The Physical Educator Vol. 76 • pp. 467–484 • 2019
https://doi.org/10.18666/TPE-2019-V76-I2-8766

PEDAGOGY

Physical Education Class and Body Image Perception: Are They Related?

Andrea K. Kennedy, Virginia Ramseyer Winter, Megan M. Corbin

Abstract

In this study, we examine if school physical education (PE) policy initiatives are related to body image among adolescents. Problems with body image often peak during adolescence, and it is important that there are ways of improving body image among youth. This cross-sectional study used data from the Health Behavior in School-Aged Children 2001–2002 survey and examined the relationship between PE (requiring PE, number of days spent in PE, and number of minutes spent exercising in PE) and both perceived body size and perceived attractiveness. Regression analyses were conducted with the three PE variables predicting perceived body size and perceived attractiveness. Among boys, requiring PE and the number of minutes spent exercising in PE were negatively related to body size perception. Among girls, number of days in PE and number of minutes spent exercising were negatively related to body size perception. The number of days spent in PE and the number of minutes spent exercising in PE were positively related to perceived attractiveness among boys, while requiring PE was negatively associated with perceived attractiveness among girls. Based on the results of this study, PE may be an important and cost-effective way of reducing negative body image among adolescents, although

Andrea K. Kennedy is a postdoctoral scholar, Suzanne Dworak-Peck School of Social Work, University of Southern California. Virginia Ramseyer Winter is an assistant professor, School of Social Work, and founding director, Center for Body Image Research & Policy, University of Missouri. Megan M. Corbin is MO-CPAP Central Region project director, Missouri Child Psychiatry Access Project, University of Missouri, School of Medicine. Please send author correspondence to andrea.kennedy@usc.edu

special consideration may be needed for reducing negative perceived attractiveness among girls. Therefore, school policy implications are discussed. Expanding school programs that promote physical activity, such as PE class, may be a great way of improving body image for a large number of students.

Adolescence is a critical period of physical and emotional development, and problems surrounding body image often peak during this time (Littleton & Ollendick, 2003). The repercussions of negative body image, which include perceived attractiveness and perceived body size as distinct constructs (Flament et al., 2012; Wiederman & Hurst, 1998), are far reaching. Negative body image is associated with depression and low self-esteem (Paxton, Neumark-Sztainer, Hannan, & Eisenberg, 2006), steroid use (Kanayama, Barry, Hudson, & Pope, 2006), suicide ideation (Brausch & Muehlenkamp, 2007), excessive dieting (Nowak, 1998), disordered eating (Neumark-Sztainer et al., 2006; Stice & Shaw, 2002), physical health (Ramseyer Winter, O'Neill, & Omary, 2017), and sexual health (Ramseyer Winter, 2016). Eating disorders in particular take a tremendous psychological and physical toll (Klump, Bulik, Kaye, Treasure, & Tyson, 2009) on adolescents and are difficult to treat (Cooper, 2011). Therefore, it is crucial that researchers determine factors associated with negative body image and, in particular, discover positive methods of improving body image among adolescents.

School is the ideal setting for reaching adolescents for physical (Foster et al., 2008) and mental (Ruini et al., 2009) health intervention and prevention efforts. Using or refining existing programs, such as physical education (PE) classes, may be a low-cost way of reaching a large amount of youth. PE classes encourage and provide a space for physical activity within schools. In adolescence, physical activity can lessen anxiety and depression (Ströhle, 2009), both of which are related to body image (Kostanski & Gullone, 1998). However, the relationship between physical activity and body image is uncertain (Sallis, Prochaska, & Taylor, 2000), and the direct relationship between school PE classes and body image components, such as perceived body size and perceived attractiveness, is unknown.

This study wants to determine if school PE policy initiatives are related to body image. Specifically, we want to know if requiring PE, the number of days youth spend in PE, and the number of minutes adolescents spend exercising in PE are related to perceived body size and perceived attractiveness. We hypothesized that all three PE factors would be related to better body image for boys and girls.

Method

We tested our hypotheses using Health Behavior in School-Aged Children, 2001–2002 (U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, 2008), a cross-national representative study of 11, 13, and 15 year olds. The approximately 45-min survey was administered in schools across the United States. Of the 465 schools selected to participate, 340 agreed to do so, representing a 73.2% participation rate. The survey used a three-stage stratified design: the school district (Phase 1), the school (Phase 2), and the classroom (Phase 3). Additionally, the study oversampled Hispanic and Black youth, and the student response rate was 81.9%. Surveys were also completed by an administrator (N = 329) and the lead health education teacher (N = 320) from the participating schools.

Participants

Participants included a nationally representative sample of sixth to 10th graders in the United States (N = 14,732). Just over half of the sample were female (n = 7,729; 52.2%), and the mean age was 13.31 years (SD = 1.56). Twenty percent of the sample identified as Hispanic or Latino (n = 2,889). With regard to race, 62.6% of the sample identified as White (n = 8,271), 23.1% as Black or African American (n = 3,051), 4.3% as Asian (n = 572), 4.0% as American Indian or Alaska Native (n = 531), 1.2% as Native Hawaiian or Other Pacific Islander (n = 157), and 4.8% as two or more races (n = 639). The majority of participants reported being born in the United States (n = 13,646; 92.6%), 42.5% reported currently living in an urban area (n = 6,140), 28.6% reported living in a suburban area (n = 4,127), and 28.9% reported living in a rural area (n = 4,165). For a list of participant demographics by gender, see Table 1.

Table 1
Participant Characteristics

Characteristic	Girls		Boys	
Grade in school (*n*, %)				
6th grade	1,506	22.6	1,462	24.0
7th grade	1,290	19.4	1,167	19.1
8th grade	1,273	19.1	1,148	18.8
9th grade	1,285	19.3	1,206	19.8
10th grade	1,308	19.6	1,112	18.2
Race (*n*, %)				
White	3,892	64.4	3,595	65.6
American Indian/Alaska Native	177	2.9	240	4.4
Asian	253	4.2	243	4.4
Black/African American	1,370	22.7	1,074	19.6
Native Hawaiian or Other Pacific Islander	56	0.9	75	1.4
2 or more races	299	4.9	253	4.6
Hispanic/Latino	1,212	18.5	1,115	18.7
Urbanicity (*n*, %)				
Urban area (city)	3,356	44.6	2,784	40.3
Suburban area (near a large city)	2,022	26.9	2,105	30.5
Rural area (not near a large city)	2,144	28.5	2,021	29.2
Country born in (*n*, %)				
United States	7,137	92.8	6,509	92.4
Other	553	7.2	533	7.6
Continuous Variables (*M*, *SD*)				
Age	13.26	1.55	13.35	1.58
BMI	20.77	4.31	21.24	4.36

Instruments

Perceived body size. Perceived body size was measured in the student survey with one item: "Do you think your body is…?" Response options included *much too thin* (0), *a bit too thin* (1), *about the right size* (2), *a bit too fat* (3), and *much too fat* (4). Thus, a larger score indicates a larger perceived body size.

Perceived attractiveness. Perceived attractiveness was measured in the student survey with one item: "Do you think you are…?" Response options included *not at all good looking* (0), *not very good looking* (1), *about average* (2), *quite good looking* (3), and *very good looking* (4). The variable was reverse coded so that a higher score indicates better perceived attractiveness.

Physical education required. One item, completed by an administrator at each participating school, measured whether PE was required by the school: "Is physical education required for students in Grades 6 through 10 in this school?" Response options included yes, no, and I don't know. The variable was recoded to no (0) and yes (1). Those who reported not knowing (n = 23) were excluded from analyses with this variable.

Number of days in physical education. Students completed the following item regarding the number of days they spent in PE each week: "In an average week when you are in school, on how many days do you go to physical education classes?" Response options included: 0 days, 1 day, 2 days, 3 days, 4 days, 5 days, and at least 1 day. Those who reported at least 1 day (n = 391, 2.8%) were excluded from analyses with this variable.

Amount of time exercising in each physical education class. This variable, completed by students, was measured with the item, "During an average physical education class, how many minutes do you spend actually exercising or playing sports?" Response options included I do not take PE, less than 10 minutes, 10–20 minutes, 21–30 minutes, more than 30 minutes, and unknown number of minutes.

Sex. Biological sex was completed by students and measured with one item: "Are you a boy or a girl?" Response options included boy and girl.

Covariates. Body size was measured by computing body mass index (BMI) from self-reported weight and height. Age at the time of the survey was calculated from reported month and year of birth.

Data Analysis

After conducting descriptives (see Table 2) and meeting necessary assumptions, we performed a series of linear regressions to test our hypotheses. We conducted analyses using IBM SPSS 23.

Additionally, we utilized a weight in all analyses, which adjusted the data for school and student nonresponse. The weight also adjusted data so race/grade category matched national data.

Table 2
Study Indicator Descriptives

	Girls		Boys	
Characteristic	***n***	***%***	***n***	***%***
Perceived body size				
Much too thin	129	1.9	140	2.3
A bit too thin	576	8.7	803	13.3
About the right size	3,483	52.5	3,516	58.3
A bit too fat	2,096	31.6	1,410	23.4
Much too fat	344	5.2	158	2.6
Perceived attractiveness				
Not at all good looking	186	2.8	156	2.6
Not very good looking	491	7.4	366	6.1
About average	2,837	43.0	2,580	43.1
Quite good looking	1,746	26.5	1,382	23.1
Very good looking	1,337	20.3	1,498	25.0
PE required				
No	727	10.0	639	9.6
Yes	6,549	90.0	6,009	90.4
Average number of days/week in PE				
0 days	1,652	22.4	1,220	18.4
1 day	481	6.5	421	6.4
2 days	849	11.5	853	12.9
3 days	966	13.1	920	13.9
4 days	336	4.6	250	3.8
5 days	2,921	39.6	2,745	41.4
At least 1 day	172	2.3	219	3.3
Number of minutes exercising in average PE class				
I do not take PE	1,643	22.3	1,202	18.2
Less than 10 minutes	309	4.2	286	4.3
10–20 minutes	820	11.1	631	9.6
21–30 minutes	1288	17.5	985	14.9
More than 30 minutes	3226	43.7	3395	51.5
Unknown number of minutes	88	1.2	99	1.5

Results

Physical Education Required

Required PE was regressed on perceived body size, BMI, and age for boys and girls separately. The regression model was significant for boys, $R^2 = .15$, $F(3, 5640) = 326.14$, $p < .001$, and girls, $R^2 = .15$, $F(3, 6234) = 370.75$, $p < .001$, accounting for 15% of the variance in perceived body size among boys and girls. However, requiring PE was significantly inversely related to perceived body size among boys, b = -0.11, $t(5640) = -2.20$, $p < .05$, 95% CI = [-0.21, -0.01], β = -.03, but not girls, b = 0.08, $t(6234) = 1.50$, $p = .13$, 95% CI = [-0.03, 0.19], β = .02. Requiring PE was related to a smaller body size perception for boys.

Required PE was regressed on perceived attractiveness, BMI, and age for boys and girls separately. The regression model was significant for boys, $R^2 = .03$, $F(3, 5593) = 51.92$, $p < .001$, and girls, $R^2 = .03$, $F(3, 6202) = 64.22$, $p < .001$, accounting for 3% of the variance in perceived attractiveness for boys and girls. Required PE was not significantly related to perceived attractiveness among boys, b = 0.01, $t(5593) = 0.25$, $p = .80$, 95% CI = [-0.07, 0.09], β = .003. Requiring PE was significantly inversely related to perceived attractiveness for girls, b = -0.08, $t(6202) = -2.11$, $p < .05$, 95% CI = [-0.15, 0.01], β = -.03, with required PE related to a worse perception of attractiveness.

Number of Days in Physical Education

The average number of days in PE each week was regressed on perceived body size, BMI, and age for boys and girls separately. The regression model was significant for boys, $R^2 = .16$, $F(3, 5525) = 338.18$, $p < .001$, and girls, $R^2 = .16$, $F(3, 6271) = 383.96$, $p < .001$. The regression model accounted for 16% of the variance in perceived body size among boys and girls. The average number of days in PE each week was not significantly related to perceived body size for boys, b = -0.01, $t(5525) = -1.13$, $p = .26$, 95% CI = [-0.03, 0.01], β = -.01. For girls, the average number of days in PE each week was significantly related to perceived body size, b = -0.02, $t(6271) = -2.60$, $p < .01$, 95% CI = [-0.04, 0.00], β = -.01, with more days in PE associated with smaller body size perception.

Next, we regressed the average number of days in PE on perceived attractiveness, BMI, and age. The model was significant for boys, $R^2 = .03$, $F(3, 5488) = 59.53$, $p < .001$, and girls, $R^2 = .03$, $F(3, 6237) = 63.50$, $p < .001$, and accounted for approximately 3% of the variance in perceived attractiveness for boys and girls. The average number of days in PE class was positively associated with perceived attractiveness for boys, b = 0.02, $t(5488) = 2.43$, $p < .05$, 95% CI = [0.00, 0.03], β = .03, but not significantly associated for girls, b = -0.003, $t(6237) = -0.47$, $p = .64$, 95% CI = [-0.01, 0.01], β = -.01.

Amount of Time Exercising in Each Physical Education Class

The number of minutes exercising in the average PE class was regressed on perceived body size, BMI, and age. The regression model was significant for boys, $R^2 = .15$, $F(3, 5672) = 337.45$, $p < .001$, and girls, $R^2 = .16$, $F(3, 6402) = 397.18$, $p < .001$, accounting for 15% of the variance in body size perception among boys and 16% of the variance among girls. Among boys, the number of minutes exercising in the average PE class was significantly inversely related to body size perception, b = -0.03, $t(5672) = -2.62$, $p < .01$, 95% CI = [-0.05, -0.01], β = -.03, with more minutes related to a smaller body size perception. Among girls, the number of minutes exercising in the average PE class was also inversely associated with perceived body size, b = -0.04, $t(6402) = -3.35$, $p < .01$, 95% CI = [-0.06, -0.02], β = -.04.

The number of minutes exercising in the average PE class was regressed on perceived attractiveness, BMI, and age. The regression model was significant for boys, $R^2 = .03$, $F(3, 5632) = 64.21$, $p < .001$, and girls, $R^2 = .03$, $F(3, 6370) = 63.34$, $p < .001$. The number of minutes exercising in the average PE class was significantly associated with perceived attractiveness for boys, b = 0.03, $t(5632) = 4.12$, $p < .001$; 95% CI = [0.02, 0.05], β = .06, but was not for girls, b = 0.01, $t(6370) = 1.21$, $p = .23$, 95% CI = [-0.01, 0.02], β = .02. More minutes exercising was related to better perception of attractiveness for boys. Refer to Tables 3 and 4 and for regression statistics for boys and girls, respectively.

Table 3
Regression Statistics for Boys

	Perceived body size				Perceived attractiveness			
Variable	**b (*SE*)**	**95% CI (b)**		**β**	**b (*SE*)**	**95% CI (b)**		**β**
Constant	-0.73 (.16)	-1.04	-0.41		3.69 (.12)	3.45	3.93	
Independent Variable								
PE Required	-0.11 (.05)*	-0.21	-0.01	-0.03	0.01 (.04)	-0.07	0.09	< 0.00
Covariates								
BMI	0.13 (< .00)***	0.12	0.14	0.40	-0.03 (.00)***	-0.04	-0.03	-0.14
Age	-0.06 (.01)***	-0.08	-0.04	-0.07	-0.03 (.01)***	-0.05	-0.02	-0.06
Constant	-0.92 (.16)	-1.23	-0.61		3.72 (.12)	3.49	3.95	
Independent Variable								
Avg. # days in PE	-0.01 (< .00)	-0.03	0.01	-0.01	0.02 (.01)*	0.00	0.03	0.03
Covariates								
BMI	0.13 (< .00)***	0.13	0.14	0.41	-0.03 (.00)***	-0.04	-0.03	-0.15
Age	-0.06 (.01)***	-0.08	-0.04	-0.07	-0.04 (.01)***	-0.05	-0.02	-0.06
Constant	-0.73 (.17)	-1.06	-0.40		3.54 (.13)	3.29	3.79	
Independent Variable								
# of min/avg. PE class	-0.03 (0.01)**	-0.05	-0.01	-0.03	0.03 (.01)***	0.02	0.05	0.06
Covariates								
BMI	0.13 (< 0.00)***	0.12	0.14	0.40	-0.03 (< .00)***	-0.04	-0.03	-0.15
Age	-0.06 (.01)***	-0.08	-0.04	-0.07	-0.03 (.01)**	-0.05	-0.01	-0.05

*$p < .05$. ** $p < .01$. *** $p < .001$.

Table 4
Regression Statistics for Girls

	Perceived body size				Perceived attractiveness			
Variable	**b (*SE*)**	**95% CI (b)**		**β**	**b (*SE*)**	**95% CI (b)**		**β**
Constant	-1.72 (.17)	-2.06	-1.39		3.87 (.12)	3.63	4.10	
Independent Variable								
PE Required	0.08 (.05)	-0.03	0.19	0.02	-0.08 (.04)*	-0.15	-0.01	-0.03
Covariates								
BMI	0.14 (< .00)***	0.13	0.15	0.39	-0.03 (< .00)***	-0.04	-0.03	-0.14
Age	0.01 (.01)	-0.01	0.04	0.01	-0.05 (.01)***	-0.07	-0.03	-0.08
Constant	-1.50 (.17)	-1.83	-1.18		3.78 (.12)	3.56	4.01	
Independent Variable								
Avg. # days in PE	-0.02 (.01)**	-0.04	-0.01	-0.03	-0.00 (.01)	-0.01	0.01	-0.01
Covariates								
BMI	0.14 (< .00)***	0.13	0.15	0.39	-0.03 (< .00)***	-0.04	-0.03	-0.14
Age	< 0.00 (.01)	-0.02	0.03	> 0.00	-0.05 (.01)***	-0.06	-0.03	-0.08
Constant	-1.35 (.18)	-1.70	-1.00		3.69 (.12)	3.45	3.94	
Independent Variable								
# of min/avg. PE class	-0.04 (.01)**	-0.06	-0.02	-0.04	0.01 (.01)	-0.01	0.02	0.02
Covariates								
BMI	0.14 (< .00)***	0.013	0.15	0.39	-0.03 (< .00)***	-0.04	-0.03	-0.13
Age	< -0.00 (.01)	-0.03	0.02	< -0.00	-0.05 (.01)***	-0.06	-0.03	-0.07

*$p < .05$. ** $p < .01$. *** $p < .001$.

Discussion

This study seeks to understand the relationship between PE programs in schools and body image perception for adolescents, specifically dimensions of perceived attractiveness and perceived body size. Understanding the relationship between PE and perceived body image can help schools utilize or improve PE classes to improve body image for adolescents. This is important because positive body image is linked to beneficial physical (Ramseyer Winter et al., 2017), mental (Gillen, 2015), and sexual (Ramseyer Winter, 2016) health outcomes.

In general, the PE variables were related to decreased body size perception among girls and boys. Required PE among boys, number of days spent in PE among girls, and number of minutes exercising among boys and girls were associated with viewing oneself as thinner. Requiring PE class does not account for the quality of physical activity during PE. It appears that for girls, increased physical activity (more days spent in PE and more minutes being physically active, rather than just requiring PE) decreases body size perception. This may be an accurate perception, as increases in physical activity are related to decreased weight gain (Must & Tybor, 2005), although we do not know if youth in this study were meeting the recommended amount of moderate to vigorous physical activity each day. Current recommendations are for youth to have at least 60 min of physical activity per day (U.S. Department of Health and Human Services, 2008). The majority of youth in this study selected the category "more than 30 minutes" when asked how many minutes they exercised in PE, but that is as much detail as the survey provided.

For boys, although days spent in PE was not associated with a decrease in body size perception, required PE and increased minutes exercising in PE were related to a decrease in body size perception. However, smaller body perception may not be interpreted as positive body image for boys, since being smaller is less likely to meet societal standards of attractiveness for men (Olivardia, Pope, Borowiecki, & Cohane, 2004). Boys who perceive themselves as smaller may simply feel like they are exercising for a longer time in PE, because of social anxiety surrounding having to exercise in front of others (Akehurst & Thatcher, 2010).

PE had a different effect on boys' and girls' perceptions of attractiveness, with PE related to an increase in boys' perceived attractiveness and a decrease in girls' perceived attractiveness. Two factors (number of minutes exercising in PE and number of days of PE) were positively related to boys' perceived attractiveness. Increased physical activity, in terms of days or minutes, among boys was related to how physically attractive they viewed themselves. Self-concept, including physical appearance perception, has been linked to physical activity in adolescents (Strong et al., 2005), and this may explain this finding. Physical activity increases endorphins and raises the mood of adolescents (Paluska & Schwenk, 2000). Being more positive and having confidence is associated with increased feelings of attractiveness (Langlois et al., 2000). Only one factor, requiring PE class, was negatively associated with girls' perceived attractiveness; however, number of days spent in class and minutes spent exercising during PE were not associated with perceived attractiveness for girls. Simply requiring PE was enough to decrease feelings of attractiveness. As Stankov, Olds, and Cargo (2012) state, "The 'beauty cost' of messy hair, runny make-up and breaking finger-nails deters at least a sub-group of girls from physical activity which may signal their interest in looking attractive and forming relationships with boys" (p. 13). Worse perceived attractiveness could also be related to social physique anxiety, since young women in PE are often required to change clothes in front of each other (Leary, 1992). Girls are likely more susceptible to the negative effects of social comparison (Myers & Crowther, 2009), which could occur in locker rooms as part of required PE class. Additional research is warranted so that these relationships can be better understood.

This study has school policy implications, as PE initiatives at schools may contribute positively to adolescent boys' and girls' body image. This study suggests that overall, adolescents may benefit from PE classes, as PE is related to decreased body size perception. The impact of PE on attractiveness is also positive for boys, although more work that combats the association between requiring PE and decreased feelings of attractiveness among girls needs to be done. Differently structured physical activity classes may be important (Couturier, Chepko, & Coughlin, 2007) to counteract the finding that requiring PE decreases girls' perceptions of attractiveness, as

the benefits of PE may outweigh the negatives. Girls might benefit more from structural changes to PE classes than their male counterparts do, reporting many barriers to participation with PE classes associated with locker rooms, including changing or showering in front of others (Couturier et al., 2007). Young girls have reported feeling a tension between desiring to feel feminine and attractive and being more active, which is associated with being more muscular and sweaty (Cockburn & Clarke, 2002). Adolescent girls may benefit from having PE classes at the end of a school day so they can avoid feeling sweaty through later class periods or having longer amounts of time to shower and change privately (Couturier et al., 2007). These potential changes could lead to improvements of girls' perceived attractiveness and continued maintenance of adolescent boys' body image. It is important that schools not only require PE, but also have a substantial number of days in PE and number of minutes spent exercising while in PE to reap the maximum benefit for body image. Although participation in PE classes has remained stable in the last few decades, the rate of physical activity is still lower than national physical activity guidelines for youth (Centers for Disease Control and Prevention, National Physical Activity Plan Alliance Secular Changes in Physical Education Exposure Ad Hoc Committee, 2016). Future studies should determine the ideal amount of physical activity needed for improving body image.

Limitations

One limitation of this study is the cross-sectional nature of the data, and therefore, causality among study variables could not be determined. Future studies should test the impact of PE on body image over time. In addition to the cross-sectional nature of the data, variables in the study came from self-report and may not be as reliable as measured data. For example, having youth recall how many minutes they spent exercising may not be as accurate as observing amount of time spent exercising. We did not have access to information such as if a school required changing for PE class, and additional information such as this may have helped in drawing stronger conclusions. Another limitation is that we cannot determine if the body image variables are viewed as positive or negative for adolescents. Although we may be able to reasonably infer that as perceived attractiveness increases body image also increases, we cannot make the

same claim for perceived body size. Larger body size is stigmatized in our culture (Latner, O'Brien, Durso, Brinkman, & MacDonald, 2008), but the ideal body type differs for boys and girls with boys expected to be larger and expectations for girls expected to be thin and curvy (Ahern, Bennett, Kelly, & Hetherington, 2010; Olivardia et al., 2004).

Conclusion

In conclusion, in addition to the physical health benefits of PE classes for adolescents in schools, PE programs could improve body image among youth, thereby possibly improving other health outcomes. Requiring some form of PE is not necessarily enough, although it may be a good start based on the results of this study. Schools should also provide PE on multiple days of the week and ensure students spend a significant amount of time exercising during PE each week. Sixty minutes or more of physical activity is recommended for youth, although specific recommendations for physical activity to improve body image is not yet known (U.S. Department of Health and Human Services, 2008). Although requiring PE is related to a more negative view of appearance among girls, special accommodations or adjustments may help alleviate these concerns. Utilizing and reforming existing programs, such as requiring more students to take PE or increasing the amount of time spent exercising in PE, would be of minimal cost but could have a beneficial impact on body image among youth.

References

Ahern, A. L., Bennett, K. M., Kelly, M., & Hetherington, M. M. (2010). A qualitative exploration of young women's attitudes towards the thin ideal. *Journal of Health Psychology, 16*, 70–79. https://doi.org/10.1177/1359105310367690

Akehurst, S., & Thatcher, J. (2010). Narcissism, social anxiety, and self-presentation in exercise. *Personality and Individual Differences*, *49*, 130–135. https://doi.org/10.1016/j.paid.2010.03.021

Brausch, A. M., & Muehlenkamp, J. J. (2007). Body image and suicidal ideation in adolescents. *Body Image, 4*, 207–212. https://doi.org/10.1016/j.bodyim.2007.02.001

Centers for Disease Control and Prevention, National Physical Activity Plan Alliance Secular Changes in Physical Education Exposure Ad Hoc Committee. (2016). *Secular changes in physical education attendance among U.S. high school students: YRBS 1991–2013*. Retrieved from http://physicalactivityplan.org/projects/secular/Secular_Trends_PE_508_FINAL.pdf

Cockburn, C., & Clarke, G. (2002). "Everybody's looking at you!": Girls negotiating the "femininity deficit" they incur in physical education. *Women's Studies International Forum, 25*, 651–665. https://doi.org/10.1016/S0277-5395(02)00351-5

Cooper, M. J. (2011). Working with imagery to modify core beliefs in people with eating disorders: A clinical protocol. *Cognitive and Behavioral Practice, 18*, 454–465. https://doi.org/10.1016/j.cbpra.2010.08.003

Couturier, L. E., Chepko, S., & Coughlin, M. A. (2007). Whose gym is it? Gendered perspectives on middle and secondary school physical education. *Physical Educator, 64*, 152–158.

Flament, M. F., Hill, E. M., Buchholz, A., Henderson, K., Tasca, G. A., & Goldfield, G. (2012). Internalization of the thin and muscular body ideal and disordered eating in adolescence: The mediation effects of body esteem. *Body Image, 9*(1), 68–75. https://doi.org/10.1016/j.bodyim.2011.07.007

Foster, G. D., Sherman, S., Borradaile, K. E., Grundy, K. M., Vander Veur, S. S., Nachmani, J., . . . Shults, J. (2008). A policy-based school intervention to prevent overweight and obesity. *Pediatrics, 121*, e794–e802. https://doi.org/10.1542/peds.2007-1365

Gillen, M. M. (2015). Associations between positive body image and indicators of men's and women's mental and physical health. *Body Image, 13*, 67–74. https://doi.org/10.1016/j.bodyim.2015.01.002

Kanayama, G., Barry, S., Hudson, J. I., & Pope, H. G., Jr. (2006). Body image and attitudes toward male roles in anabolic-androgenic steroid users. *American Journal of Psychiatry, 163*, 697–703. https://doi.org/10.1176/ajp.2006.163.4.697

Klump, K. L., Bulik, C. M., Kaye, W. H., Treasure, J., & Tyson, E. (2009). Academy for eating disorders position paper: Eating disorders are serious mental illnesses. *International Journal of Eating Disorders, 42*, 97–103. https://doi.org/10.1002/eat.20589

Kostanski, M., & Gullone, E. (1998). Adolescent body image dissatisfaction: Relationships with self-esteem, anxiety, and depression controlling for body mass. *Journal of Child Psychology and Psychiatry, 39*, 255–262. https://doi.org/10.1111/1469-7610.00319

Langlois, J. H., Kalakanis, L., Rubenstein, A. J., Larson, A., Hallam, M., & Smoot, M. (2000). Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychological Bulletin*, *126*, 390–423. https://doi.org/10.1037/0033-2909.126.3.390

Latner, J. D., O'Brien, K. S., Durso, L. E., Brinkman, L. A., & MacDonald, T. (2008). Weighing obesity stigma: The relative strength of different forms of bias. *International Journal of Obesity, 32*, 1145–1152. https://doi.org/10.1038/ijo.2008.53

Leary, M. R. (1992). Self-presentational processes in exercise and sport. *Journal of Sport and Exercise Psychology, 14*, 339–351. https://doi.org/10.1123/jsep.14.4.339

Littleton, H. L., & Ollendick, T. (2003). Negative body image and disordered eating behavior in children and adolescents: What places youth at risk and how can these problems be prevented? *Clinical Child and Family Psychology Review, 6*(1), 51–66. https://doi.org/10.1023/A:1022266017046

Must, A., & Tybor, D. (2005). Physical activity and sedentary behavior: A review of longitudinal studies of weight and adiposity in youth. *International Journal of Obesity, 29*, S84–S96. https://doi.org/10.1038/sj.ijo.0803064

Myers, T. A., & Crowther, J. H. (2009). Social comparison as a predictor of body dissatisfaction: A meta-analytic review. *Journal of Abnormal Psychology, 118*, 683–698. https://doi.org/10.1037/a0016763

Neumark-Sztainer, D., Wall, M., Guo, J., Story, M., Haines, J., & Eisenberg, M. (2006). Obesity, disordered eating, and eating disorders in a longitudinal study of adolescents: How do dieters fare 5 years later? *Journal of the American Dietetic Association, 106*, 559–568. https://doi.org/10.1016/j.jada.2006.01.003

Nowak, M. (1998). The weight-conscious adolescent: Body image, food intake, and weight-related behavior. *Journal of Adolescent Health, 23*, 389–398. https://doi.org/10.1016/S1054-139X(97)00263-2

Olivardia, R., Pope, H. G., Jr., Borowiecki, J. J., III, & Cohane, G. H. (2004). Biceps and body image: The relationship between muscularity and self-esteem, depression, and eating disorder symptoms. *Psychology of Men and Masculinity, 5*(2), 112–120. https://doi.org/10.1037/1524-9220.5.2.112

Paluska, S. A., & Schwenk, T. L. (2000). Physical activity and mental health. *Sports Medicine*, *29*, 167–180. https://doi.org/10.2165/00007256-200029030-00003

Paxton, S. J., Neumark-Sztainer, D., Hannan, P. J., & Eisenberg, M. E. (2006). Body dissatisfaction prospectively predicts depressive mood and low self-esteem in adolescent girls and boys. *Journal of Clinical Child and Adolescent Psychology, 35*, 539–549. https://doi.org/10.1207/s15374424jccp3504_5

Ramseyer Winter, V. (2016). Toward a relational understanding of objectification, body image, and preventive sexual health. *Journal of Sex Research,* 54, 341–350. https://doi.org/10.1080/00224499.2016.1190807

Ramseyer Winter, V., O'Neill, E. A., & Omary, A. (2017). Exploring relationships between body appreciation and self-reported physical health among young women. *Health & Social Work, 42*(2), e62–e67. https://doi.org/10.1093/hsw/hlx006

Ruini, C., Ottolini, F., Tomba, E., Belaise, C., Albieri, E., Visani, D., . . . Fava, G. A. (2009). School intervention for promoting psychological well-being in adolescence. *Journal of Behavior Therapy and Experimental Psychiatry, 40*, 522–532. https://doi.org/10.1016/j.jbtep.2009.07.002

Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine and Science in Sports and Exercise, 32*, 963–975. https://doi.org/10.1097/00005768-200005000-00014

Stankov, I., Olds, T., & Cargo, M. (2012). Overweight and obese adolescents: What turns them off physical activity? *International Journal of Behavioral Nutrition and Physical Activity, 9,* 1–15. https://doi.org/10.1186/1479-5868-9-53

Stice, E., & Shaw, H. E. (2002). Role of body dissatisfaction in the onset and maintenance of eating pathology: A synthesis of research findings. *Journal of Psychosomatic Research, 53*, 985–993. https://doi.org/10.1016/S0022-3999(02)00488-9

Ströhle, A. (2009). Physical activity, exercise, depression, and anxiety disorders. *Journal of Neural Transmission, 116*, 777–784. https://doi.org/10.1007/s00702-008-0092-x

Strong, W. B., Malina, R. M., Blimkie, C. J., Daniels, S. R., Dishman, R. K., Gutin, B., . . . Pivarnik, J. M. (2005). Evidence based physical activity for school-age youth. *Journal of Pediatrics, 146*, 732–737. https://doi.org/10.1016/j.jpeds.2005.01.055

U.S. Department of Health and Human Services. (2008). *Physical activity guidelines for Americans*. Retrieved from https://health.gov/paguidelines/pdf/paguide.pdf

U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau. (2008). *Health behavior in school-aged children, 2001–2002 [United States]*. https://doi.org/10.3886/ICPSR04372.v2

Wiederman, M. W., & Hurst, S. R. (1998). Body size, physical attractiveness, and body image among young adult women: Relationships to sexual experience and sexual esteem. *Journal of Sex Research, 35*, 272–281. https://doi.org/10.1080/00224499809551943