

# Fighting Fat: How Do Fat Stereotypes Influence Beliefs About Physical Education?

Christy Greenleaf<sup>1</sup>, Scott B. Martin<sup>1</sup> and Debbie Rhea<sup>2</sup>

**Objectives:** The purpose of this study was to examine college students' beliefs about youth obesity, the roles of schools and physical education in addressing obesity, and the training they receive to work with overweight youth.

**Methods and Procedure:** Physical education-related ( $n = 212$ ) and nonphysical education-related ( $n = 218$ ) majors completed a demographic questionnaire, a Modified Fat Stereotypes Questionnaire (M-FSQ), and a Perceptions of Physical Education Questionnaire. On the basis of M-FSQ scores, participants were identified as endorsing stereotypes ( $n = 360$ ) or not endorsing stereotypes ( $n = 70$ ).

**Results:** The importance of youth being normal weight was rated most highly among participants in physical education-related majors and among those who endorsed fat stereotypes. Participants who endorsed fat stereotypes, compared to those who did not, were more likely to believe that all school professionals should be involved in treating childhood obesity. Participants who endorsed fat stereotypes, compared to those who did not, more strongly agreed that physical educators should be role models by maintaining normal weight and educating parents on childhood obesity, and PE classes should focus on lifelong fitness. No group differences in perceived competencies to develop exercise, weight loss, nutritional, and educational programs for overweight youth were found.

**Discussion:** Future research is needed to determine the extent to which these types of differences result from educational curricula that link weight and health and, possibly, reinforce negative stereotypes of overweight children. Methods for effectively intervening in educational training environments to reduce fat stereotypes among preprofessionals need to be investigated.

Overweight youth face many challenges and barriers to living a healthy life. Not only are they at increased risk for health problems such as elevated blood pressure and increased insulin resistance (1), they are also likely to be teased, socially stigmatized, and marginalized (2). The psychosocial implications for young people who experience obesity bias are well documented and include increased depressive symptoms and decreased self-esteem and body image (3–6). Physical activity is often recommended to overweight youth to promote weight loss and improve health (1); however, physical activity settings seem to be particularly ripe for experiences of obesity bias.

Overweight youth have reported feeling embarrassed and self-conscious when participating in physical activity with normal weight peers (7) and experiencing weight-based teasing during physical activity (8,9). Experiences such as these can lead to decreased physical activity and enjoyment (10). Indeed, a study of obese and nonobese sixth graders found that obese children were significantly less active and had lower levels of physical activity self-efficacy than their nonobese peers (11). Clearly, this is problematic because physical activity has the potential to reduce youth obesity; yet, overweight youth seem likely to avoid and dislike physical activity settings because of the social stigma they face.

One place where overweight youth should be able to engage in physical activity without encountering social stigma is in the K-12 physical education setting. Educational settings should be free from all types of bias and stigma and this holds true for weight bias as well. Physical education is generally seen as an important, and appropriate, school environment for promoting physical activity (12). Physical education curricula are designed not only to improve motor skills and increase physical activity, but also to enhance students' personal and social responsibility and appreciation of movement (13). Not surprisingly, physical education teachers believe physical education is an appropriate setting in which to combat youth obesity and feel moderately competent to work with overweight youth in school settings (14,15). One purpose of this project was to further examine beliefs about the roles of physical education classes and schools in addressing youth obesity. Unfortunately, physical educators report having weight-biased attitudes and negative stereotypes of overweight individuals (14–16), which may diminish the effectiveness of physical education. Moreover, endorsing fat stereotypes may influence the extent to which physical education teachers believe they should play a role in promoting physical activity and be responsible for treating youth obesity.

<sup>1</sup>Kinesiology, Health Promotion, and Recreation, University of North Texas, Denton, Texas, USA; <sup>2</sup>Department of Kinesiology, Texas Christian University, Fort Worth, Texas, USA. Correspondence: Christy Greenleaf ([Christy.Greenleaf@unt.edu](mailto:Christy.Greenleaf@unt.edu))

To date, this issue has not been addressed; thus, an exploratory aspect of this project was to examine differences between those who endorse and do not endorse negative stereotypes of overweight children.

Physical educators' perceptions of their roles, responsibilities, and competencies in developing exercise, weight loss, nutritional, and educational programs for overweight youth also have been relatively unexplored. Physical education teacher education programs assume that potential teachers will become skilled at creating positive learning environments in which all youth can be successful, yet skills and strategies for working with overweight youth are rarely examined or addressed. Although many university physical education programs include training in three learning domains (psychomotor, cognitive, and social), creating an inclusive climate for students of varying body sizes is not typically emphasized. In one of the few studies examining preprofessional physical educators, O'Brien *et al.* (16) found that preprofessional physical education students had stronger implicit obesity bias compared to students in other areas of study. In addition, the authors suggested that physical education students might be socialized into having weight biased attitudes.

Following this line of thinking, we were interested in determining the extent to which students in physical education and health-related majors might differ from students in other areas of study with regard to their perceptions of obesity, specifically childhood obesity, and their beliefs about physical education. Because physical education and prehealth majors are likely to encounter overweight youth in their future professions, it is important to examine their attitudes, perceptions, and beliefs about overweight and obese youth. Expectancy theory suggests that initial impressions and stereotypes based on physical appearance can influence expectations, instruction, and feedback (17); thus first determining attitudes and perceptions of this important group of preprofessionals seems an essential first step. Moreover, by examining physical education and health-related majors in comparison to students in other majors, we may begin to identify areas for educational and training improvements for college curricula. We would expect that physical education- and health-related majors would differ in some of their beliefs, attitudes, and perceptions because of obesity- and weight-related content in their fields of study. However, to date, there has been little exploration of such potential differences. Given the paucity of research in this area, we examined undergraduate students majoring in physical education-related majors (e.g., kinesiology, health promotion, and recreation; KHPR) in comparison to students in other majors (non-KHPR).

We sought to extend previous research (e.g., 14–16) by exploring four questions. First, what are the attitudes of college students regarding the importance of children being normal weight? Second, when considering different personnel within a school environment, who is viewed as playing a major role in dealing with childhood obesity? Third, how is

the role of physical education in treating childhood obesity perceived? Finally, to what extent do college students feel they are receiving education and training to be competent to develop exercise programs, weight loss programs, provide nutritional advice, and educational programs for overweight youth? For each of these questions, we were interested in comparing the extent to which (i) KHPR and non-KHPR majors and (ii) students who endorsed and did not endorse fat stereotypes differed.

## METHODS AND PROCEDURE

### Participants

The participants were male ( $n = 230$ ) and female ( $n = 200$ ) college students ranging from 18 to 45 years of age ( $M = 22.25$ ,  $s.d. = 3.65$ ) from three universities located in the south central United States. Of the 430 college students, 212 were in KHPR-related majors (males = 105, females = 107) whereas the remaining 218 were in other non-KHPR programs (males = 125, females = 93). Of the KHPR students, 37.8% had been in college 1–2 years, 30.2% three years, and 32.1% four or more years. Among the non-KHPR students, 35.8% had been in college 1–2 years, 20.6% 3 years, and 43.6%  $\geq 4$  years. Most KHPR students had taken three or more health (65.7%) or kinesiology (85%) courses. Fewer non-KHPR students had taken three or more courses in health (50.4%) or kinesiology (32.6%). The sample included 286 whites, 92 African Americans, 27 Hispanics, 10 Asian Americans, 3 American Native Indians or Alaskan Natives, and 12 who classified themselves as “other.”

On average, male participants weighed 85.72 kg ( $s.d. = 15.27$ ) and female participants weighed 63.69 kg ( $s.d. = 11.84$ ). Based on self-reported height and weight, 8 individuals (1.86%) were considered underweight (BMI  $< 18$ ); 260 (60.46%) were normal weight (BMI 18–24.9); 114 (26.51%) were overweight (BMI 25–29.9); and 48 (11.16%) were obese (BMI  $> 30$ ). Males had higher BMIs than females ( $M = 26.14$ ,  $s.d. = 4.07$ ;  $M = 23.15$ ,  $s.d. = 3.83$ ; respectively at the  $P < 0.001$  level) and non-KHPR majors had higher BMIs than KHPR majors ( $M = 25.26$ ,  $s.d. = 4.29$ ;  $M = 24.23$ ,  $s.d. = 4.10$ ; respectively at the  $P < 0.05$  level).

### Procedure

Institutional Review Board approval was received and informed consent information was provided to participants before initiation of data collection. The data presented in this article come from a larger ongoing study of college students' obesity-related knowledge and attitudes. Students taking health-related courses completed an online survey pertaining to their (i) knowledge of weight controllability and etiology of weight, (ii) attitudes toward and beliefs about childhood obesity, and (iii) the role of schools in dealing with childhood obesity. Participants include students enrolled kinesiology courses at the undergraduate level who volunteered either for extra credit or for course credit. The survey lasted ~15–20 min. For the purposes of this article, we have highlighted and focused on only a few aspects of the larger study.

## Instruments

**Demographic questionnaire.** The online survey instrument included demographic and background items regarding participants' gender, race, age, height, and weight, school, major, or current degree pursuing, and hours completed in a certain area.

**Modified fat stereotypes questionnaire.** The Modified Fat Stereotypes Questionnaire (M-FSQ; ref. 18; modified from ref. 19) was used as a measure of weight bias. The M-FSQ consists of 32 items (16 pairings) pertaining to personal and behavior characteristics and attributes, such as happiness, laziness, attractiveness, eating habits, and activity habits, of fat and thin children. Sample items include "It is good to be fat," "It is good to be thin," "Fat children are lazy," and "Thin children are smart." Each characteristic is rated on a 4-point scale, from 1 (*really disagree*) to 4 (*really agree*). A difference score is calculated for each characteristic (e.g., lazy, healthy, eats a lot), with positive scores reflecting endorsement of the characteristic for thin children and negative scores reflecting endorsement for fat children. In addition, a total test score is calculated with higher scores reflecting greater endorsement of fat stereotypes. The M-FSQ has demonstrated adequate internal consistency (18). In the present study, the internal consistency was 0.87.

**Perceptions of physical education questionnaire.** A revised Perceptions of Physical Education Questionnaire, initially developed by Price *et al.* (20), was used to assess perceptions of the role of physical education in dealing with and managing youth overweight and obesity. The questionnaire includes 44 items pertaining to the problem of youth obesity, the role of schools, school personnel, and physical education in dealing with issues of obesity, and perceived competencies in developing exercise, weight loss, nutritional, and psychological programs for overweight youth. All items were rated on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The questionnaire has demonstrated adequate internal consistency (14,15,20). With the current sample, the internal consistency was 0.88.

For the purposes of this article, we examined only selected items from the questionnaire. Specifically, we examined: (i) perceptions of the importance of being normal weight for children's mental and physical health (two items); (ii) perceptions of the role of school personnel in working with overweight children (five items); (iii) perceived competencies in developing exercise, weight loss, nutritional, and psychological programs for overweight youth (five items); and (iv) perceptions of the role of physical education in treating childhood obesity (5 items).

## Statistical analyses

Statistical analyses were conducted using SPSS 14.0 (21). Group differences between major (KHPR, non-KHPR) and fat stereotypes (endorsed, did not endorse) were analyzed using multivariate analysis of covariance (MANCOVA), with BMI and gender entered as covariates. The fat stereotype groups were created based on total M-FSQ scores: endorsed fat stereotypes ( $n = 360$ ; M-FSQ scores above zero) and did not endorse fat

stereotypes ( $n = 70$ ; M-FSQ scores of zero and below). Thus, analyses were conducted using a 2 (major)  $\times$  2 (fat stereotype group) design: KHPR-endorsed fat stereotypes ( $n = 179$ ), KHPR–did not endorse fat stereotypes ( $n = 33$ ), non-KHPR-endorsed fat stereotypes ( $n = 181$ ), and non-KHPR–did not endorse fat stereotypes ( $n = 37$ ). BMI and gender were entered as covariates to control for the associations with the independent variables of interest (e.g., major and endorsement of fat stereotypes).

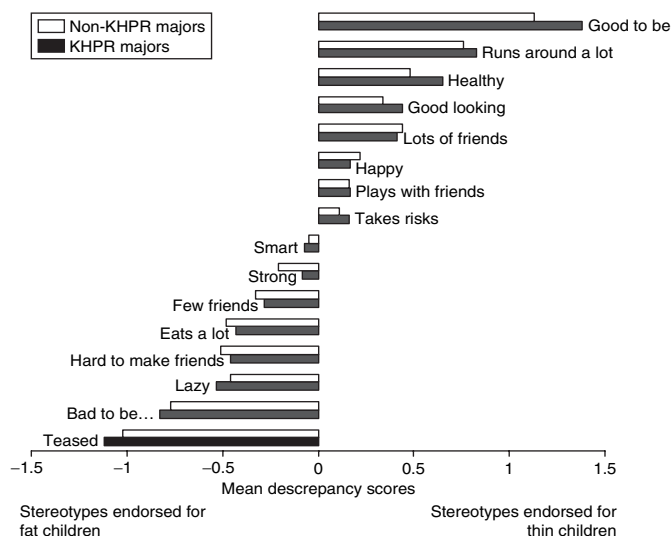
## RESULTS

### Endorsement of fat stereotypes

All FSQ difference scores were significantly different from zero ( $P < 0.05$ ), except smart and strong (KHPR majors only), and stereotypes were endorsed in the expected direction (see [Figure 1](#)). The most strongly endorsed characteristics of thin children were "good to be..." "run around a lot," and "healthy;" whereas the most strongly endorsed characteristics for fat children were "likely to be teased," "bad to be..." and "lazy." No group differences emerged between KHPR and non-KHPR majors on their total M-FSQ scores ( $P = 0.45$ ).

### Perceived importance of normal weight for physical and mental health

Participants generally agreed or strongly agreed that being normal weight is important for children's physical (73.7%) and mental (76.3%) health. Results of a 2 (major)  $\times$  2 (fat stereotype group) MANCOVA, with BMI and gender as covariates, for perceptions about the influence of being normal weight on children's physical and mental health revealed multivariate main effects for both major and fat stereotype group, Wilks'  $\lambda = 0.98$ ,  $F(2, 423) = 4.12$ ,  $P < 0.05$ ,  $\eta^2 = 0.02$  and Wilks'  $\lambda = 0.93$ ,  $F(2, 423) = 15.07$ ,  $P < 0.001$ ,  $\eta^2 = 0.07$ , respectively. The follow-up univariate tests indicated that KHPR majors viewed normal weight as being more important for physical ( $P < 0.05$ ,  $\eta^2 = 0.02$ ) and mental health ( $P < 0.05$ ,  $\eta^2 = 0.01$ ) than those in other majors (see [Table 1](#)). Participants who endorsed fat



**Figure 1** Fat stereotypes discrepancy scores.

**Table 1 Preprofessionals beliefs about normal weight, roles of professions, college education competencies, and structure of physical education classes related to obesity (means, s.d.)**

Items	Majors				Fat stereotypes				MANCOVA
	KHPR (n = 212)		Others (n = 218)		Endorse (n = 360)		Do not endorse (n = 70)		Between subjects effects
	M	s.d.	M	s.d.	M	s.d.	M	s.d.	Source
Normal weight is important to physical health <sup>a</sup>	5.69	1.50	5.27	1.69	5.60	1.53	4.83	1.83	Major* FS**
Normal weight is important to mental health <sup>a</sup>	5.57	1.45	5.34	1.59	5.63	1.44	4.57	1.66	Major* FS**
Roles of professionals <sup>b</sup>									
PE teacher	6.22	1.11	5.98	1.31	6.24	1.04	5.39	1.72	Major × FS* Major* FS**
School nurse	5.27	1.42	5.19	1.59	5.34	1.43	4.66	1.79	FS**
School counselor	5.24	1.34	5.11	1.45	5.30	1.32	4.53	1.58	FS**
School teacher	4.80	1.50	4.65	1.61	4.79	1.53	4.37	1.66	FS*
Sport coach	6.17	1.08	5.99	1.34	6.21	1.05	5.40	1.73	Major* FS**
Structure of PE classes <sup>a</sup>									
PE teachers should be role models by ... maintaining normal weight	5.67	1.30	5.41	1.52	5.67	1.38	4.89	1.49	FS**
PE classes specifically for overweight children should be available in every school	4.73	1.76	4.72	1.74	4.79	1.78	4.37	1.57	
PE teachers should educate parents about childhood obesity	5.72	1.38	5.56	1.40	5.75	1.32	5.09	1.61	FS**
Most PE classes are not designed to provide lifelong habits of exercise patterns, which would assist in weight control	5.04	1.60	4.88	1.47	5.12	1.46	4.14	1.66	FS**
PE classes with a focus on teaching lifelong fitness should be provided to children	5.80	1.30	5.51	1.38	5.79	1.26	4.94	1.52	FS**
Competencies <sup>a</sup>									
Competent in prescribing exercise programs for weight loss in children	4.72	1.52	4.43	1.52	4.62	1.55	4.34	1.33	ns
Education has not prepared me to design nutritional plans to help obese children reduce their weight	3.60	1.65	4.04	1.60	3.89	1.66	3.46	1.48	ns
Competent in providing education and training on childhood obesity to other school professional	4.62	1.46	4.08	1.54	4.34	1.54	4.40	1.43	ns
Education has not prepared me to deal with childhood obesity	3.54	1.68	3.96	1.68	3.81	1.71	3.47	1.60	ns
Education has not prepared me to design exercise programs to help obese children reduce their weight	3.49	1.70	3.89	1.69	3.71	1.73	3.60	1.58	ns

<sup>a</sup>Rating scale ranges from 1 (strongly disagree) to 7 (strongly agree). <sup>b</sup>Rating scale ranges from 1 (no role) to 7 (major role).

FS, fat stereotype; KHPR, kinesiology, health promotion, and recreation; MANCOVA, multivariate analysis of covariance; ns, not significant. \* $P < 0.05$ , \*\* $P < 0.001$ .

stereotypes (i.e., rated fat children more negatively than thin children on personal and physical attributes on the M-FSQ), in comparison to those who did not, also rated being normal weight as more important for physical ( $P < 0.001$ ,  $\eta^2 = 0.03$ ) and mental health ( $P < 0.001$ ,  $\eta^2 = 0.06$ ; see [Table 1](#)).

### Professionals Roles in Treating Obesity

Most participants agreed or strongly agreed that physical education teachers (89.5%), school nurses (71.6%), school counselors (68.1%), classroom teachers (56.7%), and sport coaches (89.1%) should be involved in treating childhood obesity.

Results of a 2 (major)  $\times$  2 (fat stereotype) MANCOVA, with BMI and gender as covariates, related to school professionals' roles in treating obesity indicated a significant interaction between major and fat stereotypes, Wilks'  $\lambda = 0.97$ ,  $F(5, 420) = 2.48$ ,  $P < 0.05$ ,  $\eta^2 = 0.03$ . The follow-up univariate ANOVAs revealed an interaction effect, with those in non-KHPR majors who did not endorse fat stereotypes ( $M = 4.95$ , *s.d.* = 1.73) having a weaker belief that PE teachers should play a major role in treating obesity than the others groups (KHPR who did not endorse fat stereotypes,  $M = 5.88$ , *s.d.* = 1.60; KHPR who endorsed fat stereotypes,  $M = 6.28$ , *s.d.* = 0.98; and other majors who endorsed fat stereotypes,  $M = 6.19$ , *s.d.* = 1.10) ( $P < 0.05$ ,  $\eta^2 = 0.016$ ). In addition, the MANCOVA revealed multivariate main effects for both major and fat stereotypes groups, Wilks'  $\lambda = 0.97$ ,  $F(5, 420) = 2.46$ ,  $P < 0.05$ ,  $\eta^2 = 0.03$  and Wilks'  $\lambda = 0.92$ ,  $F(5, 420) = 75.57$ ,  $P < 0.001$ ,  $\eta^2 = 0.08$ , respectively. The follow-up univariate tests indicated that KHPR majors believed that PE teachers ( $P < 0.05$ ,  $\eta^2 = 0.02$ ) and coaches ( $P < 0.05$ ,  $\eta^2 = 0.01$ ) should play more of a role in treating obesity than the non-KHPR majors (see [Table 1](#)). Those who endorsed fat stereotypes, compared to those who did not, also were more likely to believe that all of the school professionals (PE teachers,  $P < 0.001$ ,  $\eta^2 = 0.07$ ; school nurses,  $P < 0.001$ ,  $\eta^2 = 0.03$ ; school counselors,  $P < 0.001$ ,  $\eta^2 = 0.04$ ; classroom teachers,  $P < 0.05$ ,  $\eta^2 = 0.01$ ; and sport coaches,  $P < 0.001$ ,  $\eta^2 = 0.06$ ) should be involved in treating childhood obesity (see [Table 1](#)).

#### Roles and responsibilities of physical education teachers

A 2 (major)  $\times$  2 (fat stereotype) MANCOVA, with BMI and gender as covariates, was conducted for perceptions about the roles and responsibilities of PE teachers. The results revealed a multivariate main effect for the fat stereotype groups, Wilks'  $\lambda = 0.92$ ,  $F(5, 416) = 7.48$ ,  $P < 0.001$ ,  $\eta^2 = 0.08$ . The follow-up univariate tests indicated that those who endorsed fat stereotypes believed more strongly than those who did not endorse fat stereotypes that physical educators should be role models by maintaining their normal weight ( $P < 0.001$ ,  $\eta^2 = 0.04$ ), physical educators should educate parents on childhood obesity ( $P < 0.001$ ,  $\eta^2 = 0.03$ ), PE classes are *not* designed to promote lifelong physical activity ( $P < 0.001$ ,  $\eta^2 = 0.05$ ), and that PE classes with a focus on lifelong fitness *should* be provided to children ( $P < 0.001$ ,  $\eta^2 = 0.05$ ; see [Table 1](#)).

#### Educational and training competencies

Results of a 2 (major)  $\times$  2 (fat stereotype) MANCOVA, with BMI and gender as covariates, for educational and training competencies in developing exercise, weight loss, nutritional, and psychological programs for overweight youth revealed no significant interactions or main effects for major and fat stereotype groups (see [Table 1](#)). Across groups, participants had similar beliefs about the adequacy of educational and training experiences for helping children who are overweight or obese.

#### DISCUSSION

Given growing concerns regarding the prevalence of overweight children, health professionals have called for increased

physical activity as a strategy to help children lose weight and maintain a healthy weight. Physical education is an educational environment in which students of all body shapes and sizes should be able to participate in and enjoy physical activity, yet, research indicates that overweight children are likely to face weight bias and social stigma in physical activity settings (6,9,10). In this study, we examined the fat stereotyped beliefs of undergraduate students in physical education-related majors, in comparison to other majors. Subsequently, issues regarding group differences by major, as well as by endorsement of fat stereotypes, were examined regarding perceptions of the role of schools, school personnel, and physical education in dealing with childhood obesity and students' perceptions of their competencies in developing exercise, weight loss, nutritional, and educational programs for overweight youth.

In line with previous research (14,15), commonly held beliefs about overweight children were endorsed. In fact, 83% of our total sample had M-FSQ scores indicating that they endorsed fat stereotypes. Overweight children, in comparison to thin children, were thought to be less socially adept; whereas thin children, in comparison to overweight children, were thought to be healthier, more socially competent, and better looking. These kinds of beliefs can be problematic because previous research has suggested that teachers' expectations can influence the quantity and quality of feedback and instruction, which can subsequently influence students' performance, motivation, and enjoyment (17). Thus, having beliefs that overweight children are lazy and unhealthy may lead to having lower expectations, providing less frequent feedback, and lower quality instruction to children perceived to be overweight. Indeed, Greenleaf and Weiller (14) found that physical education teachers had lower expectations for overweight children's cognitive, social, and physical abilities than for normal weight children. Additional research is needed to determine the extent to which weight bias actually leads to differential teacher behaviors.

More than 70% of all participants agreed or strongly agreed that being normal weight is important for the physical and mental health of children, which is fairly consistent with Greenleaf and Weiller's (14) findings with physical education teachers. KHPR majors rated the importance of being normal weight more strongly than nonmajors; participants who endorsed fat stereotypes also rated being normal weight as more important to children's health than those who did not endorse fat stereotypes. The group difference by major is not surprising given that KHPR majors are typically exposed to content and material that focuses on associations between overweight and increased physical health risks and decreased mental health. In terms of the difference by fat stereotype group, individuals who viewed overweight children as less healthy, more lazy, and likely to eat a lot believed that such characteristics are detrimental to overall health. While there is evidence to support the notion of reduced health among overweight children (1), it is ill-advised to encourage fat stereotyping of children (2).

In terms of school personnel that might work with overweight children, >89% of all participants agreed or strongly agreed that physical education teachers and sport coaches

should play a major role. One interesting result was that sport coaches were rated similarly to physical education teachers. It is possible that participants viewed little difference between being a physical education teacher and being a coach; however, to our knowledge no other research has examined the idea of sport coaches as having a responsibility in treating childhood obesity. Additional research exploring whether coaches view addressing issues of obesity as part of their job and ways in which coaches might be able to effectively intervene with overweight children seems worthwhile. KHPR majors reported that physical education teachers and sport coaches should play a larger role in working with overweight youth compared to nonmajors. Physical educators, at least from the perspective of the college students in our study, have as part of their role a responsibility to work with overweight children to promote achieving a healthy weight. This also is in line with Greenleaf and Weiller's (14) findings with physical education teachers. It is encouraging that the college students who are majoring in KHPR-related areas indeed see that as part of the job.

Those who endorsed fat stereotypes, compared to those who did not, felt more strongly that all school personnel should play major roles in working with overweight children and that physical educators should role model normal weight and educate parents, and that physical education classes should be designed to promote lifelong physical activity. The challenge in interpreting and applying these results comes in terms of wanting to educate future physical educators and other health professionals about important relationships between body weight and physical and mental health, while at the same time not promoting negative stereotypes of overweight children. We want physical educators, and future physical educators, to be actively involved in working with overweight children to promote healthy lifestyle behaviors and communicating with parents regarding the health and fitness of their children. Future research is needed to determine the extent to which current KHPR curricula emphasizing physical fitness socialize students to have negative perceptions of children who are overweight. In addition, the lack of systematic education regarding fat stereotypes and weight bias within KHPR curricula needs to be examined and addressed in order to provide more adequate training so that preprofessionals can be more efficacious in their work with overweight and obese youth.

A surprising result of this study was the lack of group differences (particularly between KHPR majors and nonmajors) in perceptions of being competent and trained to work with overweight children. This result identifies a potential weakness in KHPR curricula, which typically emphasize training pre-professional physical educators for teaching physical skills and dealing with discipline, management and safety issues that are not specific to obesity. Subsequently, KHPR majors may not be receiving sufficient training, especially in regards to effectively designing and implementing physical activity, weight loss, nutritional, and educational interventions with overweight youth. Our results indicated that the KHPR majors felt no more competent to work with overweight children in these areas than students in non-KHPR majors. Accordingly, KHPR

students might benefit from added education specifically aimed at designing physical activities for overweight children. Beyond simply providing training and education so that future physical educators and health professionals feel competent in helping overweight children, it is logical that training curricula at the university level should address how to identify and deal with psychosocial aspects of weight, such as weight-based teasing and social stigma of overweight children.

As with all studies, there are a number of limitations that must be recognized when interpreting and taking meaning away from the results of this study. The descriptive nature of this project is one limitation; that is, because of the nature of the project design, we are unable to make any conclusions with regard to the underlying causes of the group differences. However, because this project is exploratory in nature and because of the lack of research in this area, a descriptive approach seemed a logical first step to gather more information about college students' beliefs, attitudes, and perceptions. Another limitation related to the study design is the reliance on self-report data which can be subject to socially desirable responding. Steps were taken to minimize the likelihood of social desirability, including instructing participants to answer honestly, informing participants that there were no right or wrong answers and assuring participants that their identities would not be connected to their responses on the survey items. Finally, while the measurement instruments used in this project have been used in previous research, additional psychometric testing is needed to provide further evidence of reliability and validity. In particular, previous research has shown only moderate levels of test-retest reliability of the M-FSQ and the Perceptions of Physical Education Questionnaire. Because it is socially acceptable to refrain from expressing stereotyped opinions, the questionnaires may be unable to discriminate between deep attitudinal change and any tendency to report 'politically correct' attitudes. The test-retest reliability of stereotyped opinions may be influenced by information received or discussed after completing the instrument the first time and before the second administration. In addition, some individuals may think that they need to improve their responses, faking good. We acknowledge that future research in this area will need to build and improve upon descriptive designs and self-report data and survey instruments.

In looking to the future of physical education- and other health-related professions, assessing preprofessional's beliefs and attitudes toward overweight children is important because the university training context (i.e., college) may be an environment in which to effectively implement educational interventions. Puhl *et al.* (22) have suggested that educational settings are important environments for weight bias interventions; yet because intervention research is limited, there is little knowledge about how to intervene effectively. Interventions aimed at reducing weight bias among future physical education and health professionals may be particularly useful, as they are the individuals who will be on the "front lines" of the "war on obesity" (23,24). School environments, and particularly physical education classes, should be free from weight bias and training future

physical educators to create positive psychosocial and physical environments that promote size friendliness where children of all shapes and sizes can be active and enjoy activity is key.

#### DISCLOSURE

The authors declared no conflict of interest.

© 2008 The Obesity Society

#### REFERENCES

- Deckelbaum JR, Williams CL. Childhood obesity: the health issue. *Obes Res* 2001;9:239S–243S.
- Puhl RM, Latner JD. Stigma, obesity, and the health of the nation's children. *Psychol Bull* 2007;133:557–580.
- Davison KK, Birch LL. Processes linking weight status and self-concept among girls from ages 5 to 7 years. *Dev Psychol* 2002;38:735–748.
- Eisenberg ME, Neumark-Sztainer D, Haines J, Wall M. Weight-teasing and emotional well-being in adolescents: longitudinal findings from Project EAT. *J Adolesc Health* 2006;38:675–683.
- Eisenberg ME, Neumark-Sztainer D, Story M. Associations of weight-based teasing and emotional well-being among adolescents. *Arch Pediatr Adolesc Med* 2003;157:733–738.
- Storch EA, Milsom VA, DeBraganza N, Lewin AB, Geffken GR, Silverstein JH. Peer victimization, psychosocial adjustment, and physical activity in overweight and at-risk-for-overweight youth. *J Pediatr Psychol* 2007;32:80–89.
- Fox KR, Edmunds LD. Understanding the world of the “fat kid”: Can schools help provide a better experience? *Reclaim Child Youth* 2000;9:177–181.
- Bauer KW, Yang YW, Austin SB. “How can we stay healthy when you're throwing all of this in from of us?” Findings from focus groups and interviews in middle schools on environmental influences on nutrition and physical activity. *Health Educ Behav* 2004;31:34–46.
- Faith MS, Leone MA, Ayers TS, Heo M, Pietrobelli, A. Weight criticism during physical activity, coping skills, and reported physical activity in children. *Pediatrics* 2002;110:e23.
- Zabinski MF, Saelens BE, Stein RI, Hayden-Wade HA, Wilfley DE. Overweight children's barriers to and support for physical activity. *Obes Res* 2003;11:238–246.
- Trost SG, Kerr LM, Ward DS, Pate RR. Physical activity and determinants of physical activity in obese and non-obese children. *Int J Obes* 2001;25:822–829.
- Cawley J, Meyerhoefer C, Newhouse D. The impact of state physical education requirements on youth physical activity and overweight. *Health Econ* 2007;16:1287–1301.
- National Alliance for Sport and Physical Education. *Moving into the Future: National Standards for Physical Education*. McGraw-Hill: New York, NY, 2004.
- Greenleaf C, Weiller K. Perceptions of youth obesity among physical educators. *Social Psychol of Educ* 2005;8:407–423.
- Savage MP. Perceptions of childhood obesity of undergraduate students in physical education. *Psychol Rep* 1995;76:1251–1259.
- O'Brien KS, Hunter JA, Banks M. Implicit anti-fat bias in physical educators: Physical attributes, ideology and socialization. *Int J Obes* 2007;31:308–314.
- Martinek T. *Psycho-social Dynamics of Teaching Physical Education*. Brown & Benchmark Publishers: Dubuque, IA, 1997.
- Greenleaf C, Chambliss H, Rhea D, Martin S, Morrow J. Weight stereotypes and behavioral intentions toward thin and fat peers among White and Hispanic adolescents. *J Adolesc Health* 2006;39:546–552.
- Davison KK, Birch LL. Predictors of fat stereotypes among 9-year-old girls and their parents. *Obes Res* 2004;12:86–94.
- Price JH, Desmond SM, Ruppert ES. Elementary physical education teachers' perceptions of childhood obesity. *Health Educ* 1990;21:26–32.
- SPSS. SPSS 14.0. SPSS Inc: Chicago, IL, 2005.
- Puhl RM, Schwartz MB, Brownell KD. Impact of perceived consensus on stereotypes about obese people: A new approach for reducing bias. *Health Psychol* 2005;24:517–525.
- Brownell KD, Puhl RM. Stigma and discrimination in weight management and obesity. *Permanente J* 2003;7:21–23.
- Devlin MJ, Yanovski SZ, Wilson GT. Obesity: what mental health professionals need to know. *Am J Psychiatry* 2000;157:854–866.