were considered overweight based on BMI criteria. The researchers measured explicit attitudes about people who are obese and used the Implicit Association Test (IAT) in order to implicitly measure bias and examine beliefs about 'fat people' and 'thin people'. They found that the participants demonstrated strong and consistent implicit anti-obesity

bias and no preferences for in-group members. The authors suggested that this lack of 'in-group' preference could have significant psychosocial consequences in healthcare, the workplace, and in society as a whole. They also found that participants endorsed explicit beliefs that obese people are more lazy and stupid when compared to 'thin' people. Interestingly, they found that correlation between implicit and explicit measures to be rather low. The authors suggest that this discrepancy may have been due to monitoring of attitudes for the explicit measures, which may lead to inter-rater reliability issues.

A major limitation for this investigation is that there was no way to know if participants considered themselves to be in-group members. Since weight is variable, it is possible that participants who were considered overweight based on BMI may not view themselves as individuals who were overweight (may view themselves as 'normal' weight but have recently gained some weight) therefore not considering themselves as in-group members. Future research could use group

Title	Purpose	Methods	Results	Conclusion
Is obesity stigmatizing? Body weight, perceived discrimination, and psychological well-being in the United States (Carr and Friedman, [5])	To investigate the frequency and psychological correlation of institutional and interpersonal discrimination that was reported by underweight, normal weight, overweight, obese I and obese II/III Americans.	Households were selected through random digit dialing. Disproportionate stratified sampling was used at the second stage in order to select respondent. The sample was stratified by age and gender; males and persons aged 65 to 74 were oversampled.	Bivariate analysis show that very obese persons (obese II/III) report significantly lower self-acceptance scores (5.22 vs. 5.56; $p \leq .001$), more frequent daily discrimination (1.58 vs. 1.39; $p \leq .001$), and are more likely to report experiences of any major discrimination (41% vs. 33%; $p \leq .001$), health-care related discrimination (8% vs. 3%; $p \leq .001$) and day-to-day discrimination (71% vs. 59%; $p \leq .001$). Compared to normal weight persons, those in the obese I category are more likely to report workplace discrimination (26% vs. 21%; $p \leq 0.05$) and more frequent daily discrimination (1.48 vs. 1.39; $p \leq 0.001$), although they do not differ significantly from normal weight persons in terms of self-acceptance.	Obese individuals are stigmatized in the United States. Obese individuals believe they are subject to unfair treatment in terms of employment, health and daily encounters due to their obesity and these encounters contribute to their poor self-evaluations.
Portrayals of overweight and obese individuals on commercial television[Field] (Greenberg et al., [14])	To examine the distribution and individual characteristics of body types on prime-time television.	Five episodes of each of the 10 top-rated prime-time fictional programs on 6 broadcast networks during the 1999-2000 season were quantitatively analyzed.	Of 1018 major television characters, 14% were females and 24% of males were overweight or obese, less than half their percentages in the general population. Overweight and obese females were less likely to be considered attractive, to interact with romantic partners, or to display physical affection. Overweight and obese males were less likely to interact with romantic partners and friends or to talk about dating and were more likely to be shown eating.	Overweight and obese television characters are associated with specific negative characteristics.
Work, obesity, and occupational safety and health (Schulte et al., [15]).	To examine whether obesity may also be a co-factor in the development of occupational asthma and cardiovascular disease and how it may contribute to the worker's response to occupational stress, immune response to chemical exposures, and risk of disease from occupational neurotoxins, along with many other health risk factors that could be a reason for workplace lost time.	-12 studies (cross sectional) identified that used job stress in association with BMI. demand control model used in 8 and other measures were used for remaining four studies	-4 studies showed significantly positive relationship with BMI, remaining 4 showed none. 2 of the studies that had another measure also showed a positive statistically significant relationship -obesity is positively associated with absenteeism -certain literature suggests that obesity may be linked to certain occupational diseases -many health factors including asthma, diabetes, HAVs, work related musculoskeletal disorders, stress, etc	Work and obesity contribute to population morbidity, mortality as well health care and societal expenses. Employers have been responsible for the preventing these, but employees have been held accountable for the prevention of their own weight.

<p>The influence of the stigma of obesity on overweight individuals (Wang et al., [13])</p>	<p>To examine the internalization of anti-fat bias among overweight individuals across man attitudes and stereotypes</p>	<p>Two studies were conducted using the Implicit Association Test (IAT), a performance-based measure of bias to examine beliefs among overweight individuals about 'fat people' vs. 'thin people'. Study two also contained explicit measures of the perceptions people hold about obese people.</p>	<p>Participants exhibited significant anti-fat bias on the IAT across several attributes and stereotypes. They also believed that fat people are lazier than thin people.</p>	<p>Unlike other minority group members, overweight individuals do not appear to hold more favorable attitudes toward in group members. This in group devaluation has implications for changing the stigma of obesity and understanding both the psychosocial and medical impact of obesity on those affected.</p>
<p>A comparison of direct vs. self-report measures for assessing height, weight and body mass index: a systematic review(Gorber et al., [16])</p>	<p>To investigate what empirical evidence exists in terms of agreement between objective (measured) and subjective (reported) measures of weight height and BMI.</p>	<p>The systematic review searched MEDLINE, EMBASE, CINAHL, PsycINFO and SPORTdiscus. 328 citations were initially identified using the search terms. Of these, 64 citations were included that met criteria after exclusions were made.</p>	<p>Overall, the data showed trends for under-reporting weight and BMI and over-reporting for height when compared to direct measures. The standard deviations were large which indicates a great deal of variability in self-reporting. These trends were valid for both men and women.</p>	<p>The large standard deviations could have implications for population health since even minor differences in body weight can significantly change BMI classifications. This could indicate that the prevalence of obesity is underestimated. The authors suggest that adhering to standardized criteria for measure could eliminate gaps in the literature. Having more accurate estimations of population obesity could aid in drawing better conclusions in allocating resources and health priorities in society.</p>
<p>Estimates of obesity based on self-report versus direct measures (Shields et al., [3])</p>	<p>To investigate the bias resulting from individuals completing a self-report on their weight rather than directly measuring height, weight and body mass index (BMI).</p>	<p>The analysis is based on 4,567 individuals gathered from the 2005 Canadian Community Health Survey (CCHS) who provided self-evaluations of their body weight and height in a face-to-face interview. They were then measured by trained interviewers compared their measured body weight and height to their perception.</p>	<p>On average, males guessed their height by 1 cm more, and females, by 0.5 cm. Females reported their weight by an average of 2.5 kg less; males, by 1.8 kg. The bias in reporting their personal weight was strongly related with the BMI category that had been measured. People who were overweight were more likely to report themselves as underweight, especially for those that were obese, compared with people of normal weight. When comparing measured to self-reported values, obesity was 9 percentage points higher in the male sample and 6 points higher in the female sample.</p>	<p>The collection of self-reported height and weight data will continue in large-scale health surveys. This is because the studies portray a bias in self-reported weight and height allowing error in classification of the population by BMI category. Obesity occurred 7 percentage points higher in the measurement aspect of weight and height than the estimate based on self-reported data (22.6% versus 15.2%).</p>
<p>Review of community-based research: assessing partnership approaches to improve public health (Israel et al., [17])</p>	<p>To provide an overview of key principles in community based research. It examines its place within the context of different scientific procedures, discuss reasons for its use, and explore the obstacles and factors that are facilitating. It observed the implications for providing community-based research that aims to improve the well-being of the public.</p>	<p>The literature review is compiled of diverse communities whom address multiple problems. The authors discuss the obstacles, problems, and things that prevent the situation from moving further. The also address factors that can help with the situation and things that can be learned from it.</p>	<p>When people cannot maintain the partnership between the community and the researchers, it can pose great challenges and drawbacks to the collection of the data. This can be due to the researchers being untrustworthy, equality, funding, and perspectives. It can also be a problem because the whole procedure is time consuming and the community being defined.</p>	<p>Community-based research is an approach that public health researchers take in order to improve public health as a very important value (173). The efforts of the partners involved can help make community-based research approaches better. This can contribute to the health of the communities that are involved in the research.</p>

Table 2: Summaries of articles addressing the perceptions of obesity in society.

membership as a criterion for inclusion in order to get a clearer picture of internalization of weight bias. Another consideration was the low correlation between implicit and explicit measures of weight bias. This finding should be further investigated to identify the psychological factors and the mechanism associated with this discrepancy. Lastly, it may be interesting to investigate the effects this internalized weight

bias has on the behaviours of individuals who are overweight. Perhaps the lack of in-group membership also translates into discrimination against in-group members. The implications for the in-group stigma against individuals who are overweight found in this study may only perpetuate the stigma toward obesity. Carr and Friedman investigated the frequency and psychological correlates of discrimination reported

by US citizens of different weight categories. The study surveyed over 3000 adults who were divided into weight categories based on BMI (ranging from underweight to obese). The first set of analyses looked at the predictors of perceived discrimination (these included major lifetime and day to day discrimination) and the second part looked at self-acceptance as a measure of psychological wellbeing [5]. They found that individuals in the highest BMI group (≥ 35) reported more institutional and day-to-day interpersonal discrimination.

Among individuals who are obese, professional workers were more likely to report employment discrimination and interpersonal mistreatment [5]. Furthermore, individuals from the highest BMI group reported lower levels of self-acceptance than 'normal' weight persons. However, this relationship was completely mediated by the perception that one has been discriminated against due to body weight or physical appearance [5]. Irrespective of how an individual who is obese is treated, the perception that they are treated unfairly is perpetrated by the negative views of obese people held in North American society and may contribute to negative self-perceptions for these individuals. The findings offer further support for the pervasive stigma of obesity and the negative implications of discriminatory biases.

One of the major limitations of this study is that it relies on self-reported weight and height (for BMI calculation) as well as self-reported experiences of discrimination and self-acceptance. A systematic review performed by Gorber et al. found consistent trends of under-reporting weight and over-reporting height in self-reports, which is a major issue for collecting accurate data. This could be due to the social pressure to conform to more desirable and socially accepted standards [3]. Furthermore, it is possible that other life factors such as chronic illness and childhood experiences could affect perceptions of discrimination and self-acceptance. There is also the possibility that the measure of self-acceptance used was confounded by experiences of discrimination. Obese individuals may view positive life accomplishments as negative because discrimination hindered their efforts [5].

Lastly, because the study used cross-sectional data, there is no way of knowing if the effects are causal or correlational. Using a quasi-experimental design, future research should further investigate whether there is a direct line of causation between increased weight and self-perceptions as well as other confounding variables associated with these negative self-perceptions. Furthermore, the correlates between other psychological and economic factors and weight-related discrimination should be investigated. These future studies should also be conducted in real-life employment environments rather than relying on perceived experiences of discrimination.

There are, however, some factors to consider in terms of conducting research in the workplace. First, attaining approval from employers and unions may be difficult to acquire. Second, creating research questions that are of interest and could result in gain (monetary, higher work output, etc.) for the employer is a consideration. Third, researchers must ensure that their work will not disrupt the current workplace and lastly, conflict could arise if the results of the research are not aligned with the desired outcomes of the employer [16,17]. Although field research is necessary, these are potential issues to consider.

Public policy and interventions

Court cases for weight-related discrimination in the workplace have been met with mixed results. The only cases that have won were those who could show that individuals were 'morbidly obese' (defined as being 100 lbs overweight or 100% over recommended weight) and

could therefore qualify as 'disabled.' Such cases were able to utilize the Rehabilitation Act or the Americans with Disabilities Act (ADA) for their court cases in the US [9,18]. There is no legislative protection for obese persons who do not qualify as 'morbidly obese.' It is currently completely within the rights of the employer to discriminate against obese employees [18]. Michigan is the only state that has passed legislation making it illegal to discriminate against individuals based on physical appearance or weight [9,18].

In Canada, the focus has been put on intervention strategies. Such strategies have included individual based strategies as well as social change models that include environmental and population strategies. Individual based strategies include promoting healthy living in terms of nutrition and physical activity, family-based prevention and counseling services. Societal level strategies include reorganization of retail food outlets, community nutrition and lifestyle education campaigns, implementation of health promotion programs in the workplace [19,20].

The consistent findings that weight-related workplace discrimination exists demonstrate the need for this policy change (Table 3). This is especially true since employment is a universally recognized human right [18]. There is also evidence that introducing company policies regarding weight bias could help alleviate weight related bias in the workplace [4,9]. Furthermore, the implementation of interventions in the workplace itself has shown promising results.

A review was conducted by Anderson et al. to investigate the effectiveness of workplace programs for health and weight management among employees. The interventions included the implementation of nutrition and physical activity programs, counseling, information and behavioural strategies, and environmental changes like changing the types of foods available in cafeterias. The review included 47 studies and the effectiveness of the programs were measured by weight-related outcomes. The authors found that worksite health promotion programs yielded modest reductions in weight (average loss of 2.8 pounds overall) and BMI (average decrease in BMI of 0.5) twelve months after the programs were implemented. These program effects were consistent across a variety of workplace settings [21]. They concluded that there is strong evidence that workplace interventions are effective; however, the effect size is modest. These findings were applicable to both men and women. Yet, "there was limited evidence to draw conclusion about differential effects by program focus" [21].

A cross-sectional online survey design conducted by Puhl and Heuer found that there is substantial support for legislative measures to prohibit weight related discrimination in workplaces in United States. The sample indicated strong support for laws to be in place to "prohibit employers from refusing to hire, firing or denying promotions to qualified obese employees" [22]. Conversely, the results indicated that very little support exists for obese persons to share the same protections as people with disabilities. This suggests that Americans may not consider obesity as a disability. This is of interest because the ADA is currently the only means for obese persons to seek legal recourse for weight related discrimination in the workplace. The authors concluded that change in legislation is needed and is supported by the US population to protect obese persons from weight related discrimination in the workplace.

A limitation of this article is that it was conducted online. This could have an effect on how representative the sample is of the population. It could also have an effect on attitude monitoring as people may feel more comfortable being honest when they are faceless but may show

Title	Purpose	Methods	Results	Conclusion
A historical analysis of public health, the law, and stigmatized social groups: the need for both obesity and weight bias legislation (Pomeranz, [18])	The article addresses the need for the setup of both science and public support in order to get the government to take more initiative in health disparities of individuals that have been stereotyped.	The supreme court was responsible for reducing the bias against the affected group.	The supreme court did not receive support from the public but instead got the public to blame the victims for their own health. Victims had to face health problems because they were not addressed by the discriminatory action. Public support therefore is necessary in order to prevent discrimination towards individuals. Under the constitution of federal law, it is not illegal to discriminate individuals based on their weight.	Public health professionals should continue to educate the public on the realities of obesity and weight bias. The toxic society and the government's role in our wellbeing and lack thereof must not be ignored. Individualism the government should not be allowed to turn away from the current health crisis simply because current notions of socially desirable traits allow them to.
Obesity in Canada: a Joint Report from the Public Health Agency of Canada and the Canadian Institute for Health Information[Field] (Public Health Agency of Canada, [19])	A report that has compiled information relative to obesity and ways in which we can prevent and treat it. It is made for individuals such as health planners to find solutions to the obesity problem in Canada.	Descriptive analysis to measure the consistency of obesity across different classes, ethnic background, age, sex, etc.	<p>1/4 of adults are obese, where obesity increases as age does in both male and females.</p> <p>-physical and psychological problems of obesity may start to exist during the beginning of childhood. This was 2.5 times higher in 2004 than 1978/79 in children aged 2-17</p> <p>-96% obesity in children and young adults aged 6-17</p> <p>-self reported obesity has been lower than when it is portrayed by others in both adults and children</p> <p>-Obesity is more concurrent in boys than girls</p>	<p>Obesity and leisure time activity are inversely related</p> <p>-psychological, social, and physical characteristics contribute to obesity</p> <p>-diet also a factor contributing to obesity (low consumption of healthy foods may make inferences for obesity)</p> <p>-Females-income increases, obesity decreases. For males-no apparent pattern.</p> <p>Two risk factors- social determinants and health behaviour's. Obesity associated with health risks (type 2 diabetes, asthma, digestive track diseases, back pains, cancer, etc)</p> <p>-Solutions: health promoting services targeting obese individuals, interventions in the community that target behaviors, environmental determinants can be targeted by public policies, training that modifies behavior of individuals, diet plans, and regular physical activity.</p>
The effectiveness of worksite nutrition and physical activity interventions for controlling employee overweight and obesity: a systematic review. (Anderson et al. [21])	Reviewed literature and assessed the effect of presenting nutritional and physical behaviors as mediators in the work place in order to control weight	Searched for evidence on databases using relevant keywords. To be included in the review, the studies had to assess health promotion programs on the work site and targeted people over the age of 18 (excluding retired individuals).	54 candidates studied in 78 papers met inclusion criteria. 7 studies excluded. 3 outcomes examined: weight in lbs, BMI, change in % body fat. Intervention compared to untreated control group. Some excluded due to small sample size.	Strong evidence of an effect of workplace nutrition and physical fitness guides.
Public opinion about laws to prohibit weight discrimination in the United States (Puhl and Heuer, [22])	To review literature on discriminatory attitudes and behaviors toward obese individuals in order to integrate this information to show whether systematic discrimination occurs and why, and to discuss needed work in this field.	Online Survey made for a sample recruited from survey sampling international (SSI). Participants reported age, sex, highest level of education, household income, height, and weight). They then read a passage addressing weight and answered questions. They finally were asked questions on experiences they dealt with involving teasing and discrimination relative to weight.	1059 participants, excluded if incomplete information which left the study focusing in on 1001 participants. Women teased more about weight. People who agreed with one law were more likely to agree with others and vice versa. Agreement for laws preventing obesity discrimination was stronger, than laws that considered it a disability. Obese individuals were more in favor of the laws compared to normal weight individuals.	Discrimination against the obese is very real and affects health and well-being. There is sufficient information to justify aggressive treatment of this topic in research, legal and real-world settings.

<p>Overweight and obesity in Canada: A population health perspective (Raine, [20])</p>	<p>The purpose of the paper is to acknowledge the problem of obesity, ways in which it can be prevented and controlled, the population's perspective on what determines obesity, and finally the strategies for addressing obesity and what determines obesity.</p>	<p>Literature collected was from both peer reviewed research publications through various health related databases and program documents that were in government web sites. Literature was identified through MEDLINE, ERIC, psyclINFO, and CINAHL from 1997 to 2003. Bibliographies of relevant papers were also screened which revealed some relevant references.</p>	<p>Obesity tends to increase in industrialized countries (>5%) in Canada which was only limited to self-report data. Individuals who were overweight had a BMI >25. In Canada, from 1970-1972 percentage of people with BMI >25 was 47% in women and 33.9% in men. In 1978-1979, BMI >25 percentage increased to 55.6% in men and 42.3% in women. Finally from 1986-1992, BMI >25 increased to 58.1% in men and 40.6% in females. So obesity was gradually increasing throughout the years. Children have increased from 15% for both boys and girls to 35.4% obese in 1996 for boys and 29.2% obese for girls.</p>	<p>The increase in obesity among Canadians has been increasing quickly and poses and explanation for an epidemic. Because obesity is on the rise, the mean BMI of the population is on the rise as well. Obesity threatens the health of individuals and can contribute to cardiovascular disease, diabetes (Type II) and cancer. This can be vital for the society, workplaces, and health systems and needs to be addressed using certain prevention and control methods.</p>
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Table 3: Summaries of articles addressing public policy and interventions.

less support when in person. This is a concern because of how people who are obese are represented in society; there may be less support in social situations. As such, the relationship between the attitudes of those supporting legislation change and behaviours toward individuals who are obese should be investigated. Interestingly, this undertaking is the first of its kind, as it sought to investigate the perspective of the general public on the issue of weight related discrimination in employment. This is notable as there seems to be support to protect individuals who are obese but not under the same protections as those with disabilities. The variables and attitudes surrounding this finding should be explored in future studies. It may also be beneficial to investigate interventions on the practices of those who are doing the discriminating in order to achieve better results in minimizing weight bias in the workplace.

This review includes a number of limitations. First, only English language articles were included in the search. Second, demographic information was not collected for a number of the included studies. Therefore, there may be other variables at play. There may be other outcome measures collected that were not reported in these studies that could be relevant to weight related interventions such as physical and mental health effects. Third, studies that did not include weight outcomes in their health promoting programs were not included which could have relevant results in terms of intervention strategies [22]. The study included health-promoting programs from a variety of workplace settings, which may suggest that the results could potentially be generalizable. However, the study also included different workplace sizes, which could have an effect on the results, as smaller workplaces could be overrepresented. In future studies, it may be useful to identify the most effective interventions for health promotion in the workplace and to use measures to identify if interventions are working for those who need them most. It may also be useful to identify if these interventions have an effect on productivity and economic outcomes. Finally, this review did not consider the objective based measures on workplace performance metrics. Currently, the literature states that workers with obesity perform more poorly than their lean counterparts on measures of attention [23], psychomotor speed [24,25], executive function [26-29], memory [26], and (less consistently) language abilities [26]. Moreover, the issues reviewed as bias could possibly be due to differences in adequacy of workplace performance, and might not actually reflect bias.

Recommendations

We have provided recommendations for future research considerations, suggestions for clinicians to consider the impact of

weight bias on a workers health. Moreover, there are recommendations for broader public and health policy to directly address weight-bias in the workplace.

Types of weight bias in the workplace

Various qualitative reviews have concluded that individuals who are overweight face weight bias and discrimination at every stage of the employment procedure [4,7,8] and across evaluative outcomes including hiring, promotions, and compensation [4,7-9].

However, to date, much of the research in the area of weight bias in the workplace has been conducted in experimentally manipulated conditions. To further elucidate the intricacies of weight bias in the workplace, future research should focus on real world studies using participants who are directly involved in workplace interactions with individuals who are overweight, both as supervisors and employees, and at varying amounts of interaction. These field studies should also review levels of bias in the environments in which individuals' work, mainly with individuals who are overweight (work environments such as weight loss clinics in which individuals who are overweight do not necessarily form the "out-group members"). Building on this strategy, the attitudes of employees who work specifically with individuals who are overweight or obese should be studied over time in order to examine whether they can change according to context and after prolonged interaction with individuals who are overweight.

Differences in results in terms of whether weight bias exists across job types (professional, technical, unskilled labor, etc.) must also be investigated further. In the meantime, workplaces could consider changing human resources policy by increasing accountability and transparency in hiring practices in such a way as to discourage discrimination while also making the evaluative process "blind." That is, by having third party supervisors review employee performance and achievements without necessarily seeing the employees who are being reviewed. Of course, the feasibility of such measures is doubtful and efforts would have to be made to convince employers of their benefit to the organization.

Finally, researchers and clinicians should conclusively determine whether weight bias translates to discriminatory behavior in the workplace. Given that a woman who is overweight are disproportionately affected by weight bias [12], the relationship between a woman's age, level of obesity and self-reported instances of discrimination should be studied more in detail. Although a worker living with obesity frequently

voice a request for greater support from their health care professional for weight management [30], most workers living with obesity do not discuss weight issues with physicians [31]. Clinicians need to work closely with workers living with obesity to provide care that is respectful, non-judgmental, and sustained [31].

Perceptions of obesity in society

Studies have been concurrent and shown that North Americans hold a negative perception of obese individuals [4,5]. Research has shown that these perceptions are both accepted and encouraged by society [13].

In light of this state of affairs, policies should be developed to protect persons who are overweight from discriminatory hiring practices and treatment in the workplace. Workplaces may choose to mention protection of obese persons in onboarding documents, in statements of equal employment opportunity in job postings and during dialogues about workplace discrimination and harassment during initial employee training. Human resources personnel could receive training on prejudice against obese employees and be held accountable for their hiring practices.

In the spirit of developing programs to change societal bias, researchers and clinicians should examine how early discriminatory perceptions are formed by conducting studies amongst school aged children as well as workers of varying age groups in professional, technical and other work settings. In addition, the correlation between popular media consumption in hours and level of bias should be examined. Finally, the permanence of bias should also be studied in order to determine the optimal age at which education and awareness programs should be instituted in schools. Further research should examine whether there are differences amongst cultures in perceptions of overweight people (e.g., for example, do people from cultures in which excess weight is viewed positively, display the same bias against obese people once removed from their countries of origin?).

Public policy and interventions

Given that there is currently no legislation in place that directly protects overweight individuals from discrimination in the workplace, policies should be developed to provide such legislative protection for overweight and obese persons at work. New regulations and laws may be created as a subsection of wider scope policy on healthy workplaces forbidding discrimination based on appearance or disability. In the case of the latter, governments would also need to amend existing legislation in order to recognize obesity as a disability.

In addition, prior research by Anderson et al. has shown that efforts to create healthier workplaces have been successful thus far, therefore further efforts should be made to make work settings healthier. This can be done by regulating aspects such as maximum working hours and time spent on sedentary work, while also ensuring there are more stringent procedures in place to ensure that employers abide by this legislation. To this end, an annual inspection of workplaces by health and safety inspectors is a possibility. Another possible implementation could be to require the creation of a workplace health and safety committees in order to ensure that employees are able to participate in the health and safety decision making process at their place of work.

Despite any new legislation, employers may still choose to avoid practices aimed at making workplaces healthier. For example, smaller companies or employers under financial duress and may meet the aforementioned suggestions with resistance in a bid to maximize the

working hours of their staff. To avoid such a situation, governments may wish to provide financial support to employers taking steps to improve in this area of employee experience.

Researchers and clinicians may also play a part in improving public policy related to weight bias by directing their focus to the study of employer motivations for the adoption of health and safety programs in the workplace. In other words, researchers should study the motivations of employers, their financial concerns, and their perceptions of overweight employees in order to determine how best to overcome apprehensions about changes in workplace structure or policy aimed at decreasing weight bias and improving the health of employees.

Discussion

Obesity and weight bias are growing issues in Canadian society and must be regarded as serious problems. This stigmatization has serious socio-economic, health and psychological consequences for obese individuals. Now that the types and prevalence of weight bias have been identified, the focus must move toward identifying how to rectify this societal issue. The mechanism underlying the stigma must be identified so that effective intervention strategies can be developed and implemented. In order to develop policy that addresses the stigmatization of obesity in the workplace and to better understand weight bias and its underlying mechanisms, more field research is necessary. As a public health issue, there is a need to educate the public and employers on the topics of obesity and weight bias in order to raise awareness of this pervasive issue. The continued development of preventative strategies targeting weight stigmatization and stigma management in the workplace and other institutions is necessary. Finally, there is also a need to advocate change in current legislation in order to prohibit discrimination and protect obese individuals from weight related discrimination.

Conclusion

The aim of this paper was to review and evaluate what constitutes obesity stigma in the workplace. Employees may experience stigma, decreased job satisfaction, and lower quality of work life. For employers, less productive workers results in lower profits. Policy makers also have a role to play by drafting and creating public health policy. Effective health policy needs to incorporate the health, cultural and social contexts of weight bias, and its relationship to quality of work life. National recognition and support of factors related to job satisfaction and quality work environments may help in identifying weight bias and in turn lead to solutions to eliminate it in the workplace. Ultimately, this is a multifactorial health issue that requires stakeholder collaboration from community organizations and funders of health care services delivery.

Conflict of Interest

None to declare.

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