A health promotion-based investigation of weight stigma and physical activity

by

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Abstract

The purposes of this dissertation were to examine the relationship between weight stigma and physical activity (PA) from the perspective of women with obesity and investigate strategies that may reduce the impact of PA-related weight stigma. I conducted three studies to address these objectives.

Study 1, entitled *Motivated, Fit, and Strong – Using counter-stereotypical images to reduce weight stigma internalization in women with obesity*, aimed to reduce weight bias internalization over the course of three weeks by changing automatic associations between weight and PA using evaluative conditioning principles. Participants in the implicit retraining group (n=48) repeatedly viewed counter-stereotypical images of people with obesity paired with positive PA words. Participants in the control group (n=55) read Canada's PA guidelines and set a weekly PA goal. The results showed that there was no time by group interaction or main effect of group on weight bias internalization, the main outcome of the study. There were no differences between groups or over time for PA attitudes, self-efficacy, or self-reported behaviour. Sixteen women participated in follow-up interviews to provide their perspectives on the images. They believed the images could help challenge widely held stereotypes about weight, fitness, and health in the general population, improve self-perceptions and encourage PA among individuals with obesity, and help identify safe and inclusive spaces for PA. However, they also noted that the images could cause a backlash to maintain or even increase negative weight-related beliefs and that organizations involved in PA may not be willing to use the images.

Study 2, entitled *Exploring the impact of physical activity-related weight stigma among women with self-identified obesity*, sought to understand how women with obesity experienced,

responded to, and were impacted by PA-related weight stigma. In this study, I applied a qualitative interpretive description approach informed by health promotion. Data was generated through semi-structured telephone interviews (n=16) and data analysis occurred through an inductive and iterative coding process. Women's experiences of PA-related weight stigma included weight stigmatizing comments and treatment, a lack of plus-size exercise clothing, inaccessible exercise equipment, and weight-centric PA messages. These experiences led to a range of emotional responses (e.g., shame, guilt, sadness, and anger) and a heightened anticipation and dread of future weight stigmatizing experiences. As a result, the women used self-protection strategies, attempted to change their body, and sometimes resisted weight-related beliefs and practices. The impacts of weight stigma on PA were to view PA as a 'lose-lose' situation, view PA as a means to an end (i.e., for weight loss), and to uncouple PA from body weight.

Study 3, entitled *Experiences of size inclusive physical activity settings among women with obesity*, investigated experiences of size inclusion within structured PA settings using interpretive description informed by an ecological settings-based approach. Women with obesity (n=9) participated in face-to-face interviews. An inductive approach was used to analyze the data and the findings were organized according to ecological levels of influence. At the individual level, size inclusion was characterized by enhanced well-being, self-worth, and belonging. This was directly connected with women's experiences at the interpersonal level, which included the use of weight-neutral practices by group and individual fitness instructors and the encouragement and lack of judgment from other exercisers. At the organizational level, an inclusive organizational culture, weight-neutral marketing, specialized programs, and accessible physical

environments contributed to size inclusion. However, weight stigmatizing beliefs and practices at the community level were believed to influence PA settings and compromise size inclusion.

Taken together, the findings of this dissertation demonstrate that weight stigma is prevalent in the PA context and this has implications for health and health equity for women with obesity. They also show that weight stigma is a multidimensional process and thus multiple strategies will be needed to reduce it. Some recommendations for PA promotion and practice are to increase the diversity of body sizes portrayed in PA images, change prevalent weight and fitness stereotypes, adopt weight-neutral approaches to PA messaging and instruction, develop a culture of size inclusion, address accessibility barriers in PA settings, and improve the availability and affordability of plus-size exercise clothing. Researchers and practitioners must also be cautious of any unintended consequences in their efforts to reduce weight stigma.

Preface

This thesis is an original work by Maxine Myre. The research studies received ethical approval from the University of Alberta Ethics Board. Study 1 (Pro00069050) was approved December 21, 2016 and an amendment was approved March 8, 2017. Study 2 (Pro00076349) was approved September 28, 2017. Study 3 (Pro00084775) was approved September 14, 2018 and a renewal was approved August 27, 2019.

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Dedication

This dissertation is dedicated to my sister, Brianne Myre.

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Chapter 1

Introduction

> *In fat obsessed cultures, we are all 'lipoliterates' who 'read' fat for what we believe it tells us about a person. This includes not only their moral character but also their health.* (Graham in Kulick & Meneley, 2005, p.178-179)

Weight stigma in physical activity

In Canada and other Western societies, people living with obesity[1] are judged, shamed, excluded, and discriminated against – in other words, stigmatized – based on their weight (Pearl, 2018; Puhl et al., 2015). It is now recognized that weight stigma contributes to negative health outcomes and inequity (Hatzenbuehler, Phelan, & Link, 2013; Pearl, 2018) and the implications are extensive, especially for women (Fikkan & Rothblum, 2012). These include direct and indirect effects on health and well-being, as well as reduced resources and opportunities for achieving health (Chrisler & Barney, 2017; Lewis et al., 2011; Puhl & Heuer, 2009). Yet, weight stigma remains pervasive and often goes unnoticed and unchallenged in the general population (Pearl, 2020; Puhl et al., 2015). Individuals with obesity are generally characterized as self-indulgent, lacking discipline, and failing to engage in the 'right' behaviours to 'take control' of their weight (LeBesco, 2011; Wray & Deery, 2008). These negative stereotypes translate to

[1] Person-first language is used throughout the dissertation, except when matching the language used in a cited study or by a research participant. Further discussion of terminology can be found in the Chapter 3 section entitled "Ethical considerations – Language".

blame, biased treatment, exclusion, and discrimination in all areas of life. Unsurprisingly, weight stigma extends to the context of physical activity (Cardinal, Whitney, Narimatsu, Hubert, & Souza, 2014; Rich & Mansfield, 2019). While physical activity can promote physical, emotional, and social health (Public Health Agency of Canada, 2018), individuals who experience weight stigma may not be afforded the resources and opportunities to participate in physical activity and gain these benefits.

Physical activity-related weight stigma can be perpetuated in many ways. For instance, physical activity promotion materials such as images, advertisements, and popular media commonly portray individuals with obesity negatively (Willis & Knobloch-Westerwick, 2014). Also, individuals with obesity are often laughed at, pitied, and shamed in physical activity settings (Flint & Reale, 2016). This may lead individuals to feel self-conscious, ashamed, and discouraged from participating (Leone & Ward, 2013; Napolitano, Papandonatos, Borradaile, Whiteley, & Marcus, 2011; Schvey et al., 2017; Zabatiero et al., 2016). Indeed, experiencing weight stigma, and more specifically *internalizing* weight stigma, has been associated with physical activity avoidance (Pearl, Puhl, & Dovidio, 2014; Vartanian & Novak, 2011), as well as other negative health outcomes (Emmer, Bosnjak, & Mata, 2020; Pearl & Puhl, 2018). This highlights the need to reduce weight stigma internalization in relation to physical activity.

Furthermore, weight stigma exists and is reproduced at multiple levels, e.g., the individual, contextual, and structural levels (Clair, Daniel, & Lamont, 2016). This means that weight stigma is more than an individual-level barrier to overcome. Our current understanding of weight stigma in the physical activity context has generally come from studies of physical activity interventions (e.g., Sabiston, McDonough, Sedgwick, & Crocker, 2009) and women's experiences of physical activity more broadly (e.g., Bombak, 2015; Scott-Dixon, 2008). More

recently, researchers have explored weight stigma from the perspective of self-identified fat women who participated in endurance sports (e.g., Inderstrodt-Stephens & Acharya, 2018; Sniezek, 2019). However, research specifically focused on the experiences and impacts of physical activity-related weight stigma is warranted.

Weight-centric physical activity practices may also contribute to physical activity-related weight stigma (Mansfield & Rich, 2013; Souza, 2015). Common weight-centric beliefs related to physical activity include the assumptions that only thin and toned bodies are physically fit; that individuals with obesity who engage in physical activity are only doing so for weight loss reasons; and that physical activity should be promoted for weight management (Mansfield & Rich, 2013). These widely held beliefs are at the root of weight-centric practices in physical activity settings, which might discourage women who do not have the 'right' body from participating in physical activity. In fact, women with obesity seek out weight stigma-free spaces where they can feel safe engaging in physical activity and exercise (Bombak, 2015; Schvey et al., 2017). Such size-inclusive physical activity settings may alleviate the impact of weight stigma in physical activity (Pickett & Cunningham, 2017b). However, the ways in which women with obesity find and experience these types of settings are not well understood. Therefore, another area that requires further research is the examination of experiences of size-inclusive physical activity settings.

Overall, it is clear that weight stigma is harmful and may prevent women with obesity from engaging in physical activity to the extent that they would like. Understanding and addressing weight stigma is necessary to promote health and health equity for people of all body sizes. This dissertation aimed to address these needs, while considering how the findings may inform health promotion practices.

Dissertation purpose

The overarching purpose of this dissertation was two-fold. It aimed to:

(i) *Examine the relationship between weight stigma and physical activity from the perspective of women with obesity (Studies 1 and 2); and*

(ii) *Investigate strategies that may reduce the impact of physical activity-related weight stigma (Studies 1 and 3).*

Structure of the dissertation

Following this introductory chapter, I review the literature that informed the dissertation's research purposes (Chapter 2) and broadly describe the paradigmatic approaches guiding the research (Chapter 3). In the next three chapters, I present the three studies I conducted, written in manuscript format.

Study 1 (Chapter 4) was a four-week online intervention to investigate whether weight bias internalization (WBI) was reduced following repeated exposure to counter-stereotypical images of physically active individuals with obesity. Women in the intervention group (n=48) completed a visual probe implicit retraining that paired professional and counter-stereotypical photos of individuals with obesity being active with positive physical activity-related words like 'fit,' 'motivated,' and 'strong'. Through principles of evaluative conditioning, the implicit retraining task was hypothesized to change automatic associations between physical activity and obesity (i.e., counter prevalent stereotypes). Women in the control group (n=55) read Canada's physical activity guidelines and set a physical activity goal for the week. Post-test WBI, the primary outcome variable, was compared between the intervention and control groups using analysis of variance. Differences in physical activity predictors (attitudes, self-efficacy) were also examined. Follow-up qualitative telephone interviews with a sub-sample of women who

were purposefully recruited (n=16) were used to gain women's perspectives about the counter-stereotypical images and what they believed to be the implications of using them in physical activity promotion.

Study 2 (Chapter 5) was a qualitative examination of physical activity-related weight stigma among women with obesity using an interpretive description approach. Sixteen women, the same participants who completed the interview for Study 1, participated in a semi-structured telephone interview. The findings represent a thematic description of (1) the women's experiences of weight stigma in physical activity, (2) their responses to physical activity-related weight stigma, and (3) the broader impacts of weight stigma on physical activity.

Study 3 (Chapter 6) was a qualitative investigation of the experiences of size inclusive physical activity settings among women with obesity. Taking an interpretive description approach, I conducted in-person interviews with nine women who self-identified as living with obesity and who had participated in physical activity that they viewed as size inclusive. These included bootcamp-style classes, yoga, dance, swimming, kickboxing, and others. The study was informed by a settings-approach to health promotion. The findings are organized to demonstrate how women's experiences of size inclusive physical activity settings reflect the interaction between individual, interpersonal, organizational, and community ecological levels.

Finally, in a general discussion (Chapter 7) I examine the findings and implications of the three studies together, describe the strengths and limitations of the research, and propose future directions for researchers and practitioners. Cumulatively, the findings from this research provide a much-needed understanding of how weight stigma, in all its forms, contributes to the exclusion of women with obesity from physical activity. The research also allows for several recommendations for reducing the impact of physical activity-related weight stigma.

Chapter 2

Literature review

> Fat *is many things, including a tissue; a signifier and symbol; a self concept; a set of experiences; and an identity that is constituted in relation to others, (sub)cultural norms, and systems of power and privilege. Fat is a curious and contradictory thing, both hypervisible and invisible; both associated with femininity and desexualized. It simultaneously signifies both poverty and abundance; public concern and private wellbeing; inadequacy and excess.* (Scott-Dixon, 2008, p. 24)

Perspectives on weight and health

Several perspectives related to body weight and its relationship with health have implications for maintaining or reducing weight stigma (Gard, 2011; Lupton, 2013; Nutter et al., 2016; Tylka et al., 2014). These are often separated into two opposing "camps"; however, a wide range of perspectives exist based on one's interpretation of available scientific evidence, as well as cultural and political beliefs (Gard, 2011). Here, I describe three broad viewpoints that are commonly discussed in the literature.

The biomedical view, also termed weight-centric or weight-normative, is considered the dominant perspective in Western societies (Bessey & Lordly, 2019; Medvedyuk, Ali, & Raphael, 2017; Nutter et al., 2016). From this view, obesity is defined by a body mass index (BMI; height to weight ratio) greater than 30 kg/m^2 and characterized as a modifiable risk factor for many chronic physical and mental health conditions including type 2 diabetes, cardiovascular disease, musculo-squeletal issues, some types of cancer, anxiety, and depression, among others (Bean,

Stewart, & Olbrisch, 2008; Corscadden et al., 2011; Williams, Mesidor, Winters, Dubbert, & Wyatt, 2015). Weight is therefore considered an indicator of health and obesity treatment (i.e., weight loss) is assumed to result in improved health (Bessey & Lordly, 2019). Since weight is believed to be regulated by an individual's lifestyle choices (e.g., eating and movement behaviours), the majority of the responsibility is placed on the individual to manage their weight (Medvedyuk et al., 2017). Proponents of the biomedical perspective argue that obesity is a major public health concern and economic burden, so the ultimate goal is to reduce the prevalence of obesity (Livingston, 2018; Nutter et al., 2016).

A second perspective is the health-centric view, which differs from the weight-centric position in part by classifying obesity as a chronic disease rather than a modifiable risk factor (Ralston et al., 2018). Similarly to the weight-centric view, obesity is acknowledged to cause negative health outcomes (Mechanick, Hurley, & Garvey, 2017). However, since the health outcomes result from adiposity – specifically fat mass, distribution, and function – BMI alone cannot be used for diagnosis (Mechanick et al., 2017; Ximena Ramos Salas, Forhan, Caulfield, Sharma, & Raine, 2017; Sharma & Campbell-Scherer, 2017). This means that a person with a BMI over 30 would not be considered to have obesity if their adipose tissue was not causing health impairments; relatedly, a person with a BMI under 30 with impaired health due to their adipose tissue could be diagnosed with obesity (Mechanick et al., 2017; Sharma & Campbell-Scherer, 2017). Additionally, it acknowledges that determinants of obesity are numerous and complex, ranging from proximal factors such as individual behaviour to more distal factors like the social and physical environment, culture, and policy (Corscadden et al., 2011; Williams, Mesidor, Winters, Dubbert, & Wyatt, 2015). Supporters of this view recognize that obesity poses a problem for population health and advocate for increased obesity treatment options and access,

improved training for health care professionals, and weight stigma reduction (Ramos Salas et al., 2017).

A third perspective is the critical weight view, in which fatness is considered a natural variation in body size and not something that needs to be changed (Ellison, McPhail, & Mitchinson, 2016; Nutter et al., 2016). In fact, the term 'obesity' is rejected, with preference for the word 'fat' as an unmedicalized descriptor (Wray & Deery, 2008). Regarding the relationship between weight and health, proponents argue that claims stating fatness necessarily leads to health impairments and reduced life expectancy are unfounded (O'Reilly & Sixsmith, 2012; Rail, Holmes, & Murray, 2010). They also draw on evidence showing that sustained weight loss is difficult to achieve and weight cycling is detrimental to health to question whether it is ethical to encourage weight loss (Bombak, 2016; Hunger, Smith, & Tomiyama, 2020). Therefore, proponents of this perspective reject the medicalization of fatness, challenge the idea that there is an "obesity epidemic," and argue against public health efforts dedicated to manage and reduce obesity rates (Gard, 2011; LeBesco, 2011; Murray, 2008).

Acknowledging that there are more than three perspectives about weight and health, each perspective has implications for promoting or breaking the cycle of weight stigma. Before considering these implications, I will explain how stigma is conceptualized and apply this to weight stigma.

Concept of weight stigma

In his classic book *Stigma: Notes on the Management of Spoiled Identity*, sociologist Goffman (1963) described stigma as a "spoiled social identity" that manifests in social interactions when a discrepancy between a person's expected and actual social identity is considered discredited or undesirable. Link and Phelan (2001) built on the foundations laid out

by Goffman to conceptualize stigma as five interacting elements: (1) an attribute is labeled, (2) the attribute is negatively stereotyped, (3) those with the attribute are separated or excluded, (4) discrimination with loss of status and loss of opportunities occurs, and (5) a lack of social and political power by the stigmatized group makes it difficult to reverse the stigmatization.

Using this conceptualization of stigma, obesity is without doubt a stigmatized condition. Individuals with obesity are labeled as different (e.g., they are compared to individuals with a "normal" weight) and that difference is subject to negative implicit and explicit stereotypes (Watts & Cranney, 2009). Personal attributes such as lazy, unattractive, self-indulgent, and disgusting are commonly used to describe individuals with large bodies (Bacon, Scheltema, & Robinson, 2001; Vartanian, 2010). People with obesity are also judged, shamed, and treated differently because of their weight. Exclusion and discrimination occur in nearly all social settings including workplaces, healthcare and educational settings, and interpersonal relationships (Puhl & Heuer, 2009). Specifically, individuals with obesity are evaluated more poorly on job evaluations and are less likely to be promoted compared to normative weight counterparts; they receive biased healthcare treatment which affects their utilization of health care services; and they are frequently teased and bullied by strangers, friends, and family (Pearl, 2018; Puhl & Heuer, 2009).

Further, individuals with obesity are portrayed negatively in all forms of media, including television, movies, books, newspapers, social media, and online (Ata & Thompson, 2010; Lupton, 2017; Pearl, 2020; Wanniarachchi, Mathrani, Susnjak, & Scogings, 2020). Compared to thinner people, individuals with obesity are less likely to be shown exercising or wearing professional clothing, are more likely to have their heads cut out of a photo or video, and are more likely to be shown consuming unhealthy food and drinks (Heuer, McClure, & Puhl, 2011;

Puhl, Peterson, DePierre, & Luedicke, 2013). In television shows and movies, larger characters are targets of derogatory fat commentary and humor (Burmeister & Carels, 2015; Himes & Thompson, 2007). Offensive comments are also common on social media, along with weight-based cyberbullying (Chou, Prestin, & Kunath, 2014; Lydecker et al., 2016; So et al., 2016). Stigmatizing obesity framing (e.g., attributing obesity to individual factors) or negative representations of individuals with obesity in the media contribute to developing and perpetuating weight stigma (Ata & Thompson, 2010; Bissell & Parrott, 2013; Boero, 2013; Chiang, Arons, Pomeranz, Siddiqi, & Hamad, 2020). Some communities have pushed back against these negative portrayals, such as online communities that promote themselves as fat accepting (Chou et al., 2014; Dickins, Thomas, King, Lewis, & Holland, 2011; Webb, Vinoski, Bonar, Davies, & Etzel, 2017). Also, registered health charities such as Obesity Canada have created freely accessible images with the intention to counter prevalent weight stereotypes in the media. On their website, they note:

> *In an effort to reduce pejorative portrayals of persons with obesity in media reporting, we have created an Image Gallery that provides a collection of photographs that [portray] individuals with obesity in ways that are positive and non-stereotypical. These images provide a fair and non-biased representation of youth and adults who have overweight and obesity. Our gallery can help promote accurate coverage of obesity-related topics in news reporting and challenge harmful weight-based stereotypes.*
> (Obesity Canada, 2017)

However, the influence of these images on perceptions of individuals with obesity is not known, especially in the context of weight stigmatizing media environments.

The aforementioned perspectives related to weight and health – i.e., biomedical/weight-centric, health-centric, and critical – can help us understand why weight stigma exists and how it is maintained. The weight-centric view perpetuates the beliefs that a person's weight is within their control, that individuals must take responsibility for their weight, and that failure to remain thin or lose weight is due to a lack of willpower – beliefs that increase judgment, self-blame, and discriminatory behaviours (Puhl & Brownell, 2003; Puhl & Suh, 2015). Unfortunately, weight-centric messages that are rooted in blame, shame, and fear are prevalent in Canadian public health policy, despite some acknowledgement of weight stigma as an issue (Alberga, McLaren, Russell-Mayhew, & Von Ranson, 2018; Medvedyuk et al., 2017; Ramos Salas et al., 2017). Therefore, the main public health goal from this dominant perspective – to reduce obesity – can perpetuate weight stereotypes and contribute to weight stigma, either intentionally or unintentionally (Simpson, Griffin, & Mazzeo, 2017).

In contrast, the health-centric perspective acknowledges that processes of weight stigma contribute to the negative health outcomes associated with obesity, beyond the effects of obesity itself (Medvedyuk et al., 2017; Pearl, 2018). Thus, health-centric proponents call for reducing weight stigma to promote health and health equity (Puhl, Himmelstein, & Pearl, 2020; Ramos Salas et al., 2017; Rubino et al., 2020). According to this perspective, positioning obesity as a chronic disease is expected to reduce stigma and improve access to and quality of care, although more research is needed to support this claim (Forhan & Ramos Salas, 2013; Ramos Salas et al., 2017). Furthermore, to reduce the emphasis on personal responsibility, more focus on the social contributors to obesity is needed (Medvedyuk et al., 2017).

There is overlap between the health-centric and critical perspectives, as they agree that weight stigma is problematic and needs to be addressed (Bombak, 2014b; Lee & Pausé, 2016).

However, advocates of the critical view argue that the medicalization of weight (including positioning obesity as a chronic disease) perpetuates moral judgment and contributes to weight stigma (Brady & Beausoleil, 2017). Individuals who perpetuate weight stigma by making judgments on moral and social worth may justify their thoughts and actions towards individuals with obesity by quoting health concerns, believing they are on "safe moral ground" (LeBesco, 2011). Another area of agreement with the health-centric perspective is the call to address health inequalities based on social determinants of health; however, according to the critical perspective, obesity prevention and treatment should not be used as a rationale to do this since improvements to social inequities are good for everyone, not just fat people (Brady & Beausoleil, 2017). I conducted the research in this dissertation at the intersection of the health-centric and the critical perspectives, e.g., by acknowledging the health impairments of obesity while challenging taken-for-granted assumptions about obesity/fatness. Despite the tensions between perspectives, bridging the gap is necessary to develop health promotion efforts to address weight stigma (Bombak, McPhail, & Ward, 2016; Trainer, Brewis, Hruschka, & Williams, 2015).

Health consequences of weight stigma

Regardless of the perspective adopted on the relationship between weight and health, they agree that weight stigma is pervasive and detrimental to mental and physical health, well-being, and quality of life (Lee & Pausé, 2016; Nutter et al., 2016; Prohaska & Gailey, 2019; Puhl & Suh, 2015; Wu & Berry, 2018). Perceived weight stigma has been associated with negative mental health outcomes such as increased anxiety, poor self-esteem, body image issues, and depression (Emmer et al., 2020; Puhl & Heuer, 2009). It has also been related to physical health outcomes like increased physiological stress, obesity, and diabetes (Puhl & Suh, 2015; Wu &

Berry, 2018). Importantly, the health impacts of weight stigma occur beyond those caused by obesity (i.e., adipose tissue impairing health; Hunger & Major, 2015; Medvedyuk et al., 2017).

Various pathways are involved in the health consequences of weight stigma. The mechanism occurring at the biopsychosocial level is the elicitation of stress, which triggers physiological, psychological, and behavioral processes that lead to negative health consequences (Tomiyama, 2019). In other words, the health outcomes of weight stigma occur *directly* through increased physiological and psychosocial stress and *indirectly* via coping and health-related behaviours (Brewis, 2014; Major, Eliezer, & Rieck, 2012; Papadopoulos & Brennan, 2015; Pearl, 2018; Tomiyama, 2014). The most commonly examined behaviours include seeking and accessing medical or health care, eating behaviours such as binge eating, and physical activity (Puhl & Heuer, 2009). As a result of direct and indirect effects on health, a vicious cycle is created whereby weight stigma leads to weight gain and weight gain leads to more weight stigma, and so on (Puhl & Suh, 2015; Tomiyama, 2014). This means that weight stigma perpetuates obesity, which directly contradicts the belief that increasing stigma will motivate individuals to lose weight (Puhl, Himmelstein, & Pearl, 2020).

Another mechanism involved in the relationship between weight stigma and health occurs at the socio-structural level because having unequal access to resources and biased treatment perpetuates health inequities (Clair et al., 2016; Hatzenbuehler et al., 2013). For example, employment discrimination due to weight may lead to income disparity, a social determinant of health (Fikkan & Rothblum, 2012).

Weight stigma internalization

Individuals are affected differently by experiences of weight stigma. One reason is the extent to which social beliefs about weight are *internalized* (Durso & Latner, 2008; Pearl & Puhl,

2018; Pudney, Himmelstein, Puhl, & Foster, 2020). Weight stigma internalization is related to how stigma is felt, by experiencing or anticipating a stigmatizing experience, and "the reduction of self-worth and accompanying psychological distress" (Bos, Pryor, Reeder, & Stutterheim, 2013). Weight stigma internalization is related but distinct from experienced weight stigma, and it is more strongly associated with negative health outcomes (Emmer et al., 2020; Papadopoulos & Brennan, 2015; Pearl & Puhl, 2016).

Weight stigma internalization has primarily been measured using questionnaires such as the Weight Bias Internalization Scale (Durso & Latner, 2008) and the Weight Self-Stigma Questionnaire (Lillis, Luoma, Levin, & Hayes, 2010), among others. Using these methods, researchers have found that greater weight stigma internalization was related to elevated levels of depression and anxiety, emotional distress, body shame, and reduced general health (Forbes & Donovan, 2019; Hilbert, Braehler, Haeuser, & Zenger, 2014; Pudney et al., 2020). It has helped explain the impact of BMI on self-reported physical and mental health indicators (Latner, Barile, Durso, & O'Brien, 2014). Additionally, weight stigma internalization has been related to maladaptive coping responses such as disordered eating (Hayward, Vartanian, & Pinkus, 2018; O'Brien et al., 2016; Puhl, Moss-Racusin, & Schwartz, 2007) and a reduction or avoidance of physical activity in women (Pearl et al., 2014; Vartanian & Novak, 2011).

Research about weight stigma internalization using qualitative methods has also contributed to our understanding of its negative impacts. Using phenomenological (Williams & Annandale, 2018) and narrative (Ramos Salas, Forhan, Caulfield, Sharma, & Raine, 2019) approaches, researchers have demonstrated the ways in which weight stigma internalization is felt and has a negative influence on identity and self-worth. Individuals with obesity reported feeling as though they had "done this to themselves" and that it was their responsibility to lose

weight. Internalizing weight stigma could lead to long-term rumination about weight stigmatizing experiences and blaming one's self for its consequences, regardless of whether one loses weight or not (Pudney et al., 2020). Despite repeated weight loss efforts, which typically involved physical activity, a lack of long-term weight loss contributed to a sense of failure, shame, and reinforced internalization.

Weight stigma in the context of physical activity

Physical activity is defined as any movement of the body leading to energy expenditure (Public Health Agency of Canada, 2018). It can range from light to vigorous intensity and encompasses activities such as sport, recreation, activities of daily living like household chores, active transportation, and others (Public Health Agency of Canada, 2018). Regularly engaging in physical activity is associated with many benefits to health and well-being that are independent of age, gender, race, ethnicity, and socioeconomic status (Collins, 2004; Public Health Agency of Canada, 2018; Tremblay et al., 2011). These include physical health benefits such as preventing chronic disease, achieving a healthier body composition, and improving physical fitness (Tremblay et al., 2011; Warburton, Charlesworth, Ivey, Nettlefold, & Bredin, 2010), as well as mental and psychological benefits like improving quality of life, self-esteem, mood, cognitive functioning, and enjoyment, and reducing anxiety and depression (Penedo & Dahn, 2005; Prakash, Voss, Erickson, & Kramer, 2015; Spence, McGannon, & Poon, 2005; Zhang & Chen, 2019). Additionally, physical activity can foster a sense of connection to others and belonging to a community (Rootman & O'Neill, 2017; Segar, Taber, Patrick, Thai, & Oh, 2017). From a health promotion perspective, opportunities for physical activity should be available to everyone, regardless of body size; however, that is not always the case.

Weight stigma has an impact on every aspect of life, and physical activity is no exception (Cardinal et al., 2014; Mansfield & Rich, 2013; Zanker & Gard, 2008). Weight-centric physical activity beliefs and practices contribute to this. Judgments about health and fitness based on weight are common, whereby individuals with obesity are assumed to be unhealthy and unfit and are consequently encouraged to lose weight to improve their health (LeBesco, 2011; Mansfield & Rich, 2013; Wray & Deery, 2008). These assumptions serve to "other" individuals with obesity, which perpetuates separation and social exclusion based on body size.

Weight bias is prevalent among professionals working within the exercise context such as physical therapists, physical educators, and fitness trainers (Panza et al., 2018). Undergraduate students studying exercise science have high automatic and self-reported negative evaluations of individuals with obesity (Chambliss, Finley, & Blair, 2004). These negative evaluations appear to develop during this university program, as students in exercise science have demonstrated stronger negative weight bias compared with students in a psychology program, and these attitudes were more negative in third year students compared to those in their first year (O'Brien, Hunter, & Banks, 2007). Some of these students go on to work in fitness settings, where professionals also demonstrate high automatic weight bias (Dimmock, Hallett, & Grove, 2009; Robertson & Vohora, 2008). Further, their bias remains high even when the individuals with obesity are shown exercising compared to a neutral context, which is concerning because it may affect the quality of the interaction between the fitness professional and the client with obesity (Dimmock et al., 2009). Fellow exercisers are also a source of weight stigma in physical activity settings (Flint & Reale, 2016; Robertson & Vohora, 2008). Findings from a qualitative study showed that frequent exercisers believed that body weight was controllable and could be regulated merely with more willpower to engage in healthy behaviours (Flint & Reale, 2016).

Some exercisers act on their negative beliefs by making derogatory comments and shaming individuals with obesity under the pretense of helping them (Flint & Reale, 2016). Receiving this poor treatment can discourage individuals with obesity from participating in physical activity to the extent that they would like. In fact, individuals with obesity have reported feeling watched, unaccepted or unwelcome in fitness settings, being humiliated or teased, feeling embarrassed and self-consciousness and navigating equipment and facilities that are inaccessible for larger body sizes (Leone & Ward, 2013; McIntosh, Hunter, & Royce, 2016; Napolitano et al., 2011; Schvey et al., 2017; Zabatiero et al., 2016).

Weight stigma has been proposed to influence physical activity through reduced exercise self-efficacy – our perceived ability to achieve a certain task – and exerciser identity – an aspect of our self-concept (Meadows & Bombak, 2019). Exercise self-efficacy and exerciser identity are psychosocial predictors of continued engagement in physical activity. For individuals with obesity, there also appears to be a complex relationship between engagement in physical activity and weight loss goals. Some people living with obesity report that there is too much focus on weight loss, others feel as though they have failed and lose motivation if they don't lose weight, and some believe that weight loss would facilitate physical activity (Leone & Ward, 2013; Zabatiero et al., 2016). Other reported weight-related barriers to being active are bodily pain resulting from excess body weight and the physical difficulty of the activities (Ball, Crawford, & Owen, 2000; Napolitano et al., 2011; Zabatiero et al., 2016).

Weight stigma in the physical activity context may ultimately limit the opportunities for individuals with obesity to have a positive relationship with and engage in physical activity (Rich & Mansfield, 2019). Weight stigma may attenuate the benefits of physical activity, instead

leading to negative affect, feelings of exclusion, and fear of being judged and teased (Bombak, 2015; Schvey et al., 2017).

Physical activity and weight stigma internalization

The negative impacts of internalized weight stigma apply in the physical activity context. Quantitative cross-sectional studies have shown that weight stigma internalization was positively associated with a higher likelihood that women will avoid physical activity (Pearl, Puhl, & Dovidio, 2014; Vartanian & Novak, 2011; Vartanian & Shaprow, 2008). Weight stigma internalization also predicted lower self-efficacy and physical activity (Hübner et al., 2015; Pearl et al., 2014). Women with obesity are more likely to report laziness as a barrier to physical activity than women of normative weight, suggesting that weight stereotypes have been internalized even in cases where it was not directly measured (Ball et al., 2000; Jewson, Spittle, & Casey, 2008; Leone & Ward, 2013; Napolitano et al., 2011). Further, women with high internalized weight stigma who participated in a physical activity intervention showed reduced engagement and enjoyment, indicating that outcomes of physical activity programming may be attenuated unless weight stigma internalization is addressed (Mensinger & Meadows, 2017). These findings suggest that reducing weight stigma internalization as it relates to physical activity may improve experiences and outcomes of physical activity in women living with obesity. However, few studies have explored ways to reduce internalized weight stigma (Pearl & Puhl, 2018).

Automatic associations and weight stigma internalization

The intervention for Study 1 was developed based on principles of automatic processing. Imagining a concept or encountering a contextual cue quickly activates related associations or propositions in memory (Gawronski, Brannon, & Bodenhausen, 2016). Associations are formed

by experiences and co-occurring stimuli in the environment, and associative evaluations are assumed to be captured by implicit measures (Gawronski & De Houwer, 2014). For example, if a person with obesity has always felt judged and shamed in physical activity situations, it may be that they would have a negative automatic association with physical activity when faced with a situational cue about physical activity. In contrast, propositional processing is rule-based; it is assumed to be the validation of evaluations resulting from associative processing using logic and reasoning (Gawronski et al., 2016). Returning to the previous example, the same person with obesity may demonstrate a positive evaluation of physical activity because of the promoted health benefits of physical activity, despite a negative automatic evaluation. Evaluations resulting from propositional processes are assessed using self-report questionnaires, reflecting the individual's explicit evaluation. Associative evaluations are usually measured by computer tasks that record response time and accuracy, and this indirect measurement reflects the person's implicit evaluation (Nosek, Hawkins, & Frazier, 2011).

Automatic processing models can help us understand and modify health behaviours by targeting constructs that reflect automatic processing such as implicit evaluations, attentional bias, and approach bias (Sheeran, Klein, & Rothman, 2017). Associative structures have malleable properties, so changes to one's associative structure can lead to changes in implicit evaluations, explicit evaluations, or both (Conroy & Berry, 2017; Forscher et al., 2019; Gawronski & Bodenhausen, 2006). One technique for altering the associative structure is implicit retraining, where a concept of interest is repeatedly paired with another to strengthen the automatic association between the two concepts (Papies, 2016). Retraining has been used to promote the positive association between fitness and fatness in undergraduate students (Berry, Elfeddali, & de Vries, 2014) and reduce attentional bias towards food cues in individual with

obesity (Kemps, Tiggemann, & Hollitt, 2016). Learning through propositional processes (e.g., reading a message about physical activity) can also elicit changes in implicit and explicit evaluations (Berry, 2016). Limited research has examined the impact of implicit retraining on self-related constructs such internalized weight stigma that may influence behaviour.

Experiential accounts of weight stigma and physical activity

To understand the relationship between weight stigma and physical activity, it is also important to bring to the forefront the voices of those who have been marginalized (Stefánsdóttir, 2020). Such personal accounts have contributed to our understanding of how people make meaning of their physical activity experiences in relation to their body size. For instance, individuals with obesity have described their relationship with physical activity as opposing extremes (e.g., love/hate, pain/pleasure, choice/duty; Bombak, 2015; Danielsen, Sundgot-Borgen, & Rugseth, 2016). They also expressed that maintaining the capacity to engage in everyday activities is a desired outcome of physical activity, so focusing on improvements in functional fitness rather than weight loss motivated their continued engagement (Bombak, 2015). Enjoyment, social connection, and mastering physical skills were also identified as goals of physical activity. However, at any time the pressure to lose weight could overshadow these positive outcomes (Bombak, 2015) and those who focused on weight loss as a goal were usually less satisfied with their physical activity experiences (Sabiston et al., 2009). Weight stigma was engrained in all physical activity experiences. For instance, women tended to avoid exercising in places where they may be ridiculed or humiliated (Harjunen, 2019). Thus, physical activity spaces where one can feel safe and relate to others with similar body sizes are desired (Danielsen et al., 2016; Sabiston et al., 2009).

Focus on women

The research conducted for this dissertation focused on women with obesity. The experiences of and outcomes related to weight stigma are often worse for women (Fikkan & Rothblum, 2012). Compared to men with a similar BMI, women have reported higher levels of internalized weight stigma (Puhl et al., 2018) and weight discrimination (Fikkan & Rothblum, 2012; Puhl et al., 2008). Women are also thought to be more vulnerable to the negative effects of weight stigma (Brewis, 2014). Even men who had experienced weight stigma reported that "it's worse for women and girls" due to gendered expectations related to body size (Monaghan & Malson, 2013). Women with obesity have reported wearing men's clothing to engage in exercise due to a lack of available exercise clothing in their size, which made them feel limited in expressing their female gender identity (Christel, O'Donnell, & Bradley, 2016). From a socio-cultural perspective, women are less permitted than men to deviate from societal ideal body shapes, which may lead to issues of body image and more frequent attempts to modify one's body to meet society's ideals (Fikkan & Rothblum, 2012; Roehling, 2012). Discourses of the body, appearance, and physiology construct an image of what it means in today's culture to have a fit and feminine body, i.e., slim, toned (Harman & Burrows, 2019; McGannon & Spence, 2010). Women with obesity may not feel like they fit, or will ever fit, within this image. Physical activity that is promoted as a means to achieve these body standards through weight loss may harm women's self-perceptions and decrease participation (Harman & Burrows, 2019; McGannon & Spence, 2010). Being 'fit' has been described as synonymous for 'looking good', and fat women are considered neither fit nor attractive based on the way they are represented in mainstream media (Scott-Dixon, 2008). Furthermore, even as women's bodies change over time (e.g., through weight gain or loss), their beliefs towards weight loss may shift but body

dissatisfaction remains (Bombak & Monaghan, 2017). In contrast, physical activity can act as a form of leisure that allows women to experience their bodies in a positive way (Mayoh, Jones, & Prince, 2020). However, women with obesity may associate physical activity with negative feelings and experiences, and may alter or abandon their physical activity routine to protect themselves from judgment and shame. Focusing instead towards the positive features of physical activity can lead women to reconstruct their views of themselves and their physical activity experiences (Sabiston et al., 2009; Sniezek, 2019); yet, it is unclear how this is/could be promoted in current physical activity practices and settings.

Research orientation towards health promotion

The research in this dissertation was conducted through the disciplinary lens of health promotion. Health promotion is a practice-based discipline situated within the public health sector and its values, principles, and strategies are well suited to examine and address physical activity-related weight stigma (Table 2.1; Potvin & Jones, 2011; Rootman & O'Neill, 2017). Health promotion focuses on "the *planned change* of lifestyles and life conditions having an impact on health, using a variety of specific strategies including health education, social marketing, and mass communication on the individual side, as well as political action, community organization, and organizational development on the collective side" (Rootman & O'Neill, 2017, p.27). The discipline employs the definition of health put forth by the international Ottawa Charter for Health Promotion, which considers health to be *holistic*, i.e., encompassing physical, mental, and social components of well-being, and *positive*, i.e., consisting of an everyday life resource rather than the absence of disease or illness or simply an end-goal (World Health Organization, 1986). Health is also considered a fundamental human

right that should be available to every person – including individuals of all body sizes (Medvedyuk et al., 2017).

According to health promotion, the factors that contribute to health and health equity are primarily social (Braveman, Egerter, & Williams, 2011; Dennis Raphael, 2016). Thus, a goal of health promotion is to reduce inequities in the social determinants of health with the aim to promote health for all. Weight stigma and related social exclusion and discrimination are social determinants of health associated with living with obesity. Weight stigma may also influence other social determinants of health such as education, income, and housing (Fikkan & Rothblum, 2012), thus compounding the disadvantages associated with living with obesity (Braveman, 2009). Examining the relationship between social determinants of health, obesity, stigma, and health outcomes, Medvedyuk, Ali, and Raphael (2017) argue that a shift in focus from obesity towards the social determinants of health is necessary to reduce weight stigmatization and improve health. This would have social justice implications, another goal of health promotion (Nutter et al., 2016).

Table 2.1 Overarching values, principles, and strategies of health promotion

Values	**Principles**	**Strategies**
• Health as a human right • Equity • Empowerment and participation • Health literacy • Social justice	• Positive and holistic health • Social determinants of health • Focus on prevention • Quality of life (Being, Belonging, Becoming)	• Advocate • Enable • Mediate • Context-specific • Targets multiple sectors and ecological levels

Note. Adapted from Rootman & O'Neill (2017)

In contrast to the negative impacts of weight stigma, physical activity can lead to better health and quality of life (Public Health Agency of Canada, 2018; Rootman & O'Neill, 2017). Yet, as opportunities to participate in physical activity are unnecessarily and unfairly reduced or unavailable to individuals living with obesity, health and well-being are diminished (McLaren, Rock, & McElgunn, 2012). Therefore, both the reduction of weight stigma and the promotion of inclusive physical activity are goals that fall within the mandate of health promotion.

Addressing physical activity-related weight stigma

Recognizing the health-damaging impacts of weight stigma and health promoting potential of physical activity, health promotion practitioners have an opportunity and responsibility to take into account the negative effects of weight stigma related to physical activity. Many sectors extending beyond medical care are responsible for promoting health, including physical activity-related professions (De Lyon, Neville, & Armour, 2017). Broadly, health promotion strategies are to *advocate* for social conditions that promote health, *enable* individuals or communities to control and improve their health, and *mediate* actions between sectors (Potvin & Jones, 2011). Specifically related to the physical activity context, health promotion may occur through many avenues, including marketing (e.g., images used in advertisements) and programming (e.g., size inclusive programs and policies).

Taking a size inclusive approach may be an alternative to the weight-centric view of physical activity that perpetuates weight stigma (Hunger et al., 2020). Mansfield and Rich (2013) suggested ways for physical activity promotion and policy to unsubscribe from dominant weight-centric approaches. Their primary recommendation is for different disciplines to engage in critical and open dialogue about the complex relationships between obesity, physical activity, and health. Creating new social constructions will be critical to destigmatization (Clair et al.,

2016). They also advocate for changes to the way physical activity programs are delivered that promote inclusion of marginalized populations. Building on this work, Pickett and Cunningham (2017b) developed a conceptual model for size inclusive physical activity spaces. According to this model, to create an inclusive culture those in leadership positions should openly discuss and model inclusive behaviour, including using and requiring others to use inclusive language. Finally, the model proposes that organizations interested in creating size inclusive physical activity spaces should strive to build a sense of community and encourage participant autonomy (Pickett & Cunningham, 2017b). However, the perspectives on this topic among women with obesity have not yet been explored.

To reiterate, the purposes of this research were (1) to examine the relationship between weight stigma and physical activity from the perspective of women with obesity and (2) to investigate strategies that may reduce the impact of physical activity-related weight stigma. These were addressed using an experimental study (Study 1) and two interpretive description studies (Studies 2 and 3).

Chapter 3

Research approaches

> *Health promotion must find a way to use research to better understand how the values, principles and processes it advocates result in an increased capacity for public health to fulfill its mandates.* (Potvin & Jones, 2011, p. 246)

Health promotion researchers adopt different social science paradigms to address their research goals (Corbin, 2016; Potvin & Jones, 2011; Tremblay & Richard, 2011). A paradigm refers to the nature of reality (i.e., ontology), the nature of knowledge (i.e., epistemology), the role of values in research (i.e., axiology), and the way knowledge is gained (i.e., methodology; Markula & Silk, 2011). Paradigmatic foundations should be aligned with the research questions and processes undertaken to answer them; they influence all research whether the researcher is aware of it or not. In this chapter, I briefly describe the ways post-positivist and constructivist approaches inform the health promotion research in this dissertation and outline associated ethical considerations. Study-specific procedures are provided in the methods sections of each individual study (Chapters 4, 5, and 6).

Post-positivist approaches to research in health promotion

Post-positivist researchers adopt an objective epistemology and use quantitative and qualitative methods. Hypotheses are generated from theories in a deductive way and tested with statistical analyses (Markula & Silk, 2011). The chosen theory dictates which variables should be studied, and those variables are thought to be measurable. Experimental designs specifically are used to determine if a treatment group differs from a control group, ultimately to infer a causal

relationship between the treatment and the outcome of interest (Kirk, 2011; Shadish, Cook, & Campbell, 2002). In the post-positivist tradition, the researcher tries to remain objective throughout the research to minimize their influence on the results (Markula & Silk, 2011).

Post-positivist approaches are best suited to address many research questions in health promotion. For instance, researchers use numerical data and statistics to examine trends in the social determinants of health over time (Raphael, 2006). They also use social cognitive theories, automatic processing models, and social ecological frameworks to understand, predict, and modify health-related behaviours including physical activity and its determinants (Gauvin & Bélanger-Gravel, 2017; Glanz & Bishop, 2010; Papies, 2016; Rhodes, McEwan, & Rebar, 2019; Sheeran et al., 2017; Van Den Broucke, 2014). Attempting at parsimony, these theories or models describe specific constructs (i.e., variables) that contribute to the behaviour of interest and how they relate to each other. Thus, theory-informed interventions may target specific constructs and use deductive analytical techniques to examine the relationships between measured constructs to determine the intervention's effect (Sheeran et al., 2017). I adopted a post-positivist paradigm for Study 1. A dual-process model and the weight stigma literature were used to generate hypotheses, collect and analyze data, and discuss the results.

Constructivist approaches to research in health promotion

Constructivist social science approaches are also valuable to generate knowledge for health promotion practice (Corbin, 2016; Potvin & Jones, 2011). Health promotion "makes room for the stories which individuals and communities tell about their everyday experience of health, and legitimizes them as being as important to our understanding of health as statistics on morbidity and mortality rates" (Robertson, 1998 cited in Tremblay & Richard, 2011). Constructivist research offers an opportunity to better understand the settings, population, and

sociocultural context of health through individual and shared perspectives and experiences, including those related to stigma (Bos et al., 2013; Thorne, 2016). I used a constructivist paradigm for Studies 2 and 3 of this dissertation, which subscribes to a subjective epistemology and qualitative methodologies (Markula & Silk, 2011). According to constructivism, humans define (or construct) their own meanings of events and experiences, and therefore knowledge is created through individual and shared accounts within specific social contexts (Markula & Silk, 2011). Another feature of constructivism is that the participants and researcher interact with each other to co-construct knowledge (Markula & Silk, 2011).

The methodology chosen for Studies 2 and 3 was interpretive description, a naturalistic, practice-based form of inquiry grounded in applied health research (Thorne, 2016). Initially developed to meet the epistemological and clinical mandates of the nursing discipline (Thorne, Kirkham, & MacDonald-Emes, 1997), it is now employed by researchers in various applied health disciplines, including health promotion (Thorne, 2016). Interpretive description aims to embrace the subjectivities of human experience and behaviour to identify patterns within individual accounts of the phenomenon. It takes into account the inherent complexity of issues and does not assume that recommendations for the discipline are necessarily the "truth" (Thorne, 2016). Interpretive description acknowledges existing disciplinary knowledge as a starting point for researchers. It does not require the researcher to put aside their knowledge and experience in the discipline, although some aspects may be challenged during the research process (Thorne, Kirkham, & O'Flynn-Magee, 2004). As is typical in various qualitative approaches, data generation and analysis are concurrent and iterative (Thorne, 2000). Using inductive reasoning, the findings are presented as an in-depth description of the phenomenon and an interpretation relevant to the applied discipline (Thorne et al., 2004). The level of interpretation in interpretive

description exists along a continuum based on how close the researcher stays to the data, from merely naming topics discussed by participants, to reporting an entirely new and abstracted conceptualization of the phenomenon (Thorne, 2016). In interpretive description, the researcher's knowledge and experience in the discipline are considered an asset, and the research design and findings are structured according to the values and practicality of the discipline. In other words, I aimed to create knowledge that could help health promotion professionals make practical decisions (Potvin & Jones, 2011).

Ethical considerations

I obtained ethical approval from the University of Alberta Research Ethics Office for all studies to ensure that procedural ethics were met. Participants received information about their rights as a participant and provided informed consent. Implied consent, where participants indicated that they read and understood the information by proceeding with the study, was obtained for Study 1. Before the start of the interviews for Studies 2 and 3, participants gave verbal and written informed consent, respectively. I respected the confidentiality of participants at all times. They are not referred to by name or identifying information in any findings or dissemination of the research.

Beyond meeting the procedural ethics required by the ethics review board, there were situational and relational ethical considerations, especially for the qualitative components of the research. Situational and relational ethics involve continuously making decisions that are based on the specific context and moment in time (Tracy, 2010). I continuously reflected on my potential impact on participants to make sure that they were always treated with respect and dignity. By aligning my research interests with the health and physical activity promotion discipline (e.g., by associating myself with the Faculty of Kinesiology, Sport, and Recreation), I

may have shifted how participants made meaning of their experiences with physical activity, or how they shared their experiences. In instances when I was asked about my relationship with the topic, I occasionally disclosed personal experiences or perceptions, with the advantage of creating a more conversational tone and establishing trust and rapport. I also mentioned that I took a weight-inclusive approach to physical activity. Finally, when I wrote and presented my findings I was careful not to compromise the interest of the participants or create more stigma-related harm.

Language

Another important ethical consideration is the language I used while conducting the research. There is no universally accepted or preferred terminology to refer to body weight (Puhl, 2020). So, the primary factor that guided my language choice, notably the distinction between 'obesity' and 'fatness', was how participants self-identified and their individual language choices. I also considered how I could avoid perpetuating weight stigma and causing unintentional harm, and what language was best aligned with my methodological approaches. Recognizing that every choice had positive and negative implications, I settled on using the person-first "person living with obesity".

Person-first language is standard accepted terminology that promotes respect and recognizes that one trait does not define a person's entire identity (Kyle & Puhl, 2014; Peers, Spencer-Cavaliere, & Eales, 2014). During recruitment for all studies, I used the person-centered inclusion criteria, "self-identified as living with obesity". This means that people who expressed interest in participating described themselves as living with obesity and accepted this terminology. Similarly to Bombak and Monaghan's (2017) qualitative study whose ethics board required them to use BMI for recruiting women with obesity, I used my choice in language as an

opportunity to discuss with participants the meanings they assigned to certain terms about body size. In my interviews with participants during studies 2 and 3, I initially avoided using any specific term. As the interviews progressed, I matched my language to that of the participant. Many participants preferred the term "obesity" rather than "fat" because they perceived negative connotations associated with the latter term, whereas some participants did not have a preference. Others used terms such as larger-bodied, curvy, heavy, and plus-sized. Regarding recruitment, person-first language has been adopted by Obesity Canada (formerly the Canadian Obesity Network) in an effort to reduce weight stigma and I could not have recruited through their social media avenues had I not used person-first language.

Still, it is important to note that the term 'obesity' is medicalized and associated with certain assumptions about health (LeBesco, 2011; Lupton, 2013; Wray & Deery, 2008). An alternative to the term 'obesity' is 'fatness', which tends to be preferred by critical weight scholars who view the term 'fat' as descriptive, similarly to other adjectives such as 'tall' or 'short' (Pickett & Cunningham, 2017b; Wray & Deery, 2008). Proponents of this perspective view fatness as a natural variation in human body size (Saguy & Ward, 2011). However, despite attempts to reclaim the word 'fat,' there are still negative connotations associated with this word (Mansfield, 2011) and some of my research participants said they would not like being referred to as fat because it was demeaning and offensive. This may indicate that I captured experience of weight stigma from individuals who endorsed obesity-related beliefs, rather than individuals who had adopted fat acceptance beliefs.

While conducting and disseminating the research for this dissertation, I remained aware and concerned that my choice of language or phrasing of research questions may unintentionally create harm or perpetuate stigma. I aimed to limit my contribution to the marginalization of

participants or women with obesity, the false dichotomy between fat and thin, and the association between weight and health (Mansfield & Rich, 2013; Pickett & Cunningham, 2017b). I have grappled with these concepts throughout my research and continue to reflect on the implications of my language choices.

Chapter 4

Motivated, Fit, and Strong – Using counter-stereotypical images to reduce weight stigma internalization in women with obesity (Study 1)

A version of this chapter is a published manuscript: Myre, M., Berry, T.R., Ball, G.D.C., and Hussey, B. (2019) Motivated, Fit, and Strong – Using counter-stereotypical images to reduce weight stigma internalization in women with obesity. *Applied Psychology: Health and Well-Being*. doi.org/10.1111/aphw.12187

Abstract

Background: This study aimed to use implicit retraining to change automatic associations between body size and physical activity (PA) in women with obesity to reduce weight bias internalization (WBI).

Methods: A Solomon-square experimental design was used to determine the effect of a four-week online implicit retraining intervention on WBI (primary measure) and PA attitudes, self-efficacy, and self-reported behaviour (secondary measures). The intervention was a visual probe task pairing counter-stereotypical images of active individuals with obesity with positive PA-related words. In qualitative telephone interviews, a sub-sample of participants provided feedback and recommendations for using counter-stereotypical images in PA promotion.

Results: Women completed the intervention (n=48) or a control task (n=55). Results of a RM-ANOVA showed no interaction or main effect of group on WBI. A main effect of time demonstrated that both groups had reduced WBI between pre-test and post-test, through to one-week follow-up. There were no differences between groups or over time for PA attitudes, self-

efficacy, or behaviour. Women who completed interviews (n=16) discussed several benefits and drawbacks of using counter-stereotypical images.

Conclusion: Implicit retraining did not reduce WBI but qualitative findings support the use of counter-stereotypical PA images.

Keywords: implicit retraining, physical activity, non-stigmatizing images, weight stigma reduction, obesity.

Introduction

Individuals living with obesity are often judged, shamed, and discriminated against – i.e., stigmatized – because of their weight. This stems from inaccurate beliefs that individuals with obesity are lazy, gluttonous, and disgusting, and are therefore entirely responsible for their weight and 'get what they deserve' (Puhl & Heuer, 2009; Vartanian, 2010). Weight stigma is consistently shown to impair physical and psychological health and well-being (Friedman et al., 2005; Papadopoulos & Brennan, 2015; Puhl & Heuer, 2009; Spahlholz, Baer, Konig, Riedel-Heller, & Luck-Sikorski, 2016). For instance, experiencing weight stigma is associated with increased stress and anxiety, reduced self-esteem and quality of life, and impaired physical health (Himmelstein, Puhl, & Quinn, 2018a). Weight stigma can also act as a barrier to engaging in health-promoting behaviours such as physical activity (PA), which is the focus of this research (Himmelstein et al., 2018a). Individuals with obesity report feeling self-conscious, embarrassed, and judged in PA contexts (Leone & Ward, 2013; McIntosh et al., 2016; Napolitano et al., 2011). They are also consistently portrayed in ways that support negative weight stereotypes (Chou, Prestin, & Kunath, 2014; Puhl, Peterson, DePierre, & Luedicke, 2013). PA media, in particular, promotes societal ideals for body shape and size. For instance, the content of women's health and fitness magazines frequently equates appearance-related standards with being thin, in addition to promoting weight loss through exercise (Willis & Knobloch-Westerwick, 2014). However, viewing weight stigmatizing images does not motivate PA in women with obesity (Pearl, Dovidio, & Puhl, 2015) and the exclusion and shame resulting from weight stigma may lead individuals to avoid PA altogether.

Yet, individuals may respond differently to experiencing weight stigma. Accumulating research demonstrates that the internalization of weight stigma damages health and well-being

independently from experienced stigma (Kahan & Puhl, 2017; Latner, Durso, & Mond, 2013; Pearl & Puhl, 2018; Pearl & Puhl, 2016). Weight bias internalization (WBI), or self-directed weight stigma, is the extent to which weight stereotypes are endorsed and applied to oneself, leading to the devaluation of one's worth associated with their social identity of living with obesity (Bos et al., 2013; Durso & Latner, 2008). WBI has been found to mediate the relationship between experiencing weight stigma and PA, where higher levels of WBI were related to lower PA (Pearl, Puhl, & Dovidio, 2014; Vartanian & Novak, 2011). In addition to acting as a barrier to PA, WBI is related to social cognitive predictors of PA such as self-efficacy, one's confidence in accomplishing a specific task even in the presence of common barriers (Hübner et al., 2015; Pearl et al., 2014). Additionally, women with high WBI have demonstrated reduced motivation to exercise immediately following weight stigmatizing experiences in their everyday lives (Vartanian, Pinkus, & Smyth, 2016). The use of maladaptive coping strategies such as avoiding potentially weight stigmatizing situations may explain the inverse relationship between WBI and PA (Hayward et al., 2018).

Given the consistent association of WBI with negative behavioural and health outcomes, reducing WBI could be a way to improve health and well-being. Currently, the role of reducing WBI on PA is not clear, given that WBI is only one of many possible barriers to engaging in PA. Physical discomfort or pain associated with elevated weight has been reported as a barrier to PA among individuals with obesity, along with other common barriers such as lack of time, self-efficacy, access, and a sense of belonging (Leone & Ward, 2013; McIntosh et al., 2016; Napolitano et al., 2011). A systematic review examined the effect of seven interventions on WBI (Pearl & Puhl, 2018). The interventions all showed small but significant decreases in WBI. In a healthy living program that did not specifically target WBI, baseline WBI moderated the level of

enjoyment and adherence to a PA intervention, supporting the evidence suggesting the important role of this construct in PA (Mensinger & Meadows, 2017). Furthermore, all the reviewed interventions targeted reflective processes (e.g., cognitive-behavioural therapy), whereas none of them have considered automatic processes. Automatic processes are the fast and unintentional activation of associations after exposure to an environmental cue (Conroy & Berry, 2017). They are known to influence the way one processes and responds to their surroundings, but the role of automatic processing in WBI reduction is not currently understood.

According to the Associative-Propositional Evaluation (APE) model, automatic associations between concepts are learned over time through experiences or by repeatedly pairing concepts together (Gawronski & Bodenhausen, 2006). Automatic associations, or associative evaluations, are held in memory and become activated by relevant environmental cues. In contrast, propositional evaluations represent the validation of associative evaluations, i.e., one's subjective assessment of the "truth" of associative evaluations using propositional reasoning (Gawronski & Bodenhausen, 2006). Associative and propositional evaluations, or implicit and explicit attitudes, may be discordant if one rejects their automatic associative evaluation through propositional reasoning (Gawronski & Bodenhausen, 2006). For many individuals living with obesity and WBI, it may be that PA cues automatically trigger negative associations due to their frequent experiences of weight stigma in this context. Frequent exposure to stereotypical images and messages can theoretically contribute to the creation of negative automatic associations about PA and the internalization of weight stigma. Individuals with obesity have shown higher automatic weight bias when seeing stereotype-consistent images (e.g., individuals with obesity sitting on the couch or eating junk food) versus stereotype-inconsistent images (e.g., individuals with obesity being active or eating healthy food; Carels et al., 2013).

As automatic associations are created by repeatedly pairing concepts, it is possible to alter the associations activated by certain environmental cues. Implicit retraining is a type of intervention that can be used to change automatic associations related to health behaviours (Papies, 2016). This technique refers to the change in attitude toward a concept by repeatedly pairing it with another valenced (i.e., positive or negative) concept (Jones, Olson, & Fazio, 2010; Papies, 2016). Among individuals with obesity, an intervention targeting automatic associations may help create more positive attitudes towards PA (Conroy & Berry, 2017). In an implicit retraining study that paired exercise-related stimuli with pleasant images, exercise implicit attitudes were improved by weakening associations between exercise and negative affect (Antoniewicz & Brand, 2016). A similar technique was used to address fitness and body size stereotypes (Berry et al., 2014). By pairing counter-stereotypical images of active individuals with obesity with positive PA words (e.g., motivated, fit, healthy), the intervention resulted in lower explicit weight bias, but no change in implicit weight bias. Using the APE model to explain these findings, Berry and colleagues suggested that the lack of change in implicit attitudes may have resulted from stable existing automatic associations, while the additional information (counter-stereotypical images) may have promoted thinking (i.e., propositional reasoning) about the associations leading to a change in explicit attitudes (Berry et al., 2014). The authors also suggested that repeated exposure to the counter-stereotypical images paired with positive words might be necessary to change automatic associations between PA and obesity. The effect of targeting automatic processing of body size and PA cues on WBI has not been tested.

Purpose and hypotheses

The purpose of this study was to use implicit retraining to change automatic associations between body size and PA in women living with obesity with the aim to reduce WBI. The first research question was: What is the effect of implicit retraining on WBI in women with obesity? It was hypothesized that women in the implicit retraining group would have lower WBI at post-test compared to women in the control group. The second research question was: What is the effect of implicit retraining on PA self-efficacy and PA attitudes? It was hypothesized that at post-test, implicit and explicit PA attitudes and self-efficacy would be more positive in the implicit retraining compared to control group due to positive affective associations activated by the implicit retraining (Gawronski & Bodenhausen, 2006). The third research question was: What is the effect of implicit retraining on moderate-to-vigorous PA (MVPA)? It was hypothesized that there would be no difference between groups on self-reported MVPA given the numerous factors influencing this behaviour. A final purpose was to contextualize the findings using telephone interviews to gain women's thoughts and recommendations about using counter-stereotypical images of physically active individuals with obesity in PA promotion.

Methods

Participants and recruitment

Canadian adults over 18 years of age who self-identified as living with obesity and were able to safely engage in PA were recruited for the four week online study. Self-perceived obesity rather than Body Mass Index (BMI) was chosen as an inclusion criterion because previous research showed that weight stigma could affect individuals even if they were not in an 'obese' BMI category (Vartanian & Shaprow, 2008). Additionally, self-perceived obesity has been more strongly related to responses to stigmatizing images than BMI (Pearl, Dovidio, & Puhl, 2015).

Sample size was powered based on a medium effect size for changes in WBI from pre-test through post-test and follow-up, yielding a target sample size of 30 per group (Pearl & Puhl, 2018). Participants were recruited through Obesity Canada's newsletter and social media avenues (Facebook and Twitter), and through list-serve notices at the university. Participants who expressed interest in participating were randomly assigned to the experimental or control group with or without pre-test. Through email, they were provided with information about eligibility and study procedures, as well as consent sheets and a link to complete the first session using Inquisit Web software (www.millisecond.com). The institution's Research Ethics Office approved the study. Participants provided implied consent by completing the first session (i.e., indicated that they met the inclusion criteria, read and understood the consent form, and agreed to participate).

Procedure

The study used a Solomon four-group experimental design, which combines pre-test-post-test and post-test-only experimental designs to determine the effect of pre-test sensitization, i.e., if conducting pre-test measures increases the participant's sensitivity to the intervention (Braver & Braver, 1988). The absence of pre-test sensitization increases the external validity of the findings (Braver & Braver, 1988). Study participation included four sessions done one week apart. Figure 4.1 outlines the measures and tasks in order of completion. At the end of the study, participants received an e-gift card to Chapters-Indigo to thank them for participating. They were given $10 for the lengthier sessions with several questionnaires, i.e., $10 for sessions 1, 3 and 4 (total $30) for participants who completed all sessions in the pre-test group, and $10 for session 3 and 4 (total $20) for participants who completed all sessions in the no pre-test group.

Women who completed the online study and agreed to be contacted for future research were recruited to participate in a semi-structured telephone interview. Purposeful sampling was used to maximize the variability of participant demographics and PA, and data generation occurred until enough information was gathered to address the research purpose (Malterud, Siersma, & Guassora, 2016). Informed consent was verbally obtained before each interview. Participants shared their thoughts about the images used in the implicit retraining and their perspectives on the broader implications of using non-weight stigmatizing portrayals of individuals with obesity in PA promotion. A reminder of the images was given to participants who had done the implicit retraining, and they were described for those who had been in the control group and had not seen the images. The interviews were audio-recorded, transcribed, and coded. The questions were part of a more extensive interview about weight stigma and PA, but only the findings relevant to the current study's research purpose are presented.

Experimental condition: Implicit retraining task

The implicit retraining intervention consisted of pairing counter-stereotypical images of active individuals with obesity with positive PA-related words. The task was repeated once per week for three weeks. Thirty images were obtained from the free image banks of Obesity Canada (www.obesitynetwork.ca/images-bank), the Rudd Center for Food and Obesity Policy (www.uconnruddcenter.org/image-library), and the World Obesity Federation (www.worldobesity.org/resources/image-bank). The images included individuals of different genders, ages, and ethnicities. New images were introduced each week to avoid over-familiarization: images 1-16 were shown during Session 1, images 8-23 during Session 2, and images 15-30 during Session 3. Examples of the images are found in Figure 4.2. The positive PA-related words (energetic, healthy, fit, strong, athletic, motivated, active, or exerciser) were

each paired with a control word (synthetic, namely, camp, modern, acoustic, implicated, noted, or professor) matched for the number of syllables and frequency of use in the English language. The words were the same during each session. Participants began the task with a practice session of 12 trials with images and words unrelated to the topic, followed by the retraining session consisting of 160 trials. During the retraining trials, one of 16 randomly chosen images appeared on the screen for 950 milliseconds (ms). Next, replacing the image, the positive and matched words appeared side by side for 500ms before disappearing and the probe ('X') would appear behind one word. The participant's task was to respond using the keyboard to indicate on which side the probe was located within a 1500 ms response time limit. The probe was behind the positive exercise word 90% of the time and behind the control word 10% of the time. Between each trial, a fixation marker ('+') appeared for 500 ms.

Control condition: Goal setting task

Participants in the control condition read Canada's Physical Activity Guidelines for adults (Canadian Society for Exercise Physiology, 2012) and set a PA goal for the upcoming week. The guidelines recommend engaging in 150 minutes of MVPA each week. They also explain the benefits of meeting the guidelines and give suggestions to increase MVPA.

Primary measure

Weight bias internalization. The Modified Weight Bias Internalization Scale (WBIS-M; Pearl & Puhl, 2014) is an 11-item measure to assess the internalization of weight stigma in individuals with obesity. Participants rated each item on a 7-point scale, from 1 (strongly disagree) to 7 (strongly agree). The internal reliability of the scale was good (Cronbach's α were .83 at pre-test, .85 at post-test, and .86 at follow-up).

Secondary measures

Experiences of weight stigma. Previous experiences with weight stigma were measured using the brief Stigmatizing Situations Inventory (SSI-B; Vartanian, 2015). This 10-item version measures the frequency at which prevalent weight stigmatizing experiences occur. For each item, participants responded on a scale from 0 (never) to 9 (daily). Cronbach's α was .82 for this scale.

Implicit PA attitudes. Implicit PA attitudes were measured using a Go/No-Go Association Task (GNAT; Nosek & Banaji, 2001). Participants categorized PA words (e.g., biking, hiking) with good or bad evaluative categories (e.g., fun-boring, healthy-unhealthy). Generic words (e.g., binding, wrapping) matched for the number of syllables and frequency of use in the English language were used as a contrast to PA words. Participants completed practice trials to familiarize themselves with the words and the Go/No-Go procedure. Then, they completed four blocks of 36 trials, where 'Go' trials were PA-good, PA-bad, generic-good, and generic-bad. The order of the blocks and trials within blocks was random. Participants categorized the words by hitting the spacebar as fast as they could if the word belonged to one of the target categories (Go), and ignored words that did not belong (No-Go). A fixation cross appeared on the screen for 500 ms before each trial and the response deadline was 850 ms. Feedback was provided with a red 'X' to indicate incorrect responses and a green 'O' for correct responses. Response latencies and accuracy were recorded, and errors and responses faster than 250 ms were removed. Implicit PA attitudes were determined by the difference between the mean response latency for PA-good trials and PA-bad trials (Nosek & Banaji, 2001).

Explicit PA attitudes. Explicit attitudes about PA were measured on a 7-point bipolar adjective scale as described by Ajzen (2006). The questionnaire included four items to measure instrumental attitudes (harmful-beneficial, worthless-valuable, healthy-unhealthy, important-

unimportant), and four items to measure affective attitudes (pleasant-unpleasant, enjoyable-unenjoyable, pleasurable-painful, good-bad). Cronbach's α were .83 at pre-test, .88 at post-test, and .87 at follow-up.

PA self-efficacy. Participants rated how confident they were on a scale of 0 (not confident at all) to 100 (completely confident) to accomplish the items for three self-efficacy subdomains that are important for PA, i.e., task, scheduling, and coping (Rodgers, Wilson, Hall, Fraser, & Murray, 2008). Task self-efficacy is one's confidence in performing specific physical activities. Scheduling self-efficacy is one's confidence in incorporating PA into one's routine when faced with other time demands. Coping self-efficacy is one's confidence in being active when facing common PA-related barriers like lack of energy. Cronbach's α, which included the three subdomains, were .90 at pre-test, .92 at post-test, and .92 at follow-up.

PA behaviour. Self-reported PA was assessed using the Godin-Shepherd Leisure Time Exercise Questionnaire (GLTEQ; Godin, 2011). Participants reported the number of bouts ≥15 minutes of PA at mild, moderate, and vigorous intensities they had done in the previous week during their leisure time. Participants' MVPA score in METs (Metabolic Equivalent Task) per week was calculated using the following formula: = (9 × Vigorous) + (5 × Moderate), as advocated by Godin. MVPA was used because Canada's Physical Activity Guidelines specify these intensities.

Demographic and weight information. Participants reported their age, income, highest level of education, province, height, and weight. BMI was calculated by dividing weight (in kilograms) by height squared (in meters) from self-reported values.

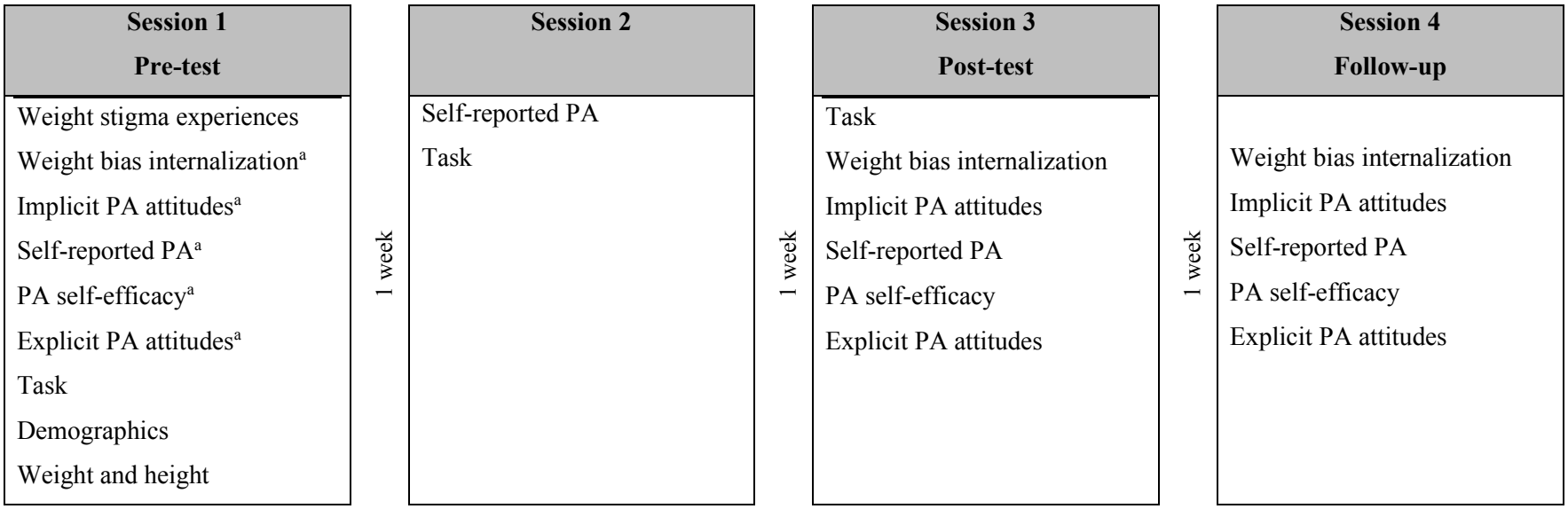

Figure 4.1 Study procedure outlining the measures and tasks completed online during each session in order of completion

PA = physical activity. [a]Participants randomly assigned to a group without pre-test did not complete these measures during Session 1.

Figure 4.2 Examples of counter-stereotypical images used in the implicit retraining task

Data analysis

Descriptive statistics including means, standards deviations, and bivariate correlations were calculated to describe the sample. The presence of pre-test sensitization was determined with analyses outlined by Braver & Braver (1988). A repeated-measures analysis of variance (RM-ANOVA) was used to test the hypothesis that WBI would be different between groups following the intervention. Group (implicit retraining or control) acted as the between-subjects variable and Time (post-test and follow-up) was used as the within-subjects variable. Univariate or multivariate RM-ANOVAs were used to test the hypotheses related to PA self-efficacy, implicit attitudes, explicit attitudes, and MVPA. Statistical significance was determined using two-tailed tests with an α of .05. Interview transcripts were coded to produce the qualitative findings. The coding process was guided by evaluation coding, which aimed to describe the way participants judged the merit and significance of using non-stigmatizing images of active individuals with obesity, as well as their recommendations for future use (Saldaña, 2016, p.140).

Results

Data screening

Data from participants who dropped out of the study after the first session and prior to post-test (n=18; 6 from the control group and 12 from the implicit retraining group) were excluded from all analyses. While there were no gender restrictions during recruitment, 94% of the sample identified as female. Since previous studies have found gender differences in vulnerability to weight stigma (Fikkan & Rothblum, 2012), levels of WBI (Puhl et al., 2018), and responses to PA messages (Segar, Updegraff, Zikmund-Fisher, & Richardson, 2012), but there were not enough males to run moderation analyses, it was decided to limit the analysis to women

(7 participants were removed). A manipulation check was performed to ensure that participants completed the assigned task for their group. One participant assigned to the implicit retraining group was removed because she did not respond during any of the three implicit retraining tasks. Data were also screened for missing or duplicate values and outliers. Less than seven percent of data were missing for any variable, and they were missing at random according to Little's MCAR test ($p > .05$), so missing values were mean replaced. Participants who reported MVPA scores greater than three standard deviations from the mean (n=2; one each from the implicit retraining and control groups) were considered outliers and were excluded from the analysis related to MVPA.

Participant characteristics

Participants included in the analyses (N=103) were women with a mean age of 44 years (range 20-77 years) and a mean BMI of 43 kg/m^2 (range 21 to 65 kg/m^2). The majority (89.3%) had completed post-secondary education. Following randomization, the control and implicit retraining groups did not differ in age, education, income, MVPA or level of experienced weight stigma at pre-test, all $p > .05$. However, participants in the implicit retraining group had a significantly higher BMI than those in the control group, t (99) = -2.34, p=0.02. Analyses that controlled for BMI were conducted and it was found that this did not change any of the results, so they are not reported here. Participant characteristics by group are presented in Table 4.1. As shown in Table 4.2, none of the variables were correlated with post-test WBI in either group.

Pre-test sensitization and retraining effect

The analysis followed the protocol outlined by Braver & Braver (1988). The two-way ANOVA (Test A) showed no Pre-test by Retraining interaction on post-test WBI, F (1, 99) = .44, p=.51, and no main effect of receiving the pre-test, F (1, 99) = 1.74, p=.19. This indicates an

absence of pre-test sensitization. There was also no pre-test sensitization effect on post-test PA attitudes, PA self-efficacy, or self-reported MVPA, all $p > .05$. There was a main effect of retraining, F (1, 99) = 4.61, p=.034 (Test D). To verify this effect, tests E, F, G, and H were conducted. The ANCOVA, which covaried the pre-test scores (Test E), showed no retraining effect, F (1, 53) = 0.108, p=.744. Similar non-significant results were found with the gain score analysis (Test F), t(53) =-.224, p=.82, and the RM-ANOVA (Test G), F (1, 53) = 1.906, p=.173. An independent-samples t-test performed on the post-test only groups (Test H) found no difference between group means, t(46) =1.744, p=0.088. Finally, results of tests E and H were combined in a meta-analysis (Test I). The meta-analytic result was non-significant, z_{meta} = 1.442, p=.075. This indicates an absence of retraining effect on post-test WBI.

Effect of implicit retraining on WBI

The analysis examining the effect of implicit retraining was repeated to include follow-up scores. For the implicit retraining group, WBI Means (SD) at pre-test, post-test, and follow-up were 5.1 (.85), 4.7 (.96), and 4.7 (1.0), respectively. For the control group, they were 5.4 (.83), 5.1 (.86), and 5.1 (.85). Due to the Solomon-square design, about half of participants did not complete pre-test measures. A two-way RM-ANOVA including post-test and follow-up data showed no Time by Group interaction, F (1, 101) = 0.02, p=.90 or main effect of Time, F (1, 101) = 0.84, p=.36 on WBI. There was a significant main effect of Group on WBI, F (1, 101) = 4.70, p=.03, with the implicit retraining group demonstrating lower WBI than the control group. The small-to-medium effect size of group at post-test, d=0.42, was maintained at one-week follow-up, d=0.40. The RM-ANOVA was repeated to include pre-test WBI from the sub-sample of participants who completed the pre-test measures. This second analysis was conducted to verify the main effect of group. Again, there was no Time by Group interaction, F (1, 53) = .10,

p=.75. Unlike the previous test, there was no main effect of Group, F (1, 53) = 1.78, *p*=.19, but there was a main effect of Time, F (1, 53) = 11.40, *p*=.001. The effect size of group at pre-test was *d*=0.37. The absence of a significant interaction indicates WBI scores over time did not vary as a function of group assignment. The main effect of time indicates there was a difference in WBI over time when participants of both groups were combined. Post-hoc tests revealed a decrease in WBI between pre-test and post-test, which was maintained at one week follow-up.

Effect of implicit retraining on PA self-efficacy and PA attitudes

Multivariate tests were used to account for shared variance between dependent variables. The RM-MANOVA conducted with task, scheduling, and coping self-efficacy as dependent variables showed no Time by Group interaction, F (1, 99) = 1.44, p =.24, no main effect of Time, F (1, 99) = 1.45, p =.23, and no main effect of Group, F (1, 99) = 2.10, p =.11. Means (SD) at post-test are shown in Table 2.

For implicit attitudes, the RM-ANOVA showed no Time by Group interaction, F (1, 101) = 2.01, p =.16, no main effect of Time, F (1, 101) = 3.07, p =.08, and no main effect of Group, F (1, 101) = .36, p =.55. Similarly, a RM-MANOVA including instrumental and affective PA attitudes as dependent variables showed no Time by Group interaction, F (1, 101) = .15, p =.86, and no main effect of Time, F (1, 101) = .00, *p*=.1.00, or Group, F (1, 101) = .71, p =.49. Means (SD) at post-test are shown in Table 2.

Effect of implicit retraining on self-reported MVPA

The RM-ANOVA conducted with self-reported MVPA in METs as the dependent variable showed no Time by Group interaction, F (1, 99) = .10, p =.75, nor main effect of Time, F (1, 99) = .83, p =.37, or Group, F (1, 99) = .16, p =.69. Means (SD) at post-test are shown in Table 2.

Table 4.1 Participant characteristics

	Control		Implicit retraining				Total	
Characteristics	*n*	M (SD)	*n*	M (SD)	*t* (df)	*p*	*n*	M (SD)
Age (years)	55	44 (13)	48	45 (11)	-.51 (101)	.61	103	
BMI (kg/m^2)	55	41 (8.8)	46	45 (8.3)	-2.34 (99)	.02*	101	
SSI (0-11)	55	2.6 (1.3)	48	2.5 (1.2)	.20 (101)	.84	103	
	n	%	*n*	%	X^2	*p*	*n*	%
Income (annual)					4.87	.56		
Less than $25000	14	25.5	7	14.6			21	20.4
$25000-$49999	11	20	11	22.9			22	21.4
$50000-$74999	12	21.8	8	16.7			20	19.4
$75000-$99999	10	18.2	11	22.9			21	20.4
Greater than $100000	4	7.3	1	2.1			5	4.9
Prefer not to answer	4	7.3	10	20.8			14	13.6
Education					7.11	.21		
High School	6	10.9	3	6.3			9	8.7
College/Vocational School	20	36.4	18	37.5			38	36.9
Undergraduate Degree	16	29.1	18	37.5			34	33.0
Professional Degree	5	9.1	3	6.3			8	7.8
Masters Degree	7	12.7	3	6.3			10	9.7
Doctorate	1	1.8	1	2.1			2	1.9
Prefer not to answer	0	0	2	4.2			2	1.9

Note. BMI = Body Mass Index; SSI = Stigmatizing Situations Inventory; PA = physical activity.

Table 4.2 Pearson's correlations between study variables at post-test

Variable	M (SD) implicit retraining	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
M (SD) control		44 (13)	41 (8.8)	2.6 (1.3)	5.1 (.86)	58.8 (19.0)	45.1 (20.7)	62.3 (22.0)	-23.3 (58.8)	5.7 (1.4)	4.8 (1.4)	21.6 (16.6)
1. Age (years)	45 (11)		-0.01	-0.11	-0.04	-0.15	-0.14	0.01	0.20	-0.16	-0.03	-0.14
2. BMI	45 (8.3)	0.11		.34*	0.26	-0.09	0.00	-0.15	0.02	-.34*	-0.13	-0.13
3. Weight stigma experiences	2.5 (1.2)	-0.20	-0.02		0.24	-0.03	-0.04	-0.26	.42**	-0.24	-0.09	0.12
4. WBI	4.7 (.94)	-0.11	0.06	-0.16		-0.15	-0.06	-0.15	0.07	0.08	-0.10	-0.02
5. Task self-efficacy	67.6 (18.9)	-0.19	-0.28	-0.22	0.07		.54**	.41**	0.07	0.13	.33*	0.16
6. Coping self-efficacy	53.0 (20.8)	-.34*	-0.13	0.02	-0.19	.70**		.50**	-0.01	0.19	.45**	.37**
7. Scheduling self-efficacy	71.3 (20.6)	-.33*	-.31*	-0.03	-0.07	.70**	.68**		-0.09	.29*	.30*	.34*
8. Implicit PA attitudes	-7.7 (57.5)	-0.02	0.10	-0.19	-0.00	0.16	0.01	0.15		0.01	0.01	-0.07
9. Instrumental PA attitudes	5.8 (1.3)	-0.23	-0.25	0.14	0.01	.53**	.58**	.65**	0.25		.53**	0.24
10. Affective PA attitudes	4.9 (1.5)	-0.17	0.04	0.09	-0.11	.39**	.48**	.68**	0.17	.62**		.33*
11. MVPA	19.9 (20.0)	-0.18	-0.27	-0.20	0.13	0.01	0.13	0.24	0.07	0.25	0.25	

Note. Correlations for the control group (n=54) are presented above the diagonal, and the correlations for the implicit retraining group (n=47) are presented below the diagonal. *$p < .05$; **$p<.01$. BMI = Body Mass Index; WBI = Weight Bias Internalization; PA = physical activity.

Findings from qualitative interviews

Sixteen women (M_{age} 40 years, range 20-59) participated in a semi-structured telephone interview. Nine were from the implicit retraining group (19% of the group) and seven were from the control group (13% of the group). Overall, the women liked the images and described them as motivating, encouraging, and relatable. In turn, they welcomed more body weight diversity in images related to PA, seeing it as a starting point to reduce weight stigmatizing attitudes in the general public. They hoped that these images could challenge stereotypes perpetuated by unrealistic images currently prevalent in PA media, and instead show that individuals living with obesity can be and are active. Concurrently, they expressed doubt that the general public would receive the images positively given that weight stigma is so ingrained in our society. They suggested pairing the images with non-stigmatizing messages and environments. Categories, frequencies, and representative quotes are presented in Table 4.3.

Table 4.3 Summary of findings from qualitative analysis

Code	Category (frequency of participants who expressed this idea)	Representative quote
Positive comments	Images are different and may challenge weight/health/fitness stereotypes (12/16)	"those images can really counter […], when we talk about health, or fitness, or wellness, there isn't just one body type that represents that." P8
	Images may normalize body size diversity and reduce negative weight-related attitudes (12/16)	"as soon as you start to normalize it, or […] make it more prevalent, then people start to […] care less about it; or people start to notice that it's just another thing." P13
	Images may encourage physical activity (e.g., by being relatable) (11/16)	"I think that […] people would see themselves in those images and hopefully see that they can participate, or that there are options out there for them." P7
	Images may identify safe spaces (6/16)	"I think it's a sign for people of safety, that this place sees me and sees me as a part of this. I'm not going to be such a random outlier that they've never conceived of, what would it be like to have a larger body in this class, or in this space?" P8
	Images may improve self-perceptions (e.g., by being relatable) (8/16)	"I think it does have a positive impact on willingness to do it, and on self-esteem, self-confidence as well. You've got kind of this mentality of well they're enjoying doing it, so I'll probably enjoy doing it." P16
Negative comments	Images may cause a backlash and promote weight stigma (6/16)	"people who make negative comments about people's body weight would not take it that well, […] people would make like fun of it, or make jokes or judgments about it." P12
	Images won't affect stable and ingrained weight-related beliefs (4/16)	"What did I have someone say to me once? That fat people just disgust them and no matter what they're always going to disgust them. So sometimes I think it's really hard to change their beliefs and the opinions of everybody" P4
	Images are unlikely to be used by organizations (1/16)	"I think [there is] this idea that if we want to promote ourselves as a fitness organization, or fitness business, or you know a healthy workplace, we can't show images of people who are assumed to be unhealthy." P8
Recommendations	Pair counter-stereotypical images with aligned messages (e.g., focus on health and enjoyment instead of weight or weight loss) (8/16)	"I would think organizations should try to focus on just not weight loss and not shaming. But instead to focus on like heart health, or reaching your goals, whatever those goals might be, that just because someone wants to be active, that does not mean that they want to lose weight." P15
	Foster body weight acceptance in physical activity spaces (3/16)	"But if it's only done in the advertising and not done in the institution itself, then it'll be short lived. […] if it's not fostered by the staff there or the environment there" P11
	Regularly use images that reflect all body sizes (12/16)	"I would say that they're completely different […] But I would definitely appreciate seeing more images like that in gyms or fitness facilities" P12

Note. P = participant number.

Discussion

WBI has repeatedly been associated with poor physical and psychological health and well-being (Kahan & Puhl, 2017; Latner et al., 2013; Pearl & Puhl, 2018). In this study, we aimed to reduce WBI with an implicit retraining task that paired counter-stereotypical images of active individuals with obesity and positive PA words. The hypothesis that participants who completed the implicit retraining would have lower WBI than those in the control group was not supported. Similar effect sizes were found for each time point and there was no effect of group when including pre-test data. This suggests that the difference between WBI at post-test and follow-up found when pre-test data was not included was due to baseline differences rather than the intervention. There was a main effect of time on WBI when including pre-test data, showing that WBI was reduced over the course of a few weeks in both groups by 0.3-0.4 points on the 7 point WBI scale. Other intervention studies have observed WBI reductions between 0.5 and 1 points (Pearl & Puhl, 2018). The test-retest reliability of the WBI scale used in this study has not been assessed (LaCroix, Alberga, Russell-Mathew, McLaren, & Von Ranson, 2017). It is possible that regression to the mean, unstable WBI scores, or simply participating in a study advertised to be about weight stigma and PA could explain the main effect of time on WBI.

Weight stigma is prevalent in North America and the participants who were interviewed pointed to the difficulty of changing weight-related beliefs, which could extend to the beliefs that they have about themselves. Furthermore, individuals living with obesity demonstrate weight bias towards others with obesity, providing more evidence of the extent to which weight stereotypes are widespread, ingrained, and difficult to change (Schwartz, Vartanian, Nosek, & Brownell, 2006).

There were no differences in task, coping, or scheduling PA self-efficacy between groups or over time. We had hypothesized that self-efficacy would improve in the implicit retraining group; this could have occurred through modeling/vicarious experience, a source of self-efficacy where participants' self-efficacy is improved by observing similar others successfully engage in the target behaviour. Vicarious experience of viewing others engaging in PA has been found to increase PA self-efficacy (Ashford, Edmunds, & French, 2010), but simply viewing images in an implicit retraining task may not be strong enough to change this construct. The images represented a variety of genders, ages, and ethnicities, so participants may not have identified with these characteristics of the images despite similarities in weight status. Although there were no changes in self-efficacy over the course of the study, interviewed participants reported that they found the images relatable and motivating. They said that seeing more images like those used in the study may improve the confidence of individuals with obesity to engage in PA. Thus, additional research is necessary to determine the impact of counter-stereotypical images on PA self-efficacy in individuals with obesity.

We also did not observe a change in implicit or explicit PA attitudes for either group. According to the APE model, automatic associations are formed over time through experiences (Gawronski & Bodenhausen, 2006). In previous research, participants who completed an imagery intervention intended to activate positive automatic associations with exercise had more positive implicit and explicit attitudes than those in a control group (Markland, Hall, Duncan, & Simatovic, 2015). However, the participants in that study were primarily undergraduate students, whereas participants in the current study were adult women (mean age 44 years) who had experienced and internalized weight stigma. Therefore, from an APE-model perspective, it may be that the participants in our study had pre-existing associative structures that were difficult to

change, or they rejected new associations during propositional processing. Another factor that may have affected PA attitudes is how participants perceived the level of PA intensity in the images. Yet, the participants from the implicit retraining group who were interviewed said they found the images to be pleasant and none of them commented negatively on the PA intensity of the person in the images. Furthermore, even though the counter-stereotypical images were paired with positive PA words over three retraining sessions, participants were likely exposed to weight stigmatizing images and messages (e.g., advertisements, social media) outside of the study. This could have nullified the effect of the implicit retraining, an idea supported by the interview findings. Participants reported that the implicit retraining images were much different from what they usually see in PA promotion. The pervasiveness of weight stigmatizing messages and images in our society may present a challenge for creating positive automatic associations between obesity and PA.

Regarding PA behaviour, a previous study found that change in WBI mediated the effects of a healthy living program on PA engagement in women with obesity (Mensinger & Meadows, 2017), supporting the notion that reducing WBI could promote PA in this population. However, in our study, there was no evidence of change in self-reported MVPA over time for either group. Previous studies were primarily cross-sectional and showed inconsistent relationships between WBI and self-reported PA (Pearl & Puhl, 2018). This indicates, unsurprisingly, that understanding engagement in PA must account for more than WBI. In addition to weight stigma, individuals with obesity report other weight-related barriers to PA such as physical discomfort and pain, as well as common barriers such as lack of time, motivation, social support, and enjoyment, elevated costs, and limited access to facilities (Leone & Ward, 2013; McIntosh et al.,

2016; Napolitano et al., 2011). Therefore, other factors will likely need to be considered to influence PA in this population.

Strengths and Limitations

Some strengths of the study were the experimental design and the exposure to multiple counter-stereotypical images at three time points. Allowing participants who self-identified as living with obesity to participate in the study promoted the ecological validity and the level of participant drop-out over time was low (<15%). Still, an intention-to-treat protocol could have been used instead of excluding participants who dropped out. Another strength was the qualitative findings, which provided context for the practical use of the counter-stereotypical images. However, recruitment occurred primarily through Obesity Canada, an organization that frequently shares messages related to weight stigma in their newsletters, through social media, and on their website. So it is likely that Obesity Canada members who chose to participate in the study were familiar with messages about weight stigma and their existing interest and knowledge about weight stigma could have influenced the results. They were also more likely to accept the label of "living with obesity" used in recruitment materials. The study should be replicated using other recruitment methods to obtain a sample that more closely reflects the general public. Information about participant ethnicity was not collected, so this could not be accounted for in the analyses. Although the study was powered to observe a medium effect size for change in WBI, it is possible that the sample size was not adequate. We also did not screen for initial level of WBI. If participants entered the study with low WBI, the intervention would not have a strong effect. However, the mean WBI at baseline was quite high (over 5 on a scale of 1 to 7), indicating room for WBI to be reduced.

Designing the study to be completed online allowed us to reach participants across Canada. They could complete the sessions when it was convenient for them on their own computers. Despite these advantages, the researchers could not provide additional explanations or clarifications if participants were unsure about the procedure and it was difficult to help with technical issues experienced by participants on their devices. It was also not possible to ensure the reliable completion of the implicit retraining task. We verified that the participant attempted the task by looking at the response latencies, but we could not account for misunderstandings or potential distractions in their environment. Another limitation is self-reported PA and future studies could use an objective measure of PA to explore whether implicit retraining using counter-stereotypical images can increase in PA.

Implications and Outstanding Questions

Overall, the results of the current study do not support the hypothesis that participating in an implicit retraining task with counter-stereotypical images of individuals with obesity being active can reduce WBI. The role of automatic processes in reducing WBI requires more research. Another consideration is that there are no clinical cut-offs related to WBI. It would be beneficial to understand what level of WBI reduction would be meaningful in a person's life. Although the quantitative findings of this study do not currently support the use of implicit retraining to reduce WBI, the qualitative findings provide evidence of the potential benefits of using images that positively portray individuals with obesity in PA media (e.g., health promotion messages, advertisements, social media, websites). Further research is needed to clarify the outcomes of using counter-stereotypical images, especially for WBI. Reducing the impact of weight stigma remains an important goal to promote health and well-being among individuals living with obesity (Kahan & Puhl, 2017).

Chapter 5

Exploring the impact of physical activity-related weight stigma among women with self-identified obesity (Study 2)

A version of this chapter is a published manuscript: Myre, M., Glenn, N.M., and Berry, T.R. (2020) Exploring the impact of physical activity-related weight stigma among women with self-identified obesity. *Qualitative Research in Sport, Exercise, and Health.* doi.org/10.1080/2159676X.2020.1751690

Abstract

Weight stigma contributes to negative health and health inequity. For women with obesity, weight stigma is prevalent in their everyday lives, including in the context of physical activity. Our current understanding of physical activity-related weight stigma is limited, and in-depth research is needed to promote inclusive and stigma-free physical activity. The purpose of this study was to understand how women with obesity experience, respond to, and perceive physical activity-related weight stigma. Sixteen women (aged 20-59 years) participated in semi-structured telephone interviews. Using Interpretive Description, a practice-based form of qualitative inquiry, we found that women's experiences of physical activity-related weight stigma reflected structural, public, and self-stigma. These experiences included stigmatizing comments and treatment, lack of appropriate and affordable clothing options, inaccessible exercise equipment, and weight-centric physical activity messages. In response, the women recounted feeling negative emotions (e.g., shame, sadness, guilt, anger) and had a heightened

anticipation of stigma. They used self-protection techniques, attempted to change their body, and occasionally acted in resistance to socially held weight-related beliefs. Weight stigma impacted the women's lives in a myriad of ways, which included viewing physical activity as a lose-lose situation and as a means to an end (i.e., for weight loss). For some women who reported resisting weight stigma, physical activity began to be uncoupled from body weight. The findings have implications for shifting physical activity promotion and practices to be more inclusive of women with obesity.

Keywords: health promotion; interpretive description; interviews; obesity; physical activity; qualitative; weight stigma; women.

Introduction

Stigma is a major driver of health inequity (Hatzenbuehler et al., 2013). Weight stigma, in particular, is pervasive in Western society and impairs health, promotes exclusion, and perpetuates inequity (Link & Phelan, 2006; Puhl & Suh, 2015). Many women living with obesity experience weight stigma on a daily basis in nearly every aspect of their lives (Fikkan & Rothblum, 2012; Puhl & Suh, 2015). One such context is physical activity. Generally thought to enhance health and well-being, physical activity may be unwelcoming or inaccessible for women with obesity (Scott-Dixon, 2008; Sniezek, 2019). In these spaces, women are expected to work towards achieving an attractive and 'fit' feminine body (i.e., slim and toned), while paradoxically only feeling like they belong if they already attained this appearance ideal (McGannon & Spence, 2010; Scott-Dixon, 2008). These gendered body ideals may lead to unique impacts of weight stigma for women (Fikkan & Rothblum, 2012; Harjunen, 2019). This is not to say that men do not experience weight stigma and its consequences; they do (Himmelstein, Puhl, & Quinn, 2018b; Lozano-Sufrategui, Carless, Pringle, Sparkes, & McKenna, 2016; Monaghan & Malson, 2013). However, the ways in which they negotiate their fat identity and respond to weight stigma can differ (Monaghan & Malson, 2013). In this study, we focused on the experiences, responses to, and impact of physical activity-related weight stigma among women with obesity.

Stigma is defined as a multidimensional social process where labeling, stereotyping, separation, and discrimination co-occur in a context in which differences in power exist between dominant and marginalized groups (Bos et al., 2013; Link & Phelan, 2001). Stigma manifests in several interrelated forms. Structural stigma incorporates societal-level norms, practices, and policies (Bos et al., 2013; Hatzenbuehler & Link, 2014). Public stigma refers to the way

individuals respond to others they believe belong to a stigmatized group, whereas self-stigma arises when a person anticipates, experiences, and internalizes stigma (Bos et al., 2013). Applying these concepts, weight stigma is the product of negative labels, stereotypes, and discrimination based on the perception of excess body weight (Puhl & Brownell, 2003). It arises from widely held beliefs equating fatness with unhealthiness, laziness, lack of discipline, and poor physical fitness (Flint & Reale, 2016; LeBesco, 2011; Puhl & Heuer, 2009). Since weight is presumed to result from individual lifestyle choices, women with obesity are judged for not engaging in the 'right' and 'healthy' behaviours and are assumed to not care about their health (LeBesco, 2011; Puhl & Brownell, 2003). This leads them to be blamed, shamed, and discriminated against in nearly every setting (Fikkan & Rothblum, 2012; Puhl & Suh, 2015). Due to exercises of power, weight stigma is not simply a barrier to overcome; it is engrained in our social structures and difficult to escape.

Weight stigma is recognized as a fundamental cause of negative health and inequity (Hatzenbuehler et al., 2013; Lee & Pausé, 2016; MacLean et al., 2009). It increases the risk of poor physical and psychological health, stress, and social exclusion and isolation (Lee & Pausé, 2016; Puhl & Suh, 2015). Thus, weight stigma can prevent individuals from fully participating in life and achieving their best health (Medvedyuk et al., 2017). This extends to the context of physical activity.

Physical activity is typically considered a health promoting endeavor that can improve physical fitness and body composition, prevent chronic diseases, enhance mental health and well-being, act as a fun leisure activity, and improve feelings of social connection and belonging (Public Health Agency of Canada, 2018). However, physical activity often takes a weight-centric approach, whereby the goal of participating is to achieve a socially desired body size and

ultimately health, with ‘weight’ and ‘health’ often used synonymously (Mansfield & Rich, 2013). For example, women with obesity are often told, by health and physical activity professionals, friends and family, the media, and society at large, that they would lose weight and be healthier if they simply exercised more (Mansfield & Rich, 2013; McGannon & Spence, 2010). As such, weight-centric approaches to physical activity promotion and practice may contribute to physical activity-related weight stigma (Mansfield & Rich, 2013).

The literature focused specifically on physical activity-related weight stigma is sparse. Much of our understanding of the phenomenon has come from studies of physical activity and related interventions (e.g., Bombak, 2015; Danielsen, Sundgot-Borgen, & Rugseth, 2016; Sabiston, McDonough, Sedgwick, & Crocker, 2009) and studies focused on the experiences of fat women participating in sports (e.g., Inderstrodt-Stephens & Acharya, 2018; Scott-Dixon, 2008; Sniezek, 2019). The findings from this research have shown that weight stigma is a thread tied through all experiences of physical activity for women with obesity; however, researchers have yet to focus specifically on physical activity-related weight stigma. In-depth, practice-relevant research is needed to guide health promotion practices to support inclusive, stigma-free experiences of physical activity for women with obesity (Bombak, 2014b).

In this study, we aimed to understand how women with obesity experience and respond to physical activity-related weight stigma. We also sought to understand the impact of weight stigma on their physical activity. The findings will be relevant to health promotion practitioners, especially those involved in the fitness, exercise, and recreation fields, to shift physical activity practices to be more inclusive of women of all body sizes.

Methods

Methodology

We used an interpretive description (ID) approach to address the research purpose. ID is a naturalistic form of inquiry grounded in applied practice (Thorne, 2016). It is underpinned by a constructivist epistemology, whereby knowledge is contextual and socially constructed (Thorne, 2016; Thorne et al., 2004). The findings in ID are thus co-created by the participants and the researchers. Further, they can exist along a continuum based on "distance from the data", with one end highly descriptive and the other more abstract (Thorne, 2016). Since the purpose of an ID study is to capture the elements of a phenomenon in a way that practitioners can grasp and use, Thorne (2016) warns against producing highly abstracted findings. Consistent with this goal, we produced a thematic description that addressed the research purpose and focused on the relevance for health promotion practice.

In ID, the researchers' theoretical and scientific disciplinary knowledge contributes to the development of the study and the interpretation of the findings; in other words, it does not ask or expect researchers to put aside or 'bracket' their prior disciplinary knowledge (Thorne et al., 2004). We aligned the current study with the principles, values, and strategies of health promotion (Potvin & Jones, 2011). Health promotion fits well with ID since first-hand accounts of health-related, subjective experiences are viewed as valuable sources of knowledge (Tremblay & Richard, 2011). According to the Ottawa Charter for Health Promotion, 'health' is a human right that encompasses mental, physical, and social well-being and the primary factors that influence health and health disparities are social (Potvin & Jones, 2011). Weight stigma is one such social factor (Medvedyuk et al., 2017). Weight stigma and resulting social exclusion may expose women to higher health risks (Galabuzi, 2016). Therefore, diminishing the impact of

weight stigma falls within the mandate of health promotion (MacLean et al., 2009; Bombak, 2014b). Concurrently, physical activity can improve health and quality of life, but only in the absence of weight stigma (Pickett & Cunningham, 2017b). All authors had academic training and expertise in health promotion, and this disciplinary knowledge contributed to their interpretations of the findings and the proposed implications of the research.

Context

In Canadian policies and programs, obesity is highly medicalized and considered to be a "burden" to the health care system and society as a whole (The Standing Senate Committee on Social Affairs, Science and Technology, 2016). Rather than addressing the social determinants of health, changing individual behaviour such as diet and physical activity is predominantly emphasized as a solution to the so-called "obesity crisis" (Alberga et al., 2018). Relatedly, the negative impacts of weight stigma on health are not typically acknowledged, and the language and proposed recommendations may actually perpetuate weight stigma (Alberga et al., 2018; Thille, Friedman, & Setchell, 2017). Regarding physical activity promotion policies in Canada, weight management and obesity reduction are often cited among the benefits of engaging in physical activity, although it is not their main focus (Public Health Agency of Canada, 2018). This broad social context should be taken into account to understand how participants in this study made meaning of their experiences of weight stigma and physical activity.

Participants: Eligibility, Sampling, and Recruitment

Prior to recruitment, we obtained ethical approval from the institution's Research Ethics Office. To be eligible to participate, potential participants needed to be women over 18 years of age who self-identified as living with obesity and had experienced weight stigma in the context of physical activity. All potential participants had previously completed an experimental study

about weight stigma and physical activity (Myre, Berry, Ball, & Hussey, 2019), during which physical activity and demographic information (i.e., age, income, education, and province of residence) was collected. In the previous study, the women had been recruited through social media posts from Obesity Canada, a charitable organization with the mission to "improve the lives of Canadians affected by obesity through the advancement of anti-discrimination, prevention and treatment efforts" (Obesity Canada, 2019), as well as advertisements distributed to the university student population by an institutional e-mail list. For this study, we generated a list of potential participants who had expressed a desire to be contacted for participation in future studies and we purposefully recruited women who met the eligibility criteria while aiming to maximize the diversity of the sample based on the physical activity and demographic information that was available to us. The first author reached out to potential participants by email to provide information about the study and ask if they would be interested in participating in an interview about weight stigma and physical activity. If they replied yes, she confirmed that they met the eligibility criteria and set a time for the telephone interview. We ceased recruitment when we had generated sufficient information to answer the research question (Malterud et al., 2016; Thorne, 2016). As shown in Table 5.1, the sixteen women who participated had a mean age of 40 years (range 20 to 59 years), were well educated, and lived in six different Canadian provinces. They also had varying levels of physical activity at the time of the interview. Thus, the women were in a position to offer insight about physical activity-related weight stigma and the sample was heterogeneous enough to capture a range of perspectives, as recommended in ID (Thorne, 2016).

Table 5.1 Participant characteristics

Name	Age	Province	Income	Education	Self-described physical activity in general at the time of the interview
Michelle	34	Nova Scotia	$25,000-49,999	Undergraduate Degree	Active
Jane	45	Newfoundland	Greater than $100,000	Undergraduate Degree	Active
Laurel	39	Alberta	$50,000-74,999	College/Vocational School	Active
Bethany	39	Alberta	Less than $25,000	College/Vocational School	Inactive
Dorothy	59	Alberta	Prefer not to answer	Doctorate	Inactive
Maureen	54	Ontario	$75,000-100,000	Undergraduate Degree	Inactive
Cynthia	45	Alberta	$25,000-49,999	Undergraduate Degree	Inactive
Stephanie	42	Saskatchewan	Greater than $100,000	Masters Degree	Minimally active
Talia	44	British Columbia	$75,000-100,000	Undergraduate Degree	Moderately active
Alice	46	Alberta	$50,000-74,999	Undergraduate Degree	Moderately active
Julia	46	Ontario	$25,000-49,999	College/Vocational School	Inactive
Brie	29	Alberta	$50,000-74,999	Undergraduate Degree	Active
Sydney	20	Alberta	Prefer not to answer	High School	Active
Nancy	42	Alberta	Less than $25,000	High School	Moderately active
Amanda	33	Ontario	Prefer not to answer	Undergraduate Degree	Active
Katie	25	Alberta	$25,000-49,999	Undergraduate Degree	Inactive

Data generation

A semi-structured interview guide with open-ended questions and probes was developed by the first author. The interview guide was tested during two pilot interviews. Afterwards, it was collaboratively modified by all authors to improve the clarity of the language and expand the list of possible probes to gain more detail, nuance, and concrete examples from participants (e.g., "Can you recall the last time this happened to you? Could you share the details of that experience?"). Topics discussed during the interviews were participants' relationship with physical activity; participants' understanding of the concept of weight stigma; their experiences of weight stigma broadly and within physical activity; their relationship with their body; how weight stigma impacted their decisions around physical activity; and how weight stigma could be addressed in physical activity promotion and practice. The first author conducted the telephone interviews and took the position of 'curious learner', focusing on the participants' experience and letting them lead the conversation (Thorne, 2016). By concurrently performing data analysis, she developed ideas that came up during earlier interviews as the data generation progressed. For example, in a later interview she may have said, "Other women have also told me that they found it difficult to find exercise clothing in their size. Could you tell me more about your experience?". The interviews were conducted over the telephone, so participants were unaware of the interviewer's appearance, including her body size. Only one participant asked whether the interviewer was living with obesity, to which she answered no. All participants provided informed consent and agreed to be audio-recorded. The interviews, which lasted between 30 and 90 minutes, were transcribed verbatim. Pseudonyms were assigned to each participant, and any identifying information (e.g., names and locations) referenced during the interview was removed from the transcripts to ensure confidentiality and anonymity.

Data analysis

The first author led the analysis. ID does not prescribe a single analytic strategy; instead, it stipulates that inductive reasoning is used to analyze the data in a way that will answer the research question and create findings that are useful in practice (Thorne, 2016; Thorne et al., 2004). Following each interview, the first author wrote a brief summary of her preliminary thoughts and reflexive notes guided by several questions, such as "what are the broad implications of this case?," "what kind of language do participants use to talk about themselves and their experiences?," "what assumptions am I/are participants making?," and "how is this case different or similar to other cases?" (Saldaña, 2016). She immersed herself in the data by listening to the audio recordings and reading the transcripts, concurrently verifying the accuracy of transcription. Using NVivo 12, the first author created preliminary codes from the transcripts. These were inductively generated and arose from the participants' own words and latent meaning. The coding process incorporated several coding strategies that were deemed appropriate to address the research purpose (Saldaña, 2016). Examples include emotion coding (e.g., "feeling embarrassed"), in vivo coding (e.g., "behaviour is never good enough"), versus coding (e.g., "contradictory thoughts about body"), process coding (e.g., "avoiding others"), and concept coding (e.g., "security"). She was cautious of becoming too attached to initial codes, creating codes that were too specific, or limiting her thinking around other possible codes (Thorne, 2016). As the analysis progressed, the first author revised and renamed the codes to represent higher-level categories that made sense of patterns and relationships within and across participants' accounts. For example, combining several codes like "feeling embarrassed", "avoiding others," and "security" led to the creation of a higher order category of "self-protection". The first author engaged in several discussions with co-authors to challenge her

interpretations and consider alternative ways of understanding and interpreting the findings. In the final analytic stages, the findings were organized and written up in a way that would make sense to health promotion practitioners.

Rigour

Rigour was ensured through methodological cohesion and reflexivity. In a methodologically cohesive study, all aspects of the research are consistent with the philosophical underpinnings of the methodology (Mayan, 2009). Thus, we made sure that our research purpose, sampling, methods, data analysis, and findings were aligned with ID's social constructivist perspective. We acknowledged our active role in the construction of knowledge and that our findings cannot represent a universal truth but rather subjective, contextual, and multiple truths. We recorded methodological and analytical decisions throughout the research process to maintain transparency, including the influence of our disciplinary knowledge in health promotion to develop the findings with the health promoter as the intended audience.

Reflexivity is the self-appraisal of how one's social position and personal experiences influence the research process and outcomes (Berger, 2015). The first author practiced reflexivity by journaling throughout the research process (Mayan, 2009). She considered how her preconceptions about weight stigma as someone who had not experienced it and her own experiences of physical activity influenced her interactions with participants, the questions she asked, and her interpretations. For example, in the early stages of the research she assumed that weight stigma would be a negative experience and perpetuate inactivity, whereas physical activity would be related to better health. To minimize any harm that could arise from participation in this research and as part of a reflexive practice, the first author followed the participants' leads when it came to language use (e.g., how they described their bodies) and

thought critically about how physical activity may not always be health promoting. She focused on deep understanding through the interviews and asked many probing questions to ensure the participants' accounts, experiences, and interpretations were captured. Discussions with co-authors, i.e., the use of 'critical friends', also helped her consider various interpretations and implications (Smith & McGannon, 2018). Overall, methodological cohesion and reflexivity strengthened the findings because it encouraged us to consider the influence of our positions on our interpretations and will allow the reader to follow along with our decisions and make judgments on the quality of the research for themselves.

Findings

We organized the findings in three sections: 1) experiences of weight stigma in physical activity; 2) responses to physical activity-related weight stigma; and 3) impacts of weight stigma on physical activity. Participant quotes are provided to support our interpretations. A summary of the findings and recommendations for health promotion practice are presented in Figure 5.1.

Experiences of weight stigma in physical activity

Comments and treatment from others

When asked about weight stigmatizing experiences in physical activity, the women we interviewed said they frequently received comments related to their bodies and behaviours. Several participants had experienced verbal harassment while being active – like being called a 'cow', 'pig', or 'fatso.' It went as far as women feeling physically threatened and unsafe. Talia recounted a particularly bad experience,

> *One situation actually in the gym, I had two males that were there and they just absolutely, I mean I felt physically unsafe, they were harassing me so bad […] I was on a piece of equipment, […] and it was just comments, like 'well what are you doing here;*

what's the point, you might as well just go and die because you're too fat to be here anyways; and you should just leave' and you know, then they tried to unplug the machine. Like to me it was one step away from what I would have considered physical, right. It stayed verbal, but it really – like I mean I was beyond uncomfortable.

Comments often reflected a simplified view of weight management. Bethany explained, "there seems to be a lot of people who think if you eat less and move more, then you're magically going to lose all the weight, and that's not really the way biology works."

Women were also subjected to comments that were disguised as helpful or encouraging, such as 'oh it's nice to see you trying something', or 'it's great to see you active'. Other comments were given under the guise of health concern. Without having any knowledge of their actions, others would assume that the women were not physically active or physically fit and suggest that they increase their physical activity. Jane shared how her work director told her she would feel better if she exercised, assuming that she did not. In reference to these types of comments, the women said they were patronizing and condescending, and caused harm even if that harm was unintentional.

Negative comments had a long-lasting effect on women's self-perceptions, as Stephanie explained,

I just had internalized so much, that my worth was attached to my weight. […] Even when I was in my late teens I was a lifeguard and swimming instructor, and I had a patron at the pool I managed ask about an aqua fitness class, and they said 'oh who's the instructor?' And one of my staff pointed at me, and they openly laughed and said, 'I think she needs to go to a few classes, I don't really think she's qualified to teach.' […] And so

you start believing that stuff right, and really thinking yeah maybe I actually am kind of just a crap person, because I obviously can't, you know, be disciplined enough to keep the weight off or lose it.

In addition to comments, the women also described being treated differently than people with a socially accepted body size. They felt that this biased treatment was due to an assumption that large women are necessarily unfit and unhealthy. Nancy explained how this played out in her sporting experiences,

Sometimes I'll get picked last until people play with me a few times, like in terms of volleyball, and then when they see me play, I get picked first and it surprises people. So, I find that it - my weight, my appearance, give people a predetermined idea of what my skillset is, and it's not always factual. Because […] my shape is not of someone who can do some of the things I do, but I still do 'em.

Talia shared an experience of receiving biased treatment during a gym orientation session, in which she was the only person asked to fill a form to use exercise equipment because she was "overweight". In most instances, the ones doing the stigmatizing had no knowledge of the women's ability or health. It was their weight alone that made them a target of differential treatment.

Lack of accessible exercise equipment and modifications

Women's feelings of exclusion during physical activity were particularly pronounced when their bodies literally did not fit. The women took these experiences to mean that physical

activity was only meant for certain bodies (i.e., thin bodies) and there were 'right' and 'wrong' ways to move. Katie described using exercise equipment,

> *For some things I just can't do them properly. Like for a rowing machine, you're supposed to get your knees basically up to your chest, and I just can't do that. So, then I use the machine wrong, technically, so then like it's taxing – it's overtaxing on some joints. […] Some of the machines like the cycling machines, they'll have a weight limit on it, and sometimes it's weirdly – weirdly light. Like it'll have a weight limit of like 200 pounds or something like that, and you're just like okay so who's meant to be using that?*

Participants expressed the desire to engage in what was considered the 'proper' version of the movement and doing modified or 'easier' versions was perceived as a failure. Some women explained that this made them want to give up on the activity altogether. Others wished that their instructors knew how to provide them with appropriate modifications so they could continue to engage in the activity. Cynthia explained,

> *For structured classes, there is definitely a lack of classes or instructors that are familiar with training somebody who is obese. That we have limitations, movement limitations. […] I can't jump up and down. I can't do jumping jacks; like my joints won't allow it and this body's carrying a lot of weight. […] It's not easy to get up and down off the floor. […] And I don't know that there are a lot of people providing classes or that knowledge, that okay, it needs to be modified to accommodate that person.*

Lack of exercise clothing

Many participants informed us that comfortable and functional exercise clothing in their size was expensive and "almost impossible to find". Brie explained,

> *I went to Victoria Secret to get an exercise bra. They didn't have any in my size, because they only make exercise bras up until a certain size. Thinking that 'oh if you are bigger than that, then you don't need it anyway, cause you don't exercise'. Things like that are just embedded in our culture and are so annoying.*

Women commented not only on the lack of exercise clothing that was available, but what they felt they were "allowed" to wear in public according to unwritten social rules. Katie explained,

> *When you see a lot of other women going to the gym, they've got like those – the crop tops and then the leggings, and no one blinks an eye. But you're not allowed to wear those, unofficially. And so, there's always this societal pressured need to cover up.*

Weight-centric messages about physical activity

Participants perceived weight-centric messages about physical activity as weight stigmatizing because they generally promoted the ideas that weight loss should be a desired outcome of physical activity and that losing weight would necessarily have a positive impact on health. As Alice shared, "we didn't put the weight on in a day, it's not going to come off in a day", which led participants to feel frustrated when programs promoted "quick fixes" or "miracles" related to weight loss and exercise. Sydney related how appearance ideals (i.e., thinness) are perpetuated in some commercial advertisements for physical activity,

You'll notice like 'lose weight fast', or like 'drop five dress sizes'; or something like that; you don't always see the 'feel good, do what you like' kind of thing, when it comes to advertising for physical activity. […] It really perpetuates that idea of you have to be smaller to be better.

Other physical activity messages viewed as problematic by participants were those promoting exercise as a punishment for eating. As Amanda explained,

I have a problem with places that are like 'earn your Friday drinks', or 'burn off your turkey dinner'. Like you know around all the holidays there's all the posts, like Halloween for example, 'to burn off like a mini Mars bar, you need to do 25 burpees'. Where there's like this association that you have to punish yourself for the food you eat.

Responses to physical activity-related weight stigma

Negative affect and anticipating stigma

Participants felt a range of negative emotions in response to weight stigmatizing experiences. They felt ashamed, sad, hurt, fearful, and angry when they were judged, harassed, or threatened based on their weight in a physical activity context. Talia described her complicated emotional response to a situation of verbal harassment by two men at a fitness center,

When it was happening, at first I was just like 'whatever guys, like just go do your thing.' I kind of brushed it off. As it escalated, it definitely went quickly into a fear situation, it's like okay I need to shut my mouth and get out of here. And afterwards it was – there was that initial feeling of just feeling horrible, like oh god, maybe I am fat, I shouldn't have

been there. But I think afterwards I just got mad. And that's a little bit more my personality, like it just – it pissed me off.

Many women explained that, at the time, they felt that they deserved to be shamed. Consider Amanda's experience after a staff member of an online program told her she was too fat to run,

I was leading a running clinic and I actually had a panic attack that night on my run, because it affected like – I suddenly had all this self-doubt. I'm like 'oh maybe I shouldn't be doing this, like maybe I am too fat to be doing this?' And all these like ridiculous…yeah like I just felt ashamed.

In part due to the negative feelings resulting from weight stigma, anticipating weight stigma became part of the women's experiences of physical activity. They described feeling uncomfortable, self-conscious, embarrassed, looked at, and judged while being physically active. They were less concerned about engaging in physical activity itself, but rather, they worried about *being seen* being active because this could lead to judgment, humiliation, or negative treatment. When they wanted to be active, they often found themselves focused on what others would think of their bodies. Katie explained how this reflected thin privilege,

There's the idea of thin privilege, where the only person who's really making judgments on your body is yourself. Whereas where you're heavier, you're not the only person making judgments, it's other people who are making judgments, whether consciously or unconsciously.

Self-protecting

The women responded to the experience and anticipation of weight stigma in various ways. They described protecting themselves by modifying the ways they engaged in physical activity and by leaving experiences of weight stigma unchallenged. Several women said they only felt comfortable engaging in individual activities such as walking, biking, or hiking, and still, they modified these activities in anticipation of experiencing stigma, particularly to avoid being seen doing physical activity. Stephanie shared how exercising at home was tied to self-protection,

> *For a long time I exercised at home, not because that's where I wanted to or what I liked the most, but because I didn't have to worry about other people, you know staring at me or making comments, or those sorts of things being part of my experience of trying to exercise more.*

Women also maintained their sense of safety during physical activity by engaging at less busy times of the day, going to places where they would not run into anyone, or participating on the periphery. Michelle, who regularly attended an aqua fitness class said, "even though I've been going to swimming for two years, I still stand in the back so that nobody can see me". Sydney said she transported her bike to another neighbourhood to avoid being recognized by anyone she knew. Nancy explained how avoiding stigmatization motivated her to choose a smaller facility even though it did not have the equipment that she wanted to use. She thought if people regularly saw her they would be less harsh and judgemental,

> *I think more it's a security blanket, because those same people see me all the time, they won't say anything, but those hundreds of people, the chances of them catching me, you*

know at the same time throughout the week or whatever, is probably a little bit slimmer. And so they might be more willing to be negative.

The anticipation of weight stigma for some women was related to such anxiety and fear of judgment that they would not engage in physical activity at all. These women's accounts revealed that they would have liked to participate but coping with the possibility of a negative experience was deemed too mentally draining and the risk of ridicule too high. For instance, Dorothy explained that she loved biking but did not go out and do it because she did not want anyone to see her. This self-protection technique went beyond physical activity contexts. Some women described excluding themselves from life more generally and the feelings of isolation that resulted. Dorothy said,

I just don't want to go out there and get hurt. So, I just hang back and let the world go by. And that's not good for mental health, or for physical health. So yeah, but I would tie it up with image, I would tie it up with my fear about the way I look.

Leaving experiences of weight stigma unchallenged was another form of self-protection. Several participants said they "ignored it" or "didn't respond" when they faced physical activity-related weight stigma. Bethany told us that she did not know how to respond without being confrontational or letting her emotions get in the way, whereas Katie explained, "really the best thing that you can do is ignore it, like you don't give them any fuel. It's just like dealing with any other type of bully". However, this came at a personal cost. In addition to the burden of weight stigma, women were taking on the burden of feeling hurt or shamed rather than making someone

else feel embarrassed or inconvenienced. Brie, whose fitness class instructor made a comment about her weight, recalled,

> *I didn't even say anything, I was too taken aback to even react to that. I went to the back of the class and like, I'm like well I paid for this class, I'm already here, I got to get through it, but I had no fun.*

The tendency to leave weight stigma unchallenged also occurred when the women faced physical barriers to their participation, such as weight limits on exercise equipment. Leaving such barriers unchallenged meant the women could avoid shame and inconveniencing facility staff. Talia described feeling tension between shame and safety,

> *There's having to overcome that you want to ask, because you want to be safe, right, well and you don't want to damage their equipment – but you want to be safe as well, so then there's like, oh man now I'm going to have to go ask this lady, like you know 'what's your weight rating on your treadmill?' And then if I don't use it, she's going to know that I'm over that weight rating and now I'm going to be embarrassed, and she's going to be embarrassed – and I'm just going to go home.*

When asked why they did not call attention to it when they experienced weight stigma, participants explained that negative weight-related attitudes were so engrained in society that they would not change. It was not worth opening themselves up to the possibility of additional weight stigma to make others understand how they were impacted.

Changing her body

Women were often unhappy with their bodies and changing it was seen as a way to escape weight stigma. Women expressed self-blame and disappointment for "letting themselves get to that point" (Talia), i.e., for becoming fat and for having a body that "isn't exactly what it should be" (Dorothy). Through weight loss, they could remove themselves from the stigmatized group and "everything would get better" (Brie). Participants felt that it was their responsibility to change, or more specifically, *fix* their bodies. This demonstrated how they personally endorsed weight-related beliefs that contribute to weight stigma. In particular, the women described accepting the common belief that they could control their weight in part through physical activity, and it was just up to them to commit to making a change and becoming 'healthier'. For example, as part of her effort to lose weight Laurel said, "I decided to make an investment in my future and get a personal trainer". Most participants said they knew what to do to lose weight but just didn't do it, which led to feelings of guilt and shame. Those who associated physical activity with changing their body, especially with weight loss, often felt discouraged if they did not succeed and developed a negative relationship with physical activity. As Stephanie put it, "activity had become this sort of almost like war zone where I had to be physically sort of attacking myself in order to be different".

Brie, who had lost some weight, said she now felt pressure to maintain high physical activity levels so that she would not regain it. This pressure came from her, as well as others such as family members and co-workers. Physical activity was tied to body weight, not enjoyment, as she explained,

> *Right now it's fairly intense, I do a lot of running, I do like three or four times a week, I play volleyball. I do strength training once a week. And that's helped me to lose a lot of*

weight […] but now I have to keep up with this intensity. […] The downside is only the pressure that I feel that I have to do something otherwise I'll go back to being fat again.

The women frequently expressed feeling tension between wanting to change their bodies and accepting them as they were and recognizing all their bodies did for them. These conflicting thoughts were especially prevalent among the women who did not experience negative health effects of their weight. As Maureen explained,

I guess I do understand, in my mind that you can be fit and be different sizes, but based on personal experience and media, and all of that, I think oh I wouldn't look good unless I lost my donut fat, or whatever.

Resisting

Despite facing weight stigma, some women continued to try different activities until they found something they enjoyed, that challenged them, and that they wanted sustain. Amanda explained how she found and joined a triathlon group after receiving weight stigmatizing comments by another group, saying, "after that online group was like 'you shouldn't run', I'm like 'well I'm going to show you'".

It took effort but these women found people and spaces that were inclusive of people with different body sizes. They sought out physical activity settings that were weight-neutral rather than weight-centric. In fact, disassociating physical activity from weight loss was a way that participants described resisting weight stigma in physical activity. For some, this occurred after realizing that weight loss did not fix their problems or make them happy. In resisting weight-centric practices, physical activity became about reducing stress, gaining "me time", and

improving well-being. Stephanie described weight-neutral physical activity as a way to "be with other people, be present in your body, or learn what makes you feel good".

Another common way the women challenged weight stigma was through body positive social media and online groups. The younger participants in particular related how these online spaces helped them resist weight-related assumptions by challenging ideas about who can be active, what the ideal body looks like, and the relationship between physical activity and weight. Sydney described the positive impact on her mental health, while Brie explained how body positive online spaces helped improve her relationship with her body, "It also helps you realize that life isn't just made up of the people that you see on the magazine covers. That's not what real people look like". Online plus-sized fitness groups were also a place to share experiences and practical tips (e.g., where to find exercise clothing), and even make connections that translated to in person relationships (e.g., exercising together). All participants who engaged with body positive social media said it presented a different perspective from mainstream fitness media.

Impacts of weight stigma on physical activity

Physical activity as a lose-lose situation

The women we spoke to found that physical activity-related weight stigma led them to receive contradictory messages about physical activity, i.e., fat women *should be* and *are not meant to be* physically active. When reflecting about physical activity, participants felt like they "couldn't win" (Jane) and their actions were "never good enough" (Brie). As Talia put it,

> *I thought here I am, you know you guys complain about looking at fat chicks and hating it, yet here I am trying to make a difference, and this is the way you're treating people.*

The women often felt ashamed, embarrassed, or excluded when they did participate in physical activity. Additionally, they would receive comments saying that should have started earlier, that they still had a long way to go (referring to weight loss), or that they shouldn't be there. Stephanie shared how discouraging it was to be in this 'lose-lose' situation,

> *It seemed like when you're in a larger body, you're kind of screwed no matter what, where it was like I was judged if it wasn't active enough, because I was, you know, contributing to my own demise, and my health problems, and all the issues. Yet if I was working out it often felt really uncomfortable and unsafe, and sometimes openly hostile, where it's like I was either not doing enough, or you know, doing it wrong; or people just like to still mock you, right or make it all about how large you are.*

Physical activity as a means to an end

For many participants, ideas surrounding health, fitness, and weight were intricately tied. Several women regularly used the terms 'healthier' and 'smaller' interchangeably. Even when improving health was said to be the main source of motivation for engaging in physical activity, losing weight was seen as a part of this, reflecting the belief that weight loss would necessarily improve health.

In participants' accounts, there were prevalent beliefs that a fat person exercising was at the "beginning of their journey," with the end goal to "arrive" at a smaller (and thus 'healthier') body. Therefore, movement through physical activity was instrumental – i.e., a means to an end, or a way to see "progress," "results," and "success" related to weight loss. Stephanie described that it was common for "movement [to be] measured by how many calories you burn and how

many pounds or inches you lose". Even medical experts contributed to these ideas by recommending exercise for weight management.

Physical activity was also instrumental because it was seen as a way to achieve a body that *belonged* in a physical activity setting. 'Fit' bodies, described as toned, muscular, skinny, buff, and having low body fat, were considered to "fit in," "be normal," and "blend in". Julia noted that if she lost weight, she would "look like the rest of them". Only once she had the 'right' body type could she participate fully in physical activity. This created another lose-lose situation: physical activity was a means to attain a 'fitter' body but was inaccessible until this 'fitter' body was achieved. Some women believed that they would never attain a thin and 'fit' body, so there was no point in engaging in physical activity at all. Dorothy said this made her feel "hopeless", while Brie said, "I'll never look like that, no matter what I do, so let's just not even try".

Physical activity uncoupled from beliefs about body weight

When participants responded to weight stigma by resisting dominant assumptions about body weight, physical activity, and health, physical activity became uncoupled from body weight. Acknowledging that it was sometimes difficult and always ongoing, these participants had disentangled taken-for-granted ideas, noting, "your movement and activity doesn't have to be wrapped up in your weight at all, and that those two things can actually be perfectly separate from each other" (Stephanie). Physical activity could be a fun and positive aspect of their lives by giving them energy or making them feel better. For some, this shift in mentality led to changes in motivation for being active. As Jane said, "I need exercise to be healthy, not to lose weight".

In challenging the prevalent assumptions between weight and health, participants also recognized that they were worthy of participating in physical activity to the same extent as others. They pushed back against those who perpetuated weight stigma and challenged assumptions related to obesity pathology. Katie said, “I also try to not avoid it entirely, because I exist too, […] I deserve to be there and they have to deal with it”.

Experiences	Responses	Impacts	Implications
Comments and treatment from others such as being teased, laughed at, stared at, patronized, and harassed by other exercisers, fitness instructors, staff members, and the general public. ***Inaccessible exercise equipment and limited modifications*** including weight limits on exercise machines. ***Exercise clothing*** is difficult to find, not affordable, and limited by what is socially 'allowed.' ***Weight-centric messaging*** about physical activity from popular media or fitness and recreation organizations.	***Negative affect and anticipating stigma:*** feeling embarrassment, shame, anger, frustration, and discouragement; feeling judged, scrutinized, self-conscious, unsafe, and excluded. ***Self-protecting:*** altering physical activity (e.g., engaging in individual rather than group activities, at home rather than in public, in smaller facilities, at less busy times, or not at all) and leaving weight stigmatizing experiences unchallenged. ***Changing her body:*** physical activity is focused on weight loss; attempting to leave the stigmatized group. ***Resisting:*** participating without apology; finding inclusive groups and spaces; finding others with shared experience; engaging with body positive social media.	***Physical activity as lose-lose:*** being stigmatized whether you are active or not; feeling pressure to be more physically active and simultaneously being stigmatized and feeling like you don't belong when you are active. ***Physical activity as a means to an end:*** feeling pressure to be active to lose weight; feeling like you will only belong once you have the 'right' body. ***Physical activity uncoupled from weight:*** increased body acceptance; engaging in physical activity for enjoyment, improving physical and mental health, and connecting with others.	Develop a culture of respect, inclusion, and safety in physical activity contexts (e.g., by leading by example, providing training to staff). Increase availability and affordability of exercise clothing in larger sizes. Examine messages about body size, health, and physical activity to avoid perpetuating blame and shame (e.g., include diverse body sizes in advertisements, avoid weight-centric approaches). Work towards shifting public attitudes and assumptions about body size and health.

Figure 5.1 Summary of findings and implications for health promotion

Discussion

This ID study explored how women living with obesity experienced and responded to physical activity-related weight stigma, and how weight stigma, in turn, impacted their physical activity. We found that multiple forms of weight stigma were embedded in women's experiences of physical activity. Public weight stigma was evident in the rude and patronizing comments and treatment the women received. Even comments that appeared supportive on the surface reflected weight stereotypes and were perceived as condescending (Sniezek, 2019). Previous research has demonstrated that individuals with obesity are teased, shamed, and humiliated by other exercisers based on a perception of excess weight (Flint & Reale, 2016; Lewis et al., 2011). Individuals who perpetuate public stigma may feel like they are on 'safe moral ground' because fatness is viewed as self-inflicted, a result of laziness and lack of will-power that necessarily leads to poor health (LeBesco, 2011; Murray, 2005; Puhl & Brownell, 2003). Women also faced structural weight stigma, such as being excluded from using some exercise equipment, having difficulty finding exercise clothing in their size, and being portrayed negatively in physical activity advertising (Christel et al., 2016; Inderstrodt-Stephens & Acharya, 2018; Lewis et al., 2011). This acts to further separate women based on body size and serves as a reminder to fat women that they are not welcome (Inderstrodt-Stephens & Acharya, 2018; Meadows & Bombak, 2019).

Weight stigma had a complicated and contradictory impact on how women with obesity engaged in physical activity. Experiences of physical activity-related weight stigma resulted in a range of negative emotions, especially self-conscious emotions such as embarrassment, guilt, and shame. Women also felt a heightened anticipation of stigma and used several protective strategies, or 'preventative practices', to minimize the potential for further distress (Lewis et al.,

2011; Sniezek, 2019). Frequently, their need for self-protection was greater than their desire to participate (Dark, 2018; Lewis et al., 2011). This could lead to social isolation and inequity in opportunities for physical activity (Puhl & Brownell, 2003). Another form of self-protection was to leave experiences of weight stigma unchallenged, such as ignoring rude comments (Lewis et al., 2011). Self-protection allowed women to reduce their distress and avoid potentially emotionally loaded confrontations. Yet, it also demonstrates how women who are stigmatized lack power, which contributes to the cycle of stigma (Link & Phelan, 2001). The broader impact of self-protection was to view physical activity as a lose-lose situation. On one hand, women were encouraged to be physically active to lose weight; on the other hand, weight stigma made them feel judged and unwelcome if they tried (Harjunen, 2019). This made it difficult to foster a positive relationship with physical activity.

Several women in this study expressed a desire to change their body (i.e., lose weight) in response to and to escape weight stigma. They believed weight loss would increase their feelings of belonging within physical activity and make them feel healthier (Bombak, 2015). Weight loss would also be a way for them to fit in feminine, mainstream exercise clothing (Christel et al., 2016). For many women, motivations for physical activity other than weight loss were secondary, which demonstrated a weight-centric view of physical activity that prioritized thinness over well-being (Scott-Dixon, 2008). Endorsing these beliefs about weight, physical activity, and health demonstrates how women self-stigmatized. Physical activity took on an instrumental, or even punitive, role; thus, another impact of physical activity-related weight stigma was that physical activity became simply a means to an end.

Some women responded to weight stigma through acts of resistance, which required them to rethink how they viewed their bodies and fitness (Dickins et al., 2011; Scott-Dixon, 2008).

These women had initially accepted dominant weight-related discourses but eventually started to challenge them, which Dickins et al. (2011) refer to as reaching a "crisis point". This was sparked by a variety of events including experiencing negative health impacts related to weight loss attempts, realizing that weight loss would not make them happier, and unintentionally coming across size acceptance information (Dickins et al., 2011). Finding alternative ways of thinking led to self-acceptance and a better relationship with physical activity (Dickins et al., 2011). In contrast to physical activity as a means to achieve weight loss, these women participated in physical activity for its own sake, understanding that fitness and fatness were not mutually exclusive (Bombak, 2015; Scott-Dixon, 2008). They worked to accept and appreciate their bodies and engaged in physical activity for enjoyment, health, and social connection. This was facilitated by accessing online spaces that made fatness visible, accepted, and celebrated (Afful & Ricciardelli, 2015; Dickins et al., 2011). However, amidst weight-centric physical activity practices the women's resistance to weight stigma was occasionally overshadowed by self-blame and a renewed focus on weight loss (Bombak, 2015). Thus, it could be challenging for women to find weight-neutral physical activity spaces (Bombak, 2015). The overall impact of resisting weight stigmatizing beliefs and practices was to uncouple physical activity from body weight. Still, this reflected personal empowerment and had limited influence on the social structures that maintain weight stigma (Sniezek, 2019). Therefore, there remains a need to change broader weight stigmatizing structures and beliefs for real, widespread social inclusion.

Implications for practice and avenues for future research

As an applied qualitative approach, ID is meant to inform practice-based decision-making. Therefore, based on our findings we explain how reducing physical activity-related weight stigma is relevant to health promotion practice. Weight stigma is a multidimensional and

dynamic process, so reducing its impact will require efforts targeting its various interacting forms (Clair et al., 2016; Hatzenbuehler & Link, 2014). For instance, as there is a bidirectional relationship between structural stigma and public stigma, changes made by individuals (e.g., physical activity instructors) or in local settings (e.g., community recreation centers) have the potential to influence broader social structures over time (Clair et al., 2016). One such change that may alleviate some of the negative impacts of weight stigma is adopting a weight-neutral approach to physical activity (Mansfield & Rich, 2013; Mensinger et al., 2016; Pickett & Cunningham, 2017). Drawing on principles from the Health At Every Size (HAES) approach, weight-neutral physical activity focuses on health irrespective of body size. It recognizes that the factors affecting body weight are numerous and complex, that health goes beyond physical health to include emotional, social, and mental health, and that weight loss should not be the reason to participate in physical activity (Mansfield & Rich, 2013). Additionally, outcomes other than weight loss and obesity reduction represent better indicators of health, and thus focusing away from weight-related outcomes could play a role in reducing weight stigma within health and physical activity promotion efforts (Bombak, 2014a; O'Reilly & Sixsmith, 2012). Especially given that all people can benefit from physical activity, health promoters should not specifically target individuals with obesity but rather endorse physical activity for enjoyment, gaining strength, and improving social connections, create cultures of inclusion by using inclusive language, and accept and celebrate diverse body sizes (Bombak, 2015; Puhl & Wharton, 2007; Pickett & Cunningham, 2017). Staff training about weight stigma and changes to the physical environment in fitness centers could also contribute to promoting weight neutral and stigma-free contexts (Puhl & Wharton, 2007; O'Reilly & Sixsmith, 2012). This would promote access to opportunities and resources for all people, regardless of body size, to participate in physical

activity. Future research may aim to examine how weight-neutral physical activity impacts individuals who do and do not experience weight stigma.

An ongoing challenge for health promoters will be to counter the weight stigmatizing physical activity messages and images from commercial and popular media (Berry & Latimer-Cheung, 2013). Nevertheless, by designing and implementing stigma-free physical activity messages and campaigns, health promoters may contribute to changing the general public's attitudes about weight and reducing weight stigma perpetuated through these avenues. Specific strategies include ensuring that messages do not perpetuate weight stereotypes or blame (MacLean et al., 2009), using images that portray greater body diversity (Bombak, 2015; Holland et al., 2015), and shifting to HAES messaging (Bombak, 2014a; Thille, Friedman, & Setchell, 2017; O'Reilly & Sixsmith, 2012). While there is evidence that positive portrayals can influence the general public's attitudes about individuals with obesity (Pearl, Puhl, & Brownell, 2012), further research is warranted regarding images related to physical activity.

Additionally, achieving weight stigma-free health promotion will require health promoters to engage with individuals with obesity to understand their perspective and priorities related to their health and well-being (Bombak, 2014b; Pickett and Cunningham, 2017; Puhl et al., 2017). Although we have focused on women in this investigation, health promotion practitioners need to consider the perspectives of both women and men. Also, research that examines how physical activity-related weight stigma is experienced across and intersects with different social positions and layered oppressions, according to gender, sexual orientation, dis/ability, or race, for example, is an essential next step to ensuring health promotion initiatives support equity and inclusion.

Strengths and limitations

A strength of the study is that using ID allowed us to inform health promotion practice. Our findings may be generalizable in ways aligned with qualitative inquiry (Smith, 2018). For instance, while the research focused on the perspectives of a small group of women with obesity, the findings may be relevant more broadly, including in relation to men with obesity (Lozano-Sufrategui et al., 2016). Additionally, our findings may demonstrate analytical generalization since they supported broader conceptualizations of weight stigma (Smith, 2018). Recruiting women with varied sociodemographic characteristics and physical activity levels allowed us to capture various perspectives; however, we did not compare experiences of physical activity-related weight stigma between inactive and active women or examine regional differences. We also did not collect information about participant ethnicity and/or race. Finally, participants were primarily recruited through Obesity Canada's social media channels and being exposed to Obesity Canada's messages about weight stigma may have influenced the findings.

Conclusion

This study provided novel insights into experiences and impacts of physical activity-related weight stigma among women who self-identified as living with obesity. The findings extend our understanding of the consequences of weight stigma and demonstrate the need to address weight stigma in the context of physical activity to improve health equity. Thus, the findings have several implications for physical activity promotion and practices that may influence health and well-being for people of all body sizes. Only in the absence of weight stigma can physical activity positively impact health and quality of life. All people deserve to feel as though they belong in physical activity spaces, and to have access to meaningful

movement opportunities and communities without being subjected to the exclusive forces of weight stigma. As Dorothy put it, this means:

> *Feeling the freedom to go out there and walk, regardless of what you look like, in terms of your body size or shape. […] You should be able to do it without feeling like you're interfering with the perfect world.*

Chapter 6

Experiences of size inclusive physical activity settings among women with obesity (Study 3)

This chapter is being prepared for submission to a peer-reviewed journal.

Abstract

Weight stigma within physical activity settings can lead to the exclusion of people with obesity from these spaces. In this interpretive description study, we aimed to understand how women with obesity experienced size inclusive physical activity settings. The study was informed by an ecological, settings-based approach to health promotion. Nine women self-identifying as living with obesity participated in a semi-structured interview. Our findings show that at the individual level, size inclusion was experienced as an enhancement of personal well-being, self-worth, and belonging. This was closely tied to the interpersonal level, whereby weight-neutral practices used by fitness instructors and trainers, as well as the encouragement and lack of judgment from other exercisers positively contributed to the women's experiences. Many factors related to the organizational level were also involved in their experiences in the physical activity setting. In particular, women described how the organizational culture, inclusive marketing, specialized programs, and aspects of the physical space could enhance or limit their feelings of inclusion and participation. However, weight stigma was still prevalent in women's experiences outside of the physical activity setting and this could influence the individual, interpersonal, and organizational levels of the setting and compromise size inclusion. Based on

our findings and principles of health promotion, we provide practical recommendations to improve size inclusion in physical activity settings.

Keywords: ecological model; fitness spaces; health promotion; inclusion; interpretive description; physical activity; qualitative; weight stigma.

Introduction

Physical activity may contribute in numerous ways to quality of life and well-being (Public Health Agency of Canada, 2018). Most often emphasized in public health are the physical and mental health benefits associated with moderate to vigorous physical activity. These benefits include prevention or reduction of chronic illness, improvement in body composition and physical fitness, and improvement in cognitive function and mood (Penedo & Dahn, 2005; Prakash et al., 2015; Segar et al., 2017; Tremblay et al., 2011; Warburton et al., 2010). Physical activity can also act as leisure to promote an individual's physical and psychological fulfillment, their belonging to a community, and achievement of skills and goals (Rootman & O'Neill, 2017; Zhang & Chen, 2019). These various benefits align with the holistic definition of health in health promotion. However, experiencing weight stigma related to physical activity can limit access and participation in many ways (Myre, Glenn, & Berry, 2020). Thin female bodies are highly valued in Western society and physical activity settings are environments where women's bodies are on display, scrutinized and worked on (Craig & Liberti, 2007; Myre et al., 2020; Scott-Dixon, 2008). Size inclusive physical activity spaces are needed to lessen the effects of weight stigma and improve equity of access to physical activity (Pickett & Cunningham, 2017b; Souza, 2015). There are some physical activity settings that women have described as weight-neutral, inclusive, and non-stigmatizing (Myre et al., 2020). However, our understanding of the impact and challenges associated with size inclusive physical activity from the perspective of women who participate is limited. To address this gap, the purpose of this study was to understand how women living with obesity experience size inclusive physical activity settings. The findings may inform the practice of health promotion related to physical activity.

Weight stigma and size inclusion in physical activity

Weight stigma contributes to the marginalization of individuals with obesity and can threaten the pursuit of health (Hatzenbuehler et al., 2013; Pearl, 2018). A physical and social space where weight stigma is often perpetuated is the structured physical activity setting (e.g., fitness center, yoga studio). Many women have felt judged and embarrassed, received derogatory comments, and struggled to manage inaccessible equipment in these settings (Bombak, 2015; Leone & Ward, 2013; Myre et al., 2020; Schvey et al., 2017). They also cope with assumptions related to body weight, which are prevalent in everyday life but particularly salient in the physical activity context. For instance, women with obesity are presumed to be unhealthy and lack physical ability and fitness, and that they are, or should be, exercising for weight loss (Mansfield & Rich, 2013). Consequently, women with obesity may feel unwelcome, and even unsafe in physical activity settings. Unsurprisingly, the experience or anticipation of weight stigma in physical activity settings can restrict women from starting or continuing to engage in physical activity (Mansfield, 2011; Myre et al., 2020; Schvey et al., 2017). This can perpetuate inequities in opportunities to participate in physical activity as a health-promoting activity. Therefore, strategies to manage weight stigma in these settings are needed to reduce the marginalization of and provide greater access to physical activity among women with obesity (Rich & Mansfield, 2019).

In fact, whether a setting is deemed safe and shame-free is a factor that women with obesity consider when choosing where and when to engage in physical activity (Bombak, 2015; Schvey et al., 2017). Participating in a weight-neutral healthy living program has been shown to reduce internalized weight stigma in women with obesity (Mensinger & Meadows, 2017) and improve physical activity levels and depression symptoms (Watkins, Ebbeck, & Levy, 2014).

However, these programs were delivered as part of research studies, and the impact of participating in existing size inclusive programs outside of a research setting has not been assessed. Instructors of size inclusive yoga classes have highlighted that authentic leadership, inclusive language, sense of community, and a focus on health are strategies they use to create a culture of inclusivity (Pickett & Cunningham, 2017a). Exploring the perspectives of people accessing these spaces is a necessary next step.

Settings-based approach

A health promotion strategy outlined in the Ottawa Charter is to create supportive environments, i.e., "conditions that are safe, stimulating, satisfying, and enjoyable" (World Health Organization, 1986). Drawing from the principles of a settings approach to health promotion, this study focused on the physical activity setting as a practical entry point for managing weight stigma (Frohlich, Poland, & Shareck, 2017). Founded on a social ecological perspective, the settings approach recognizes that individuals, organizations, physical spaces, and social factors interact to create a unique context in which health may be promoted (Poland, Krupa, & McCall, 2009; Shareck, Frohlich, & Poland, 2013). While the focus is on the setting itself and not just the individuals within it, individuals and settings reciprocally influence each other, so health-promoting settings must also be sensitive to the needs of individuals (Kokko, Green, & Kannas, 2014). Settings vary widely in nature and scale. For instance, cities or communities are large settings that contain several smaller-scale settings within them, such as workplaces, schools, and hospitals. Settings approaches are used in health promotion to "situate practice in its context," recognizing that a one-size-fits-all approach is unlikely to be effective (Poland et al., 2009). Examining sports clubs through a settings-based approach, Kokko, Green, and Kannas (2014) demonstrated that health promotion activities can occur at several levels

including day-to-day practices, club culture, and organizational policies, among others. In this study, we aimed to understand how structured physical activity settings are experienced as size inclusive for women with obesity. Thus, the setting for this study is a local-level micro setting (i.e., physical activity facilities within a city). We responded to the research questions: How do women living with obesity experience size inclusive physical activity settings? From their perspective, what can be done to improve size inclusion?

Methods

Methodology

To address the research questions, we used interpretive description (ID) guided by the principles and strategies of a settings-based approach to health promotion. ID is a constructivist approach to qualitative inquiry that is rooted in an applied discipline (Thorne, 2016). Combining ID with a settings-based approach was appropriate because each focuses on understanding the context and proposing applications for practice (Frohlich et al., 2017; Thorne, 2016).

Participants, sampling, and recruitment

We recruited adult women (over 18 years old) in Edmonton, Alberta who self-identified as living with obesity and who had current or previous experience in a size inclusive structured physical activity setting. Structured physical activity settings were defined as community or corporate public spaces where women could engage in physical activity; it did not include home practices or research-based physical activity interventions. Participants, not the researcher, identified the setting as size inclusive. By recruiting women who had experience engaging in structured physical activity, we were able to focus on size inclusive experiences rather than the many known barriers to participating in structured physical activity such as time, cost, and

convenience of location (Bauman et al., 2012). We recruited a convenience sample of participants online through Obesity Canada social media posts and University of Alberta mailing lists. All participants provided written informed consent and demographic information including age, ethnicity, and subjective social status (i.e., self-perception of social status based on income, education, and occupation). Each participant was assigned a pseudonym. All women identified as White and middle-class. Valerie was within the age range of 26-35 years, Madelyn 36-45 years, Shannon, Eleanor, and Rita 46-55 years, and Fran, Simone, Christine, and Beatrice 56-65 years. We stopped recruiting when had collected sufficient in-depth information to address the research questions (Malterud et al., 2016; Thorne, 2016). We acknowledge that the limited diversity regarding ethnicity and subjective social status is a limitation of the study and more research will be needed to gain additional perspectives.

Data generation and analysis

Semi-structured interviews were used to generate data. An interview guide was tested during a pilot interview with a member of Obesity Canada's public engagement committee to ensure that the questions were clear and that it did not perpetuate weight stigma. The first author conducted nine in-person interviews lasting 60-90 minutes. All interviews were audio-recorded and transcribed. During the interviews, participants were asked about their relationship with physical activity, their experiences of size inclusive structured physical activity, the role of physical activity for their health and body image, and their perspectives about reducing weight stigma in physical activity settings.

The first author led the analysis. After each interview had been transcribed, she listened to the audio recording to ensure the accuracy of the transcript and wrote reflective notes that served as preliminary analyses. She asked broad questions such as "how does this relate to health

promotion?" "How does this relate to structured physical activity settings?" And, "how is this similar or different from other accounts?" Using NVivo version 12, she coded and recoded the transcripts (Saldaña, 2016). She shared several versions of the findings with co-authors, who acted as 'critical friends' to stimulate critical thinking and reflect on biases (Smith & McGannon, 2018). To ensure rigour, she regularly referred to the research questions and the principles and values of health promotion, ensured methodological cohesion, and practiced reflexivity, following the same procedure as with Study 2 (see Chapter 5, section entitled "Rigour").

Findings

The participants had or were currently engaging in many forms of structured physical activity including bootcamp-style fitness classes, yoga, aquasize, Zumba, dance, kickboxing, running groups, and personal training. These activities were offered at both community and corporate facilities. While women reported common facilitators and barriers to physical activity such as time, cost, location of the facility, and enjoyment of the activity (Bauman et al., 2012), for this study our analysis focused on their experiences specific to size inclusion. The themes we identified reflected the interaction of individual, interpersonal, organizational, and community levels of influence that characterize settings and we organized the findings accordingly. The findings are summarized in Table 6.1.

Individual level

Personal well-being uncoupled from weight

Women shared that their thoughts about their weight, health, and physical activity had shifted over time. In particular, they had worked to disassociate physical activity from body size and appearance. The women noted that weight loss was complex and for them, physical activity was not a realistic way to lose weight. Madelyn described how she had been overweight her

entire life, so she needed to "think about exercise from a different perspective" and adopt reasons other than weight loss for engaging in physical activity. Beatrice described physical activity as a journey separate from weight, "we weren't on some race to get me to a certain size or a certain weight […]. I had my own journey that I wanted to go within."

By not focusing on weight loss, the women became more aware of how physical activity could enhance their personal well-being. Each woman talked about the importance of physical activity for their mental, emotional, and physical health. They explained how engaging in physical activity improved their energy, mood, and quality of life. They also believed that weight alone was not a good indicator of health or physical fitness. They pointed out how changes in their physical abilities were often unrelated to weight loss, such as increasing strength and mobility (Shannon). Focusing on alternate outcomes (i.e., other than weight loss) was seen as more realistic and tangible signs of progress and achievement. For example, Valerie explained that she could swim more laps before taking a break, despite her weight remaining the same. Women also reported learning new skills, which motivated them to continue with the activity. Rita, who took a belly dancing class with a size inclusive instructor, said, "I'm going to take that class with her again, because I learned how to do the alphabet with my hips."

Some women realized that despite having a larger body, they were otherwise healthy, and they came to accept their body size. Rita said, "I might not be a size two, but at least I don't have ailments, so I should be proud of what I have. It's the cards I was dealt with and I'll just deal with it." Several women connected their focus on health rather than weight with the stage of their life. Capturing the perspectives of several participants, Shannon explained,

> *It hasn't been til I've gotten older and had more experiences and realizing okay I'm getting more benefits, it's not so much about me looking smaller. It's not about that, it's*

about my mental health, it helps my mental health, I can deal with some of my stresses. You know and if I'm more fit, I don't have to have sleep apnea and stuff.

Some women still wanted to lose weight, but it was not their main motivation for engaging in physical activity. Rita said,

Yeah, maybe that could be a side effect, you could, say, put it down at number four. Number one, have fun. Number two, reduce stress. Number three, you know, better for your health, longevity; able to add a little bit more pep to your step; learn new dance moves; and feel safe.

Beatrice described how having a better relationship with physical activity "led to a better quality of life",

I really am consciously wanting to have a different relationship than I did previously. With 'why I'm at the gym', right? So, being healthier but without worrying about whether or not the scale moves, a functional movement, reduction in joint pain or just increasing mobility, range of motion stuff. So more like a almost like a physio therapy type approach to getting the most out of the body I have without any promises of weight loss as an outcome.

Overall, when women cultivated a positive association with physical activity unrelated to their weight, it took up a larger part in their lives (Eleanor); it became a form of self-care, rather than punishment.

Enhanced self-worth and belonging

Several women expressed how they had been negatively affected by self-stigma, i.e., the application of stigmatizing weight-related beliefs to themselves (Pearl & Puhl, 2018). In contrast, participating in size inclusive physical activity was associated with a positive sense of self-worth and outlook on life (Shannon). In particular, physical activity made them feel accomplished, confident (Madelyn, Shannon, Beatrice), strong (Madelyn, Beatrice), and powerful (Beatrice). Beatrice said, "I started to recognize that I had strengths, that I was powerful, that I could do more than I thought I could do".

When the women did not have to worry about judgment, fitting in, feeling safe, or hurting themselves, they could participate in and enjoy physical activity. Valerie said, "you reach a point where like I'm really tired […] of feeling like that this is not for you." Size inclusive physical activity, in contrast, allowed women to feel comfortable and safe moving at their own pace and challenging themselves. They learned to listen to their bodies and respond accordingly. Rita noted that progress was more important than perfection. Shannon said, it "makes you feel part of that, being able to participate." Valerie explained that as a result of attending a size inclusive yoga studio, she enjoyed yoga for the first time, whereas her previous experiences had left her feeling self-conscious and discouraged.

Size inclusive physical activity countered the belief that women needed to change their bodies to be worthy. Having frequently felt like she was not "good enough," Rita had changed her relationship with her body, which she described as, "the thing that you got with you, you can't take it off like a dress and get a new one." She continued to say, "I have to look at my body as my friend, rather than my foe". Thus, by engaging in size inclusive physical activity, women had come to appreciate their bodies and celebrate what it could do instead of focusing on what it could not do. Valerie related this to a reframing of her physical abilities,

> *Inclusivity probably would go a long way towards helping people accept their appearance. […] Especially when you have experiences where you – like you can't do something well. Like you know, my stupid body can't do this. I can't do this. Instead, being like okay well no I can't do this, but I can do this other thing that I couldn't do a month ago.*

This process of self-acceptance was challenging and ongoing, as Rita explained,

> *Your inner dialogue is what you hear all day; and if it's always negative and putting yourself down – 'you're not good enough'. […] It's an ongoing thing […] but I have to say 'no, stop'. You know just, 'you're fine, you're enough'. And I keep telling myself 'you're enough'. I wish I could tell myself, my 20-year old self that, 'you're enough'.*

Interpersonal level

Fitness instructor and trainer practices are weight-neutral

The women explained that physical activity instructors and trainers contributed to size inclusion in physical activity settings by using various weight-neutral practices. These included treating everyone with respect, providing modifications, supporting individual goals, and celebrating outcomes unrelated to body size.

A practice that women believed promoted size inclusion and created a supportive atmosphere was to acknowledge and welcome new participants (Shannon, Madelyn). Shannon shared that "when you are larger, it's so intimidating to begin with," so having an instructor say hello and introduce themselves made her feel included. Women believed that instructors played a role in building a culture in the physical activity setting that was focused on effort and trying

your best (Madelyn). According to Beatrice, a "good" instructor was "somebody who really did look out and see bodies of every size as their athletes while leading a class". Thus, each person's value was not based on size or other appearance traits. This was conveyed not only by what the instructors said but their facial expression and body language (Simone, Beatrice). This related to the individual level, in that instructors and trainers could support women's sense of worth by treating them with respect and dignity. Beatrice shared her experience,

> *When I started working with trainers, I had a very low self-esteem, very negative. Just, you know, it took everything I had to even physically walk out of the change room and to the training area, that was like a major accomplishment. And I think they recognized that but they didn't, they didn't pander to it, they didn't treat me like I wasn't, shouldn't be there.*

Women sometimes felt like they needed to prove that weight stereotypes were wrong and assumed that others would judge them based on their size. Rita described a conversation with a running-group instructor, during which a lifetime of experiencing weight bias led her to expect it,

> *I said, 'I know I'm the largest person in that room, but I wanted to prove to everybody that I'm not going to leave, I'm going to stick it out.' […] And she [the instructor] goes, […] 'honestly, I don't think you should have thought that, cause I don't think nobody thought of you as a failure […] or as we don't want you there'. So, I was like wow, here am I thinking the worst of some people.*

Another weight-inclusive practice adopted by size inclusive instructors and trainers was to provide options for all abilities. Women recalled how instructors recognized that everyone had

different abilities, goals, and challenges, and as Rita put it, "did not assume that someone who's larger won't be able to catch up to the class". Instructors supported participants by offering several options for completing different movements and normalizing the practice of choosing the best option for each person (Madelyn) without judgment or singling anyone out (Rita). Fran described the instructors of her aquasize classes as "very good about saying, do your own thing, modify where you have to, and you know they'll show different moves. If you want more of a workout modify this way. If this is bothering you, slow it down this way". Women also appreciated when instructors suggested modifications to improve safety of the movements. For instance, they proposed specific modifications to prevent aggravating existing joint injuries and exercising without pain. They also reminded participants to listen to their bodies. Fran said, "they're very good about saying, work to your pace, if it hurts –you know your body, I don't know your body. If this doesn't work for you, we can find something else". Instructors suggested lower and higher-impact options and demonstrated how to use equipment and props so that everyone could participate in their own way. Madelyn explained that these modifications provided a way to monitor her own success, "there is a level of satisfaction to say like, well before I needed two blocks, and now I only need one".

In contrast, some women had experienced classes that were not inclusive to different fitness levels and ability. For Simone, this impacted her participation,

> *I remember years ago in a class when if you couldn't keep up the instructor would always, you know, kind of bark at you and say 'faster, faster, do this, do that'. And I didn't last very long in those kind of classes. […] I would quit going because it was too discouraging.*

Also, some women who had serious injuries did not feel like the classes they attended catered to their health concerns. Beatrice shared how she could not participate even with the modifications offered, which led to discouragement and not participating,

> *I'm not supposed to do forward bends, that could aggravate my disk. Think about your last yoga class and how many forward bends you did. What am I supposed to do while y'all are doing forward bends? Stand there. That feels pretty crappy. If you can't do the activities.*

Many women had also had experiences where modifications were not offered. Some women believed it was difficult for instructors to imagine the kinds of modifications needed for individuals with larger bodies if they were not large themselves, as Christine described,

> *I don't know if they can [understand] unless they're overweight themselves. And a lot of the instructors are not overweight, so how can they know how this is going to affect somebody, you know. You can try and imagine it, and they say, 'well you have to be careful', yeah but it's more than that.*

Other weight-neutral practices were to encourage personal goals and celebrate performance outcomes. Women felt like they were encouraged to have their own goals. Valerie compared her experience at a size inclusive yoga studio to mainstream studios,

> *It didn't matter if you couldn't do something; it wasn't like well the goal is to be able to do it. The goal is to increase your flexibility, or like whatever you feel like your own personal goal is. Whereas other studios I feel like, the goal is to do it correctly.*

Size inclusive physical activity instructors and trainers celebrated performance outcomes such as running farther, lifting more weight, having better endurance, or simply showing up. Madelyn shared how this initially surprised her given the typical promotion, expectation, and praise of weight loss within exercise contexts,

> *I lost some weight, some obvious amount of weight and no one ever said a thing. […] And I was like, 'oh I wonder why, maybe they don't notice or whatever'. And then I realized that's because they don't care, that's not why you're there for them. […] They don't say 'oh good job you lost weight', like that's not part of that for them. […] The only thing she ever said was 'your endurance is really good; you're keeping up really well with the class'. […] Looking back on it now, I'm like 'oh okay I get what you were doing', that really it doesn't matter whether you have lost weight or gained weight, you're still here. 'I'm happy you're here', that's basically the message you're getting.*

When it was difficult for the women to see their own improvement, the instructor provided that feedback. As Beatrice explained, "There was a cheerleader aspect to that relationship, the personal trainer-athlete relationship. […] They celebrated my successes and helped remind me when I was having a success, and then they framed it for me so that I would notice it." Notably, the client-instructor relationship was bidirectional. Beatrice shared how she had to convince a fitness professional to not focus on her weight,

> *Once I got through to them that we're not measuring and weighing me because I'm not here to lose weight. And got them out of that mindset, because so many of them, that's why people signed for personal training was to impact measurements that I knew wouldn't move. So, I didn't need to put myself through that. […] But it took me a while to*

find my own voice to speak up that way. This ability didn't come intrinsically like that was years in the making, getting strong enough to say, 'I don't need that.'

Enhanced social well-being: Participants relate to and engage with each other

In addition to instructors and trainers, interactions with other exercisers in the physical activity setting contributed to size inclusion. Women shared how they felt more comfortable in settings with diverse exercisers because they felt like they could relate to the other participants. Notably, their descriptions of diversity went much beyond body size to include ethnicity, age, and physical ability. Rita noted,

Diversity actually makes me go there because it feels inclusive. Yes I'm a larger lady, but I think a lot of people can look at themselves as being different, and saying I'm the only Black lady here; I'm the only Asian lady; I'm the only – I'm so tall, everyone is short; or I'm so short, everyone is so tall I can't do half these exercises; or I'm 80 years old and there's a 20 year old. You know what I mean, like once you get the diversity, you get the different shapes and sizes, it almost seems easy to get to and go.

Women also explained how having a shared goal or a shared challenge helped them identify with other participants and enhanced their feelings of comfort and belonging (Valerie, Eleanor). This created what they perceived to be a shared understanding that they were all there to work together (Simone) and that everyone was welcome (Madelyn). Women also recognized that each person had different body ailments, no matter their size. Thus, in addition to having shared goals, women related how everyone could have their own individual goals and still

participate together. Fran described how relating to other participants was tied to feeling comfortable going at her own pace in a Zumba class,

> *That was a lot of fun because you just do what you can – I mean there are people who are going all out, right, and then there's others whose knees don't move and who can't move that fast, or do – you know be on one leg for a long time, or whatever. But that was very comfortable because you had other 'like' people, right.*

Another interpersonal aspect was the friendly atmosphere created by participants (Simone). People chatted and encouraged each other without judgment or ridicule. Christine described how this related to her social well-being outside of her aquasize class, "It's also now an important social aspect of my life, because I swim with the same people regularly and sometimes we'll go for coffee after or something, and share stories and stuff." In contrast, interactions with other exercisers that were perceived as judgmental or condescending could have a negative impact on women's self-perception and, consequently, participation in the activity. Simone shared with us such an experience,

> *I remember one exercise class in Calgary when we were doing sit-ups, two women started laughing at me, you know in the class. And so, I never went back. I never exercised again for a couple of months, I never – I quit going, and I was really – felt self-conscious a lot. And so, stuff like that really does affect, not just your motivation, but your mental outlook kind of. And it makes you just not want to participate.*

Beatrice recalled a different kind of negative experience, which was patronizing rather than outright judgmental,

I've had comments from participants, you know, fellow participants that, although I'm sure they meant them to be helpful, weren't particularly helpful. Usually, it's the negativity that I experienced wasn't bullying, it was more, it was a passive aggressive, sort of 'good for you for coming' and, and just singling you out in the class to cheer you on when you were having to modify an activity bringing attention to the big girl in the classroom, I found that less than helpful. You know, it was that 'you should just be glad you're here' kind of thing. And you know, there, there are lots of people who show up at a fitness class who may need to modify because they've just had knee replacement surgery or they're a runner and they're rehabbing it, and they don't get treated the way that the big girl in the class does, there's a difference, I could feel the difference.

These negative interactions between participants frequently occurred outside of the exercise space itself. For example, while showering in the change room, Eleanor recounted,

I've had people come up to me and say, like 'you're very brave'. […] And then I think well why are you saying that to me, like there's three people, or four people in here, why are you coming to me saying it? And I really believe it was because I'm overweight. Like they think somehow like oh well shit, like 'you should be more embarrassed than me, I'm not fat'.

Organizational level

Leading by example: All bodies are welcome, and ridicule is not tolerated

Women's accounts revealed the important role of organizational culture in promoting size inclusion within physical activity settings. When asked about the atmosphere, Simone

described it as "an absence of ridicule." Participants conveyed feeling welcome, not being laughed at, judged, or mocked (Valerie), and not needing to look a particular way to participate (Madelyn). The culture of acceptance of all bodies and fitness levels was viewed as originating from and being reinforced by the organization's leadership. Madelyn remarked on how this tied into the organization's mission, contrasting corporate fitness facilities promoting weight loss with community centers focused on building community. Women perceived the owners and managers of fitness facilities to have a top-down impact on the organizational culture, such as setting and modeling a low level of tolerance for exclusion (e.g., saying it is or isn't acceptable to make fun of people). Simone expressed,

> *If the owners or the top management shows intolerance with different body types, then that will carry down through – through to the staff, right. And if the owner's making a joke about – well look at, you know laughing when – when somebody overweight tries to do something, then the staff's going to pick that up and they're going to have the same – but if you know, the owners hear or see, see a staff do something like that and they're right on top of it and say, we don't do that here. Then the staff will follow suit.*

Relatedly, organization may lead by example through their hiring and staffing practices. Women recounted how employing individuals with different weights and abilities reflect the organization's value that all bodies are welcome.

Specialized programs are offered

While specific movement modifications provided by instructors or trainers at the interpersonal level contributed to size inclusion, organizations were also viewed as having a role in class inclusion by offering specialized programs that were tailored for individuals with

specific needs. For example, offering a chair yoga class could allow individuals with reduced mobility to participate. Valerie related how this forethought was appealing for those experiencing difficulty getting up and down from the floor, "it wasn't just like okay well come to the class and modify it as you go, it was like, this is modified already […]. So, anybody can come." Offering specialized classes or programs was viewed as "a huge step towards making people feel welcome" (Valerie) because it allowed women to feel comfortable starting where they were at without judgment. Valerie described her experience attending a size inclusive yoga studio as "revolutionary" because it was a space "designed specifically for people who have been excluded, or marginalized". Although she moved in different ways compared to a traditional/mainstream North American yoga class, she still felt valued as a person.

Some women believed that offering classes specifically targeted towards women with larger bodies might encourage them to try it because they would share an aspect of their identity with other participants and the instructors would be aware of some challenges associated with having a larger body size (Fran). However, most women believed it was more important to tailor programming for particular needs rather than size (e.g., a knee injury, arthritis). Women also pointed out how it was necessary for organizations to think in advance about how to accommodate for their clients' needs. If this wasn't done, they could not participate. Several women (Fran, Eleanor, Beatrice) shared their experiences of being excluded from participating based on a lack of forethought. Eleanor recounted,

> *I just felt like when I walked in, they didn't know what to do with me. Right, like they didn't know what to say; they didn't know how to handle it. They weren't really equipped to deal with someone who might be a challenge to them, that wasn't already like active in some way, right. […] If you don't kind of fit in with […] what their program's set up for,*

or the way their organization is planned – they don't know what to do with you. So, you're both left standing there uncomfortable thinking well what do we do now? I guess I'm leaving. Bye.

Over time, women who experienced exclusion in physical activity settings were discouraged from participating altogether. Valerie explained,

I think that you go to enough classes where you feel like 'I don't belong here, I'm not good enough to do this' – whatever. Probably you feel like well I'm not good enough to do any sort of activity, like why should I bother? Because I can't do kick boxing; I can't do you know flow yoga; so, like there's obviously nothing for me, so what's the point?

Marketing incorporates messages of inclusion

Physical activity organizations send messages of inclusion based on how they market and promote themselves, which is seen to reflect the organization's culture. For instance, the photos and language (Shannon) used in marketing materials may indicate who is welcome and who will feel like they "blend in". Valerie shared examples of marketing that she perceived as welcoming, which was tied to the programming offered at the facility,

If it's just like a zillion buff people on the website, it makes me think like well I'm not welcome there. That's not a place for me, necessarily. But when they make an effort to be like this really is for anybody to come, or if they have specialized classes, I'm much more likely to go somewhere. Yeah like women's classes, or beginner classes or whatever. As opposed to, like good luck, we only have one level, there you go. I feel like I would just be like inclined to be like no, this is not happening.

The women said that, in addition to offering specialized programs, it was also important for organizations to have information about these programs on their website. Eleanor expressed how this would indicate to her that the setting might be size inclusive, although she would need to actually go to see if inclusive practices were implemented. Thus, an organization's marketing may be a person's first exposure to the culture of the organization. If it is not perceived as size inclusive, women may be less likely to visit the facility or try out their programs. Rita shared such an experience,

> *There is an exercise place just up the street from me. […] And I thought wow I would like to try that. So, I go online, I went on their Facebook page and then all of a sudden, they had this portrait of a person, and of course the headless people, overweight headless people, 'Why look like this when you could look like this?' […] I'm thinking wait a minute, you're trying to promote people to bring in, but you're making fun of someone who's fat, who has that body? And that was it, I'm like F You. There's no way you're getting my money.*

While women viewed weight-neutral marketing as a way to identify welcoming settings, weight-centric marketing was seen as more prevalent. Promises of weight loss demonstrated a simplistic view of weight management, as Beatrice described,

> *We were raised to believe that eat less move more was a treatment or a viable option if you were carrying extra weight. So, that was actually the way that most fitness programs that I've been involved with too approached fitness, or approached participation in their course was, in some way, we're going to get that weight off of you.*

These methods of advertising are not realistic (Shannon) and in fact harmful and "fraudulent" (Beatrice). In contrast, marketing approaches that women perceived to be size inclusive were the celebration of successes unrelated to weight or inches lost and promotions that did not depend on body size or fitness levels. Rita explained how a weight-centric message could be modified to become weight-neutral,

> *Whenever they have someone who's made the wall or whatever, 'she lost 14 inches and 'x' number of pounds'. Don't, don't. How about something else like oh, she can now run an extra minute; or she can lift this much thing; or she feels good; or, or you know or say – you could even say she went down a dress size. Or she feels like she has lots of energy, you know, or she can sleep better. Other things than just weight, you know or, or her skin cleared up; or [laughs] she's regular now. I don't care, there's so much you could do other than just weight, inches and stuff like that.*

The setting's physical space is accessible and safe

Size inclusion (or exclusion) was also evident by the accessibility and safety of the physical environment. Accessibility was seen to start right at the door. Benches at the entrance provided a safe way to remove shoes, whereas turnstiles made the space less welcoming. As Beatrice put it, "that's pretty much saying we don't want big people here, because you can't fit through those [turnstiles]. Unless you go sideways, and even then, it's like, it's iffy. And you can get stuck and you can get fat stuck in between the pole, and it's horrible." Larger and more private change rooms also contributed to women feeling comfortable (Fran, Beatrice).

Another aspect of the environment was the layout of equipment. Women explained that some facilities placed equipment (e.g., exercise bikes) so close together that there was no space to manoeuvre through the area (Shannon, Beatrice). Beatrice explained how this made her feel like she was on display,

> *They just pack people in so they don't allow for somebody to feel safe just getting into their zone. So, having a few machines that were off in areas where you could go for a bit of a private, more private workout, I think would help people upsized to feel welcomed.*

Fran recounted having to walk down a ramp to retrieve exercise equipment to participate in a fitness class, and eventually deciding to stop attending because the risk of falling was too high. In contrast, she described elevator lifts to enter and exit the pool as "fantastic" and these made it possible to several women to participate in classes such as Aquasize (Fran, Christine). Another example of how the physical layout could improve accessibility was given by Eleanor, who described how assigning different speed levels for each lane of a walking/running track made her feel like she could participate because she wasn't in anyone's way or competing with anyone. Furthermore, several women said that spaces with dimmer lights helped them feel less self-conscious because they did not feel like they were being looked at and judged (Madelyn, Beatrice). Relatedly, women also tended to prefer spaces without mirrors or windows. Eleanor explained,

> *I really don't want to be on display when I'm sweating and everything like that. I just don't like it period. So, I don't feel like you look at your best and most of us, when you go out in public you have a certain standard for yourself. Right. Well that's pretty public if*

you're in the window. So, that would turn me off right away. Right away, I'd be like forget that.

Importantly, women judged very quickly whether they would feel safe and welcome in a setting based on the physical environment. Madelyn recounted how she hadn't felt uncomfortable in a physical activity setting because she wouldn't have chosen to be there in the first place, "I'd walk in the door and go yeah no, I'm not doing this". Similarly, Rita shared her experience entering a yoga studio that was marketed as size inclusive,

The one thing that put me off is when I walked in the door they had all these diet foods – like shelves and shelves, and shelves of diet food. […] So, my first impression about it is like, I'm coming in here, but you're already telling me I'm not good enough because I should have to eat this, but I can go in the back and do your exercise because I'm fat.

In general, women would not return to a fitness facility if they felt uncomfortable or unsafe in the physical space.

Community level

Societal weight-related attitudes and practices do not support size inclusion

Many participants talked about the ways in which weight and obesity are perceived at a societal level and how this demonstrates the prevalent bias and stigma against individuals with obesity. The women challenged some common misconceptions relevant to the physical activity context, such as the belief that body size necessarily determines health (Beatrice), that people with larger bodies are not active or have no athletic ability (Valerie), that any health issue is due to excess weight (Eleanor), and that weight management is simply a matter of calories in-calories

out (Madelyn). Women believed that the widespread acceptance of these ideas on a societal level manifested in physical activity settings. Beatrice associated negative societal attitudes to the organizational culture of fitness settings,

> *I don't think the culture of the gym is going to change until overall, we shift our, like, if you're selling gym memberships based on the promise of weight loss, and that is still, here comes January, that is still going to be the main thing that they are focused on, that intrinsically says your fat body is flawed, your large body has no value, or has less value, and you should be willing to do something to change it, what is wrong with you. So that culture is how they get people to the gym.*

This was frustrating for women, as Rita expressed,

> *I think that's the thing that pisses me off is sometimes people think that we are a lost cause, larger ladies, larger people. And that we're not worth it, that we're garbage or we're fat, or you know we're the – we're the insignificant. It's the accepted prejudice, right. […] Oh you're fat, oh you're probably dumb, you know, or you don't even know how to lose weight and all you have to do is stop eating and exercise more.*

Valerie shared how weight-related assumptions impacted her physical activity,

> *I find it upsetting that there are people that want to be more active. And are societally told like 'you need to be active, cause clearly you aren't, and you're lazy' or whatever. But then are just like well I don't want to, I don't want to be the only person at the gym who isn't like a body builder. I don't want to be the only person at the pool who isn't –*

[…] So like, well I want to get fit, or I want to do this, but I can't find something that suits me and that I'm comfortable, so I'm just not going to.

Therefore, participants saw a need to not only address these misconceptions and stereotypes, but change practices to be more inclusive. One strategy that was suggested was through media and general marketing strategies. Valerie explained how this could even impact individuals beyond those living with obesity,

I think there's a lot of like media influence, it's like if you are not athletic and you do not look like this, then you are like less valuable than this other person. And I think that it's sort of reflected in the gym culture a little bit, in that like maybe it's less accessible. Like well you're in a wheelchair, well you're obviously not as important as this person because there's no fitness classes for you, so you're – like what's the point of you being fit because you can't look like that so who cares.

Another practice that requires change is the availability and affordability of exercise clothing in larger sizes. Beatrice explained,

I know of a couple of stores like I would find a couple stores that I knew had some things that would work for me. But again, they were stores that cater to people of size, you paid a premium, you were certainly nothing cute like what you can get matching tops and bottoms and all the things that you could get for other, other sizes of athletes wanting to work out. And then nothing that addresses some of the skin issues and things like that too like, it'd be great if people designed some clothing that would help support you in your

most vulnerable places. But also allow for wicking and keeping those areas from getting damaged, diseased.

Overall, women believed that continuing to stigmatize people based on body size was unacceptable. Simone related how it was time to "be more aware of people's emotional wellbeing", whereas Madelyn, who said, "what I wish more than anything, that my size was acceptable" also shared her hope for change: "I'm hopeful that we get to the point where we're like […] this is something that's complex that you're dealing with, rather than this is a failure of you as a person".

Table 6.1 Summary of findings according to ecological level of influence

Ecological level	Findings
Individual	• Personal well-being uncoupled from weight • Enhanced self-worth and belonging
Interpersonal	• Fitness instructor and trainer practices are weight-neutral • Enhanced social well-being: Participants relate to and engage with each other
Organizational	• Leading by example: All bodies are welcome and ridicule is not tolerated • Specialized programs are offered • Marketing incorporates messages of inclusion • The setting's physical space is accessible and safe
Community	• Societal weight-related attitudes and practices do not support size inclusion

Discussion

This study aimed to understand how women living with obesity experienced size inclusive physical activity settings. Using ID and informed by a settings-based approach to health promotion, we found that size inclusion resulted from bidirectional relationships between individual, interpersonal, organizational, and community factors.

At the individual level, we found that in retrospect women's thoughts about physical activity and their self-perceptions had become more positive while their focus on weight loss had decreased. As a result, they prioritized other aspects of physical activity such as improving functional fitness, learning new skills, and enjoying themselves (Bombak, 2015). In contrast to weight stigma, which implies that larger people have less worth, size inclusivity could improve self-worth and enhance feelings of belonging. Consistent with our findings, other research has found that stigmatized people who feel like their identities are valued show greater self-integrity and sense of belonging (Cook, Purdie-Vaughns, Meyer, & Busch, 2014). Thus, size inclusive physical activity practices may have a role in mitigating internalized weight stigma, which could influence exercise self-efficacy (Meadows & Bombak, 2019) and long-term participation in physical activity (Huberty et al., 2008). There appeared to be a relationship between life stage, self-perceptions, and physical activity. Some research has found that age predicted mental health-related quality of life, whereby older individuals placed more value on health than appearance and cared less about what people thought (Pudney et al., 2020). Other research found that body and weight concerns, as well as the impacts of weight stigma, persisted throughout women's lives (Pila, Solomon-Krakus, Egelton, & Sabiston, 2018). Examining differences between life stages was beyond the scope of the current study, but presents an area for future research.

At the interpersonal level, women's interactions with fitness class instructors, personal trainers, other exercisers, and staff members contributed to their feelings of belonging in the setting. While some women preferred one-on-one instruction, others enjoyed the social aspects of participating in a group (Danielsen et al., 2016). Still, the characteristics of what women described as "good" instructors or personal trainers were similar: they were welcoming; they

offered modifications to ensure that everyone could participate in their own way; they encouraged women to listen to their bodies; and they did not assume anyone's ability based on their body size (Pickett & Cunningham, 2017a). This is in contrast with research demonstrating that physical activity and recreation center employees and other exercisers often hold negative weight-related attitudes (Dimmock et al., 2009; Flint & Reale, 2016; Robertson & Vohora, 2008), which translates to judging, teasing, or bullying exercisers with larger bodies (Cardinal et al., 2014; Flint & Reale, 2016; McIntosh et al., 2016; Schvey et al., 2017). Even group fitness instructors who describe themselves as local-level health promoters use weight-centric practices (Markula & Chikinda, 2016). Yet, our findings show that weight-neutral approaches to physical activity instruction may be more health promoting, particularly for women with obesity.

We also found reciprocal relationships between individual and interpersonal levels. For instance, on one hand weight-neutral teaching practices used by fitness instructors or trainers could help women improve their self-perceptions, while on the other hand women could encourage instructors to adopt weight-neutral practices (e.g., suggest not weighing their clients and avoid using weight loss as a way to motivate their clients).

Another interpersonal relationship in the physical activity setting that women found important was the social interactions between exercisers. Relating to other participants in the setting was important (i.e., sharing something in common), but even more so was the lack of judgment and the idea that everyone could participate together despite their differences. Thus, peer support and social connection contribute to positive experiences in the physical activity setting (Danielsen et al., 2016). Size inclusion at the interpersonal level was associated with the organizational level, as women perceived facility staff and managers, along with facility policies,

to have a role and responsibility for modeling and upholding a non-judgmental and non-stigmatizing standard within the setting.

Organizations were believed to promote size inclusion through their organizational culture, programming, marketing, and physical spaces. Leaders in these settings have the role of modeling and championing attitudes and behaviours related to size inclusion (Pickett & Cunningham, 2017b). This shows another reciprocal relationship between levels of influence: at the individual level, women's well-being was promoted by focusing away from their weight or weight loss and organizations could enhance this by using weight-neutral practices. Our findings did not demonstrate an impact of individuals on organizational practices, although it would be possible according to a social ecological framework (Cook et al., 2014). Some women thought organizations could offer plus-size specific programs so they could relate with others based on body size. However, a more prevalent view was to offer specialized classes based on ability rather than weight. For example, classes geared towards a particular issue (e.g., poor knee mobility) helped them find commonalities with others exercisers. From the women's perspectives, this signaled to them that the organization and instructors were considering their clients' specific needs. This related to how the program was promoted, i.e., for increased mobility and functionality rather than weight loss, and without judgment. Relatedly, women explained how they perceived messages of size inclusion before even entering a physical facility, through organizations' websites and social media. Inclusive marketing strategies signal to potential clients that they are welcome (Cook et al., 2014; Pickett & Cunningham, 2017a). Due to prevalent and internalized weight stigma, women with obesity may assume they will be judged and treated poorly in physical activity settings (Myre et al., 2020). Organizations may alleviate this anticipation of weight stigma by explicitly stating that weight stigma will not be

tolerated and that people of all body sizes are welcome. Relatedly, the findings also showed the importance of following through (i.e., with their practices and programming) with statements they make online or in promotional materials. Another aspect of the organizational-level contribution to size inclusion was the physical environment, which could create or remove barriers to participation. Specifically, women found that benches at the entrance of the facility, removal of turnstiles, private change stalls and large showers, spaces without mirrors or windows, and increased space between exercise equipment allowed them to access the physical environment in a way that was safe and comfortable. Organizations must consider the diverse needs of their clients to eliminate these environmental barriers (Richardson & Motl, 2019).

From a settings-based approach, it is important to acknowledge that physical activity settings exist within a larger community setting, and individuals move from one setting to another in their daily lives (Kokko et al., 2014). Weight stigma is still prevalent at the community level and this influences the physical activity context (Lewis et al., 2011). For instance, an issue that is removed from the setting itself but has implications for participating in physical activity is the lack of exercise clothing in larger sizes (Christel et al., 2016; Myre et al., 2020). Therefore, addressing issues surrounding weight stigma is necessary to support size inclusion in physical activity and life more broadly.

Strengths, limitations, and next steps

An asset of this study was the naturalistic and practice-relevant inquiry into women's experiences of structured physical activity using ID. Learning from naturalistic settings improves the transferability of research findings, i.e., determining what could feasibly be applied in other similar physical activity settings (Poland et al., 2009). Using an ecological, settings-based approach was helpful to show the multiple levels that influence one's behaviour; this is relevant

for a behaviour such as physical activity, which may be seen as solely an individual's responsibility (Sallis, Owen, & Fisher, 2008). It is especially relevant to demonstrate the multiple levels of influence on physical activity for individuals with obesity, who, due to weight stigma, are often assumed to simply lack the willpower to be active.

A limitation of the study is that the women had participated in many types of physical activity offered through different facilities. While this was viewed as appropriate for an exploratory study such as this, future studies may aim to examine activity-specific experiences of body weight inclusion. Furthermore, by recruiting women who were already accessing these settings to engage in physical activity, we could focus on experiences in the settings rather than the barriers they may experience in accessing or joining them. However, this likely excluded women based on other social determinants of health such as education and income, which have been associated with time and money spent at fitness facilities (McLaren et al., 2012).

Our sample consisted of women over 30 years of age, and many described how their perceptions about their body and their reasons for participating in physical activity had changed over time. Thus, gaining a better understanding of experiences of size ex/inclusive physical activity in a younger population is warranted. It is also important to examine how size intersects with other identities (Shareck et al., 2013). In this study, experiences in physical activity settings existed at the intersection of several identities related to body size, gender, age, and physical ability, highlighting the need to consider the intersection of personal factors when addressing inclusion and accessibility. There are also opportunities to learn from inclusion-related practices in other types of settings such as workplaces, as well as the experience of individuals with other stigmatized identities such as mental illness or disability (Poland et al., 2009; Richardson & Motl, 2019).

In future studies, researchers could examine the physical settings themselves to identify areas that demonstrate size in/exclusion, as well as integrate participant observations in their investigations, such as accompanying participants while they engage in physical activity (Bombak, 2015). Building on our understanding of participants' experiences, researchers may seek to gain the perspectives of instructors, personal trainers, and management personnel who work in physical activity settings.

Conclusion

This study helped advance our understanding of size inclusive experiences in physical activity settings among women with obesity. Women living with obesity have previously identified these settings as a place where they would participate in physical activity if they were size inclusive (Bombak, 2015; Schvey et al., 2017). Weight-neutral practices employed at each social ecological level were found to contribute to size inclusion in the physical activity context. Enhancing size inclusion in these settings may promote women's health and well-being, not only through the benefits of engaging in physical activity but also by improving self-perception, belonging, and inclusion. Building on this understanding, practitioners connected to the physical activity setting are in a position to reduce weight stigma and contribute to making physical activity inclusive to people of all body sizes (Poland et al., 2009).

Chapter 7

General Discussion

> *All women deserve to live with respect and enjoy their lives now, rather than at some point in the distant future "when I'm thin enough." Helping professionals are in a key position to incorporate the message of positive self-esteem for all women, regardless of size, into their practice and create meaningful change. It is not enough that we decry the media obsession with thinness. It is up to us to make the world a safer place for fat women to live in peace and good health.* (Lyons, 1989)

This dissertation aimed to examine the relationship between weight stigma and physical activity among women with obesity and identify strategies to reduce the harmful effects of weight stigma. Study 1 was an experimental online study to test whether weight bias internalization could be reduced among women with obesity using repeated exposure to counter-stereotypical images paired with positive physical activity words. Study 2 was a qualitative exploration of the way women with obesity experienced and responded to physical activity-related weight stigma, and how weight stigma impacted their physical activity. Study 3 was a qualitative investigation of the experiences of size inclusive structured physical activity settings among women with obesity. In this chapter, I summarize the findings from these three studies, discuss the implications of the dissertation as a whole, and outline the strengths and limitations of the research. I conclude with some outstanding questions and final remarks.

Contributions

The results of Study 1 showed that the weight bias internalization of women in the experimental group (who completed a modified visual probe task that repeatedly showed counter-stereotypical images of physically active people with obesity paired with positive physical activity-related words) was not different from the weight bias internalization of women in the control group (who read Canada's Physical Activity Guidelines and set a physical activity goal for the week). There were also no group- or time-related differences in physical activity self-efficacy, physical activity attitudes, or self-reported physical activity. Previous interventions aiming to reduce weight bias internalization have primarily focused on counseling to help individuals cope with stigma (Cook, Purdie-Vaughns, Meyer, & Busch, 2014; Pearl & Puhl, 2018). This study contributed to the literature by testing the effect of images that could be widely used (i.e., implemented on a larger scale than counseling) and focused on automatic processes (i.e., one way images used in media and health promotion are mentally processed). The images used in the study were taken from online images banks created by Obesity Canada, the Rudd Center for Food Policy and Obesity, and the World Obesity Federation. Although these organizations encourage the use of their images to reduce weight bias, the effectiveness of such a health promotion strategy was not known. While the experimental findings of Study 1 did not support the use of the images to reduce weight bias internalization, the qualitative findings suggested that there might be benefits to their use. Women said that the images, which they found relatable and motivating, were different from the images they usually saw related to physical activity. On one hand, they believed the images could challenge negative stereotypes about weight, fitness, and health, help identify safe spaces to engage in physical activity for women with obesity, and potentially improve self-perceptions. On the other hand, however, they

doubted the images would be used by organizations, and thought that if they were, the counter-stereotypical images may have no effect and might even increase weight stigmatizing beliefs in the general public. Nonetheless, the women believed the images should be used to promote physical activity but might have limited effects on weight stigma and their feelings of belonging in physical activity spaces if non-stigmatizing messages and environments were not also available.

The findings of Study 2 demonstrated that women experienced weight stigma in physical activity in various ways. They reported being judged, laughed at, patronized, stared at, and even harassed by other exercisers, fitness setting staff, and people from the general public. They were exposed to weight-centric physical activity messaging and advertisements, had difficulty finding exercise clothing that fit and was affordable, and faced weight restrictions and inaccessible exercise spaces. In response to these experiences, women felt embarrassed, ashamed, angry, frustrated, and discouraged. They used self-protection strategies such as engaging in physical activity at home instead of in public, frequenting smaller and less busy facilities, or not engaging in any physical activity; they also tended to leave weight stigma experiences unchallenged. Additionally, the physical activity they engaged in was often motivated by a desire to change their body, particularly to lose weight. In contrast, some women resisted experiences of weight stigma by participating in weight-neutral physical activity, finding size inclusive groups, and accessing body positive social media. Previous studies had focused on general experiences of physical activity (Bombak, 2015), experiences within physical activity research interventions (Sabiston et al., 2009), or sport-specific experience of weight stigma (Scott-Dixon, 2008; Sniezek, 2019). Thus, this study addressed a gap in the literature to gain a better understanding

of the impact of weight stigma on physical activity among women with obesity who were physically active and inactive.

The findings of Study 3 showed how aspects of inter-related ecological levels played a role in women's experiences of size inclusive physical activity settings. At the individual level, women felt an improved sense of belonging and well-being by participating in size inclusive physical activity. Interpersonal-level factors associated with size inclusion included positive and weight-neutral interactions with fitness instructors, personal trainers, and other exercisers. At the organizational level, inclusive organizational culture, programming, marketing, and physical environments enhanced size inclusive experiences. While an increasing number of research studies have focused on the negative experiences and consequences of physical activity-related weight stigma, Study 3 contributed to our understanding of what *inclusion* could and does look like. Thus, this study added to the literature by identifying setting-specific strategies within the individual, interpersonal, and organizational levels that may reduce the impact of weight stigma (Cook et al., 2014). The findings intersect with those of Studies 1 and 2, which found that counter-stereotypical images may be necessary but insufficient to reduce weight stigma without inclusive physical activity settings (Study 1) and that weight-neutral physical activity advertisements and settings could help women with obesity resist weight stigma (Study 2).

Taken together, the findings of the three studies highlight the complexity of addressing weight stigma in the physical activity context and provide evidence for the positive portrayal and inclusion of individuals with obesity on health and well-being. They also have implications for researchers, for health promotion practitioners, and for professionals and organizations involved in providing physical activity, fitness, and recreation opportunities to the public.

Implications

The results add to the literature about weight stigma internalization and representation within physical activity messaging and social media in relation to the reduction of weight stigma, and therefore have several implications for these research areas.

Stigma research in the last 20 years has increasingly focused on weight stigma and, more recently, stigma internalization (Chen et al., 2020). The current research findings showed that participants were aware of weight-related social stereotypes and often endorsed and applied them to themselves, leading to internalized weight stigma. Previous research had found an association between weight stigma internalization and physical activity avoidance (Pearl et al., 2014; Vartanian & Novak, 2011), yet the findings of Study 1 found no correlation between weight stigma internalization and MVPA. Exploring this relationship further using interpretive description enhanced our understanding to show that women who experienced weight stigma did not simply avoid physical activity but responded and were impacted in various ways. For instance, Study 2 findings showed that some women who experienced weight stigma avoided physical activity, while others participated alone at home or in spaces where they felt comfortable. Physical activity was often experienced as a lose-lose situation, or "damned if you do, damned if you don't." This is congruent with other research showing that internalizing stigma can lead to a "why try" effect (Corrigan, Larson, & Rüsch, 2009). The findings of Studies 1 and 3 suggest that size inclusive physical activity environments, in addition to physical activity messaging and imagery, may have an effect on weight stigma internalization. As weight stigma remains prevalent in the general population, identifying strategies to help individuals become more resilient to internalized stigma is important. Reducing the impact of stigma on those

affected by it may improve psychological well-being, coping with stigma-related stress, sense of belonging, and self-integrity (Cook et al., 2014).

Positive representation within physical activity public health messages, advertising, and social media was another concept found throughout the findings. These showed that women found counter-stereotypical images relatable and motivating (Study 1), that accessing body positive social media content could help women resist weight stigma (Study 2), and that non-stigmatizing and size inclusive portrayals on fitness facility websites could signal a safe and welcoming space (Studies 1 and 3). Yet, the intervention in Study 1 that used repeated pairing of counter-stereotypical images and positive physical activity words was not successful in reducing weight stigma internalization in our sample. Other interventions targeting automatic biases using evaluative conditioning principles were successful at reducing automatic racial biases (Fitzgerald, Martin, Berner, & Hurst, 2019). Important distinctions between these studies and Study 1 in this dissertation, however, are the targeted bias (race versus weight) and population (others versus self). Other research testing the effect of similar positive representations found lower weight bias associated with images of individuals with obesity engaging in weight-neutral behaviours such as giving a presentation in an office (Pearl et al., 2015), with images of plus-sized fashion models (Smirles & Lin, 2018), and with physically active individuals with obesity (Berry et al., 2014). In a systematic review of interventions to reduce implicit biases, which included some studies on implicit weight bias, counter-stereotypical portrayals and strengthening counter-stereotypical associations were identified as promising strategies for bias reduction (Fitzgerald et al., 2019). In the case of weight stereotypes, the effect of such interventions on automatic evaluations may be limited due to a social culture that promotes these biases. Thus, weight stigmatizing content that remains prevalent in mainstream media and public health

campaigns may counter efforts at positively representing individuals with obesity (Heuer et al., 2011; Holland et al., 2015; Lupton, 2017; Young, Subramanian, & Hinnant, 2016). For instance, celebrity fat-shaming events have been associated with an increase in implicit weight bias (Ravary, Baldwin, & Bartz, 2019). Another example is the recent proliferation of social media posts referencing the "quarantine-15" or "corona-15", a social media trend based on the anticipation and fear of weight gain resulting from self-isolation during the coronavirus pandemic (Pearl, 2020). These highlight pervasive weight stigmatizing beliefs in our society today and may reinforce automatic associations between physical activity and weight management. Thus, exposure to counter-stereotypical images may have a limited effect on implicit and explicit weight bias and weight stigma internalization in such a social media climate (Pearl, 2020). This may encourage us to ask whether Obesity Canada and other organizations should continue to promote the use of non-stigmatizing images to address weight stigma. My findings and those from other studies suggest that portraying a diversity of body sizes in physical activity promotion is warranted, but this must be done in combination with structural and institutional changes to address weight stigma.

Weight stigma remains a multidimensional social process contributing to health inequity (Hatzenbuehler et al., 2013). As a discipline focused on eliminating health inequity by addressing social determinants of health, health promotion has a role in reducing weight stigma. The process of destigmatization will require targeting multiple levels (i.e., intrapersonal, interpersonal, structural) of the ecological system (Cook et al., 2014). Changing attitudes and beliefs about weight among physical activity practitioners and professionals and the general public will require the adoption of new beliefs (e.g., physical activity does not contribute significantly to weight loss, weight loss is complex and does not always result in improved

health). New beliefs will need to be viewed as credible (Clair et al., 2016) and replace existing automatic associations. MacLean et al., (2009) argued that public health messaging should be screened for weight-stigmatizing content to avoid stereotyping and blaming individuals with obesity and to prevent the spread of misinformation about obesity, which increase marginalization. Additionally, beliefs that associate morality with body size must also be addressed. Greater obesity moralization has been associated with increased anti-fat attitudes, disgust, and endorsement of weight discrimination, thereby demonstrating resistance to weight stigma reduction efforts (Ringel & Ditto, 2019).

The findings from Studies 2 and 3 revealed that some women felt personally empowered and resisted dominant ideas about weight. According to a social ecological perspective, such individual factors may have an influence within and across levels to enact change (Cook et al., 2014). However, due to the nature of being in a stigmatized position (i.e., having less power), individuals who feel personal empowerment may still have a limited effect on institutional and structural weight-stigmatizing practices (Scott-Dixon, 2008; Sniezek, 2019). An aspect of weight stigma reduction that was not specifically examined in this dissertation is the role of policy, particularly to address structural weight stigma. Current policies may contribute to weight stigma (Alberga et al., 2018; Clair et al., 2016; Ramos Salas et al., 2017). Weight inclusive health policies, on the other hand, may include legislation regarding weight-based discrimination, anti-bullying policies in the education system, weight stigma training for educators and healthcare practitioners, removal of environmental barriers in healthcare settings, and the elimination of weight stigmatizing messages in public health and popular media (Hunger et al., 2020; Pearl, 2018). Some of these recommendations may be relevant in the physical activity context, including anti-bullying policies, education about weight stigma for physical activity

professionals, removal of physical weight-related barriers, and ceasing to use weight-focused messaging. Still, more research is needed to determine the impact of these changes, along with any unintended consequences that may inadvertently increase stigma (Mittelmark, 2014).

Practical implications

The findings support a number of recommendations for physical activity and recreation professionals aiming to increase size inclusion and reduce physical activity-related weight stigma. Overall, these recommendations are focused on adopting weight neutral practices (Mansfield & Rich, 2013; Souza, 2015).

The findings of the research demonstrated that size inclusion within physical activity could have a positive impact on women's personal and social well-being. Additionally, they showed that people employed in the physical activity and fitness industries could perpetuate or mitigate weight stigma. In fact, these individuals may be a main source of physical activity support for adults (De Lyon et al., 2017). While it may be challenging to convince physical activity and fitness professionals to adopt weight-neutral practices especially if they hold negative weight-related attitudes (Dimmock et al., 2009; Panza et al., 2018; Robertson & Vohora, 2008), shifting their perspectives about weight might encourage them to adopt size inclusive practices (Thorne, 2016, p.117). This may be done through education and professional development about weight stigma for professionals involved in physical activity and health promotion and programming. This type of training has been implemented in the context of weight management for several primary care professions (Kushner, Zeiss, Feinglass, & Yelen, 2014) and public health promoters (McVey et al., 2013). A similar strategy could be used within organizations/workplaces or through degree programs such as within required courses to obtain a Bachelors of Kinesiology. In one study, kinesiology students who learned about uncontrollable

causes of obesity and the consequences of weight bias had reduced the blame component of weight bias compared to students who learned about the controllable aspects of weight and health consequences of obesity (Wijayatunga, Kim, Butsch, & Dhurandhar, 2019). These findings provide preliminary evidence supporting such teaching practices related to obesity and weight stigma but more research is needed to understand whether reductions in weight bias can be sustained and whether they translate to less biased treatment of individuals with obesity in professional settings.

Another recommendation informed by the findings is to address accessibility barriers in physical settings that may impact participation by individuals with larger bodies. For example, organizations can provide access to adapted equipment and equipment with higher weight capacities, decrease the number of mirrors in their spaces, and eliminate weight-focused messages. Changes to the design of physical activity programming may also contribute accessible and inclusive options for people of all body sizes.

Furthermore, without more options for exercise clothing, women with obesity will continue to be excluded from fully participating in physical activity (Christel et al., 2016). This may lead to internalized weight stereotypes, body dissatisfaction, and a focus on weight loss as a way to escape the stigmatized group and 'fit in,' both in exercise clothing and subsequently, in exercise settings (Christel et al., 2016). Yet, it is not the women's responsibility to make themselves fit in; the fashion industry has a role in size inclusion. Again, this involves addressing weight stigma. Owners and designers of clothing companies may subscribe to weight stereotypes such as not believing women with obesity engage in physical activity (Christel, 2014). They may not want women with obesity wearing their garments, or they may believe that offering plus-size garments promotes obesity – a common argument against body positivity and size inclusion

(Hunger et al., 2020). Therefore, there is a need to advocate for affordable and appropriate exercise clothing and support clothing companies/brands that provide a wide range of sizes.

Strengths and limitations

Study-specific strengths and limitations were discussed in Chapters 4, 5, and 6. Overall, the strengths of the dissertation were that it was guided by principles and values of health promotion, it considered applications for practitioners, and it applied quantitative and qualitative methods. Still, the findings and conclusions must be interpreted in light of some limitations. For instance, participants were recruited for all studies primarily from the Obesity Canada community. It is not known how the findings would have differed had participants been recruited through other means, or using other language such as 'fat' instead of 'obesity'. There may have been a response bias, whereby those who had a higher awareness of weight stigma may have been more inclined to participate. Additionally, the research focused on weight stigma solely from the perspectives of women who had experienced it; further insight could have been gained from the perspectives of other stakeholders and through observations. Since the majority of participants included in this research identified as White, middle-class, and female, future research should also consider the impact of intersecting identities, as these lead to compounding experiences of oppression and marginalization (Brady & Beausoleil, 2017; van Amsterdam, 2013).

Future directions

There are many avenues available for researchers and practitioners who wish to expand on the three studies conducted for this dissertation. Building on the results of Study 1, researchers may examine the role of automatic processing of counter-stereotypical images among individuals with and without obesity, as well as professionals working in the physical

activity, fitness, and recreation area. More evidence is needed to inform the use of these images to ensure that there are not unintended consequences such as reinforcing weight stigmatizing attitudes and behaviours.

More research based on the findings of Studies 1 and 3 is needed to examine the impact of participating in size inclusive physical activity classes on weight bias internalization. Weight-loss and weight-neutral approaches have been compared in the context of randomized control trials (e.g., Mensinger et al., 2016); a next step would be to examine the impact in real-life (i.e., less controlled) settings. It would also be interesting and relevant to understand the impact of size inclusive physical activity practices on those who don't experience weight stigma, and on other marginalized groups who may be excluded from mainstream forms of physical activity.

Another direction for researchers is to examine physical activity-related weight stigma across the lifespan. In fact, early experiences of physical activity-related weight stigma, particularly in physical education classes, can impact one's self-perception and relationship with physical activity into adulthood (Dark, 2018; Sykes & McPhail, 2008). Developing a negative relationship with physical activity in childhood or adolescence may lead some women to believe it is not for them. Another reason to examine weight stigma over the lifespan is that many participants in this research said they had struggled with their weight for their entire lives, and other research has shown that body concerns and weight stigma can have long-lasting effects for women as they age (Pila et al., 2018). Therefore, it may also be relevant to examine the impact of weight fluctuations on perceptions of weight stigma and relationship with physical activity.

Conclusion

In examining the relationship between weight stigma and physical activity, I found that weight stigma had a profound impact on how women with obesity viewed themselves and their

place in physical activity and the world more broadly, which impacted how they engaged in physical activity. Relatedly, I believe the quote by Lyons (1989) included at the start of this chapter is just as relevant thirty years later, meaning that we need to do more to reduce weight stigma. The findings of this dissertation support recommendations for adopting weight-neutral and inclusive approaches to physical activity promotion and practice, improving body size diversity in physical activity media, changing prevalent weight, fitness, and health stereotypes, and addressing structural accessibility barriers, so that women of all body sizes can engage in physical activity without fear of judgment, humiliation, exclusion, or discrimination.

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Appendix A – Study 1

A1 – Recruitment poster

Opportunity to participate in a research study and receive a gift card to Chapters-Indigo

This online study about weight stigma and physical activity will involve a few computer tasks and questionnaires each week for four weeks. The sessions will last between 10 and 40 minutes depending on the week.

You may be eligible if:

- You are an adult (aged 18 years and older)
- You are living with obesity
- You are comfortable reading English
- Your health status is such that you may engage in physical activity

If you are interested in participating or for more information, please contact Maxine Myre by email: myre@ualberta.ca.

Thank you for your interest!

A2 – Information and consent sheet (pretest group)

Information and Consent
Study title: Weight stigma and physical activity

You are being invited to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to read the following information carefully. Please contact the principal investigator if anything is not clear or if you need more information.

Principal Investigator
Maxine Myre: myre@ualberta.ca
PhD Student, Faculty of Physical Education and Recreation
1-141 University Hall, Van Vliet Complex, University of Alberta
Edmonton, Alberta, Canada, T6G 2H9

Supervisor
Dr. Tanya Berry: tanyab@ualberta.ca, (780) 492-3280
Professor, Faculty of Physical Education and Recreation
1-153 University Hall, Van Vliet Complex, University of Alberta
Edmonton, Alberta, Canada, T6G 2H9

Purpose of the research: The purpose of this study is to change perceptions of physical activity in individuals with obesity that have experienced weight stigma.

Study procedure: This study will require you to complete four sessions online. Sessions will occur once a week and will last between 10 and 40 minutes depending on the session. During these sessions, you will be asked to complete some computer tasks and questionnaires.

Benefits and risk: Your participation in this study will offer insight about perceptions of physical activity from individuals living with obesity with the aim of identifying ways to reduce the negative consequences of weight stigma related to fitness. The risks associated with this study are not expected to surpass the risks associated with everyday life. However, you may feel frustrated at times because the computer tasks are very fast, or some questions may make you feel uncomfortable. You have the right to withdraw or refuse to answer any questions at any time without penalty.

Confidentiality and anonymity: If you choose to participate, the information that you will share will remain strictly confidential. You will be assigned a unique participant ID number that will only be associated with your name and email address until the end of the study, at which point any identifying information will be deleted. You may only withdraw your data until data

collection is complete, since it will not be possible to identify your data once the file with identifying information is deleted. Only the researchers will have access to the data and your identity will not be revealed at any time. The data from this study will be used in aggregate form in academic papers and presentations. The data from this study will be stored electronically in a secure location.

Incentives: You will receive a $30 Chapters-Indigo gift card, or $10 Chapters-Indigo gift card for completing the first, third and fourth online sessions because these sessions will take longer than the other session (there will be additional questionnaires and computer tasks). The gift card is to show our appreciation for the time you are taking to complete them. The gift cards will be sent electronically to your email. Therefore, your email address will need to be shared by the principal investigator with a third party (Chapters-Indigo). If you prefer to not receive the gift cards, please let Maxine Myre know and she will not share your email address.

Debriefing: You will be debriefed on the study details after the last online session. At this point, you will also have the opportunity to provide your contact information if you wish to receive a summary of the results of the study once it is available.

This study has been approved by the University of Alberta Research Ethics Board. If you have any concerns about the ethical conduct of the study or your rights as a participant, you can contact the University of Alberta Research Ethics Office by telephone: (780) 492-2615.

By proceeding with the experiment, you are indicating that you read and understood the information that was presented. You understand that your participation in this study is strictly voluntary and you have the right to withdraw at any time or refuse to answer any questions without penalty.

A3 – Information and consent sheet (no pretest group)

Information and Consent
Study title: Weight stigma and physical activity

You are being invited to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to read the following information carefully. Please contact the principal investigator if anything is not clear or if you need more information.

Principal Investigator
Maxine Myre: myre@ualberta.ca
PhD Student, Faculty of Physical Education and Recreation
1-141 University Hall, Van Vliet Complex, University of Alberta
Edmonton, Alberta, Canada, T6G 2H9

Supervisor
Dr. Tanya Berry: tanyab@ualberta.ca, (780) 492-3280
Professor, Faculty of Physical Education and Recreation
1-153 University Hall, Van Vliet Complex, University of Alberta
Edmonton, Alberta, Canada, T6G 2H9

Purpose of the research: The purpose of this study is to change perceptions of physical activity in individuals with obesity that have experienced weight stigma.

Study procedure: This study will require you to complete four sessions online. Sessions will occur once a week and will last between 10 and 30 minutes depending on the session. During these sessions, you will be asked to complete some computer tasks and questionnaires.

Benefits and risk: Your participation in this study will offer insight about perceptions of physical activity from individuals living with obesity with the aim of identifying ways to reduce the negative consequences of weight stigma related to fitness. The risks associated with this study are not expected to surpass the risks associated with everyday life. However, you may feel frustrated at times because the computer tasks are very fast, or some questions may make you feel uncomfortable. You have the right to withdraw or refuse to answer any questions at any time without penalty.

Confidentiality and anonymity: If you choose to participate, the information that you will share will remain strictly confidential. You will be assigned a unique participant ID number that will only be associated with your name and email address until the end of the study, at which point any identifying information will be deleted. You may only withdraw your data until data

collection is complete, since it will not be possible to identify your data once the file with identifying information is deleted. Only the researchers will have access to the data and your identity will not be revealed at any time. The data from this study will be used in aggregate form in academic papers and presentations. The data from this study will be stored electronically in a secure location.

Incentives: You will receive a $20 Chapters-Indigo gift card, or $10 Chapters-Indigo gift card for completing the third and fourth sessions because these sessions will take longer than the other sessions (there will be additional questionnaires and computer tasks). The gift card is to show our appreciation for the time you are taking to complete them. The gift cards will be sent electronically to your email. Therefore, your email address will need to be shared by the principal investigator with a third party (Chapters-Indigo). If you prefer to not receive the gift cards, please let Maxine Myre know and she will not share your email address.

Debriefing: You will be debriefed on the study details after the last online session. At this point, you will also have the opportunity to provide your contact information if you wish to receive a summary of the results of the study once it is available.

This study has been approved by the University of Alberta Research Ethics Board. If you have any concerns about the ethical conduct of the study or your rights as a participant, you can contact the University of Alberta Research Ethics Office by telephone: (780) 492-2615.

By proceeding with the experiment, you are indicating that you read and understood the information that was presented. You understand that your participation in this study is strictly voluntary and you have the right to withdraw at any time or refuse to answer any questions without penalty.

A4 – Questionnaires

Modified Weight Bias Internalization Scale (WBIS-M)

Because of my weight, I feel that I am just as competent as anyone.[1]
I am less attractive than most other people because of my weight.
I feel anxious about my weight because of what people might think of me.
I wish I could drastically change my weight.
Whenever I think a lot about my weight, I feel depressed.
I hate myself for my weight.
My weight is a major way that I judge my value as a person.
I don't feel that I deserve to have a really fulfilling social life, because of my weight.
I am OK being the weight that I am.[1]
Because of my weight, I don't feel like my true self.
Because of my weight, I don't understand how anyone attractive would want to date me.

Items are rated on a 7-point scale (1 = strongly disagree; 7 = strongly agree). [1]Reverse-scored. (Pearl & Puhl, 2014).

Stigmatizing Situations Inventory-Brief (SSI-B)

Below is a list of situations that people encounter because of their weight. Please indicate whether, and how often, each of these situations happens to you.

Being singled out as a child by a teacher, school nurse, etc., because of your weight.
Being stared at in public.
Children loudly making comments about your weight to others.
Having a doctor recommend a diet, even if you did not come in to discuss weight loss.
Having a romantic partner exploit you, because she or he assumed you were 'desperate' and would put up with it.
Overhearing other people making rude remarks about you in public.
Not being hired because of your weight, shape or size.
Having family members feel embarrassed by you or ashamed of you.
Having people assume you overeat or binge eat because you are overweight.
Being glared at or harassed by bus passengers for taking up 'too much' room.

Items are rated on a 9-point scale (0=Never, 1=Once in your life, 2=Several times in your life, 3=About once a year, 4=Several times per year, 5=About once a month, 6=Several times per month, 7=About once a week, 8=Several times per week, 9=Daily) (Vartanian, 2015).

Implicit physical activity attitudes (GNAT)
The words used for each category were:

"Good" words: pleasant, fun, enjoyable, pleasurable, exciting, satisfying, useful, healthy, and important.

"Bad" words: unpleasant, horrible, boring, painful, unenjoyable, dissatisfying, useless, unhealthy, and unimportant.

"Physical activity" words: walking, swimming, hiking, strength training, biking, stair climbing, stretching, and jogging.

"Generic" words: singing, region, southern district, shrubs, kept, binding, news, wrapping, and identify.

Explicit physical activity attitudes
Instrumental attitudes: For me to exercise at least 30 minutes each day in the forthcoming month is:

harmful-beneficial
worthless-valuable
healthy- unhealthy
important-unimportant

Affective attitudes: For me to exercise at least 30 minutes each day in the forthcoming month is:

pleasant-unpleasant
enjoyable-unenjoyable
pleasurable-painful
good-bad

Items are rated on a 7-point bipolar adjective scales as suggested by (Ajzen, 2006).

Multidimensional Self-Efficacy for Exercise Scale

Task Efficacy: How confident are you that you can:

Complete physical activities using proper technique?
Follow directions to complete physical activities?
Perform all of the required movements?

Coping efficacy: How confident are you that you can:

Do physical activity when you feel discomfort?
Do physical activity when you lack energy?

Do physical activity when you don't feel well?

Scheduling efficacy: How confident are you that you can:

Include physical activity in your daily routine?

Consistently do physical activity three times per week?

Arrange your schedule to include regular physical activity?

Responses are provided on 100% confidence scales ranging from 0= not confident at all to 100= completely confident (Rodgers et al., 2008).

Godin-Shepherd Leisure-Time Exercise Questionnaire (GLTEQ)

During the last 7-day period, how many times did you do the following kinds of physical activity for more than 15 minutes in your free time (Godin, 2011)?

Strenuous Exercise (heart beats rapidly)

Total duration for the week in minutes

Moderate Exercise (not exhausting)

Total duration for the week in minutes

Mild Exercise (minimal effort)

Total duration for the week in minutes

Demographics and weight information

Please indicate your gender.

Male

Female

Other

Prefer not to answer

Please indicate your age.

*Participant chooses age from 18 to 64 years

What is your current height in centimeters?

What is your current weight in kilograms?

Please indicate the province or territory you currently live in.

Alberta

British Columbia

Manitoba

New Brunswick

Newfoundland and Labrador

Northwest Territories
Nova Scotia
Nunavut
Ontario
Prince Edward Island
Quebec
Saskatchewan
Yukon

What is the highest level of education you have completed?

Have not completed high school
High School
College/Vocational School
Undergraduate Degree
Professional Degree
Masters Degree
Doctorate
Other

Please indicate your annual income.

Less than $25,000
$25,000-49,999
$50,000-74,999
$75,000-100,000
Greater than $100,000
Prefer not to answer

A5 – Interview guide

[These questions were asked at the end of the interview for Study 2]

This relates to the online study you participated in. During that study, you completed a computer task that showed different images.

1. What were your general impressions of these images?
    a. What specifically did you notice? (e.g., people, tasks they were doing, etc.)
2. How would you compare the images used in the study to other images you have seen related to fitness/physical activity?
3. The images we chose for the online study were of people living with obesity being active. The purpose of that study was to see if using those images had a positive impact on how people living with obesity think about being active. What do you think would be the broader impact if those images were used to promote physical activity? (e.g., by recreation or fitness centers, etc.)

A6 – Summary of results provided to participants

Using images to counter weight-related stereotypes and internalized weight bias in physical activity

Written by Maxine Myre. Maxine is a PhD candidate in the Faculty of Kinesiology, Sport, and Recreation at the University of Alberta. Her PhD research examines the relationship between weight stigma and physical activity among women living with obesity with the goals of reducing the impact of weight stigma and improving body weight inclusion in physical activity.

It is rare to see positive images of individuals with obesity in physical activity-related media. The mostly negative portrayals can increase the internalization of weight bias, which is associated with stress, anxiety, and reduced motivation for physical activity.

In a study published recently in the academic journal *Applied Psychology: Health and Well-Being*, we wanted to know if pairing positive and counter-stereotypical images of individuals with obesity with words like "motivated", "fit", and "strong" could reduce weight bias internalization. The images used included some from Obesity Canada's free image bank. Over three weeks, participants in the experimental group completed a computer task that repeatedly showed the counter-stereotypical images with positive physical activity-related words. We wanted to see if seeing the images paired with positive words would increase positive

associations with individuals with obesity being active, which might reduce weight bias internalization. Participants in the control group read Canada's Physical Activity Guidelines and set a physical activity goal for each week.

We found that weight bias internalization was not different between the two groups. There were also no differences in participants' confidence or attitudes about physical activity, or how much physical activity they reported doing. Our results showed that it is difficult to change internalized weight bias when it comes to obesity in our society. Participants may have been exposed to stereotypical images outside of the study that counteracted any effects of the experiment.
In follow-up interviews with sixteen women who participated in the study, we asked what they thought about positive images of active individuals with obesity and what they believed would be the broader impact of using them in physical activity promotion. Here is what we found:

Positive comments

- Images may challenge weight/health/fitness stereotypes
- Images may normalize body size diversity and reduce negative weight-related attitudes
- Images may encourage physical activity and improve self-perceptions
- Images may help identify safe spaces

"I think that people would see themselves in those images and hopefully see that they can participate, or that there are options out there for them" – participant quote

Negative comments

- Images may not affect stable and engrained weight-related beliefs
- Images may cause a backlash and promote shame and blame
- Images are unlikely to be used by organization

"What did I have someone say to me once? That fat people just disgust them and no matter what they're always going to disgust them. So sometimes I think it's really hard to change their beliefs and opinions" – participant quote

So, although our experimental study did not reduce weight bias internalization, the interview findings supported the use of counter-stereotypical physical activity images. In particular, the women we interviewed recommended that:

- Images reflecting all body sizes should be used in physical activity media
- Images should be paired with messages that focus on health and enjoyment instead of weight loss
- Physical activity spaces that are inclusive of all body sizes are needed

What's next? We're following up with another study to test how these images are perceived by people in the general public to see if some of the comments from our interview participants are supported. We will continue working to change negative perceptions of individuals with obesity in physical activity.

Thank you to everyone who participated in this study and to co-authors Dr. Tanya Berry, Dr. Geoff Ball, and Brad Hussey. If you have any comments or questions, please email Maxine at myre@ualberta.ca.

Appendix B – Study 2

B1 – Information and consent sheet

Information Sheet
Study title: Experiences of weight stigma and physical activity

You are being invited to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to read the following information carefully. Please contact the principal investigator if anything is not clear or if you need more information.

Principal Investigator
Maxine Myre: myre@ualberta.ca
PhD Student, Faculty of Kinesiology, Sport, and Recreation
1-141 University Hall, Van Vliet Complex, University of Alberta
Edmonton, Alberta, Canada, T6G 2H9

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Professor, Faculty of Kinesiology, Sport, and Recreation
1-153 University Hall, Van Vliet Complex, University of Alberta
Edmonton, Alberta, Canada, T6G 2H9

Purpose of the research: The purpose of this study is to understand your experiences of weight stigma in a physical activity context, and gain your thoughts on the role of images as a way to reduce the negative effects of weight stigma.

Study procedure: This study will involve one telephone interview with the principal investigator (Maxine Myre). The interview is expected to last between 30-60 minutes. Before starting the interview, we will ask if you have read and understood this information letter and obtain your verbal consent. With your permission, the interview will be audio-recorded and transcribed by a professional transcriptionist. We have your age, gender, and education level from your participation in the online study about weight stigma and physical activity. We will use that information to describe our sample when we publish the research. For example, we will say something like "Participants were 15 women, with an average age of 35 years, most of whom had a university degree."

Benefits and risk: Your participation in this study will offer insight about weight stigma from someone who has firsthand experience with the aim of identifying ways to reduce the negative

consequences of weight stigma. The risks associated with this study are not expected to surpass the risks associated with everyday life. However, some questions may make you feel uncomfortable. You can withdraw or refuse to answer any questions at any time.

Confidentiality and anonymity: If you choose to participate, the information that you will share will remain strictly confidential. Only the researchers and a professional transcriptionist will have access to the data and your identity will not be revealed at any time. You may withdraw your data up to one week after the interview is conducted. You will be assigned a fake name that will only be associated with your name and email address until the end of the study, at which point any identifying information will be deleted. The data from this study will be stored electronically on a password-protected computer.

The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

By scheduling and participating in the interview, you are indicating that you read and understood the information that was presented. You understand that your participation in this study is strictly voluntary and you have the right to withdraw or refuse to answer any questions at any time.

Consent Sheet

You will be asked these questions at the beginning of the interview to obtain your verbal consent. You do not need to fill out this form.

Do you understand that you have been asked to be in a research study?	Yes	No
Have you read and received the Information Sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this study?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that you can quit at any point during the interview?	Yes	No
Do you understand that you can withdraw at any time during the data collection part of the study and that any comments that you provided up to that point will not be used?	Yes	No
Do you understand who will have access to the data collected?	Yes	No
Do you agree to be audio-recorded during this interview?	Yes	No
Do you understand that you have up until one week after your interview to withdraw what you have shared in the interview?	Yes	No

B2 – Interview guide

Introduction

Thank you for taking the time to talk to me today. I am a PhD student in the Faculty of Kinesiology, Sport, and Recreation at the University of Alberta. I'm interested in understanding your experiences of weight-related stigma and how they may have impacted your physical activity, so I will be asking questions about that during the interview. Also, since you have previously completed an online study about weight stigma and physical activity, I would like to ask your thoughts about that study towards the end of the interview. The whole interview should last about an hour.

I am very interested in your perspective, so there are no right or wrong answers. You are also in no way obligated to respond. If at any time you feel uncomfortable answering a question you may simply state that you do not want to respond and we will move on. Your participation in this research is completely voluntary and you may stop at any time. Have you read the information letter that I sent through email? Do you understand that your information will be kept confidential and that you will never by identified by name or any other identifying information? Do you have any other questions about this research? If you agree, we will continue.

I'll be recording this session because I don't want to miss any of your valuable comments. Is it okay with you that I audio-record this conversation? I will transcribe the information and delete the recording. Do you have any questions before we get started?

I mentioned that I'm interested in understanding how experiences of weight stigma have impacted your physical activity.

1. How would you describe your relationship with physical activity?
2. What about in the past? Have you always been active?
3. Would you describe yourself currently as active or inactive?
4. Please describe your current weekly physical activity routine.
    a. What motivates your physical activity?
    b. What do you like and not like about this routine?
    c. What are the barriers to participating in physical activity to the extent you would like to?
5. In my work, I'm interested in weight stigma. I'm wondering what this term means to you.
6. What kinds of experiences of weight stigma have you had?
    a. What impact did that experience have on you? How did it make you feel? What happened next or did it lead to a particular outcome?
    b. Have you had other experiences? This may be something you've felt or noticed rather than something that was more direct. For example, feeling like you've been treated differently because of your weight.
    c. Does any particular instance stand out for you? Do you mind sharing the details of that experience with me?
    d. Can you recall the last time this happened to you? Do you mind sharing the details of that experience with me?
7. Does the possibility of encountering weight stigma affect your decisions around physical activity?

    a. If yes, how so? For example, how does it affect when and where you do physical activity?
    b. If no, can you elaborate? What motivates you to continue being active? Is weight stigma at the back of your mind? Something you just have to deal with?
8. Have you experienced weight stigma in relation to physical activity?
    a. If so, can you describe specific instances?
    b. How did you respond to these situations?
    c. What impact do you think these experiences have had on your physical activity?
    d. What impact have they had on your life more broadly?
9. How would you describe your relationship with your body? (or: How would you describe your body image? How you do you feel about your own body?)
    a. How do you think this relates to your experiences of weight stigma?
    b. If using a particular term to describe herself (e.g., curvy): I noticed you've described yourself several times as X, can you tell me more about what this means to you? Who would fall into this category?
    c. In the more policy/government-based physical activity promotion materials/messaging they tend toward the accepted 'medicalised' terms of obese, overweight, etc. How do you feel about these terms in reference to the promotion of physical activity for people of all body sizes?
10. What advice would you give to someone who feels stigmatized for their weight but is trying to become more active?
11. What suggestions do you have for agencies promoting physical activity that might address weight stigma or support people of all body sizes to become more active?
    a. For example: participACTION, public health agency of Canada, physical activity guidelines, etc.
12. What suggestions do you have for agencies providing physical activity services (e.g., fitness or recreation centers) that might address weight stigma or support people of all body sizes to become more active?

[Asked interview questions for Study 1 – Appendix A5]

Your answers have been great, you've given me a lot of think about. Is there anything else that you would like to share with me on this topic before we wrap up? Thank you very much, I appreciate you taking the time to talk to me and sharing your perspectives.

Appendix C – Study 3

C1 – Recruitment sheet

Women needed for a research study about weight stigma and physical activity classes!

Do you:

- Self-identify as living with obesity?
- Participate in structured physical activity classes that are body-weight inclusive? These can be yoga, bootcamp, zumba, swimming, dance, or other types of movement-focused classes.
- Live in the Edmonton area?
- Want to share your experiences?

Then we want to chat with you! You will be asked to participate in an in-person interview with the primary researcher, Maxine, at a convenient location for you.

To participate or get more information, contact Maxine Myre by email at myre@ualberta.ca.

Please share with anyone who might be interested!

C2 – Information and consent sheet

Information Sheet
Study title: Experiences of body weight inclusive physical activity classes

You are being invited to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what it will involve. Please take the time to read the following information carefully. Please contact the principal investigator if anything is not clear or if you need more information.

Principal Investigator
Maxine Myre: myre@ualberta.ca
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Supervisors
Tanya Berry, PhD: tanyab@ualberta.ca, (780) 492-3280
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Research Associate, Centre for Healthy Communities, School of Public Health
3-093 Edmonton Clinic Health Academy, University of Alberta
Edmonton, Alberta, Canada T6G 1C9

Purpose of the research: The purpose of this study is to understand your experiences of body weight inclusive physical activity classes.

Study procedure: This study will involve an interview with the principal investigator (Maxine Myre). The interview is expected to last between 45-90 minutes. With your permission, the interview will be audio-recorded and transcribed. We will ask for some demographic information in a short paper survey. We will use that information to describe our sample when we publish the research. For example, we will say something like "Participants were 15 women, with an average age of 35 years, most of whom had a university degree."

Benefits and risk: Your participation in this study will offer insight about weight stigma in physical activity settings from someone who has firsthand experience. With your help, we hope to identify ways to reduce the negative consequences of weight stigma and make physical activity spaces inclusive for individuals of all body sizes. The risks associated with this study are

not expected to surpass the risks associated with everyday life. However, some questions may make you feel uncomfortable. You can withdraw or refuse to answer any questions at any time.

Confidentiality and anonymity: If you choose to participate, the information that you will share will remain strictly confidential. Only the researchers will have access to the data and your identity will not be revealed at any time. You may withdraw your data up to one week after the interview is conducted. You will be assigned a fake name that will only be associated with your name and email address until the end of the study, at which point any identifying information will be deleted. The data from this study will be stored electronically on a password-protected computer.

The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

Your participation in this study is strictly voluntary and you have the right to withdraw or refuse to answer any questions at any time.

Consent Sheet

Please answer the following questions:

Do you understand that you have been asked to be in a research study?	Yes	No
Have you read and received the Information Sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this study?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that you can quit at any point during the interview?	Yes	No
Do you understand that you can withdraw at any time during the data collection part of the study and that any comments that you provided up to that point will not be used?	Yes	No
Do you understand who will have access to the data collected?	Yes	No
Do you agree to be audio-recorded during this interview?	Yes	No
Do you understand that you have up until one week after your interview to withdraw what you have shared in the interview?	Yes	No

C3 – Demographic information survey

1. What is your age?
   18-25
   26-35
   36-45
   46-55
   56-65
   Over 65

2. To which ethnic group do you most identify (your ancestry and cultural heritage)?

3. How would you describe your social status (combination of income, education, and occupation)?
   Upper
   Middle
   Low

C4 – Interview guide

Introduction

Thank you for taking the time to talk to me today. I am a Ph.D. candidate in the Faculty of Kinesiology, Sport, and Recreation at the University of Alberta. I'm interested in understanding your experiences in structured physical activity classes and how these experiences might relate to weight stigma. I expect the interview to last between 45 and 90 minutes.

I am very interested in your perspective, so there are no right or wrong answers. You are also in no way obligated to respond. If at any time you feel uncomfortable answering a question you may state that you do not want to respond and we will move on. Your participation in this research is completely voluntary, and you may stop at any time.

I'll be recording this session because I don't want to miss any of your valuable comments. Is it okay with you that I audio-record this conversation? Do you have any questions about the research or the interview before we continue?

Questions

1. How would you describe your relationship with physical activity?
2. Have you had any experience of weight stigma in physical activity settings?
   a. Would you mind sharing some examples with me?
3. How does the possibility of being stigmatized for your weight affect your decisions about being active?
4. Can you describe the physical activity class you're currently enrolled in?
   a. How frequently do you attend this class?

    b. How did you learn about the class? Did you access any promotional materials? What were they?
    c. Why did you or what made you choose this class?
    d. What did/do you hope to get out of participating in the class?
    e. What do you like/not like about the class?
    f. How would you describe the environment where you take the class? The space? The people? The instructors?
    g. For you, what do you like/dislike in an instructor? (e.g., their size, their ability, the language they use, the way they motivate participants, etc.) and why?
    h. What makes this class non-weight stigmatizing for you? How does it compare to other classes you've participated in?
    i. Would you recommend this class to others? If so, why and to whom? If not, why?
5. Have you participated in other structured physical activity classes?
    a. What were they like?
    b. What did you like/dislike about them?
6. Are you active outside of the structured class setting? In what ways?
    a. Have your experiences in a structured class setting influenced your physical activity outside of the formal class?
7. How would you describe your health (thinking about health broadly)?
    a. What is the role of physical activity for your health?
8. How do you feel about your body?
    a. Has participating in physical activity classes changed your perspectives about your body?
    b. If yes, in what way?
9. How do you think organizations or facilities or others offering structured physical activity could promote inclusivity for people of all body sizes? How could they reduce the impact/incidence of weight-stigma?
10. Do you have anything to add?