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# Weight Bias Among Physical Educators: A Scoping Review

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## Abstract

*This study is a scoping review of empirical research examining weight bias among physical educators. Specifically, we sought to determine the extent, range, nature, and findings of research studies concerning weight bias in physical educators. Five online databases were used to identify studies published in English between 1985 and 2021 according to our search criteria. Upon retrieving 19 publications, we conducted a content analysis and appraisal of each publication. Findings were reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR; Tricco et al., 2018). Studies from nine countries were categorized into four groups based on their focus. All revised studies demonstrated weight bias among participants. Given that weight bias can act as a barrier to engaging higher-weight youth in physical education, interventions to reduce weight bias in physical educators are warranted.*

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## Introduction

Research shows that higher-weight youth experience weight stigma across various settings, including schools (Lessard et al., 2021; Puhl & Latner, 2007; Puhl & Lessard, 2020). Weight stigma is defined as the "social rejection and devaluation that accrues to those who do not comply with prevailing social norms of adequate body weight and shape" (Tomiyama et al., 2018, p. 1). In other words, weight stigma refers to weight-related negative attitudes resulting in stereotypes, prejudice, and discrimination (Hart et al., 2021). Weight stigma examples include teasing, bullying, harassment, unfair or inferior treatment, and pressure to lose weight. In a literature review, Puhl and Lessard (2020) reported body weight as a primary reason for bullying in young people. According to Puhl and Lessard (2020), it is estimated that "nearly a quarter to a half of all youth have been bullied for their body weight" (p. 403).

Weight stigma is associated with many adverse outcomes for young people's health and well-being (Guardabassi et al., 2017). Concerning mental health, studies have shown correlations between weight stigma and depression, anxiety, poor self-esteem, and body dissatisfaction in youth (Warnick et al., 2022). In addition, discrimination based on body size has also been linked to lower academic performance and negative social experiences (Puhl & Lessard, 2020). Lastly, weight stigma also impacts children and adolescents' physical health. Weight stigma has been associated with weight gain, maladaptive eating behaviors, and physical activity avoidance (Puhl & Lessard, 2020).

Although peers are the most common source of weight discrimination among young people, research shows that family members and educators can perpetuate weight stigma by holding weight bias (Puhl & Latner, 2007; Puhl & Lessard, 2020). Weight bias refers to negative thoughts, beliefs, feelings, and assumptions about larger-bodied individuals. Often, such beliefs result from stereotypes of fat people, misguided assumptions about the relationship between health and weight, and attributions of responsibility for body size (Chrisler & Barney, 2017; Daníelsdóttir et al., 2021). For example, a common misconception fueling weight bias is that fatness results from moral failures and that higher-weight individuals have control over their body sizes (Puhl & Lessard, 2020). Unfortunately, despite

the evidence that body size is influenced by a wide range of factors beyond diet and exercise (e.g., genetics, stress levels, socioeconomic status; Wright & Aronne, 2012), society continues to blame higher-weight people for their sizes and stereotype them as lazy, unmotivated, or undisciplined, perpetuating weight bias, and consequently, weight stigma (Cossrow et al., 2001; Hinman et al., 2015).

Scholars have shown the presence of weight bias among preservice and in-service health-related professionals, including those in medicine (Sabin et al., 2012), nursing (Darling & Atav, 2019), nutrition (Swift et al., 2013); and exercise fields (Chambliss et al., 2004). Because exercise is seen as a strategy for weight loss, professionals in this area might contribute to highly stigmatizing environments, perpetuating weight stigma. For example, Panza and colleagues (2018) reviewed studies examining weight bias in exercise professionals and concluded that 17 out of 20 reviewed studies showed moderate to high weight bias among their samples. Although studies have confirmed the existence of weight bias among physical educators, to date, no study has summarized and appraised their findings. Thus, questions remain regarding the extent to which weight biases are prevalent among this professional group, how those biases manifest in physical education (PE), and their potential implications for children's health and well-being. In this study, we undertook a scoping review of empirical research examining weight bias among physical educators. Specifically, we aimed to determine the extent, range, and nature of research on weight bias among physical educators, the findings from these studies, and the gaps in the existing literature.

## Method

We conducted a scoping review to identify and map the evidence of weight bias among physical educators. In contrast to systematic reviews, scoping reviews aim at answering "broader research questions and to describe concepts and knowledge gaps in an often-emerging field" (McGowan et al., 2020, p. 178). Furthermore, scoping reviews are valuable tools for determining the scope of coverage, available evidence, and knowledge gaps related to a specific topic (Munn et al., 2018).

## Eligibility Criteria

This review included empirical studies that explicitly examined weight bias among physical educators, including pre-service and in-service teachers and college professors. Only peer-reviewed articles that were published in English between the years 1985 and 2021 were included. We used this time frame to fit two papers by Tinning (1985, 2020) addressing weight stigma in PE and account for studies published in 2021 (the year we conducted this study). Papers addressing physical activity that showed no relation to PE classes or teacher training were excluded. Conceptual papers and reviews of the literature were also excluded.

## Information Sources

After consulting with an experienced librarian and drafting the search strategy, we used the following online databases to identify relevant articles: *Eric*, *SPORTDiscuss*, *APA PsychINFO*, *CINAHL*, and *ProQuest*. The search was conducted during June and July of 2021 and was supplemented by scanning reference lists of recent and relevant studies. We exported the selected sources to *Zotero* (Corporation for Digital Scholarship, 2006), a reference management tool.

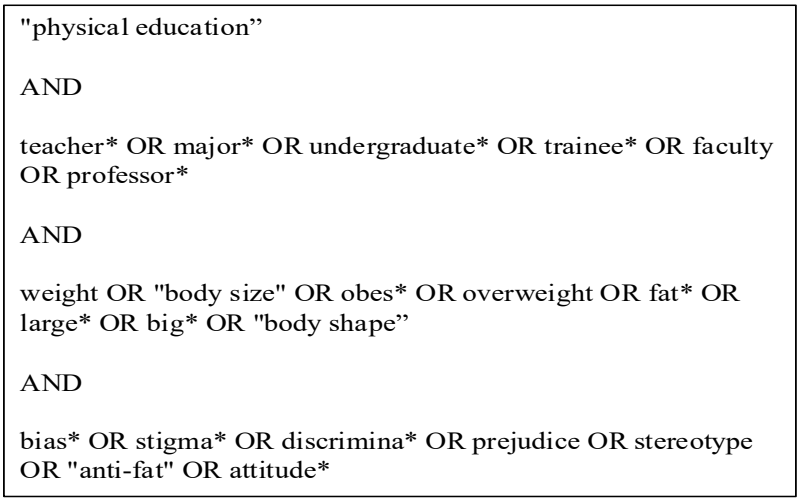
## Search

We followed the Scoping Review Guide from the University of South Australia Library (n.d.) to create the search strategy. First, we identified the main key terms related to the study: body weight, bias, and physical educators. Then, for each key term, we listed possible alternative concepts. For example, for bias, we listed stigma, discrimination, prejudice, stereotype, anti-fat, and attitude. Second, we combined the key terms and alternative concepts using the connectors "OR" and "AND." We also use truncation (*) to facilitate phrase searching. Figure 1 shows our final search strategy, which we applied to every database.

## Selection of Sources of Evidence

After duplicates were removed, we screened all yielded abstracts independently using *SysRev* (Bozada et al., 2021), an online literature review tool. Initially, we achieved a 95.5% agreement in our screen-

**Figure 1**
*Search Strategy*




ing. We then met and discussed our disagreements until we established a consensus, deciding to exclude articles that did not address weight bias, targeted other populations (e.g., health educators), or examined physical educators' perceptions of obesity more broadly. Next, we independently assessed the full text of all remaining publications to determine their eligibility. We established each article's eligibility by examining its measurements. That is, articles that used an instrument designed to assess weight bias were included in this review.

## Data Charting Process

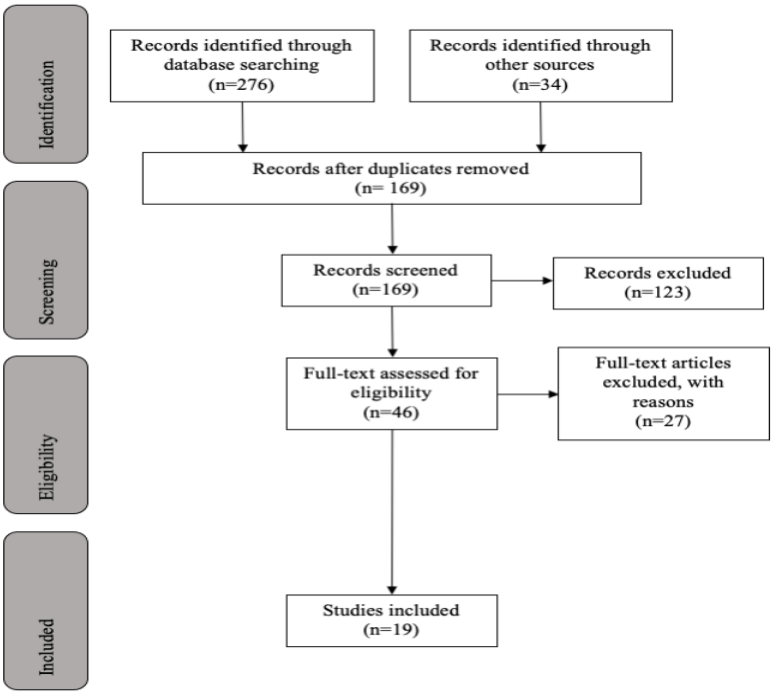
Once we defined the articles to be included in the review, we developed a chart to determine which variables to extract from the studies. We charted the data independently, discussed our findings, and continuously updated the chart through an iterative process. The following variables were extracted from each study: publication year, country, purpose, context, participants, data sources, data analysis, and main findings. Once we charted the data, we re-examined the studies' focus and used content analysis to categorize the reviewed studies according to their primary aims. We categorized all studies independently and met to discuss disagreements until a consensus was established.

## Results

Figure 2 outlines the article selection process according to the PRISMA-ScR. Our initial search yielded 276 items, which we added to a reference manager (*Zotero*). We then included another 34 records identified through other sources. We used *Covidence* (Veritas Health Innovation, 2022), a systematic review management tool, to remove all duplicates. After duplicates were removed, both authors screened all 169 remaining abstracts independently using *SysRev*, another literature review online tool. Initially, we achieved a 95.5% agreement in our screening. We met and discussed our disagreements until we established a consensus, deciding to exclude 123 articles during the screening phase. Next, we assessed the full text of 46 articles independently to determine their eligibility. We chose to exclude another 27 articles that did not meet the inclusion criteria. A total of 19 studies were included in this scoping review.

**Figure 2**

*Article Selection Process According to the PRISMA-ScR.*



The selected 19 studies included those focusing explicitly on weight bias among physical educators. Table 1 provides a detailed summary of study characteristics. The studies were conducted in nine different countries; however, most were in the United States (*n* =11, 58%). Most studies included multiple participant groups, including PE teachers (*n* = 12, 63%). Several studies focused on PE majors (*n* = 5, 26%), one focused exclusively on PE teachers, and another on physical education teacher education (PETE) professors (*n* = 1, 5.2% each). In terms of the research setting, we identified five different contexts, including universities, K-12 schools, market data, professional organizations, and multiple settings. However, the majority of studies were conducted in universities (*n* = 12, 63%), with K-12 schools coming second (*n* = 4, 21%).

Concerning research methodology, most studies were quantitative (*n* = 17; 89.5%) with a couple of mixed methods (*n* = 2; 10.5%) (Readdy & Wallhead, 2016; Rukavina et al., 2008). Table 2 displays the instruments used to assess participants' weight bias in each study. A wide range of measurements were used, with 13 different instruments identified across the 19 studies. The Implicit Association Test (IAT; Greenwald et al., 1998) was the most prevalent instrument across the reviewed studies (*n* = 10; 52.6%). The Anti-fat Attitudes Questionnaire (AFA; Crandall, 1994) and Anti-fat Attitudes Scale (AFAS; Morrison et al., 1999) were also commonly employed (*n* = 5; 26.3% each), with the Anti-fat Attitudes Test (AFAT; Lewis et al., 1997) coming next (*n* = 4, 21.1%). Interestingly, instruments designed specifically for use with physical educators were least frequently used across these studies: Perception of Obese Students by Physical Education Teachers questionnaire (POSPET; Fontana et al., 2013) (*n* = 1; .05%) and PETE professors' perceptions of obese physical education teachers and majors (Fontana et al., 2017) (*n* = 1; .05%).

Throughout our appraisal, we identified four primary purposes across the 19 studies, including (a) Identification, (b) Comparison, (c) Association, and (d) Intervention. Table 3 offers a list grouped by their primary purpose, and a discussion of each group follows.

## Identification

Most studies (*n* = 7; 37%) sought to identify the presence of weight bias in physical educators. Weight bias was identified across a

**Table 1**
*Description of Included Studies (n = 19)*

| Study variable | Number of studies (%)[1] |
|---|---|
| Country | |
| United States | 11 (58%) |
| Australia | 1 (5.2%) |
| Canada | 1 (5.2%) |
| England | 1 (5.2%) |
| Hong Kong (China) | 1 (5.2%) |
| Italy | 1 (5.2%) |
| New Zealand | 1 (5.2%) |
| Spain | 1 (5.2%) |
| Multiple Countries | 1 (5.2%) |
| Participants | |
| Multiple participant groups | 12 (63%) |
| Physical education teachers | 1 (5.2%) |
| Physical education professors | 1 (5.2%) |
| Physical education majors | 5 (26%) |
| Research Setting | |
| Universities | 12 (63%) |
| K-12 Schools | 4 (21%) |
| Market data | 1 (5.2%) |
| Professional organizations | 1 (5.2%) |
| Multiple settings | 1 (5.2%) |

range of samples in the reviewed studies, including PETE professors (Fontana et al., 2017), PE majors (Fontana et al., 2013; Greenleaf et al., 2008; O'Brien et al., 2007; Peters & Jones, 2010), and elementary and secondary PE teachers (Fontana et al., 2013; Greenleaf & Weiller, 2005; Newmark-Sztainer et al., 1999). Researchers reported weight bias in their samples across several of the reviewed studies. In a study in the U.S., Greenleaf and Weiller (2005) found that physical educators expected "normal weight" youth to perform better in endurance, flexibility, coordination, sport competence, and strength than those with larger bodies. Similarly, Peters and Jones (2010) found evidence of anti-fat bias in their sample of PE majors in England. Participants' perceptions of fat children's physical selves were significantly lower for their body image, sport competence, physical condition, physical self-worth, and global self-esteem. Along the same lines, Greenleaf et al. (2008) found that PE majors across three universities in the U.S.

**Table 2**
*Weight Bias Measurement Across All Studies*

| Weight bias measurement | Number of studies (%)[2] |
|---|---|
| Implicit Association Test (IAT) | 10 (52.6%) |
| Anti-fat Attitudes Questionnaire (AFA) | 5 (26%) |
| Anti-fat Attitudes Scale (AFAS) | 5 (26%) |
| Anti-fat Attitudes Test (AFAT) | 4 (21%) |
| Attitudes toward Obese Persons Scale (ATOP) | 2 (10.5%) |
| Beliefs About Obese People Scale (BAOP) | 2 (10.5%) |
| Explicit Ratings Test (ERT) | 2 (10.5%) |
| Fat Stereotypes Questionnaire (FSQ) | 1 (5.2%) |
| Modified Children & Youth Physical Self Perception Profile | 1 (5.2%) |
| Modified Fat Phobia Scale | 1 (5.2%) |
| Modified Fat Stereotypes Questionnaire (FSQ) | 1 (5.2%) |
| Perception of Obese Students by Physical Education Teachers questionnaire (POSPET) | 1 (5.2%) |
| PETE professors' perceptions of obese physical education teachers and majors | 1 (5.2%) |

**Table 3**
*Studies' Primary Purposes*

| Studies' purpose | Number of studies (%) | Citation |
|---|---|---|
| Identification<br>To identify the presence weight bias among physical educators | 7 (37%) | Fontana et al. (2013)<br>Fontana et al. (2017)<br>Greenleaf & Weiller (2005)<br>Greenleaf et al. (2008)<br>Neumark-Sztainer et al. (1999)<br>O'Brian et al. (2007)<br>Peters & Jones (2010) |
| *Comparison*<br>To compare weight bias between physical educators and the groups | 5 (26%) | Alameda & Whitehead (2015)<br>Carmona-Márquez et al. (2021)<br>De Caroli & Sagoni (2015)<br>Lau et al. (2018)<br>Lynagh & Morgan (2015) |
| *Association*<br>To examine the association between weight bias in physical educators and other variables | 3 (16%) | Peterson et al. (2012)<br>Readdy & Wallhead (2015)<br>Rukavina et al. (2019) |
| *Intervention*<br>To evaluate weight bias interventions | 4 (21%) | Rukavina et al. (2008)<br>Rukavina et al. (2010)<br>Russell-Mayhew et al. (2015)<br>Tingstrom & Nagel (2017) |

strongly endorsed fat stereotypes of larger-bodied children, such as laziness, less physical attractiveness, and lower social competence.

An additional finding from a few studies was weight biases toward larger-bodied physical educators. For example, Fontana et al. (2017) found that despite favoring accepting higher-weight students into PETE programs, professors across the U.S. disapproved of larger-bodied physical educators being role models to children. Greenleaf and Weiller (2005) reported a similar finding, as elementary, secondary, and college teachers across the U.S. strongly endorsed the belief that PE teachers should be role models by maintaining a "normal weight."

Research seeking to identify weight bias in physical educators reported implicit and explicit weight biases and weight control beliefs. Physical education professors, teachers, and majors generally expressed a strong implicit anti-fat bias but a neutral explicit attitude toward larger-bodied individuals (Fontana et al., 2013, 2017). For instance, both Fontana et al. (2013) and O'Brien et al. (2007) found that PETE majors had a strong implicit anti-fat bias, which increased as they neared completion of their training in the program.

In addition to implicit and explicit weight biases, a couple of studies identified weight control beliefs as an indicator of weight bias. For example, Greenleaf and Weiller (2005) found that most physical educators in their study attributed fatness to "poor eating behaviors, sedentary lifestyles, and excessive calorie intake…as well lack of self-control" (p. 415). Similarly, Neumark-Sztainer et al. (1999) found that about half of their sample believed that fatness was caused by overeating and poor eating habits. Still, half also agreed that it could be due to factors outside of their control, such as biological disorders.

## Comparison

Five studies (26%) compared weight bias between physical educators and other groups. These studies were rooted in a greater variety of research contexts, including six different countries: the U.S. and Mexico (Alameda & Whitehead, 2015), Spain (Carmona-Márquez et al., 2021), Italy (De Caroli & Sagoni, 2015), Hong Kong (China) (Lau et al., 2018), and Australia (Lynagh & Morgan, 2015). Two studies compared weight bias in higher education settings (Alameda & Whitehead, 2015; Lynagh & Morgan, 2015), three in secondary schools (Carmona-Márquez et al., 2021; De Caroli & Sagoni, 2015;

Lau et al., 2018), and one in the elementary school level (Lau et al., 2018).

The points of comparison differed across the five studies. For instance, Alameda and Whitehead (2015) examined the explicit and implicit anti-fat attitudes of Mexican and American PE and exercise science majors. They found that neither group exhibited problematic explicit anti-fat biases; however, differences emerged regarding implicit anti-fat biases. American students scored higher on good-bad and motivated-lazy subscales, indicating that they tended to associate larger-bodied individuals with being bad and lazy. Although Lynagh and Morgan (2015) also examined weight biases among preservice teachers, their study in Australia compared health and PE specialists to non-specialists. Both groups of preservice teachers had a strong implicit negative bias toward higher-weight children, but this was stronger among health and PE specialists. Explicit anti-fat attitudes were not as evident, but negative stereotypes were.

Whereas these studies compared weight bias across higher education contexts and programs of specialization, two studies compared weight biases among PE and non-PE teachers at the elementary and/or secondary school level. In a study based in Spain, Carmona-Márquez et al. (2021) compared PE and mathematics teachers' anti-fat attitudes and stereotypes, as well as whether PE teachers' biases impacted the obesity-related attitudes and behaviors of their adolescent students. They found that 80% of all teachers had implicit negative attitudes, with no significant differences between them. However, PE teachers showed stronger implicit anti-fat stereotypes. Although they showed sympathetic attitudes toward higher-weight students, they often associated fatness with being bad and lazy, whereas mathematics teachers did not.

In the same vein, in a study based in Hong Kong (China), Lau et al. (2018) compared primary and secondary school PE and non-PE teachers' implicit anti-fat. The male PE teachers had more favorable attitudes towards "normal weight" children, whereas male non-PE teachers had more favorable attitudes toward larger-bodied children. Female PE teachers had more favorable attitudes toward "normal weight" youth, whereas female non-PE teachers had neutral attitudes toward students from all weight statuses. This study (in contrast to most others in this review) demonstrated an interaction between

weight bias and gender. Both male and female PE teachers showed significantly more weight bias than non-PE teachers. Interestingly, age also influenced weight bias, as younger teachers showed more biases than older teachers.

Lastly, in a study based in Italy, De Caroli and Sagoni (2015) investigated the differences between adolescents and their PE teachers/trainers concerning anti-fat attitudes and weight stereotypes. Within this comparison, they further examined the difference between adolescents involved in agonistic versus non-agonistic physical activity (intensive exercise three to seven days a week versus regular exercise twice a week) and PE versus curricular teachers. They found adolescents involved in non-agonistic physical activity expressed higher anti-fat attitudes than others, and curricular teachers expressed a higher dislike for larger-bodied individuals. Adolescents involved in agonistic physical activity and PE teachers attributed positive and negative stereotypes to overweight individuals, including weakness, laziness, and rejection on the one hand and happiness, intelligence, and sweetness on the other.

## Association

Researchers of three studies (16%) examined the associations between physical educators' weight biases and other variables. All three studies were in the U.S.: one focused on PE teachers and coaches at the secondary school level (Peterson et al., 2012) and two others on PETE majors (Readdy & Wallhead, 2016; Rukavina et al., 2019). Across the studies, different variables were examined concerning physical educators' weight biases.

Peterson et al. (2012) investigated how students' body weight and gender influenced PE teachers' and sports coaches' expectations of their abilities and performance. They found that participants' expectations, attributions, and attitudes regarding students may be negatively influenced by body weight and differ by student gender. For example, physical educators and coaches held more negative attitudes and had lower expectations for the physical abilities of larger-bodied students. Although participants were more likely to attribute higher-weight females' abilities and performance to external factors (e.g., lack of physical activity, poor eating habits, and home environment), there was no difference in participants' beliefs about the factors influencing the physical ability and performance of males.

Readdy and Wallhead (2015) investigated the associations between anti-fat bias among PETE majors and the quality and quantity of feedback they provided to students of different body sizes. This study was one of the two that used mixed methods, as the researchers also qualitatively assessed the preservice teachers' perceptions of differential behavior toward students based on their weight, including the potential consequences of it and strategies to eliminate it. Findings indicated no significant correlation between teachers' implicit and explicit anti-fat biases. Instructors with strong implicit and explicit bias tended to give more feedback to students of all weight statuses. Those with moderate bias generally interacted less frequently with students they perceived as fat. Based on qualitative interview results, some educators may change their feedback to be more encouraging to higher-weight students. Still, teacher behavior seemed to be influenced more by the desire to use good pedagogy and improve all learners' skills rather than their perception of students' weight.

Additionally, in higher education, Rukavina et al. (2019) examined whether weight-related attitudes mediated the influence of goal orientation on attitudes toward cultural diversity among preservice physical educators. They found that negative stereotypes of fat people's character traits significantly mediated the relationships of task orientation and appreciating diversity, task orientation and valuing diversity, and task orientation and willingness to implement cultural pluralism. In other words, pre-service teachers with a higher orientation toward individual improvement and task mastery were less likely to agree with these negative traits of fat people, which ultimately influenced their attitudes toward cultural pluralism and diversity.

## Intervention

Lastly, researchers of four studies (21%) evaluated the outcomes of weight-bias interventions. Three studies were conducted in the U.S. (Rukavina et al., 2008; Rukavina et al., 2010; Tingstrom & Nagel, 2017) and one in Canada (Russell-Mayhew et al., 2015). All interventions targeted undergraduate students and used pre-and post-tests to evaluate their effectiveness. Two studies used control groups (Rukavina et al., 2010; Tingstrom & Nagel, 2017), and one employed a mixed-method design (Rukavina et al., 2008). The interventions

differed in length and content across the studies, and their findings also varied.

In a mixed-methods study in the U.S., Rukavina et al. (2008) conducted a six-week intervention among undergraduate university kinesiology students (including PETE majors) to change students' attitudes toward larger-bodied individuals. The intervention included a classroom component to increase students' awareness of how anti-fat biases can hinder a healthy lifestyle. Students were also involved in a service-learning project using fitness testing with school-aged children. Participants completed the anti-fat attitude test (AFAT) before and after the intervention. They also wrote reflective papers on the factors leading to unhealthy lifestyles and the importance of PE, which were analyzed as the qualitative component of the study. The participants did not report high overall weight bias, but the results indicated certain anti-fat attitudes and stereotypes related to weight control/blame and physical/romantic attractiveness. Participants' attitudes toward people being responsible for their weight significantly reduced after the intervention. However, the perception that fat people are lazy did not.

In a related study, Rukavina et al. (2010) assessed the efficacy of an intervention to reduce kinesiology undergraduate students' explicit and implicit biases. The intervention included both classroom and service-learning components. More specifically, the classroom components included: (a) conscious raising discussion on weight biases in society, (b) perceptions of weight controllability, (c) perspective taking, (d) role-playing on environmental cues that elicit implicit weight bias, and (e) a service-learning project administering fitness testing to expose students to higher-weight children's exercise behavior and their peers' responses. This study included both an experimental and a control group. Findings indicated that participants did not have explicit but strong implicit bias, particularly on the lazy/motivated scale. The intervention decreased participants' explicit bias on the social character disparagement and weight control/blame subscales, but no change in their implicit bias, reinforcing the difficulty of changing firmly established implicit biases.

Tingstrom and Nagel (2017) used a control and experimental group to assess the outcomes of an intervention incorporated into the PETE curriculum in two universities in the U.S. The intervention

was approximately 1 hour and integrated into a PE methods class session. The control group continued with their regular PE methods content instead of receiving the intervention. Specifically, the intervention was designed to be interactive and stimulate student reflection and problem-solving, including environmental factors that affect weight, the relationship between physical educators' attitudes and biases and their teaching behaviors, the challenges faced by larger-bodied individuals in physical activity settings, and best practices and instructional strategies for teaching higher-weight children. Findings indicated a significant decrease in anti-fat bias among students who received the intervention and an increase in bias among those who did not.

Lastly, in a study based in Canada, Russell-Mayhew et al. (2015) assessed the impact of a three-hour professional development workshop delivered to health and PE pre-service teachers. The interactive workshop addressed risk factors that impact the development of eating disorders and obesity, body image, weight bias, self-esteem, media, and diet within the context of school-based health promotion and disease prevention. The purpose of the study was to evaluate the workshop's effectiveness on preservice teachers' attitudes toward body image, size acceptance, eating, and physical activity, along with its impact on participants' perceived self-efficacy to address weight-related issues. Findings indicated that the professional development workshop positively affected participants' anti-fat attitudes, body image, implicit weight bias, and ability to address weight issues.

## Discussion

In this scoping review, we examined empirical research on weight bias among physical educators. Although studies have confirmed the existence of weight bias among PE majors, teachers, and PETE professors, to our knowledge, this is the first review to summarize and appraise their findings. The reviewed studies were conducted in nine different countries; however, most were in the U.S. The research setting was mostly higher education and focused on pre-service PE teachers. Regarding research methodology, most studies employed quantitative approaches, with only two using mixed methods (Readdy & Wallhead, 2016; Rukavina et al., 2008).

As a result of this scoping review, we identified some gaps in the literature and made recommendations for future research. As

mentioned, most studies were based in the U.S. Although this may reflect the eligibility criteria, as we exclusively focused on articles published in English, it also points to a potential gap in knowledge because little may be known about weight bias among PE professionals in other parts of the world. Moreover, most studies focused on pre-service teachers. Still, more research should examine weight bias among university professors responsible for teacher education and in-service PE teachers who work directly with children and youth.

Further, most studies were quantitative and relied on a wide range of instruments to measure weight bias (e.g., AFA; Crandall, 1994; AFAS; Morrison et al., 1999; AFAT; Lewis et al., 1997; IAT; Greenwald et al., 1998). It is important to note that most of those instruments were developed in the 1990s when fears of an "obesity crisis" were rising, and anti-fat rhetoric was acceptable (Cain et al., 2022). As a result, those instruments focus on negative traits associated with fatness and higher-weight people, contributing to the stigmatization of those individuals. More recently, scholars have called for the development of non-stigmatizing measures of attitudes toward fatness (Cain et al., 2021). One such instrument, the Fat Attitudes Assessment Toolkit (FAAT; Cain et al., 2022), was designed to assess contemporary attitudes towards higher-weight individuals through a multidimensional and non-stigmatizing approach. Thus, utilizing such an instrument to assess physical educators' attitudes toward larger-bodied people from a comprehensive and nuanced perspective is warranted. In addition, more mixed-methods and qualitative research should be conducted to uncover new insights into weight bias among physical educators and its impact on their teaching.

Lastly, in this scoping review, we identified four primary purposes among the reviewed studies: (a) Identification, (b) Comparison, (c) Association, and (d) Intervention. The most frequent purpose was to identify weight bias among physical educators. A few noticeable gaps emerged from examining these purposes. First, although minimal gender differences were found across the studies, most of the participant populations were predominantly white; therefore, future research should consider the variables of race or ethnicity and weight bias. Across all studies, implicit weight bias was present among physical educators. One potential area of future investiga-

tion is the relationship between physical educators' body image and weight biases.

As this scoping review and the literature show, weight biases are prevalent among physical educators and can create a barrier to creating inclusive climates for young people with diverse bodies. A few studies in this review show that physical educators might have lower expectations for higher-weight youth, provide less feedback during class, and assume that they are lazy. This is problematic since teachers are expected to provide the same quality of instruction to all students regardless of their body size and abilities. Equally concerning was the fact that physical educators might be more biased compared to other majors and teachers of other disciplines.

Given the prevalence and adverse consequences of weight stigma, it is surprising that only four studies have reported on interventions aimed at reducing weight bias in physical educators. These were all focused on undergraduate students. None targeted PETE professors or elementary or secondary school teachers, which points to a noticeable gap. Therefore, designing, implementing, and evaluating interventions to reduce weight bias, stigma, and discrimination in all physical education settings is warranted and an urgent task.

## Conclusion and Limitations

All 19 studies included in this scoping review demonstrated some measure of weight bias among their participants, showing that physical educators held weight biases. Moving forward, researchers should consider adopting contemporary and non-stigmatizing instruments to assess physical educators' attitudes toward higher-weight individuals and body fat, such as the FAAT (Cain et al., 2022). Given the harmful association between weight stigma and young people's mental and physical health, researchers should consider the development, implementation, and evaluation of weight stigma interventions targeting physical education majors, teachers, and university professors. This scoping review was limited to articles published in English and within our specified time frame. This review was also limited to studies that purposefully measured weight bias among physical educators. We did not assess the quality of the studies or examine their methods. This decision, although deliberate, may have influenced our interpretation.

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