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## Weight-Inclusive Physical Activity: A Systematic Evaluation of Virtual Resources

**Authors:** Megan Sutton<sup>1</sup> (msutto6@uwo.ca), Sara Stanley<sup>1</sup> (sstanl3@uwo.ca) Alison Doherty<sup>1</sup> (adoherty@uwo.ca), Molly Driediger<sup>1</sup> (mdriedig@uwo.ca), Rachel Calogero<sup>2</sup> (rcaloger@uwo.ca), Catherine M. Sabiston<sup>3</sup> (catherine.sabiston@utoronto.ca), Angela Meadows<sup>4</sup> (a.meadows@essex.ac.uk), Aryel Maharaj<sup>5</sup> (aryel.maharaj@uhn.ca) & Eva Pila<sup>1</sup> ([epila@uwo.ca](mailto:epila@uwo.ca))\*.

\* Corresponding author

### Abstract

**Background.** Higher-weight individuals report lower rates of physical activity behavior and poorer physical activity experiences compared with their normative-weight counterparts, likely owing to the pervasiveness of weight stigma in physical activity contexts. Employing weight-inclusive strategies may improve physical activity outcomes, though little is known about the practical application of weight-inclusive principles in physical activity contexts. Further, given the prominence of virtual methods of information dissemination, exploring online weight-inclusive resources is valuable.

**Methods.** Using Google, Instagram, and snowball searches, a virtual environmental scan was conducted to collect publicly available weight-inclusive physical activity resources. Two independent coders applied an *a priori* codebook to all eligible resources to evaluate application of weight-inclusive principles.

**Results.**  $N = 80$  weight-inclusive physical activity resources were identified, offering a range of educational materials (40%) and/or provision of physical activity services (76.3%). Virtual resources generally adhered to weight-inclusive principles by showcasing diversity in body size, using weight-inclusive language, and centering physical activity that honors body's signals and cues, however, some also included weight-normative content. Provisional physical activity resources primarily targeted diverse-bodied end-users, offered a range of physical activity types (e.g., yoga, weight training, dance), were membership-based, and offered asynchronous access.

**Conclusions.** This study utilizes a systematic approach to collect and evaluate virtual, publicly available, weight-inclusive physical activity resources. Virtual physical activity resources that adhere to weight-inclusive principles may be important for increasing accessible physical activity opportunities for higher-weight individuals.

## Background

Engagement in regular physical activity provides individuals with many physical, mental, and social-emotional health benefits. For instance, individuals who participate in approximately 150 minutes of moderate-to-vigorous intensity aerobic physical activity per week<sup>1</sup> are less likely to develop a variety of non-communicable diseases,<sup>2</sup> such as coronary heart disease, type 2 diabetes, major depression, and anxiety disorders.<sup>3</sup> Moreover, research suggests that physical activity behavior is associated with greater resilience and emotional regulation, and lower rates of psychological distress.<sup>4</sup> While individuals across the weight spectrum engage in physical activity, higher-weight individuals are more likely to report low behavioral engagement,<sup>5,6</sup> high avoidance,<sup>5-7</sup> and negative psychological experiences (e.g., depression, disordered eating behaviours, body dissatisfaction)<sup>7-10</sup> in physical activity contexts compared with normative-weight individuals<sup>i</sup>, potentially contributing to the disparities in health and physical activity behavior that are observed in this population.

One possible explanation for these outcomes in higher-weight individuals is the effect of weight stigma in physical activity contexts.<sup>5,11</sup> Weight stigma refers to negative attitudes and social devaluations of higher-weight individuals based on size, shape, and weight, and manifests as stereotypes, rejection, prejudice, and discrimination.<sup>12,13</sup> Both experienced (e.g., overt discrimination) and internalized (e.g., self-directed) weight stigma are associated with poorer physical and mental health outcomes in higher-weight individuals,<sup>14</sup> including a higher risk of suicidality,<sup>14</sup> depression and anxiety,<sup>15</sup> disordered eating,<sup>16-18</sup> lower self-esteem,<sup>15,19</sup> avoidance of healthcare,<sup>14,19</sup> body image concerns,<sup>20,21</sup> avoidance of exercise,<sup>20</sup> and poorer overall well being.<sup>22-25</sup> Indeed, while pervasive in many contexts, including education, employment, and healthcare,<sup>26</sup> weight stigma in physical activity can be a critical barrier to physical activity behavior in higher-weight individuals.<sup>5,9,11,27</sup>

Weight stigma is upheld in the traditional culture of physical activity which tends to be “weight-normative” (i.e., centering weight as an indicator of health).<sup>28-30</sup> Indeed, weight management is central to the public health promotion of physical activity,<sup>31,32</sup> and changes to body weight and body composition are embedded within public health recommendations and traditional physical activity promotion paradigms.<sup>33</sup> The pervasive weight-normative approach to physical activity is contrary to evidence that physical activity can improve many physical and psychological health indices *regardless* of changes in weight,<sup>14,30,34</sup> and that weight-normative approaches perpetuate weight stigma, which is independently detrimental to health and well-being.<sup>20-22,26</sup>

To address concerns with the weight-normative approach, activists and scholars advocate for a “weight-inclusive” approach to health,<sup>14,35,36</sup> which “acknowledges that weight is not a behaviour or personal choice and that normal human bodies come in a wide range of weights and seeks alternatives to the overwhelmingly futile and harmful practice of pursuing weight loss”.<sup>30(p6)</sup> Rooted within the ‘Health at Every Size®’ (HAES®) model, the weight-inclusive approach specifies the importance of respecting body diversity and recognizes that health and weight are independent, promoting holistic health-enhancing behaviours (e.g., honoring bodily cues of hunger and satiety, autonomous, enjoyable and non-stigmatizing physical activity) and eradicating weight bias, stigma, and discrimination.<sup>37</sup> Though most of

the literature applying HAES®-informed and weight-inclusive principles centers healthcare,<sup>18</sup> there is value in applying these principles to physical activity contexts.<sup>29,32,38,39</sup>

Creating weight-inclusive physical activity spaces is critical to increasing participation and improving psychological physical activity experiences for higher-weight individuals.<sup>27,28,40</sup> To develop weight-inclusive physical activity contexts, scholars have recommended (a) using inclusive language<sup>27,29</sup>; (b) cultivating a caring community<sup>29,38</sup>; (c) ensuring physical space is accessible<sup>38,40,41</sup>; (d) promoting body diversity<sup>27,40</sup>; (e) developing knowledge on weight-inclusivity<sup>27</sup>; and (f) having a leadership commitment to improvement.<sup>29,40</sup> Though this approach is potentially promising to increase access to stigma-free physical activity opportunities for higher-weight individuals, little research has explored *if* and *how* weight-inclusive principles and recommendations are applied to physical activity contexts in practice.

While the application of weight-inclusive principles in traditional physical activity contexts has been limited, weight-inclusive physical activity service provision is being offered through grassroots initiatives that have been popularized on various social media platforms, thereby meriting systematic assessment and evaluation of virtual weight-inclusive physical activity resources. As such, the purpose of the present investigation was to systematically identify and describe virtual weight-inclusive physical activity resources and evaluate the extent to which such resources implement current recommendations and principles of weight-inclusive physical activity. Further, this research aims to identify gaps in the current physical activity landscape that can inform the development of future weight-inclusive physical activity service provisions.

## Methods

### Philosophical Orientation & Positionality

The present research was approached through a post-positivist epistemology with a realist ontology<sup>42</sup> to investigate virtual, publicly available, weight-inclusive physical activity resources. This approach positions reality to be a single, observable phenomenon that can only be known imperfectly through researcher interpretation. Under this philosophical orientation, we used a combined deductive and

inductive approach<sup>43</sup> to knowledge acquisition during the development of a codebook, data collection, and analysis. Despite the systematic approach to this research, the team acknowledged the subjectivity introduced into our description and evaluation of the weight-inclusive physical activity resources. The primary researchers involved in data collection and interpretation (MS: queer, cisgender, thin person of colour; SS: queer, cisgender, thin white woman; EP: cisgender, thin white woman) acknowledge their role in the research process, whereby their social identities, positionalities, and biases impacted how the study was conducted and the interpretation of the results. For instance, as thin individuals, the researchers have not experienced stigmatization or discrimination based on their weight, and experience privilege in traditional physical activity settings. Therefore, to support methodological rigor within this paradigm, the researchers consulted an advisory committee ( $N = 8$ ) comprised of academics (e.g., professors, researchers, etc.), activists (e.g., prominent members of fat-acceptance organizations, the fat-liberation movement, etc.), and individuals with lived experience as higher-weight individuals to inform this work, including the development of the codebook and the interpretation of the findings. Additionally, the researchers made efforts to minimize bias in the scientific process by adopting a deductive approach to the analysis (e.g., utilizing an *a priori* coding framework, reporting estimates of consensus and interrater consistency).

### **Search Strategy**

A virtual environmental scan approach was employed, a process that involves collating public-facing information through internet browsers and social media searches to increase knowledge in the area of interest.<sup>44,45</sup> Adapting methods recommended by Godin et al,<sup>44</sup> three search strategies were used to identify and compile available data: a) customized Google and Instagram searches, b) snowball sampling from Google and Instagram searches (i.e., exploring each search result for related resources), and c) expert consultation. Google was chosen as the sole search engine as ~92% of internet users utilize this over other search engines.<sup>46</sup> Instagram was also included, given the high number of monthly active users<sup>47</sup> and recent proliferation of weight-inclusive and size-inclusive communities and activist accounts on this platform.

To identify a list of keywords and search terms, the research team examined a) a set of  $n = 18$  exemplar websites known to the research team via community or personal connection that contained weight-inclusive physical activity resources; b) existing academic literature; c) consultation with academic experts (i.e.,  $n = 3$  researchers with expertise in weight-inclusive physical activity); and d) consultation with the advisory committee. This process resulted in eight key terms pertaining to weight-inclusive physical activity: “weight inclusive,” “body positive,” “health at every size,” “HAES,” “weight neutral,” “anti-diet,” “fat positive,” and “size inclusive”.<sup>28,29,37,38</sup> Each of these terms were further combined with “fitness,” “physical activity,” and “exercise,” generating a total of 24 unique search terms.

### **Resource Collection**

Data were collected in three phases beginning in October 2022, December 2022, and January 2023, respectively. First, internet searches were conducted by one researcher on Google via a private browser (Incognito mode) with location services disabled. A scraping software (Thruuu) was used to compile the first five pages of results for each search term,<sup>48</sup> based on previous environmental scan protocols, on the assumption that it is impossible to reasonably screen all retrieved Google results, and that the most relevant results would be on the first five pages.<sup>44</sup> Advertisements, suggestions, and autocompleted searches suggested by Google were excluded.

Second, one researcher conducted an Instagram search using similar protocols to the Google search (i.e., searches were completed on a private browser tab with location services turned off, 50 posts were included as it is impossible to retrieve all posts under each hashtag).<sup>44</sup> A newly generated Instagram account was created to conduct the searches and avoid the platforms’ algorithm tailoring the search results based on previous searches. The pre-determined 24 search terms were manually searched in the form of hashtags (e.g., #weightinclusivephysicalactivity) by the primary research team and the most recent 50 posts from public Instagram accounts were included for review. If there were fewer than 50 posts under the hashtag, all available posts were included. The public Instagram accounts from which the posts originated were then manually searched for any external website attached to the account (via the profile biography). Any external websites included in the account were included for review.

Third, a snowball search was conducted by two researchers, consisting of scanning the compiled search results from Google and Instagram to identify additional resources that met the search criteria but may have been missed in the first search steps.<sup>49</sup> All website links collected from the Google and Instagram searches were opened and additional resource links were accumulated in the same fashion as in previous steps of the search. Finally, content experts consisting of advisory committee members ( $n = 8$ ), academics ( $n = 3$ ), and community-based partners ( $n = 2$ ) conducting work on weight-inclusive physical activity were consulted to identify additional resources that may have been missed from the initial three search strategies.

### **Resource Selection**

Following data collection, duplicate links were removed to ensure results were unique. Resources retained following duplicate removal were reviewed for inclusion if the resource: a) was in English; b) explicitly identifies adopting weight-inclusive principles; c) included some prescriptive material; d) included or is related to physical activity; and e) could be accessed and evaluated virtually by the research team. Inclusion criteria were determined iteratively and in consultation with advisory committee ( $n = 8$ ) and content experts ( $n = 3$ ) while investigating the exemplar sites, and only resources meeting all inclusion criteria were retained for review.

### **Codebook Development**

A hybrid approach that incorporated both a deductive *a priori* template of codes, and an inductive data-driven process was adopted. Specifically, to evaluate the extent to which resources were weight-inclusive, an *a priori* codebook was developed deductively using guidelines from existing literature pertaining to weight-inclusive physical activity (i.e., HAES®-informed and weight-inclusive principles for healthcare contexts<sup>18</sup> and collective recommendations identified in the introduction (i.e., (a) through (f)).<sup>27-29,38,40</sup> In a subsequent step, two coders applied the initial codebook to a subset of collected resources ( $n = 30$ ) in a collaborative and iterative process that allowed for refinement of the codebook as new data were integrated. In this step, the initial deductive template developed from the literature was

refined based on the subset of resources (e.g., “type of weight-inclusive approach” was added as a coding category to further specify which ideological approach of weight-inclusivity was applied).

Collectively, this process produced a final codebook which captured descriptive characteristics of the resources, including a) target audience; b) resource type; c) cost; d) access; e) resource origin; and f) interactivity. Additional coding characteristics were developed to code resources that offered explicit physical activity services, including the following supplemental codes: g) physical activity service provision; h) type of weight-inclusive approach; i) resistance to societal ideals; j) presence of weight-normative content; k) diversity in body representation; l) focus on honoring body’s needs; m) inclusive language; and n) inclusion of adaptations/modifications. The final codebook consisted of many overlapping categories that aligned with existing literature on HAES®-informed and weight-inclusive principles (i.e., “honoring body’s needs”), weight-inclusive physical activity recommendations (i.e., “inclusion of adaptations/modifications”) and codes novel to the current subset of resources (i.e., “type of weight-inclusive approach”).

### **Coding Procedures**

All resources were coded for the six descriptive characteristics (a to f), and resources that included the explicit provision of physical activity (e.g., offering virtual physical activity classes) were coded for the eight features of physical activity provision (g to n). Physical activity provision resources were excluded from coding for any of the following reasons: resource owners opted out of inclusion and requested researchers do not attend a live class, access to the site was lost between the time of data collection and content assessment (i.e., broken or inactive links), or the content pertained to educational physical activity provision for physical activity professionals (e.g., educational training on how to provide weight-inclusive physical activity), but did not include direct-to-consumer physical activity provision (e.g., virtual fitness classes).

Two researchers independently coded all resources, by examining all available features of each website, and where relevant, inspecting a selection of provisional physical activity classes available on each site (i.e., viewing at least one random asynchronous video via an on-demand library, or by attending



at least one synchronous, virtual class). Payment was made to gain access to the provisional content when required or when requested by the site owner. To mitigate harm caused by having normative-weight researchers occupying spaces targeted at exclusively higher-weight users, all site owners were contacted via email to obtain consent to participate in the class as researchers, the researchers actively participated in the live classes (versus observing the classes only for purposes of evaluation), and the researchers identified themselves and their positionality to the class participants at the start of the class. If consent was not provided or the provisional physical activity could not be viewed, the resource was excluded from the content analysis. After each researcher independently coded the resources, discrepancies between coders were identified and resolved through discussion to generate the final set of results.

## Results

### Preliminary Results

The Google search was completed November 2022 ( $n = 1142$ ); the Instagram search was completed January 2023 ( $n = 394$ ); and the snowball search and expert consultation completed February 2023 ( $n=861$ ). Collectively, the search strategy yielded a total of  $n = 2396$  initial links. After manual duplicate removal, there were  $n = 1173$  novel resources that were then reviewed for inclusion. After applying the inclusion criteria to all resources, the final dataset consisted of  $n = 80$  total resources which were coded descriptively. A subset of the total sample consisted of  $n = 61$  resources that contained physical activity service provision, thus underwent an evaluation of their physical activity content and delivery (Figure 1) (see Supplemental File A for a list of the physical activity resources reviewed at the time of data collection).

### Main Results

Descriptive characteristics are summarized in Table 1. Inter-rater reliability of the descriptive coding was high,  $\kappa=0.91$ . 63.8% of resources were targeted towards end users across the weight spectrum, while only 25.0% were developed specifically for higher-weight individuals. A notable proportion of resources also contained educational material, though resources predominantly included physical activity provision, with 81.3% offering some kind of activity. While some resources offered free content, 85.0%

required payment to access, with 60.0% being via a recurring membership. The resources varied in offering live or on-demand provision. Lastly, while some resources garnered a community aspect through one-sided (i.e., users interact with content but not each other) or two-sided interactivity (i.e., users interact with content and each other), most had no interactive component for users.

The subset of resources that contained physical activity provision are summarized in Table 2. Inter-rater reliability of the provisional physical activity coding was high,  $\kappa=0.96$ . 83.6% of resources were classified as having a primary purpose of offering physical activity provision via synchronous or asynchronous fitness classes (versus educational or community hubs that offered minimal or limited physical activity participation opportunities). 62.3% of resources demonstrated weight-inclusivity through the active celebration of diverse bodies and higher-weight individuals, as well as actively promoting anti-bias and anti-oppressive attitudes. The remainder were ‘passively’ weight-inclusive by adopting principles of body neutrality and acceptance (e.g., welcoming of all individuals, regardless of one’s size, shape, or weight). Similarly, 52.5% resources challenged or confronted various societal ideals (e.g., whiteness, thinness, straightness, etc.). This was accomplished by addressing intersectional identities, acknowledging the experiences of those who belong to multiple marginalized social groups, and explicitly opposing various forms of discrimination (e.g., weight-based stigma, racism, etc.). Some resources also sought to address overt weight stigma experienced by higher-weight individuals through education and advocacy. Most resources positively portrayed diverse bodies (67.2%), promoted behavioral engagement in physical activity that honors the body (82.0%), used weight inclusive language (75.4%), and provided users with a variety of modifications to ensure their physical activity provision was accessible to higher-weight participants (88.5%). Notably, there was minimal display of weight-normative ideals, though a small portion contained related content (e.g., encouraging fat and weight loss goals, weight-normative fitness class titles, and testimonials regarding weight loss).

### Discussion

Despite the growing scholarly interest in weight-inclusive physical activity, and a proliferation of initiatives offering weight-inclusive physical activity provisions, there is limited systematic understanding

of the practical applications of weight-inclusive physical activity. The present investigation identified, described, and evaluated the current landscape of virtual, publicly available weight-inclusive physical activity resources. The systematic search identified 80 virtual weight-inclusive physical activity resources that were categorized as educational and/or offering weight-inclusive physical activity service provision. Overall, resources generally adhered to weight-inclusive principles by showcasing diversity in body size, using weight-inclusive language, and centering physical activity that honors body's signals and cues. Physical activity provision resources offered a range of physical activity types, were often membership-based, and mostly offered asynchronous access. Notably, few resources that offered physical activity provision were designed specifically for higher-weight individuals and opted to generate spaces that were explicitly inclusive to individuals of all sizes. This study offers novel insights into the characteristics of weight-inclusive physical activity resources offered virtually and has highlighted features that may be included in future physical activity programming opportunities to ensure weight-inclusivity for higher-weight individuals.

Weight-inclusive physical activity resources were characterized as predominantly targeting end-users (i.e., individuals interested in physical activity opportunities), with few offerings for training fitness providers on weight-inclusive physical activity. Most resources explicitly stated that they were designed to meet the diverse needs of individuals in all bodies, regardless of shape, size, or weight, which aligns with scholarly recommendations emphasizing the importance of an organizational culture of size inclusion in the provision of physical activity.<sup>40,41,50</sup> Explicit attempts to foster weight and size inclusion in physical activity settings, at both the individual and structural levels, have been proposed as necessary strategies to support physical activity self-efficacy, increase opportunities for physical activity engagement and enjoyment, and emphasize enhancing personal well-being, contrasting the weight-centric culture of traditional fitness centers.<sup>6,40,50</sup> The diversity of mission statements and resource purposes may also be useful in offering a series of participation options to end-users seeking weight-inclusive physical activity. For example, some individuals may value engaging in physical activity in an environment that actively celebrates higher-weight individuals and centers the experience of this population in broader,

societal context, while others may wish to participate in physical activity without a focus on the body, ultimately favoring body neutrality.<sup>40</sup>

The proportion of resources that were explicitly designed for higher-weight individuals were limited – which could highlight a target area for future resource development. It is possible that this limited availability reflects the co-opting of “weight neutrality” and “body positivity” that has proliferated in online social movement communities to convey a general sense of inclusion, as opposed to the anti-oppressive origins of the fat liberation movement.<sup>51-53</sup> Indeed, few resources had embedded elements of resistance or opposition to societal oppression (e.g., explicitly addressing weight stigma, combating anti-fat oppression in physical activity, intersectionality and the compounding effect of experiencing multiple forms of marginalization).<sup>29</sup> However, given that individuals who possess marginalized identities can feel excluded from physical activity spaces, previous research has identified a unifying participant identity that can emerge through a focus on inclusion, body respect, autonomy, and empowerment.<sup>6,28,54</sup> Future research should explore the participation experiences of higher-weight individuals in physical activity contexts that support size inclusion and weight diversity, versus contexts that are exclusively designed for higher-weight individuals.

Most physical activity provisional resources included some form of asynchronous content which – while not explicitly focused on eradicating physical activity-related weight stigma – increases accessibility, reduces barriers to access, and offers a mode of private behavioral engagement that promotes psychological safety.<sup>40,55</sup> Additionally, most resources – though pay-for-service – also included free physical activity content or offered flexible and sliding scale payment options. This element fosters inclusion as it attempts to expand access to individuals with varying socioeconomic statuses who may not be able to afford traditional gym memberships. Numerous studies have revealed that weight stigma negatively impacts income, as higher-weight individuals are often paid less than their lower-weight counterparts, even when health limitations, familial variables and job performance are controlled.<sup>56,57</sup> As such, offering accommodating payment methods is particularly important in establishing a weight-inclusive physical activity landscape.<sup>28</sup>

Current literature surrounding weight inclusive physical activity suggests that when physical activity resources intentionally enable interpersonal connection, higher-weight participants can encourage one another and develop a sense of community and belonging that ultimately supports continued physical activity participation and enjoyment.<sup>28,40,58,59</sup> Interestingly, more than half of the resources identified did not contain any interactive elements or opportunities for community building. This may be due to the virtual nature of the resources, as establishing connection and community online would likely be more challenging compared with in-person programming. While existing literature has investigated the importance of community in physical activity broadly, it has not been assessed in the context of weight-inclusive physical activity. As many of the resources identified in this study do not include an interactive element, future research should examine the integration of social and interactive elements in weight-inclusive physical activity provision. Investigations on the matter may determine the relevance and necessity of interactive features for its role in enhancing physical activity participation and enjoyment of weight-inclusive resources.

Notably, most resources embedded positive representations of diverse body shapes, sizes, and weights in promotional material, informational sections, and throughout the provisional physical activity content, and many resources were designed and led by higher-weight individuals. Positive representations of active fat identities have been proposed as critical pathways to promoting weight-inclusive physical activity via the normalization of non-normative active bodies.<sup>6</sup> Positive representations of fatness in physical activity contexts are important in combatting negative anti-fat representations in fitness contexts and pervasive messaging of promoting physical activity as a weight-loss tool.<sup>6,40,60</sup>

Asynchronous and synchronous physical activity class offerings commonly employed HAES®-aligned physical activity by focusing on attuned and accessible movement that honors bodily needs. For example, instructors focused on attuned movement by instructing participants to remain connected to oneself and attend to one's needs throughout the instruction. Moreover, instructors guided the class through various movements, where exercises were often accompanied by multiple variations and modifications that would suit a range of abilities. This was done in an attempt to increase participant

inclusion and ensure all participants could engage in the physical activity. This kind of instruction may help shift participants away from weight-normative goals (i.e., appearance- and/or weight-related goals) and toward honouring the body and enjoying the movement.<sup>61</sup> Notably, exercise modifications were offered in one of two ways. Many instructors introduced an exercise, after which they would present various modifications to that movement as ‘easier’ alternatives. Occasionally instructors utilized a more progressive model, where the most basic form of a movement was demonstrated, followed by variations to the exercise intended to increase difficulty. Though both methods foster inclusivity and accessibility in physical activity, they may send different signals to those who elect the modified form of movement. Including modifications to ‘simplify’ an exercise after demonstrating the movement may imply that those engaging in the modified version are less capable than those engaging in the original movement, potential producing feelings of inadequacy or inferiority.<sup>62</sup> It may also suggest the ‘easier’ movement was included as an afterthought as opposed to an exercise that was an intentional element of the instructor’s class. This may subtly create a hierarchy within the physical activity and may discourage individuals from participating. Contrastingly, the progressive model may serve as a more uplifting and deliberate approach to incorporating inclusivity in physical activity. Building upon movements allows individuals to challenge themselves to engage in increasingly difficult variations of exercises without putting down those who elect the initial version offered. It is recommended that future studies should investigate these methods of incorporating modifications to exercise to explore potential differences concerning client enjoyment and future participation. Instructors also often employed weight-inclusive language (e.g., using ‘fat’ in a neutral manner), and used encouraging and affirmative phrases when referring to the body during instruction. These key factors have been consistently recommended in the promotion of weight-inclusive physical activity, where existing studies highlight the significance of attuned movement, physical activity modifications, and inclusive language.<sup>38,40,50,61</sup>

While most resources adhered to weight-inclusive principles, there were five resources that contained weight-normative content including: weight-normative fitness class titles (e.g., ‘seriously sculpted,’ ‘12 weeks to leaner legs,’), testimonials regarding weight loss, and incentivizing weight loss

goals. It is likely these resources were included in the search strategy due to the co-opting of ‘body positive’ and ‘weight neutral’ terminology.<sup>51-53,63</sup> Similar findings have emerged from studies of dietitians who claim to engage in weight-neutral practices, with nearly two-thirds incorrectly believing that this philosophy is compatible with pursuit of weight-loss goals.<sup>64</sup> While the weight-normative approach is deeply embedded in a variety of health and wellness settings and is particularly prevalent in physical activity contexts,<sup>11</sup> the presence of weight-normative content within resources that are advertised as weight-inclusive is concerning; when supposedly ‘safe’ spaces are unsafe, the potential for harm is magnified. This reflects the pervasiveness of weight-normative ideologies in physical activity contexts, thus critical appraisals of physical activity resources that claim to be weight-inclusive are necessary.

### **Limitations**

Several limitations should be considered when interpreting the findings from this study. The virtual nature of the scan limited the resources that the researchers were able to access. For instance, researchers had to exclude all in-person services whose websites solely served as advertisement (e.g., fitness facilities, studios, etc.). Moreover, the researchers were unable to examine personal training and one-on-one coaching. Such services are tailored to each individual and their respective needs, and researchers aimed to merely observe how instructional, weight-inclusive physical activity occurs in naturalistic contexts. Finally, researchers only reviewed resources offered in English. Therefore, there may be high-quality, weight-inclusive personal training services and/or non-English resources that were excluded from the present analysis. Similarly, the researchers were unable to assess several resources that met inclusion criteria at the time of data collection, but suffered a technical error before the content could be evaluated (e.g., links expiring). These limitations reduced the final sample size and limited the generalizability of the findings, as in-person and individualized services may have additional, novel applications of weight-inclusive principles that could not be evaluated as part of the study.

Additionally, due to the relative novelty of the environmental scan method in this context, researchers opted to include Google and Instagram as the only search engines. Though this work serves as an important first step, future studies should explore additional search engines and social media platforms

(e.g., Patreon, Twitch, TikTok, YouTube, etc.), developing a larger and more comprehensive scan of virtual resources. Finally, data were collected through active participation in one class of the physical activity content of included resources. Given the instructors were notified in advance, the presence of the research team may have disrupted the natural environment, and the class may not have been representative of typical physical activity provision. To add, the primary research team that conducted the collection and analysis of data comprised of thin individuals, who are not stigmatized for living in larger bodies. Such researchers occupying spaces created for higher-weight individuals may have impacted the research process, particularly in instances where the researchers attended synchronous physical activity classes.

### **Conclusions**

The findings of this systematic virtual resource scan suggest that existing weight-inclusive physical activity resources generally reflect weight-inclusive principles and appropriately apply these principles in real-world physical activity service provision contexts. To date, these principles on promoting weight-inclusive physical activity have been largely theoretical, thus this research is an important step in connecting scholarly recommendations with the current landscape of weight-inclusive physical activity resources that are offered in practice. Future studies should assess end-user perception of weight-inclusive physical activity resources to determine their efficacy in creating safe spaces according to the targeted demographic. Expanding current knowledge of weight-inclusive practices is essential in the development of guidelines and recommendations for other physical activity resources to increase weight-inclusion and eradicate weight stigma that currently poses a significant barrier to physical activity participation for higher-weight individuals.

**Competing Interests** The authors have no competing interests to declare.

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## Tables & Figures

**Table 1.** Descriptive Characteristics of Weight-Inclusive Physical Activity Resources ( $n = 80$ )

Category		Description	N (%)
Target Audience	End User	The resource is intended for those seeking to participate/engage in weight-inclusive physical activity	71 (88.8%)
		Exclusively for higher-weight individuals	20 (25.0%)
		For diverse-bodied individuals	51 (63.8%)
	Professionals	The resource is intended to inform fitness/physical activity professionals (e.g., personal trainers, fitness instructors)	16 (20.0%)
	Other	The resource is not intended for individuals seeking to engage in weight-inclusive physical activity or fitness professionals (i.e., healthcare workers, academics, family members)	7 (8.8%)
Resource Type	Physical activity provision	The resource contains material through which users can access and participate in virtual physical activity	65 (81.3%)
		Yoga	31 (38.8%)
		Dance	19 (23.8%)
		High Intensity Interval Training (HIIT)	12 (15.0%)
		Weight Training	29 (36.3%)
		Other	30 (37.5%)
	Educational	The resource contains material intended to provide information surrounding at least one aspect of weight-inclusive principles	32 (40.0%)
	Other	The resource contains material that is not physical activity provision or educational content (e.g., assessment tool, community events)	6 (7.5%)
Cost	Free	The resource contains content that does not require payment to access	25 (31.3%)



	Pay for Service	The resource contains content that requires payment to access	68 (85.0%)
		Single Payment	39 (48.8%)
		Membership	48 (60.0%)
		Sliding Scale	20 (25.0%)
Access	Live	The resource is only available at certain times; attendance is required	52 (65.0%)
	On-Demand	The resource can be accessed at any time	67 (83.4%)
Interactivity	Two-sided	The resource has a community aspect; users can engage with others (e.g., community boards, social media pages)	20 (25.0%)
	One-sided	Users may engage with the resource but will not interact with others (e.g., comment sections, user testimonials)	16 (20.0%)
	None	Users cannot interact with others	44 (55.0%)

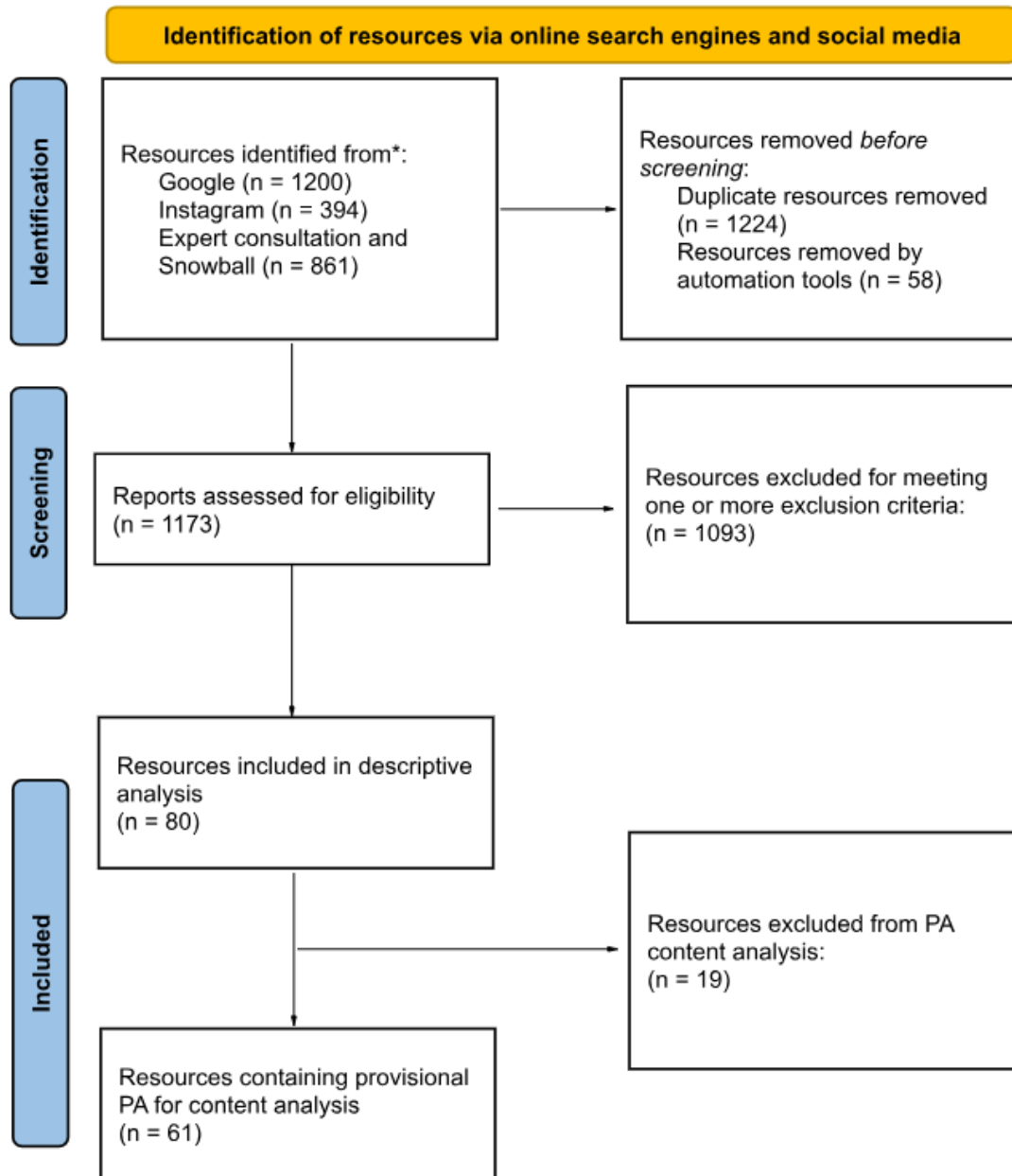
*Note:* Results are displayed as absolute frequencies, as resources can be classified in multiple categories and subcategories.

**Table 2.** Features of Weight-Inclusive Physical Activity Provision Resources ( $n = 61$ )

	Category	Description	<i>N</i> (%)
Target Audience	Higher-weight individuals	The resource is intended for higher-weight individuals specifically	18 (29.5%)
	Diverse Bodies	The resource is intended for individuals of all sizes	43 (70.5%)
	Physical Activity Provision as Primary Focus	The primary focus of the resource is physical activity provision	51 (83.6%)
Weight-Inclusive Approach	Body Neutrality & Acceptance	The resource is accepting of, or neutral towards all individuals, regardless of weight, shape, or size	23 (37.7%)
	Fat liberation & Anti-Oppression	The resource actively celebrates higher weight bodies and opposes societal beauty standards	38 (62.3%)
Resistance to Societal Ideals	Intersectionality	The resource accounts for the interplay of possessing multiple (marginalized) identities	32 (52.5%)
	Addressing Stigma	The resource seeks to combat/dismantle the oppression/prejudice higher weight individuals may face in society (and/or in physical activity spaces specifically)	23 (37.7%)
	Weight Normative Content	The resource contains material that perpetuates weight normative ideals	5 (8.2%)
	Diversity in Body Representation	There is a positive representation of a variety of body shapes and sizes portrayed throughout the resource	41 (67.2%)
	Honoring Body	There is an emphasis/attention on using physical activity to honor body's needs; users are instructed to pay attention to how the body feels	50 (82.0%)

Inclusive Language	The resource utilizes language that is intentionally inclusive of individuals in larger bodies	46 (75.4%)
Modifications	The resource offers variations/alternative exercise options to accommodate diverse bodily abilities	54 (88.5%)

*Note:* Results are displayed as absolute frequencies, as resources can be classified in multiple categories and subcategories.



**Figure 1.** Summary of resources that were included for analysis. Note: PA denotes physical activity.

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<sup>1</sup> Note, in the present context, ‘normative’ is used in the sense of societally acceptable weight/BMI levels and is contrasted with ‘higher weight’ – these terms are chosen in lieu of more medicalized language based on BMI categories, in line with recommendations of civil rights organizations fighting for the rights of higher-weight individuals.<sup>65</sup>