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RESEARCH ARTICLE

“I feel proper self-conscious all the time”: A qualitative study of adolescent girls’ views of menstruation and physical activity. [version 1; peer review: 1 approved with reservations]

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Abstract

Background: Many children and adolescents do not engage in sufficient physical activity. Girls are less active than boys, and their activity levels decline more steeply with age. Menstruation may be associated with the decline in girls’ activity but there are few person-centred studies examining adolescent girl’s experiences of menstruation and physical activity. These are needed to understand the influence that menstruation has on the physical activity experiences of girls to inform effective interventions.

Methods: Focus groups were conducted with 46 girls aged 13-15 years across three schools. The discussions explored; experiences of, barriers to and facilitators of being active during menstruation; experiences in physical education/sports teams; and talking with others about periods and being active. Data were analysed using thematic analysis.

Results: Four themes were identified: 1) balancing perceived barriers and benefits 2) motivation and enjoyment, 3) social influences and 4) coping strategies. Participants reported using diverse strategies to overcome barriers to being active posed by menstruation and the importance of peer-support and enjoyable forms of activity.

Conclusions: Menstruation has a strong influence on girls’ physical activity experiences through intra- and inter-personal factors. The implications for how these can be addressed in efforts to increase girls’ physical activity are discussed.

Keywords

Physical Activity, Girls, Adolescents, Menstruation, Exercise, Puberty, Periods

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report

1. **Yvonne Laird** , University of Sydney, Sydney, Australia

Any reports and responses or comments on the article can be found at the end of the article.

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Introduction

Childhood and adolescent physical activity are associated with benefits to physical and psychological health¹. Globally, it is recommended that children and young people engage in moderate-to-vigorous-intensity physical activity for at least, or an average of, 60 minutes per day through a variety of aerobic and muscle-strengthening activities²⁻⁵. Most young people do not meet these recommendations⁵⁻⁷ and girls become increasingly less active with age⁶⁻¹¹. Understanding the factors that influence the decline of girls' physical activity in adolescence is critical.

There have been many efforts to increase young people's physical activity through school, family and community-based interventions, however evidence syntheses highlight that such interventions have had, at best, a small positive effect in general^{12,13} on girls' physical activity¹⁴. For example, a high quality trial of a school-based intervention in Australia (Physical Activity 4 Everyone) resulted in a 10-minute increase in adolescent boys accelerometer-assessed moderate-to-vigorous physical activity compared to controls, but only a 4-minute increase for girls¹⁵. Despite small effects, interventions that are multicomponent, school-based, grounded in theory, target both sedentary behaviour and physical activity, and that specifically target girls have been shown to hold most promise¹⁴. Better understanding of the factors that uniquely affect girls' physical activity is needed to design more effective targeted interventions.

The onset of puberty, comprising biological, physical, social and psychological changes¹⁶, coincides with the decline in girls' physical activity⁸. To date, studies have primarily focused on how changes in body shape and self-perceptions at this time affect girls' physical activity¹⁷; yet, whilst menstruation is a key pubertal experience, there is limited research examining the influence of menstruation on girls' experiences of, and engagement with, physical activity.

In a recent Youth Sport Trust survey of 19,036 girls in England, menstruation was the third largest barrier to school-based physical activity, behind a lack of confidence and disliking being watched whilst active¹⁸. Quantitative evidence indicates that menstruation interferes with girls' daily activities and can lead to reductions in physical activity¹⁹⁻²³; however, this work focusses narrowly on menstrual pain and menstrual-cycle patterns rather than broader experiences of menstruation. A qualitative grey literature report concerning puberty and sport identified several menstruation-related barriers to being active²⁴. These included irregular periods, fear of leaking, hygiene concerns, embarrassment, pain/weakness and a lack of coping resources.

Girls consistently engage in less physical activity than boys, yet interventions specifically aiming to increase girls' physical activity have largely had small or null effects¹⁴. This may be, in part, due to the lack of detailed consideration of the impact of menstruation on their physical activity in the development of these interventions. However, as there are no peer-reviewed qualitative studies on this topic, there is a lack of evidence on which to base improved interventions. With this in mind, and to inform the development of future strategies targeting adolescent girls'

physical activity, this study aimed to qualitatively explore adolescent girls' view on how menstruation influences their physical activity.

Methods

Data are from a qualitative, phenomenological focus group study conducted with 46 adolescent girls in years 9 and 10 (ages 13–15 years) from three secondary schools in South West England and Guernsey, Channel Islands. Homogeneous purposive and convenience sampling techniques were used to recruit three schools in the UK where girls in years 9 and 10 were invited to participate²⁵. These two sampling methods were used to address our research question that was specific to the characteristics of the group of interest. This facilitated group interviewing whilst also allowing us to describe this group in depth.

Information and consent forms were provided for pupils and parents. Of 260 eligible participants, 49 (19%) consented and 46 (18%) participated in focus groups between September and November 2018.

Ethical approval and consent to participate

Ethical approval for this study was provided by the School for Policy Studies Research Ethics Committee at the University of Bristol. Written informed consent for the publication of participant's details was obtained from both the participants and parents/guardian of the participant.

Data collection

Participants reported their age, ethnicity, menstrual characteristics (10 items)²⁶ and physical activity (how many days of they did 60 minutes or more of moderate-to-vigorous physical activity, 0-7). Nine focus groups (3 Year 9, 4 Year 10 & 2 mixed year groups) were conducted (by JH), involving between 2 and 8 pupils (Mean = 5.22 pupils, SD = 2.23) and lasting between 25 and 40 minutes. Focus groups were recorded (Olympus DS-3500). A topic guide was used (available as *Extended data*)²⁷, following pilot testing and covered; experiences of, barriers to and facilitators of being active during menstruation, experiences of PE/sports teams in the context of menstruation and talking with others about menstruation and being active. Ongoing analysis and reflection of the depth of information collected in the focus groups informed the decision to stop the focus groups²⁸.

Data analysis

Audio-recordings were transcribed verbatim, anonymised and loaded to QSR NVivo 10 (QSR International Pty Ltd, v10, 2012) for organisation and management. Thematic analysis was used concurrently with data collection to determine saturation and iteratively generate codes and themes²⁹. Analysis was led by JH and supported by LEC and SJS and followed five steps; (1) Immersion: through transcription, repeated reading and comparison to original audio to capture emotions. (2) Initial Coding & framework generation: Inductive and deductive coding strategies were used to identify segments of text using the participants' own words which reflected predetermined thematic areas (e.g., barriers to being active whilst menstruating) and new/unexpected ideas. JH and LEC independently coded two

transcripts each and triangulated initial codes through discussion including SJS which formed a coding framework that was applied to the remaining transcripts. (3) Iterative coding: As further transcripts were coded, previously coded transcripts were revisited to verify that the coding still applied. Categories were created through identifying commonality between codes. (4) Theme formation: Themes and subthemes were developed from categories based on their content through discussion. (5) Quote selection: several quotes capturing the diversity of each theme and subtheme were extracted which were then refined to a smaller number of quotes to represent the breadth and nuances within each theme. Descriptions of techniques used to enhance trustworthiness (Table S1) and The Consolidated Criteria for Reporting Qualitative Studies Checklist (Table S2) are available as an *Extended data* file.

Results

Participant characteristics

Table 1 displays participant characteristics. All but one girl had started menstruation, 59% reported regular periods and 35% irregular. On average, girls engaged in 60 minutes of moderate-to-vigorous physical activity on 3.5 days a week. Only two girls reported meeting the UK physical activity recommendations at the time of 60 minutes every day.

Themes

Following analysis of the focus group data, four themes were identified: 1) balancing perceived barriers and benefits, 2) motivation and enjoyment, 3) social influences and 4) coping strategies. Transcripts are available under restricted access (see *Underlying data*³⁰).

Balancing perceived barriers and benefits. Most girls described feeling unprepared for being active during menstruation. Some did not have sufficiently detailed information or thought

that the information was provided too late, when they had already reached menarche. Some girls felt they had been provided with false information through school, family members and friends.

“I didn’t really learn much about it. I knew that you’d bleed a lot but I don’t remember hearing anything about cramps or being active.” (Focus group 7, Year 10).

“My mum told me apparently when you get out [the pool] it’s just [blood] like everywhere but I just don’t go swimming really”. (Focus group 2, Year 9).

Participants commonly discussed their fears related to leaking and feeling exposed and uncomfortable when active which sometimes lead to avoidance of taking part in certain activities or being active altogether. Some concerns were the result of the clothing girls were required to wear for activities such as P.E., gymnastics or dance and these were heightened for most girls when wearing more revealing clothing, such as a leotard or swimming costume.

“Like dance comps we have to wear knickers and I feel proper like self-conscious all the time. I just feel like everyone is staring at you” (Focus group 1, Year 10)

Other concerns revolved around sanitary products being unsuitable or not providing the right protection for some activities.

“Pads are not good for running, that just, I don’t know, it doesn’t really stick cus when you’re like sweating and everything. It all sort of just comes off and then it makes a mess” (Focus group 4, Year 10)

Furthermore, most girls reported disliking using tampons, finding them uncomfortable to use, and therefore were more likely to avoid some types of physical activity where using tampons might be more appropriate than other products.

Table 1. Characteristics of sample.

Focus group	N	Age (yrs) M (SD)	School year	Ethnicity (% White British)	Age of menarche (yrs) M (SD)	N days per week of 60-min MVPA ^a M (SD)
1	8	14.3 (0.46)	10	100	12.0 (1.31)	4.6 (1.92)
2	5	13.2 (0.44)	9	80	11.6 (1.14)	3.8 (1.10)
3	2	13.0 (0.00)	9	100	12.0 (0.00)	4.5 (2.12)
4	4	14.3 (0.50)	10	75	12.3 (0.50)	2.8 (1.26)
5	8	14.3 (0.46)	10	88	11.8 (0.89)	3.3 (1.39)
6	3	14.0 (0.00)	10	100	12.3 (0.58)	3.7 (1.53)
7	4	13.8 (0.50)	9 & 10	100	11.5 (0.58)	2.3 (0.96)
8	5	13.8 (0.45)	9 & 10	100	11.6 (0.55)	3.6 (1.82)
9	7	13.6 (0.53)	9	100	11.0 (1.29)	3.1 (0.69)
Overall	46	13.8 (0.37)	-	93.6	11.8 (0.76)	3.5 (1.49)

^a Moderate-to-vigorous Physical Activity.

“I really don’t like tampons so I usually just ask to hand in a note because if it’s any other sport I wear a sanitary pad but when it’s swimming you can’t so I just, have to skip” (Focus group 8, Year 9).

The physical and psychological symptoms of menstruation, such as cramps, tiredness, back pain, and low mood were barriers to being active. For some, symptoms worsened during physical activity and others reported performing less well, particularly in team sports, and so were concerned about letting their team down.

“When I did go for my runs I got really hot and sweaty and then that made everything feel really uncomfortable and like messy.” (Focus group 4, Year 10).

“I don’t think I can be bothered so much, so I don’t try as hard and then I let the team down a bit”. (Focus group 7, Year 10).

However, one girl found the shared responsibility of peers within team sports supportive.

“Like a team effort, is not just singly, you’re more relied on kind of thing, I suppose you are relied on in a team but you’ve got people to back you up If you need it” (Focus group 9, Year 9)

Whilst symptoms were a barrier to physical activity for some girls, for others being active provided some relief by distracting from their symptoms and improving their mood. In these instances, this led to higher levels of activity during menstruation even though this was not seen as the ‘norm’.

“I think I’ve actually got more physical, I know that sounds bad, but you think generally that people would become less active, less physical once they started their periods but it’s not. It’s like a way of not thinking about it.” (Focus group 9, Year 9).

Motivation and enjoyment of physical activity. Enjoying and valuing physical activity and being regularly active, were main reasons that some girls remained active during menstruation. Girls who were generally active and liked or valued specific activities were more likely to remain active, whereas girls who generally disliked being active reported that menstruation strengthened these feelings.

“If you like the sport it puts you in a good mood but if you don’t like the sport you just get more miserable cus you’re not engaged so you don’t wanna do it and you don’t wanna be there” (Focus group 5, Year 10).

However, many of the girls did remain active whilst on their period, and this was largely due to a broader health-related motivation, with many wanting to try their best or push themselves to be active.

“I do a lot more [exercise] now, but I don’t think that’s just because of my period, it’s because I’ve decided to be more healthy, so I go for more runs and things like that, I don’t do it in spite of the time of the month but I do it just because I want to”. (Focus group 4, year 10).

Participants reported that being able to choose from a range of activities enabled them to select those they liked and felt comfortable doing during menstruation, which increased their enjoyment and likelihood of taking part. Group-based activity was favoured due to the positive and social atmosphere in addition to providing distraction. A minority of girls reported using menstruation as a reason to avoid activities they did not like, including when they were not menstruating. They viewed menstruation as an excuse that was “easy to use”, in that it would not be challenged by (especially male) teachers:

“If it’s a sport that I don’t particularly want to do, I might feel like I can easily use my period as an excuse not to do it, but if it’s something I really want to do or it’s something that I force myself to do, then I kind of just deal with it.” (Focus group 7, Year 10).

However, some girls felt so embarrassed by menstruation that they would rather use the excuse of having a cold:

“Yeah, I do find myself faking a cold quite a lot...if you have to use period as an excuse” (Focus group 5, Year 10).

Social influences. The girls reported being more likely to be active during menstruation with their female peers because they shared an understanding of the effects of menstruation and an openness within close friendship groups regarding their menstrual cycles.

“In our friendship group, I find it’s okay if we want to go out and do something active and I’m on my period...it’s just comforting knowing that they know I’m on my period and they can acknowledge that.” (Focus group 7, Year 10).

Peers supported one another by compromising on the activities that they do together when one of them is menstruating:

“I think we’ll try and compromise. If we know someone in our group is on their period, we’ll do stuff like play a game rather than go in the water swimming or doing something too active.” (Focus group 7, Year 10).

Peers also gave practical support, by carrying and providing friends with sanitary products, discussing periods with teachers on their friend’s behalf and disguising the noise made by opening products when in changing rooms to avoid embarrassment:

“The wrapper is making loads of noise, people are sort of literally listening to you. You have to like flush the toilet or have a friend there to put the hand dryer on” (Focus group 4, Year 10)

In comparison to their peers, older female figures were not perceived to be as supportive of the girls’ physical activity. Participants described how female relatives and teachers spoke of their own menstruation experiences without considering that these could be very different to theirs. This was often interpreted as expressing a lack of empathy and inhibited some from talking openly with their teachers.

“Even with female teachers, they might not get cramps a lot or they get really mild cramps; whereas, one of us could

get really bad cramps and they wouldn't understand as much because they're just used to their cramps. They'll think, 'I deal with it, so you should be able to deal with it'. (Focus group 7, Year 10)

Most girls generally felt less comfortable approaching male teachers about menstruation. However, some felt, as male teachers found discussing menstruation challenging, they were more likely to allow them to not take part in P.E. than their female teachers.

"Sometimes it's actually better with men cus they don't understand and they're just like 'fine' ... with women they're like 'oh well I do this and this and this so you can do this!' and I'm like 'no, go away'." (Focus group 8, Year 10)

Girls who had P.E. lessons or sports alongside boys tended to feel uncomfortable with the idea that the boys may be aware of them menstruating but, conversely, were worried that if boys were not aware, they may not consider potential discomfort or other symptoms.

"Err you get quite self-conscious (during mixed P.E. lessons) because the boys will notice anything that the girls notice as well so it's not much of a difference, but you do feel kind of scared" (Focus Group 5, Year 10)

"If you're doing a contact sport they aren't going to be as aware of the pain you're in, like how your boobs can get sensitive as well so they might accidentally hit your boobs more than a girl would" (Focus group 5, Year 10).

Coping strategies. In addition to the peer support described above, participants described a range of personal coping strategies they used to overcome the challenges posed by menstruation to being active. Girls reported choosing dark or tight clothing, as well as carrying spare underwear or tying a jacket around their waist to hide any potential leakage.

"Or even a jacket to tie around your waist, sometimes if you leak as well and then people won't notice". (Focus group 5, year 10)

Others reported using either two pads at once or specific types of sanitary products, such as night-time pads or tampons, and changing their products prior to activity as ways to reduce the likelihood of leaking.

"Tampons, they are my very good friends [laughs], I've used them ever since I started because the first time I started, we were going on a swimming holiday". (Focus group 6, Year 10)

To make being active on their period more comfortable, many of the girls reported using pain killers and/or other methods of pain relief such as hot water bottles or stretching. For many, their coping strategies were not limited to during menstruation itself, but also involved ensuring they would be prepared for being active by tracking their cycles using apps or by keeping sanitary products in their bags throughout the month. Girls also

reported a flexible approach to being active, which considered the personal nature of their menstrual symptoms.

"Also keep a track because if you keep track, you're able to see if it would fall on a day that you do sports. Miss out on a few things to start with, when you get it, and then once you know what kind of period you've got, then you can do it". (Focus group 7, Year 10)

As well as practical strategies, the girls also felt that choosing activities that they feel comfortable doing during menstruation helped them maintain their activity levels. This sometimes meant choosing lower intensity activities or avoiding those which involve awkward movements which they felt increased the risk of leaking such as gymnastics. They also wanted to advise younger peers to not be too tough on themselves, and to not let their periods stop them being active.

"Well advice, I would say just keep doing it, don't let it stop you but if you don't feel like doing it, don't like force yourself to do it cus it doesn't matter, it's you, you can always go next week". (Focus group 4, Year 10)

Discussion

Few adolescent girls are sufficiently active to get health benefits^{6,8,10}. Previous research shows that menstrual symptoms are generally associated with reduced physical activity^{21,26,31}, yet the voice of adolescent girls on this topic is largely un-represented, with only grey literature reports of menstruation-related barriers to physical activity. In this study we sought to provide a person-centred, qualitative perspective on menstruation and adolescent girl's physical activity.

We found that the adolescent girls in this study reported highly individual and diverse experiences of how menstruation and physical activity influence each other. Most found menstruation to be a barrier to being active, and some used physical activity as a means of coping with menstrual symptoms. Girls reported a deficiency in knowledge about the interaction of menstruation and physical activity but identified common barriers to being active during menstruation including fear of leaking, menstrual-symptoms, ineffective sanitary products and general lack of enjoyment of physical activity. These findings align with and extend those in the grey literature²⁴ as well as reflecting specific components of several more general barriers to girls' activity, such as self-esteem, physical self-perceptions and fears of being watched^{32,33} which were exacerbated during menstruation. However, girls identified important motivational factors which they felt created resilience to these barriers such as finding activities they enjoy, having choice in the activities they do and what they wear, having a flexible approach to being active which accommodated time being less active, peer-support and group/team-based activity.

Girls reported a range of strategies to keep active during menstruation, (e.g. wearing suitable clothes/sanitary products, using pain relief strategies, and choosing certain activities), but these appeared to be based on acquired experience rather than

any advice or education received. Health messaging around menstruation tends to primarily focus on the biological aspects of the menstrual cycle rather than personal experiences³⁴⁻³⁶ and there appears to be a lack of advice for girls, parents or teachers, on how to navigate being active during menstruation. Our findings highlighted girls' concerns about talking with P.E. teachers, creating excuses, coping with the challenges of unsuitable clothing, and interacting with boys, which demonstrate the taboo which still surrounds menstruation and the negative influence that the fear of embarrassment and self-consciousness has on their physical activity. Recent government-level commitments to empower girls to be physically active (e.g., 37) are to be welcomed but our findings demonstrate that it is critical that interventions address the individual, social, institutional and cultural barriers posed to girls' physical activity by menstruation.

Implications

Our findings demonstrate, in adolescent girls' own words, the challenges that menstruation poses to their experiences and levels of physical activity. To increase physical activity amongst girls it seems critical that these factors are addressed in contexts in which girls are active (e.g., school, sports or active clubs, gyms & community provisions) as well as through specific interventions or programmes to increase girls' physical activity. The findings of this study suggest that future strategies should focus on: enhancing girls' knowledge, preparedness and expectations for being active during menstruation; fostering an enduring enjoyment and / or valuing of physical activity; embracing and enhancing the support that peers can provide with regards to both menstruation and physical activity; changing institutional policy (e.g., PE kit), improving interactions with teachers and parents and sharing coping strategies. However, further research is needed to better understand the lived experiences of a more diverse participant group and to work with girls to translate our findings into acceptable and feasible intervention strategies. Our research can also inform the development of questionnaires, so that future research can explore the prevalence of the barriers and facilitators we identified and their association with physical activity behaviour.

Strengths and limitations

The study is the first peer-reviewed person-centred analysis of adolescent girls' experiences of the impact of menstruation on physical activity and included nine focus groups comprising 46 girls from two school year groups. However, the findings are limited to the views of girls from three schools who were largely White British. There is some evidence that menstruation is a major barrier to physical activity amongst girls from Black, Asian and minority ethnic groups¹⁸. Further, girls who participated may have been more engaged or more enthusiastic about being physically active. However, only two girls met the UK physical activity guidelines, so the findings are not likely to only represent very active girls. There is a need for further research in this area in larger and more diverse samples.

Conclusions

Menstruation influences adolescent girls' experience of physical activity through both intra- and interpersonal factors and girls put considerable effort into overcoming the barriers menstruation poses to their physical activity. Our findings can inform the development of future research and the design of interventions to support girls to stay active during adolescence.

Data availability

Underlying data

University of Bristol Data Repository: Data from Menstruation and PA (10-2020). <https://doi.org/10.5523/bris.21ho700jicbdj27jbigloke4df30>.

This project contains transcripts from focus group discussions held in this study.

To comply with ethical procedures and to protect the identities of the participants, access to the data is restricted. The guide to [accessing research data guidance](#) outlines the reasons access may be granted and the request process. To request access to this data, please complete the [data request form](#).

Extended data

University of Bristol Data Repository: Extended Data from Menstruation and PA (10-2020). <https://doi.org/10.5523/bris.20bnp2xpxs1wc2qilecghiakld27>.

This project contains the focus group topic guide in DOCX and RTF formats.

Reporting guidelines

University of Bristol Data Repository: COREQ checklist for "I feel proper self-conscious all the time": A qualitative study of adolescent girls' views of menstruation and physical activity'. <https://doi.org/10.5523/bris.20bnp2xpxs1wc2qilecghiakld27>.

Data are available under the [Non-Commercial Government Licence for public sector information](#).

Author contributions

The project was conceived by SJS and LEC and refined/developed by JH. JH collected all data and led the analysis within a broader MSc research dissertation. LEC and SJS had input to the analysis and interpretation. The first draft of the paper was written collaboratively by all authors and all authors contributed to editing the paper and approved submission.

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References

1. Poitras VJ, Gray CE, Borghese MM, *et al.*: **Systematic review of the relationships between objectively measured physical activity and health indicators in school-aged children and youth.** *Appl Physiol Nutr Metab.* 2016; **41**(6 Suppl 3): S197–239.
[PubMed Abstract](#) | [Publisher Full Text](#)
2. Office of Disease Prevention and Health Promotion: **Physical Activity Guidelines for Americans, 2nd Edition.** 2018.
[Reference Source](#)
3. Weggemans RM, Backx FJG, Borghouts L, *et al.*: **The 2017 Dutch Physical Activity Guidelines.** *Int J Behav Nutr Phys Act.* 2018; **15**(1): 58.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
4. Australian Department of Health: **Australian 24-Hour Movement Guidelines for Children (5-12 years) and Young People (13-17 years): An Integration of Physical Activity, Sedentary Behaviour, and Sleep.** Australia; 2019.
[Reference Source](#)
5. Department of Health and Social Care: **UK Chief Medical Officer' Physical Activity Guidelines.** 2019.
[Reference Source](#)
6. Cooper AR, Goodman A, Page AS, *et al.*: **Objectively measured physical activity and sedentary time in youth: the International children's accelerometry database (ICAD).** *Int J Behav Nutr Phys Act.* 2015; **12**: 113.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
7. Jago R, Salway R, Lawlor DA, *et al.*: **Profiles of children's physical activity and sedentary behaviour between age 6 and 9: a latent profile and transition analysis.** *Int J Behav Nutr Phys Act.* 2018; **15**(1): 103.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
8. Metcalf BS, Hosking J, Jeffery AN, *et al.*: **Exploring the adolescent fall in physical activity: A 10-yr cohort study (EarlyBird 41).** *Med Sci Sports Exerc.* 2015; **47**(10): 2084–92.
[PubMed Abstract](#) | [Publisher Full Text](#)
9. Corder K, Sharp SJ, Atkin AJ, *et al.*: **Age-related patterns of vigorous-intensity physical activity in youth: The International Children's Accelerometry Database.** *Prev Med Rep.* 2016; **4**: 17–22.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
10. Dumith SC, Gigante DP, Domingues MR, *et al.*: **Physical activity change during adolescence: a systematic review and a pooled analysis.** *Int J Epidemiol.* 2011; **40**(3): 685–98.
[PubMed Abstract](#) | [Publisher Full Text](#)
11. Jago R, Salway R, Emm-Collison L, *et al.*: **Association of BMI category with change in children's physical activity between ages 6 and 11 years: a longitudinal study.** *Int J Obes.* 2020; **44**(1): 104–113.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
12. Metcalf B, Henley W, Wilkin T: **Effectiveness of intervention on physical activity of children: systematic review and meta-analysis of controlled trials with objectively measured outcomes (EarlyBird 54).** *BMJ.* 2012; **345**: e5888.
[PubMed Abstract](#) | [Publisher Full Text](#)
13. Love R, Adams J, van Sluijs EMF: **Are school-based physical activity interventions effective and equitable? A meta-analysis of cluster randomized controlled trials with accelerometer-assessed activity.** *Obes Rev.* 2019; **20**(6): 859–70.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
14. Owen MB, Curry WB, Kerner C, *et al.*: **The effectiveness of school-based physical activity interventions for adolescent girls: A systematic review and meta-analysis.** *Prev Med.* 2017; **105**: 237–49.
[PubMed Abstract](#) | [Publisher Full Text](#)
15. Sutherland RL, Campbell EM, Lubans DR, *et al.*: **The Physical Activity 4 Everyone cluster randomized trial: 2-Year outcomes of a school physical activity intervention among adolescents.** *Am J Prev Med.* 2016; **51**(2): 195–205.
[PubMed Abstract](#) | [Publisher Full Text](#)
16. Patton GC, Viner R: **Pubertal transitions in health.** *Lancet.* 2007; **369**(9567): 1130–9.
[PubMed Abstract](#) | [Publisher Full Text](#)
17. Knowles AM, Niven AG, Fawkner SG, *et al.*: **A longitudinal examination of the influence of maturation on physical self-perceptions and the relationship with physical activity in early adolescent girls.** *J Adolesc.* 2009; **32**(3): 555–66.
[PubMed Abstract](#) | [Publisher Full Text](#)
18. Youth Sport Trust: **Girls Active 2017-2019.** 2019.
[Reference Source](#)
19. Houston AM, Abraham A, Huang Z, *et al.*: **Knowledge, attitudes, and consequences of menstrual health in urban adolescent females.** *J Pediatr Adolesc Gynecol.* 2006; **19**(4): 271–5.
[PubMed Abstract](#) | [Publisher Full Text](#)
20. Pitangui AC, Gomes MR, Lima AS, *et al.*: **Menstruation disturbances: prevalence, characteristics, and effects on the activities of daily living among adolescent girls from Brazil.** *J Pediatr Adolesc Gynecol.* 2013; **26**(3): 148–52.
[PubMed Abstract](#) | [Publisher Full Text](#)
21. Hillen TI, Grbavac SL, Johnston PJ, *et al.*: **Primary dysmenorrhea in young Western Australian women: prevalence, impact, and knowledge of treatment.** *J Adolesc Health.* 1999; **25**(1): 40–5.
[PubMed Abstract](#) | [Publisher Full Text](#)
22. Banikarim C, Chacko MR, Kelder SH: **Prevalence and impact of dysmenorrhea on Hispanic female adolescents.** *Arch Pediatr Adolesc Med.* 2000; **154**(12): 1226–9.
[PubMed Abstract](#) | [Publisher Full Text](#)
23. van Iersel KC, Kiesner J, Pastore M, *et al.*: **The impact of menstrual cycle-related physical symptoms on daily activities and psychological wellness among adolescent girls.** *J Adolesc.* 2016; **49**: 81–90.
[PubMed Abstract](#) | [Publisher Full Text](#)
24. Women in Sport: **Puberty & Sport: An invisible stage.** 2018.
[Reference Source](#)
25. Palinkas LA, Horwitz SM, Green CA, *et al.*: **Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research.** *Adm Policy Ment Health.* 2015; **42**(5): 533–44.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
26. Parker MA, Sneddon AE, Arbon P: **The menstrual disorder of teenagers (MDOT) study: determining typical menstrual patterns and menstrual disturbance in a large population-based study of Australian teenagers.** *BJOG.* 2010; **117**(2): 185–92.
[PubMed Abstract](#) | [Publisher Full Text](#)
27. Sebire S, Collison L, Harvey J: **Extended Data from Menstruation and PA.** 2020.
<http://www.doi.org/10.5523/bris.20bn2xpxs1wc2qilecghiakld>
28. Braun V, Clarke V: **To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales.** *Qual Res Sport Exerc Health.* 2019; 1–16.
[Publisher Full Text](#)
29. Braun V, Clarke V: **Using thematic analysis in psychology.** *Qualitative Research in Psychology.* 2006; **3**(2): 77–101.
[Publisher Full Text](#)
30. Sebire S, Collison L, Harvey J: **Data from Menstruation and PA (10-2020).** 2020.
<http://www.doi.org/10.5523/bris.21ho700jicbdj27jbigloke4df>
31. Maruf FA, Ezenwafor NV, Moroofo SO, *et al.*: **Physical activity level and adiposity: are they associated with primary dysmenorrhea in school adolescents?** *Afr J Reprod Health.* 2013; **17**(4): 167–74.
[PubMed Abstract](#)
32. Biddle SJH, Whitehead SH, O'Donovan TM, *et al.*: **Correlates of participation in physical activity for adolescent girls: A systematic review of recent literature.** *J Phys Act Health.* 2005; **2**(4): 423–34.
[Publisher Full Text](#)
33. Slater A, Tiggemann M: **Gender differences in adolescent sport participation, teasing, self-objectification and body image concerns.** *J Adolesc.* 2011; **34**(3): 455–63.
[PubMed Abstract](#) | [Publisher Full Text](#)
34. Betty: **Encouraging Open and Honest Talk about Periods UK 2017.**
35. Plan International UK: **Break the Barriers: Girls' experiences of menstruation in the UK.** 2018.
[Reference Source](#)
36. NHS: **Starting you periods.**
[Reference Source](#)
37. Department of Education, Department for Digital, Culture, Media and Sport, Department of Health and Social Care: **School Sport and Activity Action Plan.** 2019.
[Reference Source](#)

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? **Yvonne Laird** 

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A well-written manuscript and important contribution to the literature on physical activity and adolescent girls. Clear research, policy and practice recommendations. I have some suggestions for clarification:

- The authors note that there has been no specific focus on menstruation/physical activity in the peer-reviewed literature. However, several qualitative studies have focused more generally on barriers and facilitators to physical activity in adolescent girls. Has this issue not been mentioned in these studies with a broader focus? If so, why is a more detailed focus warranted and, if not, why not?
- It is unclear why focus groups were selected over other data collection approaches, such as individual interviews.
- The authors note in the discussion that there remains a taboo surrounding menstruation. What steps were taken to ensure that the girls were comfortable during the focus groups? How was this managed as part of the data collection? There is some detail on this in the COREQ statement but limited information in the manuscript.
- The method states that thematic analysis was used, citing Braun and Clarke (2006), suggesting use of reflexive thematic analysis. The use of thematic analysis has not been justified and some aspects of the analytical approach is inconsistent with reflexive thematic analysis (e.g. use of a coding framework, identifying themes in advance, use of multiple coders). Can the authors clarify the type of thematic analysis conducted, provide a justification for this, and clarify/justify any divergence from the stated type of thematic analysis?
- What was the rationale for identifying themes in advance of analysis?
- Did participants also complete a survey? If so, at what time point and was this used to

inform sampling?

- The participant voice in the title of the paper is powerful but when reading the full quote in the results, it is less clear to me if the quote relates to feeling self-conscious about physical activity and menstruation or feeling self-conscious about the clothing they have to wear.
- The theme headings could be more specific.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Not applicable

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Physical activity in adolescent girls, qualitative research.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.
