

Evaluating the impact of a brief yoga intervention on preadolescents' body image and mood

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### **Abstract**

Yoga is an embodying activity that promotes body awareness, body connection, body responsiveness, and appreciation of body functionality, and it therefore may be a beneficial school-based intervention for children's body image. The present study examined the impact of a 4-week yoga intervention on pre-adolescent girls' and boys' body image (body appreciation, body esteem, and body surveillance) and mood (positive and negative affect) 1-week post-intervention and at 6-week follow-up. British children ( $N = 344$ ; 54.4% female) aged 9-11 years were recruited from four schools, two of which were randomly assigned to the yoga intervention and two to a physical education control condition. Unexpectedly, both groups increased body appreciation, body esteem, and positive mood, and decreased body surveillance and negative affect from baseline to post-intervention and/or follow-up. Children in the yoga intervention evaluated the sessions very favourably; the majority desired to participate in more lessons. Potential explanations for these findings are discussed.

*Keywords:* children, yoga intervention, positive body image, body surveillance, mood, embodiment.

## Introduction

Approximately 40-50% of 6-12-year-olds experience body dissatisfaction (Smolak, 2011), with girls as young as age 6 desiring a thinner body (Dohnt & Tiggemann, 2006). Prospective studies demonstrate that, during pre-adolescence and adolescence, body dissatisfaction is associated with increased negative affect (Ferreiro, Seoane, & Senra, 2011), reduced physical activity (Neumark-Sztainer, Paxton, Hannan, Haines, & Story, 2006), and eating disorder symptoms (Ferreiro, Seoane, & Senra, 2012), while body appreciation is associated with increased intuitive eating (Andrew, Tiggemann, & Clark, 2016). Therefore, it is essential to identify interventions that decrease body dissatisfaction and increase body appreciation for pre-adolescents.

Existing body image interventions largely focus on targeting sociocultural and cognitive-behavioural attitudinal risk factors associated with negative body image (Piran, 2015), and their efficacy appears promising for adolescent girls (Ross, Paxton, & Rodgers, 2013). However, effective body image interventions for boys and younger girls are less well established. Scholars have begun to advocate for the examination of embodiment-based interventions (Menzel & Levine, 2011; Piran, 2015), as embodying activities are important to developing and maintaining positive body image. Embodying activities enhance an awareness of the body, connectedness with the body, and feelings of competence and empowerment. These activities are linked to positive body image directly and indirectly by reducing objectification (Menzel & Levine, 2011).

Yoga is one such embodying activity (Mahlo & Tiggemann, 2016). It combines mind and body practices, including physical postures (asanas), breathing exercises, and relaxation techniques (Serwacki & Cook-Cottone, 2012). Yoga inspires body awareness and encourages appreciation of the body's functionality. Furthermore, yoga offers an ideal setting for incorporating messages which promote self-acceptance, body connection, and body

responsiveness (Neumark-Sztainer, 2014), which are key to developing and maintaining a positive body image (Piran, 2015). Consequently, yoga may be a beneficial tool to promote children's positive body image.

Yoga can be easily integrated into schools, which provide an ideal setting to access large, inclusive groups of children (Diedrichs & Halliwell, 2012). Two recent systematic reviews of school-based yoga reported preliminary evidence that yoga may be beneficial for mood, tension, and memory (Ferreira-Vorkapic et al., 2015; Khalsa & Butzer, 2016). However, there has been little examination of yoga's impact on children's and adolescents' body image. A qualitative evaluation with 28 adolescents indicated yoga was associated with increased awareness of, and respect for, the body (Conboy, Noggle, Frey, Kudesia, & Khalsa, 2013). Additionally, adolescents who participated in a 12-week yoga-based program reported reduced body surveillance compared to those in traditional physical education (P.E.) (Cox, Ullrich-French, Howe, & Cole, 2017). One study examining pre-adolescents found girls who completed a 10-week intervention based on yoga, discussion, and relaxation reported reduced body dissatisfaction and bulimic symptoms compared to non-randomized controls (Scime & Cook-Cottone, 2008)—however, the novel impact of yoga to these outcomes cannot be discerned. Further research is needed to examine whether school-based yoga can improve children's body image.

The current study aimed to examine the impact of a 4-week yoga intervention on pre-adolescents' body image and mood. Based on embodiment theory, it was hypothesised that girls and boys in the yoga intervention would report increased body appreciation, body esteem, and positive mood, and decreased body surveillance and negative mood, compared to a traditional P.E. control group.

## **Method**

### **Participants**

Children ( $N = 344$ ; 54.4% females) aged 9-11 years ( $M_{\text{age}} = 9.34$ ,  $SD_{\text{age}} = 0.69$ ) were recruited from four primary schools in South West England. Two schools were randomly assigned to the intervention condition ( $n = 190$ , 48% female) and two to the control condition ( $n = 154$ , 62% female).

## Measures

**Body esteem.** The Appearance subscale of the Body Esteem Scale for Children (Mendelson & White, 1993) contains 13 items (e.g., “I like what I look like in pictures”) rated on a 5-point Likert scale from *No—disagree a lot* (1) to *Yes—agree a lot* (5). It has evidenced reliability and validity in samples of children as young as eight.

**Body appreciation.** The Body Appreciation Scale-2 for Children (Halliwell, Jarman, Tylka, & Slater, 2017) contains 10 items (e.g., “I feel good about my body”) rated on a 5-point Likert-type scale from *Never* (1) to *Always* (5). It has evidenced good internal consistency, 6-week test-retest reliability, and construct validity among children aged 9-11.

**Body surveillance.** The Body Surveillance subscale of the Objectified Body Consciousness Scale-Youth (Lindberg, Hyde, & McKinley, 2006) contains four items (e.g., “During the day, I think about how I look many times”) rated on a 5-point Likert scale from *No—disagree a lot* (1) to *Yes—agree a lot* (5). It has evidenced good internal consistency, 2-week test-retest reliability, and construct validity with girls aged 9-12.

**Mood.** The Positive and Negative Affect Scale for Children (Ebesutani et al., 2012) contains five positive affect items (e.g., “Joyful”) and five negative affect items (e.g., “Scared”). Participants rate how often they have experienced each feeling in the past few weeks on a 5-point Likert scale from *Not at all* (1) to *Extremely* (5). It has evidenced high internal consistency among children aged 6-18.

**Feedback on yoga.** Participants in the intervention condition were asked to provide feedback on four statements related to comfort (“I felt comfortable during the yoga lessons”),

capabilities (“I could do the yoga poses I was asked to do in the lessons”), and enjoyment (“I thought the yoga lessons were fun,” “I would like to do more yoga lessons”) on a 5-point Likert scale from *No—disagree a lot* (1) to *Yes—agree a lot* (5).

### **Procedure**

After approval by the Institutional Research Ethics Committee, four primary schools were recruited via email and randomly allocated to the intervention or control condition. Passive parental consent and active participant consent were obtained. Questionnaires were completed in classrooms—they were read aloud by researchers to facilitate comprehension. Completion took approximately 20 minutes. Filler items were included to distract from the explicit focus on body image.

Baseline data were collected during the first week of term, immediately after school holidays. Participants in the intervention condition engaged in yoga once a week for 4 weeks instead of their regularly scheduled physical education (P.E.) lesson. Yoga lessons lasted 40 minutes and were delivered by a certified female yoga instructor. Each lesson incorporated simple yoga asanas with a focus on breath and relaxation (see Figure 1 for program content). The control group attended P.E. lessons as usual. Groups each included 16 to 29 participants. All participants completed the post-intervention questionnaires 1 week after the final yoga session and follow-up questionnaires 6 weeks later.

## **Results**

### **Preliminary Analyses**

Missing data were minimal and data was missing completely at random,  $\chi^2(8523) = 8661.08, p = .15$ ; thus, analyses were run using pairwise deletion. To protect against bias, relevant significant effects were analysed under multiple imputation with 50 imputations (MI50).

Means, standard deviations, and alphas for study variables at all time points are

reported in Table 1. At baseline, there were no statistically significant differences between the intervention and control groups on body esteem, body appreciation, body surveillance, negative affect, or positive affect,  $\Lambda = .98$ ,  $F(5, 299) = 1.08$ ,  $p = .37$ ,  $\eta_p^2 = .02$ . There were significant differences according to gender,  $\Lambda = .92$ ,  $F(5, 299) = 5.04$ ,  $p < .001$ ,  $\eta_p^2 = .08$ .

There was a trend for higher body appreciation,  $F(1, 303) = 4.05$ ,  $p = .05$ ,  $\eta_p^2 = .01$ , MI50  $F(1, 308) = 3.71$ ,  $p = .055$ ,  $\eta_p^2 = .01$ , and significantly higher body esteem among boys than girls,  $F(1, 303) = 17.99$ ,  $p < .001$ ,  $\eta_p^2 = .06$ , MI50  $F(1, 308) = 17.76$ ,  $p < .001$ ,  $\eta_p^2 = .06$ . Body surveillance,  $F(1, 303) = 16.84$ ,  $p < .001$ ,  $\eta_p^2 = .05$ , MI50  $F(1, 308) = 18.43$ ,  $p < .001$ ,  $\eta_p^2 = .06$ , and negative affect,  $F(1, 303) = 7.00$ ,  $p = .009$ ,  $\eta_p^2 = .02$ , MI50  $F(1, 308) = 6.65$ ,  $p = .01$ ,  $\eta_p^2 = .02$ , were significantly higher among girls than boys.

### **Intervention Effects on Body Image**

To examine the impact of the yoga intervention on body image, a time (baseline, post-intervention, follow-up)  $\times$  condition  $\times$  gender mixed-design ANOVA was conducted.

Nonsignificant effects were found for condition,  $\Lambda = .98$ ,  $F(3, 242) = 1.30$ ,  $p = .28$ ,  $\eta_p^2 = .02$ ; condition  $\times$  gender,  $\Lambda = .99$ ,  $F(3, 242) = 0.31$ ,  $p = .81$ ,  $\eta_p^2 = .004$ ; time  $\times$  gender,  $\Lambda = .97$ ,  $F(6, 239) = 1.46$ ,  $p = .19$ ,  $\eta_p^2 = .04$ , and time  $\times$  condition  $\times$  gender,  $\Lambda = .98$ ,  $F(6, 239) = 0.77$ ,  $p = .60$ ,  $\eta_p^2 = .02$ .

There was a significant main effect of gender,  $\Lambda = .91$ ,  $F(3, 242) = 8.26$ ,  $p < .001$ ,  $\eta_p^2 = .09$ , replicating differences in baseline data. There was also a significant main effect of time,  $\Lambda = .87$ ,  $F(6, 239) = 5.86$ ,  $p < .001$ ,  $\eta_p^2 = .13$ . The time  $\times$  condition interaction effect was marginally significant,  $\Lambda = .94$ ,  $F(6, 239) = 2.15$ ,  $p = .05$ ,  $\eta_p^2 = .05$ ; at the univariate level this interaction was significant for body esteem,  $F(2, 488) = 3.44$ ,  $p = .03$ ,  $\eta_p^2 = .01$ .

For body appreciation, there was an improvement over time for both groups,  $F(2,$

496) = 10.22,  $p < .001$ ,  $\eta_p^2 = .04$ . Simple contrasts revealed an increase in body appreciation from baseline to post-intervention,  $p = .004$ , MI50  $p = .002$ , and from baseline to follow-up,  $p < .001$ , MI50  $p < .001$ . Similarly, body surveillance decreased over time for both groups,  $F(2, 496) = 17.61$ ,  $p < .001$ ,  $\eta_p^2 = .07$ , from baseline to post-intervention,  $p < .001$ , MI50  $p < .001$ , and from baseline to follow-up,  $p < .001$ , MI50  $p < .001$ .

The significant time  $\times$  condition interaction for body esteem was explored by running analysis separately by condition. There was an increase in body esteem in the intervention group,  $F(2, 260) = 4.32$ ,  $p = .01$ ,  $\eta_p^2 = .03$ , and control group,  $F(2, 240) = 12.91$ ,  $p < .001$ ,  $\eta_p^2 = .10$ . Although body esteem did not change from baseline to post-intervention in the intervention group,  $p = .43$ , MI50  $p = .27$ , it increased from baseline to follow-up,  $p < .01$ , MI50  $p < .001$ . The control group increased body esteem from baseline to post-intervention,  $p < .001$ , MI50  $p < .001$ , and from baseline to follow-up,  $p < .001$ , MI50  $p < .001$ .

### **Intervention Effects on Mood**

The same ANOVA model was run on positive and negative mood. Nonsignificant effects were found for condition,  $\Lambda = .99$ ,  $F(2, 247) = 0.30$ ,  $p = .74$ ,  $\eta_p^2 = .002$ ; condition  $\times$  time,  $\Lambda = .99$ ,  $F(4, 245) = 0.47$ ,  $p = .76$ ,  $\eta_p^2 = .01$ ; time  $\times$  gender,  $\Lambda = .99$ ,  $F(4, 245) = 0.85$ ,  $p = .49$ ,  $\eta_p^2 = .01$ ; and time  $\times$  gender  $\times$  condition,  $\Lambda = .98$ ,  $F(4, 245) = 0.71$ ,  $p = .58$ ,  $\eta_p^2 = .01$ .

There were significant effects of gender,  $\Lambda = .97$ ,  $F(2, 247) = 4.36$ ,  $p = .01$ ,  $\eta_p^2 = .03$ , and condition  $\times$  gender,  $\Lambda = .98$ ,  $F(2, 247) = 3.20$ ,  $p = .04$ ,  $\eta_p^2 = .03$ . Gender effects were nonsignificant in the control group,  $\Lambda = .96$ ,  $F(2, 118) = 2.27$ ,  $p = .11$ ,  $\eta_p^2 = .04$ , and significant in the intervention group,  $\Lambda = .93$ ,  $F(2, 128) = 4.90$ ,  $p = .01$ ,  $\eta_p^2 = .07$ , for negative mood which was higher for girls than boys,  $F(1, 129) = 8.71$ ,  $p = .01$ ,  $\eta_p^2 = .06$ , but not for positive mood,  $F(1, 129) = 0.87$ ,  $p = .35$ ,  $\eta_p^2 = .01$ . Most relevant to our hypotheses, there was



a significant effect of time,  $\Lambda = .91$ ,  $F(4, 245) = 6.35$ ,  $p < .001$ ,  $\eta_p^2 = .09$ . Positive mood increased,  $F(2, 496) = 12.85$ ,  $p < .001$ ,  $\eta_p^2 = .05$ , from baseline to post-intervention,  $p < .001$ , MI50  $p < .001$ , and from baseline to follow-up,  $p < .001$ , MI50  $p < .001$ . Negative mood decreased,  $F(2, 496) = 4.33$ ,  $p = .01$ ,  $\eta_p^2 = .02$ , with a trend for a reduction from baseline to post-intervention,  $p = .03$ , MI50  $p = .056$ , and a significant reduction from baseline to follow-up,  $p = .01$ , MI50  $p = .004$ .

### **Intervention Feedback**

The majority of children reported that they felt comfortable during the lessons (78%), they could do the yoga poses (90%), the yoga lessons were fun (87%), and they would like to do more yoga lessons (78%).

### **Discussion**

This study evaluated the impact of a brief yoga intervention on pre-adolescents' body image and mood. Results unexpectedly revealed improved body image and mood across the yoga and the P.E. control group. Yoga participants evaluated the sessions very favourably, with the majority desiring to participate in more yoga lessons.

There are several possible explanations for our findings. The yoga sessions replaced the intervention group's P.E. classes, and the control group participated in P.E. as normal. Baseline data were collected after holidays, and post-intervention and follow-up data were collected towards the end of the term. It may be that school-based physical activity, including both yoga and P.E., improves body image and mood. Indeed, P.E. containing six weeks of dance increased adolescent girls' body satisfaction (Burgess, Grogan, & Burwitz, 2006). Thus, while P.E. was conceptualized as a placebo control condition, it may have been an intervention, prompting positive effects on body image and mood.

Additionally, yoga delivered once a week for four weeks may not be sufficient to afford benefits over P.E. Previous research reporting yoga improves body image has

evaluated yoga programs over 10 or 12 weeks (Conboy et al., 2013; Cox et al., 2017; Scime & Cook-Cottone, 2008).

Other possible explanations generalise across intervention studies. A growing number of studies report improvement in body image related variables among the control group, and the potential explanations for this are discussed in more detail elsewhere (see Halliwell et al., 2016). Briefly, changes in the control group may be attributed to demand characteristics, methodological factors such as heightened anxiety during the first administration of unfamiliar questionnaires leading to more negative baseline evaluations, or developmental factors. For instance, McCabe and Ricciardelli (2005) reported that boys and girls experience a decrease in perceived sociocultural influences and a plateau in body image over a 16-month period from ages 9-10, the same age as our participants.

There are several additional limitations to the current study. Including an assessment-only and/or a non-physical activity based control group would have helped isolate the reason for our findings. The sample was predominantly White and, therefore, the experiences of pre-adolescents of other ethnicities were not explored. Also, due to practical considerations, participants were allocated by school rather than by individual. There maybe school-level factors that impacted the findings.

In conclusion, the brief yoga intervention was not more effective than regular P.E. classes in increasing positive body image, decreasing body surveillance, and enhancing mood. However, the pattern of results also suggests that body image researchers need to attend to methodological and developmental issues to increase confidence in the validity of intervention evaluation efforts. Future research should examine more regular and sustained engagement with yoga among pre-adolescents in schools, as most children in the yoga condition expressed their desire to continue yoga.

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Table 1

*Means, Standard Deviations, and Alphas for Body Esteem, Body Appreciation, Body**Surveillance, Positive Mood, and Negative Mood by Condition, Time, and Gender*

	Body Esteem	Body Appreciation	Body Surveillance	Positive Mood	Negative Mood
<b>Girls</b>					
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
<b>Intervention</b>					
Baseline	3.55 (0.99)	3.82 (0.85)	2.78 (1.35)	3.84 (0.83)	2.19 (1.01)
Post	3.59 (1.01)	3.85 (0.87)	2.68 (1.29)	4.03 (0.83)	1.97 (0.95)
Follow-up	3.69 (1.11)	3.92 (0.97)	2.67 (1.35)	4.14 (0.80)	1.95 (0.92)
<b>Control</b>					
Baseline	3.62 (0.89)	3.86 (0.77)	2.90 (1.14)	3.82 (0.83)	1.91 (0.83)
Post	3.92 (0.90)	4.08 (0.71)	2.50 (1.10)	3.95 (0.87)	1.85 (0.68)
Follow-up	3.81 (0.95)	4.01 (0.79)	2.55 (1.04)	3.85 (0.78)	1.91 (0.76)
<b>Total</b>					
	<i>α</i>	<i>α</i>	<i>α</i>	<i>α</i>	<i>α</i>
Baseline	.94	.90	.86	.80	.84
Post	.95	.90	.85	.84	.80
Follow-up	.96	.92	.85	.83	.83
<b>Boys</b>					
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
<b>Intervention</b>					
Baseline	3.90 (0.80)	3.88 (0.83)	2.43 (1.13)	3.81 (0.82)	1.79 (0.64)
Post	4.01 (0.87)	4.12 (0.83)	2.10 (0.98)	4.16 (0.75)	1.77 (0.76)
Follow-up	4.24 (0.75)	4.20 (0.79)	1.88 (0.82)	4.19 (0.85)	1.61 (0.54)
<b>Control</b>					
Baseline	4.15 (0.59)	4.23 (0.60)	2.07 (1.00)	4.05 (0.62)	1.79 (0.67)
Post	4.35 (0.70)	4.30 (0.67)	1.94 (0.88)	4.28 (0.63)	1.68 (0.76)
Follow-up	4.39 (0.66)	4.37 (0.63)	1.76 (0.83)	4.32 (0.65)	1.71 (0.65)
<b>Total</b>					
	<i>α</i>	<i>α</i>	<i>α</i>	<i>α</i>	<i>α</i>
Baseline	.89	.89	.80	.74	.71
Post	.94	.90	.75	.82	.79
Follow-up	.94	.90	.68	.86	.67



## APPENDIX

### Yoga Program Content

Four 40-minute sessions incorporated free-flow storytelling with supporting yoga asanas and focus on breath. Each session followed this format:

#### **Opening**

- Instructor guided children to welcome themselves and their peers to the practice.
- Instructor told children that, at any time they felt uncomfortable, they had permission to sit on their mat, watch, and join back in when they felt ready.
- Instructor guided children to practice a breathing exercise (blowing up like a balloon and deflating).

#### **Warrior Sequence**

- Instructor told children to find a memory of when they felt “really good” about themselves and focus on how the memory caused them to feel in their bodies. Instructor had children engage in an exercise to “turn those good feelings up” to find their own inner super hero.
- Instructor guided children into Sun Salutations whilst discussing the useful qualities that can be gleaned from each asana.
- Instructor guided children from Warrior 1 to Warrior 3 balance.

#### **Storytelling**

Instructor then guided children into a thematic story for each session whereby they find their inner superheroes/warriors and go “on an adventure” as they practice asanas to find inner confidence (Session 1), value autonomy and collaboration (Session 2), act with integrity and community (Session 3), and discover “what’s on the inside that counts” (Session 4).

The asanas practiced during the adventure include Warrior 1, Warrior 2, Warrior 3, Downdog, Crab, Cobra, Updog, Plank, Locust, Dolphin, Boat, Eagle, Tree, Forward Folds, Chair, Airplane, Bridge, etc. Children were encouraged to enjoy what their bodies could achieve in the postures and appreciate that even though they may not be as long / strong / flexible as they may wish; their bodies were doing a really good job for them.

#### **Breathing exercise**

- Instructor guided children to practice blowing feathers and bee breath (humming) to engage their concentration, stamina, skill, and the ability to take deep breaths.

#### **Relaxation exercise**

- Instructor guided children into Savasana.
- Instructor guided children to make a wish and take the time to think about their dreams and ambitions.

#### **Closing**

- Instructor guided children to return to a seated position on their mats.
- Instructor guided children to thank themselves and each other for the practice.
- Instructor guided children to summarize the thematic story.
- Instructor guided children to recall some of asanas practiced.

