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The Influence of the Breast on Sport and Exercise Participation in School Girls in the United Kingdom



Joanna Scurr, Ph.D.^{a,*}, Nicola Brown, Ph.D.^b, Jenny Smith, Ph.D.^c, Amanda Brasher^a,
 Debbie Risius, Ph.D.^a, and Anna Marczyk^a

^a Department of Sport and Exercise Science, University of Portsmouth, Portsmouth, United Kingdom

^b School of Sport Health and Applied Science, St Mary's University, Twickenham, United Kingdom

^c Department of Sport and Exercise, University of Chichester, Bishop Otter Campus, Chichester, West Sussex, United Kingdom

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ABSTRACT

Purpose: Emerging evidence suggests that breasts may be a barrier to physical activity for adult females. With only 12% of the UK 14-year-old girls achieving exercise guidelines, to understand deterrents to exercise in this population, we should consider whether breasts may also influence sport and exercise participation in school girls. This survey-based study investigated the influence of the breast on sport and exercise participation and breast-specific concerns in the UK school girls.

Methods: A survey was developed to assess demographics, breast characteristics, breast-specific concerns in sports, breast knowledge, views on breast education, and sport participation. Chi-squared tests assessed associations between participation and breast size, sports bra use, and breast concerns.

Results: Two thousand eighty-nine school girls aged 11–18 years completed the survey, for 97 their breasts had begun developing and 96% reported wearing breast support. Forty-six percent of girls reported that their breasts had some effect on their participation in compulsory sports and exercise, which was more prevalent in girls aged 13–14 years (51%) and in larger-breasted girls (63%). More than 50% reported never wearing a sports bra during sports. Breast concerns were high with 73% reporting ≥ 1 breast-specific concern in sports; with breast bounce being most prevalent (38%).

Conclusions: As most of the breast concerns raised in this survey could be addressed via education and 87% of girls wanted to know more about breasts, this study demonstrates a need for breast education for school girls, which may reduce the influence of the breast on sport and exercise participation.

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IMPLICATIONS AND CONTRIBUTION

This study identifies a substantial influence of the breast on sport and exercise participation in school girls. Breast concerns during sports were high with 73% of girls reporting ≥ 1 concern. Most concerns are addressable via education; therefore this study provides evidence for such an intervention in schools.

The physical changes that take place during puberty are considered of great psychological significance [1], and studies have reported that these physical changes have an influence on

body image [1] and self-esteem [2]. For girls, breast development is an important anatomical change that occurs during puberty. For approximately 85% of girls, the breasts are the first manifestation of puberty [3]. In 2012, the Women's Sport and Fitness Foundation reported that girls in the United Kingdom (UK) dropped out of sports around the time of puberty and that only 12% of 14-year-old girls reached physical activity guidelines [4]. Levels of physical activity among adolescent girls are known to be lower than those of boys [5] and associations have been found

Conflicts of Interest: There are no conflicts of interests.

* Address correspondence to: Joanna Scurr, Ph.D., Department of Sport and Exercise Science, University of Portsmouth, Spinnaker Building, Cambridge Road, Portsmouth, PO1 2ER, United Kingdom.

E-mail address: Joanna.scurr@port.ac.uk (J. Scurr).

between personal factors such as body image and physical activity [6–8].

The first research on the effect of the breast on sport and exercise participation was recently published [9] and identified that the breast was a barrier to sports participation for 17% of adult females. Burnett et al. [9] reported that the breast was the fourth greatest barrier to sport and exercise participation, behind energy/motivation (first), time constraints (second), and health (third); however, the breast has rarely been considered in physical activity research. “I can’t find the right sports bra” and “I am embarrassed by excessive breast movement” were the most influential breast-related barriers to activity. Interestingly, Burnett et al. [9] also demonstrated that increased breast health knowledge was related to increased levels of sport and exercise participation, concluding that increasing breast health knowledge may reduce barriers to exercise participation in adult females. With the additional pressures of adolescence, it is reasonable to suggest that the breast may also play a role in deterring sport and exercise participation in adolescent girls.

The breast contains weak internal support [10], and therefore, physical activity causes independent breast movement, which increases with breast size [11]. This independent movement has been associated with breast pain in up to 72% of exercising females [12]. Additionally, it has been hypothesized that repeated loading of the supporting structures of the breast may cause irreversible stretch of these structures leading to breast ptosis (sagging) [10]. This movement has also been suggested to cause embarrassment [13], and it may cause changes in functional movement [14]. Although research has identified that appropriate breast support can be effective at reducing the negative consequences of breast movement [15], the bra marketplace can be overwhelming and confusing for the consumer. Bra fit issues are common and more problematic for larger-breasted women [16]; poor bra fit may compromise the function of even the most appropriate breast support products [13]. Research has identified that getting changed is an issue associated with school sports participation [17–19] and therefore changing into a sports bra may also be difficult for school girls. These variables singularly or in combination add further rationale to the hypothesis that the breast may influence sport and exercise participation for school girls in the UK. However, school girl’s breast-specific concerns during sport and exercise have yet to be investigated, and without this knowledge appropriate interventions in this area are difficult.

A previous breast education intervention for girls aged 11–16 years in Australia demonstrated improvements in bra knowledge, bra fit, and levels of bra support worn [20]. This study focused on adolescent athletes connected to sporting academies that provided sports science support and other specialist coaching services. However, in the UK, little is known about the general adolescent female population’s knowledge of breast health or bras and the influence that this may have on sport and exercise participation. Therefore, the aim of this study was first to investigate the influence of the breast on school and college girls’ participation in sport and exercise and second to understand their breast concerns. Based on the previous literature in the area, it was hypothesized that lower levels of sport and exercise participation would be associated with girls with larger breast sizes, girls with lower sports bra use, and finally with a greater number of breast-specific concerns. It was also hypothesized that reported effects of breasts on sport and exercise participation would be greater in year 8 onward (from the age of 12 years

onward), compared with year 7 girls, and greater in larger-breasted girls compared with smaller-breasted girls.

Methods

Survey development

Following full institutional ethical approval, a survey was developed using the following procedure. First, a literature review was conducted to aid the development of a discussion guide for four focus groups. These focus groups aimed to explore opinions, perceptions, and experiences associated with the breast (not reported in this article). Three of the focus groups were conducted with pupils aged 11–12 ($n = 6$), 13–14 ($n = 6$), and 16–18 ($n = 6$) years, respectively, and one was conducted with teachers ($n = 6$). Focus group data were analyzed using inductive content analysis, whereby raw data were grouped into themes, and themes were grouped into higher order themes. Using these themes and the literature in the area as a framework, a group of four researchers (three breast health specialists and one psychologist) developed a six-part survey. The survey included multiple-choice, Likert scale, and free-text format questions and was designed to take no more than 10 minutes to complete. An information sheet and consent form was included at the start of the survey, to enable participants to provide written informed consent. The survey assessed participant’s demographics, sport and exercise participation, breast-related information (age, school attended, ethnic group, breast size, and breast support preference), breast-specific concerns relating to sport and exercise, and participants’ views on breast education. The survey was piloted with five school girls who met the inclusion criteria for this study, leading to minor amendments to the wording and question order.

Procedure

Adolescent girls ($n = 2,089$) aged 11–18 years (15% in year 7; age 11–12 years, 23% in year 8; age 12–13 years, 25% in year 9; age 13–14 years, 25% in year 10; age 14–15 years, 7% in year 11; age 15–16 years, 3% in year 12; age 16–17 years, and 2% in year 13; age 17–18 years) were recruited via schools and colleges (making it difficult to report a response rate). Inclusion criteria were minimal (female, in years 7–13). Schools and colleges were given the option to use an opt-in or opt-out procedure for parent/guardian consent. All schools and colleges chose the opt-out method which meant that if parents/guardians did not agree to their daughters’ participation in the survey they informed the head teacher and their daughter was excluded from the study. Surveys were provided to each school or college, either in paper format ($n = 1,869$) or online ($n = 220$). The questions and format of the online survey were identical to the paper-based survey to maintain equivalency and increase reliability of the mixed-mode strategy [21]. To establish descriptive statistics, electronic submissions were automatically logged and paper copies were collected and manually entered into Microsoft Excel (2010; Microsoft, Redmond, WA).

Statistical analysis

Data were analyzed using predictive analytic software (IBM Predictive Analytic Software, Armonk, NY), the alpha level for statistical significance was set at .05 for all analyses. Chi-squared

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