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Fostering Girls' Active Lifestyles: Uncovering Barriers and Levers for Involvement in Physical Activities

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Physical activity (PA) is linked to numerous health advantages, but adolescents typically demonstrate inadequate levels of PA, with girls engaging in less PA than boys. This study aims to explore the factors hindering and promoting PA among girls aged 11–18 years, examining how existing literature addresses these factors through an ecological framework. A scoping review was conducted using the Preferred Reporting Items for Systematic reviews and Meta-Analysis extension for Scoping Reviews protocol. Six databases were searched between October 2022 and November 2024, and 41 articles published between 1993 and 2024 were analyzed. The main barriers to PA for girls were their relationship with their bodies and the influences of peers and teachers, while the main facilitators were social interactions, family or teacher support, and choice of activity. These findings highlight the importance of developing a socioecological framework that addresses personal, interpersonal, and environmental factors to enhance understanding of the issue of girls' engagement in PA.

Keywords: girls' engagement, ecological model, physical literacy

Key Points

The review aimed to identify and categorize barriers and facilitators affecting girl's types of engagement (physical, psychological, social, and cognitive) in physical activity within an ecological model and to identify gaps in the literature. Key barriers include body image concerns and the influence of peers and teachers. Conversely, facilitators include competence, autonomy, and social interactions.

The review underscores the need for multifaceted interventions to enhance physical activity among girls, with a significant emphasis on the role of social factors in both psychological and physical engagement.

Inadequate levels of physical activity (PA) are associated with significant social and health concerns (Ekelund et al., 2019). Research consistently links insufficient PA to a higher risk of noncommunicable diseases, including cardiovascular disease, obesity, type 2 diabetes, and certain types of cancer (Warburton & Bredin, 2017). Beyond physical health, inadequate PA also negatively impacts mental well-being, leading to a higher prevalence of mental health disorders like depression and anxiety (Mammen & Faulkner, 2013; Teychenne et al., 2010). Notably, girls tend to be significantly more affected by insufficient PA than boys across developed countries (Varma et al., 2017).

Despite significant progress in promoting gender equity across various domains, true equality remains elusive in many facets of society (Sustainable Development Report, 2020), and PA is no exception. Worldwide, a persistent gender gap exists: A European cross-sectional study conducted between 2002 and 2010 revealed that most adolescents have insufficient levels of activity according

to the World Health Organization guidelines; those rates were higher in girls (92%), compared to boys (82%; Kalman et al., 2015). Numerous studies and surveys consistently demonstrate that girls are less active than boys across different age groups and cultural context (Apété et al., 2012; Van Tuyckom & Scheerder, 2010), later confirmed as a worldwide trend (Guthold et al., 2020).

The gender disparity in PA engagement can be attributed to a constellation of interrelated factors, particularly the social and cultural construction of the relationship between women and PA, leading to less appeal to the women population (Taunton Miedema et al., 2023). Education systems can influence this issue, with formal schooling sometimes inadvertently reinforcing such perceptions (Solmon, 2014). A recent systematic review (Moreno-Llamas et al., 2022) shed light on the fact that girls are more likely than boys to encounter negative stereotypes and bias, potentially acting as deterrents to their involvement in PA. Research by Mendez et al. (2006) demonstrated that girls are more prone to experiencing harassment and criticism in physical education (PE) context, further discouraging their engagement in PA. Additionally, limited access to safe spaces, low socioeconomic status (Moreno-Llamas et al., 2022), lack of appropriate facilities, dominance of male-oriented curricula in PE (Cogérino, 2003), and a lack of women role models further exacerbate the problem, while concomitantly reducing girls' motivation to engage in PA. These inequalities not only reinforce gender disparities but also negatively

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impact girls' health and well-being. This underscores the urgent need to first listen to girls' voices regarding their needs in PA interventions and then develop targeted strategies to promote gender equity in PA participation.

The study of the engagement of a specific population in particular behaviors is a complex one. In their scoping review, Hastie et al. (2022) showed that engagement could be an individual behaviour or a theoretical framework, with many definitions and a need for consensus. Kiesler and Sakumura (1966) provided a definition of engagement in PA as "the connection between an individual and their behavioural actions" (p. 30). Therefore, engagement in PA signifies the bond between an individual and their participation in PA.

The above definition of engagement is one part of the foundations of the concept of physical literacy (PL), which represents "the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engaging in physical activities for life" (Whitehead, 2019, p. 8). The global consensus in the scientific and grey literature tends to model PL as a holistic system with four intertwined dimensions: physical, psychological or affective, social, and PA knowledge and understanding (Gandrieau et al., 2023; Keegan et al., 2019). In this perspective, at a personal level, engagement in PA is a multifaceted concept that includes physical, cognitive, psychological, and social components (Hastie et al., 2022) to support active lifestyles. It is crucial to consider these different dimensions of engagement to understand how they act as facilitators or barriers to PA participation. However, engagement in PA cannot be reduced to an analysis of the individual determinants of PL. Cairney et al. (2019) revealed that PL takes place within a multilevel and systemic environment. The relevance of a complex systems oriented model is obvious when it comes to understanding the gender gap in PA, requiring a framework to identify key factors that influence girls' PA engagement.

The ecological model is recommended in the scientific literature to explain the barriers and facilitators to PA engagement (Hynnen et al., 2016). Initially constructed to understand human behavior more generally (Bronfenbrenner & Morris, 2006), and then adapted to study PA engagement (Bauman et al., 2012), its underuse is often highlighted to explain the lack of effectiveness of intervention studies in PE (Rodrigo-Sanjoaquin et al., 2022). The ecological model acknowledges that PA behavior is influenced by numerous factors across five interconnected systems: individual, interpersonal, environmental, local and national policy, and global systems. A sixth system covers these five first: the chronological system, which highlights the critical need to consider developmental stages throughout one's life from early exposures in infancy to the challenges of older adulthood. Adopting a multilevel strategy supports the creation of interventions tailored to overcome obstacles and utilize facilitators at every stage, ranging from personal motivation to community involvement, thereby significantly enhancing the likelihood of successfully fostering PA among specific participant groups, like girls.

In their systematic review, Duffey et al. (2021) identified key obstacles met by girls in their PA engagement framed by an ecological model. They highlighted insufficient support from peers, family, and teachers, as well as time constraints, as the three main challenges. Nevertheless, there is a gap in their systematic review, as they focused on the three dimensions of the first level of an ecological framework (individual, interpersonal, and environmental) and did not identify distinct political, global, and chronological determinants specific to girls. In addition, the methodology focused solely on girls' participation, rather than

broadening the inclusion criteria to include the gender gap in PA, which may limit the findings of the exploratory review. Methodologically, Duffey et al. (2021) conducted a systematic review which only included studies in a meta-analysis. Indeed, there are gaps in the systematic review of Duffey et al. (2021) and their initial work could be complemented by a scoping review, which broadens the perspective of a systematic review by (a) identifying and mapping available evidence using a wider range of methods within the articles, (b) identifying and analyzing knowledge gaps, and (c) conducting preliminary analysis with a view to providing an innovative systematic overview of current understanding on topic (Munn et al., 2018).

The aim of this scoping review is to identify barriers and facilitators that shape the engagement of adolescent girls aged 11–18 years in the complex realm of PA. The objectives include (a) to have an overview of this gender gap across the systems of the ecological framework, (b) to map the dynamics of interaction between individual constructs (represented by dimensions of PL) within each subsystem of the ecological model, and (c) identify potential gaps in the literature.

Methods

The protocol was drafted using the PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analysis extension for Scoping Reviews) checklist and explanation (PRISMA-ScR, *Annals of Internal Medicine*, n.d.).

Eligibility

All types of scientific sources were included in the search, such as experimental studies, qualitative research, and systematic reviews, except for expert opinions and opinion-based reviews. Articles published between 1970 and 2024 were included, as preliminary research indicated that 1970 was the earliest appearance of our topic in the literature. We included studies with participant samples consisting of girls aged 10–18 years, excluding specific target groups such as adolescents with disabilities, high potential, or overweight. Only articles related to PA or PE were retained. Studies conducted in countries where gender equality is not guaranteed by law were excluded.

Studies were included if they addressed any of the following themes:

- Girls' engagement or disengagement in physical activity (PA),
- Gender inequality in PA, including disparities in the type, amount, or accessibility of PA,
- Barriers to progression in PA for girls,
- Reasons and contributing factors to gender inequality in PA, or
- Positive initiatives aimed at promoting PA among girls.

Studies that defined girls and boys as a binary sexual division, and studies that considered different gender identities were all included.

Search Strategy

The strategy was divided into three phases: (a) preliminary research, (b) construction of the Boolean strategy, and (c) distribution of the role of each researcher.

First, the leading author (Goldstein) conducted preliminary research to identify articles on the topic and test the effectiveness

of different keywords, using different databases (Cochrane, PROSPERO, SPORTDiscus, and ERIC). In a second phase, a list of keywords and specific Boolean operators were defined and discussed by both the leading author (Goldstein) and the panel of experts (Schnitzler and Lefèvre). We define also the use of the six databases (PubMed, Cairn, PsychINFO, ERIC, ProQuest, and SPORTDiscus) included in our research. The search strategy was mainly structured with the following search terms: girls' engagement/disengagement/sedentary/ participation/investment/ involvement, physical activity/physical education/ sport/, factors/ facilitators/program, and gender equality/gender inequality. The first Boolean operator was: ("gender inequality" AND (factors OR reason OR origin) AND ("physical activity" OR "physical education" OR sport). All keywords and Boolean operators used are available in the [Appendix](#). In the third phase, we established three groups of reviewers: the lead author (Goldstein), who was involved in all stages of evidence selection; the secondary reviewers (Camille Felder and Martin Keller), who contributed to the selection of eligible articles; and a panel of experts, who reviewed and discussed the inclusion of the final articles.

Selection of Evidence

The selection of evidence was divided into three main stages: identification, screening, and inclusion of articles. The identification and screening process was carried out in a double-blind fashion by the lead author (Goldstein) and the secondary reviewers (Felder and Keller). First, all Boolean operators were tested in six databases to identify titles potentially relevant to our topic. Second, the abstracts of the selected articles were reviewed. In the third step, only articles whose abstracts met all inclusion criteria were retained for full-text reading. After this step, the results of the first author (Goldstein) and second reviewers (Felder and Keller) were combined. After removing duplicates, the reading of the selected articles was divided between the lead author (Goldstein) and the second reviewers (Felder and Keller), who assessed the articles for eligibility. The final inclusion process was carried out by the lead author (Goldstein) and the panel of experts (Schnitzler and Lefèvre), who reviewed all articles and classified them into three categories: included, excluded, or for discussion. Articles in the "for discussion" category were collectively reviewed and discussed to reach consensus.

Analysis of Source of Evidence

Data of included articles were extracted by the leading author (Goldstein) according to the following fields: title, date, country, study type, study context (school or out-of-school PA), objectives, methodology, number of participants, age of population, grade level (middle school, high school, or both), type of evidence, global outcome of the study, ecological dimensions analyzed, theoretical framework of the study, type of engagement (according to the dimensions of PL). The panel of experts (Schnitzler and Lefèvre) checked and, if necessary, completed the data on the following topics: global outcome of the study, ecological dimension, and type of engagement.

After data extraction, articles were categorized as either barriers or facilitators to girls' participation in PA. Barriers were defined as factors that limit girls' access, engagement, or persistence in PA, whereas facilitators were factors that facilitate or promote these aspects. In addition, all articles in the barriers and facilitators categories were further classified according to the five

systems of the ecological model: individual, interpersonal, environmental, policy, and global.

Our analysis employed the socioecological model proposed by Bauman et al. (2012) to examine the dynamics of PA. This model posits that individual behavior is shaped by a hierarchy of interacting subsystems ranging from the microlevel to the macrolevel, encompassing individual characteristics, interpersonal relationships, environmental factors, regional or national policies, and global influences. At the same time, we integrated an additional level of analysis by examining each article through the lens of PL, which encompasses the components of the physical (skills and fitness), psychological (attitudes and emotions), social (interaction with peers), and cognitive (understanding and comprehension) dimensions of engagement.

We assessed the prevalence of specific barriers or facilitators within the literature by analyzing the frequency with which they were reported across the corpus, thereby identifying patterns of recurrence.

Results

This section consists of five distinct segments: the articles included (see flowchart), an overview detailing the characteristics of the corpus, a table describing each study, a two-part analysis of the results, and a graph summarizing all the results. [Supplementary Table S1](#) (available online) lists all the studies in the corpus and provides essential information to understand the objective and outcome of each study, categorized by barriers and facilitators. Tables 1 and 2 provide an analysis of the results based on the ecological system and PL frameworks, highlighting the main findings across the corpus. Finally, the graph provides a global overview of the results by linking the ecological model and the PL.

Articles Included

Figure 1 shows the Preferred Reporting Items for Systematic reviews and Meta-Analysis flowchart. A total of 4,723 (Goldstein)/4,441 (Felder and Keller) articles were identified using our Boolean operators. After title screening, 4,498 (Goldstein)/3,927 (Felder and Keller) articles did not meet the inclusion criteria, resulting in 225 (Goldstein)/514 (Felder and Keller) articles. A further 128 (Goldstein)/384 (Felder and Keller) articles were excluded based on abstract screening, after a pooling of resources with Goldstein and Felder and Keller to remove 99 duplicates, and 50 articles did not pass the second eligibility check. A total of 80 articles was identified for full-text review, leaving 41 articles for data extraction. Articles with doubts about inclusion or exclusion for full-text review were double-checked by the second review team.

Characteristics of the Source of Evidence

The research articles included in this scoping review were mainly from institutions in Europe and United States. Specifically, 22% of the articles came from researchers in the United Kingdom and 32% from the United States. The remaining 46% of articles came from research mainly in Europe or Australia. There were 17% of articles published between 2000 and 2010, 63% between 2011 and 2020 and 17% after 2021. Only 2% of the articles were published before 2000. The sample sizes varied between five and 483, 465

Table 1 Summary of Barriers

Subsystems of the ecological model	Description of the barriers	PL dimension	Articles	Recurrence ^a
Individual (12)	Lack of energy	Psychological	Ávalos-Ramos et al. (2024), Rosselli et al. (2020)	3
	Lack of willpower	Psychological	Cowley et al. (2021), Rosselli et al. (2020)	2
	Lack of time for individual change (other hobbies/priority)	Social	Cowley et al. (2021), Wetton et al. (2013), Craike et al. (2009), Neumark-Sztainer et al. (2003), Ávalos-Ramos et al. (2024)	5
	Priority for friends	Social	Cowley et al. (2021)	1
	Lack of social connection	Social	Mitchell et al. (2015)	1
	Lack of motivation	Psychological	Ávalos-Ramos et al. (2024), Iago et al. (2019), Shen (2015)	3
	Lack of enjoyment	Psychological	Ávalos-Ramos et al. (2024), Zarrett et al. (2020)	2
	Feeling of incompetence in physical activity	Psychological	Cowley et al. (2021), Shen (2015), van Daalen (2005), Wetton et al. (2013)	4
	Lack of self-confidence	Psychological	Ávalos-Ramos et al. (2024), Mitchell et al. (2015), Zarrett et al. (2020)	3
	Relationship to the body	Psychological/ social	Cowley et al. (2021), Fissette (2013), Iago et al. (2019), Franklin (1993), Monge-Rojas et al. (2017), Watson et al. (2015), Zarrett et al. (2020)	7
	Unpleasant experience with physical activity	Psychological	Zarrett et al. (2020)	1
	Lack of success in competition	Social	Franklin (1993)	1
Interpersonal (12)	Interaction with the teacher	Social	Cogérino (2003), Verscheure et al. (2014)	2
	Peer rejection and a too competitive environment	Social	van Daalen (2005)	1
	Girls need to prove her skills to boys	Social	Fissette (2013)	1
	The teacher's attitudes favor boys	Social	Bonniot-Paquien et al. (2009), Cowley et al. (2021), van Daalen (2005), Wetton et al. (2013)	4
	Comparison with others	Social	Tidmarsh et al. (2022)	1
	Practicing with boys	Social	Tidmarsh et al. (2022)	1
	Repetitive lessons	Psychological	Tidmarsh et al. (2022)	1
	Forms of grouping	Social	Tidmarsh et al. (2022)	1
	Criticism/exclusion from the boys	Social	Cowley et al. (2021), Watson et al. (2015), Zarrett et al. (2020)	2
	Parent's presence (playground context)	Social	Bocarro et al. (2015)	1
	Lack of parental support	Social	Zarrett et al. (2020)	1
	Teachers who reproduce gendered norms	Social	Clark (2015), Cowley et al. (2021)	1
Environmental (11)	Lack of individual choice (activity, schedule, and group)	Social	Cowley et al. (2021), Fissette (2013), Mitchell et al. (2015), Tidmarsh et al. (2022)	4
	Sociocultural level of the family	Social	Lee & Lim (2022)	1
	Unsuitable changing rooms	Psychological/ social	Kirby et al. (2012), Niven et al. (2014)	2
	Lack of offer of team sports clubs	Psychological/ social	Kirby et al. (2012)	1
	Lack of offer of extracurricular activities	Social	Kirby et al. (2012)	1
	Sports facilities (quality and variety)	Social	Cowley et al. (2021), Niven et al. (2014)	1
	Lack of female presence in the educational team	Psychological/ social	Zarrett et al. (2020)	1
	Gender diversity	Psychological/ social	Kim (2022)	1

(continued)

Table 1 (continued)

Subsystems of the ecological model	Description of the barriers	PL dimension	Articles	Recurrence ^a
	Weather conditions not adapted to PA or clothes not adapted to weather	Social	Iago et al. (2019), Niven et al. (2014), Watson et al. (2015)	2
	Insufficient time devoted to PA (during PE)	Social	Cowley et al. (2021), Niven et al. (2014)	1
	Lack of time for external change (school pressure, other obligation)	Social	Cowley et al. (2021), Craike et al. (2009), Iago et al. (2019)	3
Political (1)	School programming that benefits boys/Males' standard curriculum	Social	Cogérino (2003)	1
Global (7)	Sexism and sexual harassment	Psychological/ social	van Daalen (2005)	1
	Gender inequality	Psychological/ social	Cowley et al. (2021), Kinsman et al. (2015)	1
	Physical activity not adapted to girls' beauty standards	Social	Monge-Rojas et al. (2017)	1
	The increase in the level of development of countries leads to more active leisure time for boys than for girls	Social	Ricardo et al. (2022)	1
	Physical activity's gender stereotypes and gendered social expectations	Social	Cowley et al. (2021), Fiset (2013), Watson et al. (2015), Zarrett et al. (2020)	3
	Lack of place for a diversity of sexual orientation	Social	van Daalen (2005)	1
	Physical and social anxiety	Social	Iago et al. (2019)	1
Chronological (1)	The increase of obstacles with time	Social	Craike et al. (2009)	1

Note. PL = physical literacy; PA = physical activity; PE = physical education.

^aRecurrence: The number of times a barrier appears in different article.

Table 2 Summary of Facilitators

Ecological model	Description of the facilitator	PL dimension	Authors	Recurrence ^a
Individual (3)	Sense of competence	Psychological	(Kim, 2022; Noonan et al., 2019; Watson et al., 2015)	3
	Be in good health	Psychological/physical	(Tidmarsh et al., 2022)	1
	The desire to have fun, to be active and to learn new things	Psychological	(Maljak et al., 2020; Tidmarsh et al., 2022)	2
Interpersonal (11)	Less pressure on the results	Psychological/social	(O'Donovan & Kirk, 2008)	1
	Positive connections with coaches	Psychological/social	(Maljak et al., 2020)	1
	Teams work and socialization	Psychological/social	(Maljak et al., 2020)	1
	Friendly environment	Psychological/social	(Maljak et al., 2020)	1
	Social interactions	Psychological/social	(Bevan et al., 2021; Bocarro et al., 2015; Lamb et al., 2018; Marttinen et al., 2021; O'Donovan & Kirk, 2008)	5
	Body image work	Psychological/social	(Kinsman et al., 2015)	1
	Mentor presence	Psychological/social	(Bevan et al., 2021; Franklin, 1993; Marttinen et al., 2021)	2
	Peer support	Psychological/social	(Kim, 2022; Neumark-Sztainer et al., 2003; Zarrett et al., 2020)	3
	Family supports	Psychological/social	(Franklin, 1993; Gillison et al., 2017; Kinsman et al., 2015; Neumark-Sztainer et al., 2003; Noonan et al., 2019; Zarrett et al., 2020)	6
	Teachers supports	Psychological/social	(Ávalos-Ramos et al., 2024; Kim, 2022; Kinsman et al., 2015; Mitchell et al., 2015; Neumark-Sztainer et al., 2003; Zarrett et al., 2020)	6
	The presence of female sports models	Psychological/social	(Bevan et al., 2021; Franklin, 1993; Zarrett et al., 2020)	3
Environmental (11)	Cooperative learning unit	Social	(Bofill-Herrero et al., 2022)	1
	Diversity of activities	Psychological	(Davis, 2003; Lamb et al., 2018)	2
	The choice of activities and co-creation of the curriculum	Social/psychological	(Ávalos-Ramos et al., 2024; Lamb et al., 2018; Mitchell et al., 2015; Owen et al., 2019; Verloigne et al., 2017)	5
	Coach training and resources	Social	(Guagliano et al., 2015; Kinsman et al., 2015)	2
	Health and injury prevention activities	Psychological/social	(Davis, 2003)	1
	Low cost of PA	Social	(Zarrett et al., 2020)	1
	The links between PA and daily life or future health	Social	(Davis, 2003)	1
	Embodied learning	Social	(Lambert, 2018)	1
	Easy access to PA	Social	(Zarrett et al., 2020)	1
	Facilities available in the parks	Social	(Bocarro et al., 2015)	1
	Life skill development	Physical	(Young et al., 2006)	1
Political	No study founded			
Global	No study founded			
Chronological	No study founded			

Note. PL = physical literacy; PA = physical activity.

^aRecurrence: The number of times a barrier is mentioned in different articles.

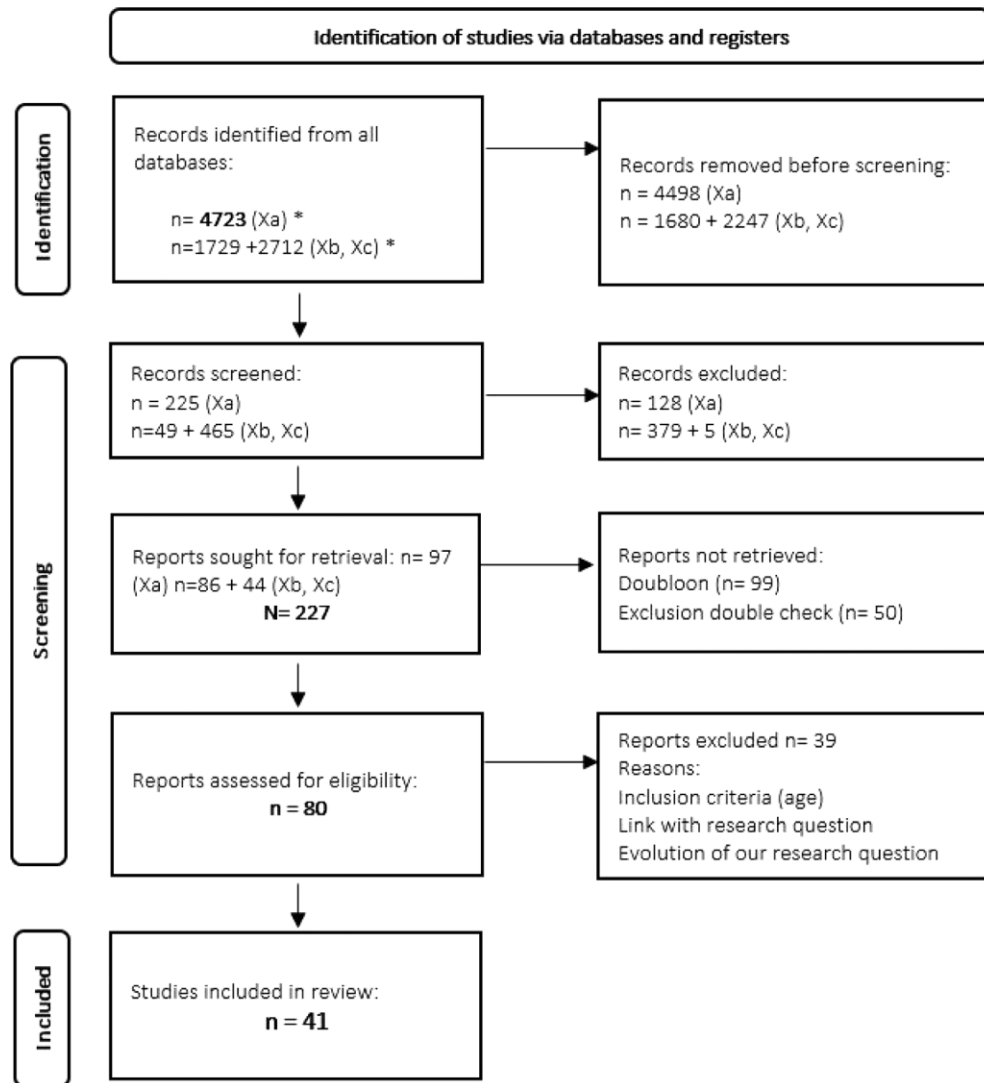


Figure 1 — Flow diagram. *Xa=reviewers who analyzed all the database; Xb, Xc=reviewers who each analyzed half of the database. From: PRISMA-ScR, *Annals of Internal Medicine* (n.d.).

participants. In 32% of the articles, the sample size was between 100 and 500 participants, while 51% of the articles have a sample size of less than 100 individuals. Only 17% of articles have a population size of more than 1,000 participants. 60% of the studies were conducted in an out-of-school context, and only 40% of the studies were conducted in a school setting. In terms of methodology, the peer-reviewed studies were mostly qualitative (59%), while 37% were quantitative in nature. Two studies used mixed qualitative and quantitative methods. 85% of the results came from observational studies. We found only six studies using a quasi-experimental design in the full sample of articles. 36% of the articles were mainly concerned with barriers to PA. 34% were concerned with facilitators to PA, and 30% of the articles were concerned with barriers and facilitators. The nature of engagement varied across studies, with most mentioning physical engagement, a few mentioning psychological and social engagement, and none mentioning cognitive engagement. The theoretical frameworks used to analyze the research questions were plural, including social cognitive theory, theory of planned behavior, and ecological theory. Except for two articles (Ávalos-Ramos et al., 2024;

Verscheure et al., 2014), biological sex was always used to define the binary categorization of girls and boys in the study. The article focused mainly on pupils in secondary school (58%) or pupils in secondary and higher education (27%), and only 15% of the articles focused only on student in higher education. [Supplementary Table S1](#) (available online) summarizes the main information about each study.

Main Results

Barriers to PA for Girls

Table 1 shows the 44 different identified barriers to PA for girls in the whole corpus of articles. Twenty-eight barriers appeared in only one study, while 16 barriers appeared in different studies. Most of the barriers are distributed in the individual subsystem ($n = 12$), interpersonal ($n = 12$), and the environmental subsystem ($n = 10$) of the ecological framework. Only one article purported to analyze barriers that belong to the political or chronological subsystem. The most recurrent obstacle which appeared in the corpus is “the relationship with their body.” In total, the main

barriers were mainly of a social nature in 40 studies, psychological in 13 articles, and a mix of social and psychological barriers in 16 studies. No physical or cognitive barriers were outlined in the selected articles.

In the individual subsystem category, we identified three recurring obstacles across various studies: first, the issue of body image (referenced in seven studies, considered both a psychological and a social barrier); second, the challenge of time constraints to undertaking PA (mentioned in three studies, considered a social barrier); and third, a feeling of incompetence in PA identified in four studies. The research consistently showed that girls often felt anxious about participating in activities where they perceived boys to be more proficient. This anxiety was linked to a need to prove themselves in comparison to boys, particularly in team sports, where they also feared being judged. (Cowley et al., 2021; Fiset, 2013; Iago et al., 2019). They also felt obliged to look feminine (not to sweat, to maintain neat and tidy hair, indeed to always look their best; Monge-Rojas et al., 2017). The girls also perceived that their bodies were not adapted to undertaking PA due to the biological changes occurring during adolescence (Watson et al., 2015). Several girls reported that their negative self-perception of their bodies served as a barrier to their participation (Zarrett et al., 2020). We found different individual reasons for the lack of time devoted to PA or sports: Other priorities were deemed more important, such as spending more time with friends or other hobbies (Cowley et al., 2021; Neumark-Sztainer et al., 2003; Wetton et al., 2013). Girls also highlighted their feelings of incompetence in PA: They felt less capable (Shen, 2015) or doubted their skills for engaging in PA (Cowley et al., 2021) or just perceived having low levels of competence in PA (van Daalen, 2005; Wetton et al., 2013). Other obstacles to engagement appeared only once, such as the lack of energy, giving priority to spending time with friends, lack of self-confidence, or reporting a bad experience with PA. These obstacles appeared just in one article and mainly in some observational studies.

In the interpersonal subsystem, barriers were distributed between interactions with peers (Bocarro et al., 2015; van Daalen, 2005) and teachers (Clark, 2015; Cogérino, 2003; Verscheure et al., 2014). The negative influence of peers on their participation mainly emerged in girls' interactions with boys, where they reported criticism and attempted exclusion from boys during mixed-gender activities. Girls also perceived that teachers' attitudes tended to favor boys in PA, experiencing sex-based differences in expectations that discouraged them from participating.

In the environmental subsystem, two obstacles showed greater recurrence: the lack of choice ($n = 4$) and the weather conditions for participation ($n = 3$). Girls complained of the lack of choice for the type of activity (Cowley et al., 2021; Fiset, 2013; Mitchell et al., 2015; Tidmarsh et al., 2022), for the scheduling of activity, or for the group composition (Cowley et al., 2021). The role of unsuitable changing rooms (Kirby et al., 2012; Niven et al., 2014), clothes not adapted to the weather conditions, or the nature of the activity (Niven et al., 2014; Watson et al., 2015) were prominent obstacles reported under the environmental subsystem.

We only found one obstacle relative to the political system. We found perceptions that the PE curriculum in school favored boys, principally in choice of activities more related to perceived masculine gender norms (Cogérino, 2003). In the global subsystem, the main obstacles were relative to sex-based differences. Girls mentioned the perceived influence of "gendered" social expectations or stereotypes (Watson et al., 2015) and the stereotypes associated with the nature of the activity (Fiset, 2013) as a barrier to PA.

Pressure to conform to gender stereotypes was also perceived by girls as a barrier (Watson et al., 2015).

There was some evidence of the evolution in the recurring barriers reported, based on the time of publication of an article. The feeling of incompetence and the teacher's favoritism toward the boys are barriers that appear in the articles during all periods, while the lack of time for PA and the issue of gender diversity only appear in articles from 2020 onwards in the sampled literature.

Facilitators to PA for Girls

Table 2 shows a total of 25 different facilitators for girls' engagement in PA in the full sample of articles, most of which were of a psychological and social nature. A total of 15 facilitators appeared in just one study, while 10 facilitators appeared in different studies. Most facilitators emerged in the interpersonal ($n = 11$) and environmental ($n = 10$) subsystems. There are only three facilitators that were observed in the individual subsystem. The most recurrent facilitators we found in the corpus belong to the interpersonal subsystem and include family or teacher support and the importance of social interactions. In the individual subsystem, feeling competent in an activity was reported as a positive effect on girls' engagement (Kim, 2022; Noonan et al., 2019; Watson et al., 2015). Maljak et al. (2020) mentioned that the desire to have fun, be active, or learn new things motivated girls to participate in PA, while Tidmarsh et al. (2022) mentioned a concern for good health as a facilitator for their involvement.

In the interpersonal subsystem, three facilitators are recurrent: social interactions, family support, and teacher support. Girls emphasized the importance of being able to develop friendships in a PA context (Martinen et al., 2021; O'Donovan & Kirk, 2008). Social connections are also important for girls to engage in PA (Bevan et al., 2021; Bocarro et al., 2015). In one study, girls proposed that mixed sex groupings allowed them to build more social relationships within the cohort. We also found a correlation between the level of family support and the level of engagement of girls in PA (Gillison et al., 2017; Neumark-Sztainer et al., 2003; Noonan et al., 2019; Zarrett et al., 2020). Teacher support is also a recurrent facilitator in the study. The importance of training in sport science for teachers of PA was also noted (Kinsman et al., 2015). Teacher support was also reported as having a positive impact on girls' PA (Neumark-Sztainer et al., 2003; Zarrett et al., 2020). Finally, girls value good relationships with teachers (Kim, 2022; Mitchell et al., 2015). We also observed other important influences in this subsystem, such as the presence of women role models (Bevan et al., 2021; Franklin, 1993; Zarrett et al., 2020) or the presence of mentors (Bevan et al., 2021; Martinen et al., 2021).

In the environmental system, a major recurring facilitator is the choice of PA for girls. In some interventions, girls were allowed to choose and co-create the whole curriculum (Lamb et al., 2018; Owen et al., 2019; Verloigne et al., 2017). We also found that girls were more engaged or motivated when they had greater choices of activity (Avalos-Ramos et al., 2024; Mitchell et al., 2015; Owen et al., 2019; Verloigne et al., 2017), with many related levels in this subsystem, such as the diversity of activity (Davis, 2003; Lamb et al., 2018), the level of training for teachers and coaches and quality of available resources (Guagliano et al., 2015; Kinsman et al., 2015), and life skills development (Young et al., 2006).

There was some development in the recurring facilitators over time of publication of the articles in the literature base surveyed. Support from family or teachers and women role models are facilitators that appeared in articles during all periods (1993–2024) of the search, while the importance of social

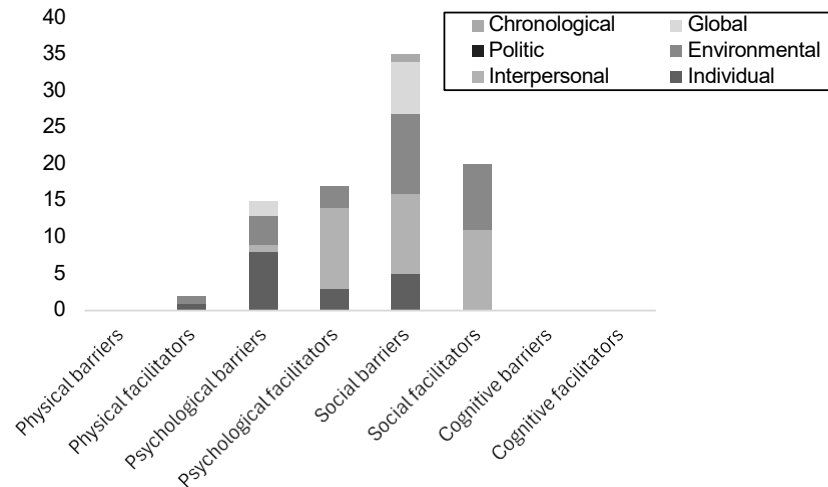


Figure 2 — Distribution of the recurrence of proposed barriers and facilitators according to the ecological and physical literacy framework.

interactions and friendship only appeared in more recent articles (2010–2024).

Figure 2 shows that the proposed barriers and facilitators are mostly related to the psychological and social dimensions of participants' behavior. Cognitive and physical dimensions of PL are rarely or never mentioned in the literature. Psychological dimensions affect both barriers and facilitators, while social barriers tend to predominate. Barriers and facilitators reported in the environmental subsystem are present in each PL dimension, while the global subsystem is only proposed to affect barriers in the psychological and social dimensions.

Discussion

This scoping review aimed to identify and analyze barriers and facilitators to adolescent girls' engagement in PA through the intersection of the ecological framework and PL. The findings reveal that most studies focus on PA engagement, while the barriers and facilitators predominantly address psychological and social dimensions. Furthermore, barriers and facilitators were identified mostly at the individual, interpersonal, and environmental levels of the socioecological system. Key barriers include body image concerns, lack of confidence, and negative interactions with teachers and peers. In contrast, facilitators such as supportive relationships, autonomy in activity choices, and positive social interactions play critical roles in fostering participation.

Impact of Subsystems and PL Dimensions

Bronfenbrenner's Bioecological Theory (2006) underscores the importance of considering multiple systems in understanding human behavior. The findings of this review highlight that barriers and facilitators are most frequently identified at the individual, interpersonal, and environmental levels.

The PL framework offers a complementary perspective, emphasizing the need to address engagement across physical, psychological, social, and cognitive dimensions. However, a clear gap exists in addressing cognitive engagement—knowledge and understanding of PA—which is rarely considered in the reviewed literature. This is a critical oversight, as cognitive engagement can

serve as a gateway to fostering long-term participation. For instance, programs that enhance girls' understanding of the health benefits of PA and debunk myths surrounding gender roles in sports could significantly influence their willingness to participate.

Body Image as a Barrier Across Subsystems

Body image concerns emerged as the most recurrent barrier, cutting across multiple levels of the ecological model. Girls reported feeling judged on their appearance or physical competence, particularly in mixed-gender settings, which discouraged participation (Cowley et al., 2021; Fisette, 2013). These concerns are compounded by societal stereotypes that associate femininity with appearance rather than physical capability; for example, Monge-Rojas et al. (2017) found that girls avoided sweating or disrupting their appearance during PA, reflecting broader cultural pressures. In the political subsystem, seeking to comply with the demands of a male-centric (i.e., led and designed by males) PE curriculum may exacerbate the insecure feeling of being exposed in a noncompetitive environment (Cogérino, 2003).

Addressing body image concerns requires a multipronged approach. Educational programs that promote body confidence and challenge societal stereotypes are essential. For example, incorporating discussions on body positivity into PE classes could help reshape girls' perceptions of themselves and their capabilities. Additionally, creating inclusive PE curricula that offer diverse, noncompetitive activities may reduce the anxiety associated with participation and foster a more welcoming environment.

The Interpersonal Subsystem: Opposing Influences

The interpersonal subsystem presents a complex interplay of barriers and facilitators, making it a critical area for intervention. Teacher attitudes were identified as both a barrier and a facilitator. Negative teacher behaviors, such as favoring boys or reinforcing gender stereotypes, were highlighted in eight studies (Bonniot-Paquien et al., 2009; Cogérino, 2003). For instance, girls reported feeling undervalued when teachers prioritized boys in feedback or activity selection, as shown in Table 1. These biases not only discourage participation but also perpetuate the perception that PA is not "for girls."

Conversely, supportive teacher attitudes significantly enhance engagement. As illustrated in Table 2, teacher encouragement and inclusive pedagogical approaches were mentioned in 11 studies as key facilitators. Girls valued teachers who created a positive environment and tailored activities to their interests and abilities (Kinsman et al., 2015). Similarly, family support emerged as a critical facilitator. Parental encouragement and involvement, such as attending sports events or providing logistical support, were associated with higher levels of participation (Gillison et al., 2017; Martinen et al., 2021).

Peer interactions also played a dual role. While supportive peers enhanced motivation and confidence, negative experiences, particularly in mixed-gender settings, acted as significant barriers.

Girls frequently reported feeling excluded or criticized by boys, which reinforced their reluctance to participate (Cowley et al., 2021; Watson et al., 2015). These findings suggest the need for targeted interventions to foster positive interpersonal relationships within PA contexts.

Interventions should prioritize teacher training to address unconscious gender biases and promote inclusive practices. Additionally, programs that encourage peer collaboration, such as cooperative learning techniques like the Jigsaw method (Cochon Drouet et al., 2023), can help create a supportive environment. Strengthening family involvement, for example, through workshops or community events, can further enhance girls' engagement by reinforcing the value of PA within their social networks.

Disparities in Engagement and PL Dimensions

A notable finding of this review is the mismatch between the emphasis on physical participation and the psychological and social dimensions of barriers and facilitators. Despite the centrality of physical engagement in definitions of PL, few interventions directly address physical barriers, such as inadequate facilities or lack of access to appropriate clothing. Instead, most studies focus on psychological and social factors, often treating them as ancillary to physical participation.

Even more striking is the lack of attention to cognitive engagement. As highlighted by Cale and Harris (2018), the cognitive dimension of PL—knowledge and understanding of PA—plays a crucial role in fostering long-term engagement. However, only one study in this review explicitly linked cognitive engagement to participation. This oversight represents a missed opportunity to leverage educational strategies to enhance girls' understanding of PA and its benefits.

Future interventions should adopt a more holistic approach, integrating physical, psychological, social, and cognitive dimensions. For example, PE programs could include educational components that teach girls about the physiological and psychological benefits of PA, as well as strategies for overcoming common barriers. These initiatives could help bridge the gap between knowledge and action, fostering a deeper and more sustainable engagement with PA.

Methodological Gaps in the Literature

This review identified several methodological limitations in the existing literature. As detailed in the "Results" section, we found only six studies using a quasi-experimental design in the full sample of articles, while the majority were observational. This reliance on observational data limits the ability to establish causal relationships between interventions and outcomes. Additionally, most studies had small sample sizes, with 51% involving fewer than 100 participants, restricting the generalizability of findings.

Longitudinal analyses were also scarce, with only four studies examining changes over time. This lack of longitudinal data makes it difficult to understand how barriers and facilitators evolve during adolescence, a period marked by significant physical, psychological, and social changes (Clark, 2015; Lamb et al., 2018). Moreover, policy and global factors—key components of the ecological model—were largely overlooked. Few studies examined how national policies or cultural norms influence girls' PA participation, leaving a critical gap in understanding systemic barriers.

To address these gaps, future research should prioritize experimental and longitudinal designs with larger, more diverse samples. Additionally, studies should explore the role of policy and global factors in shaping PA opportunities for girls, particularly in contexts where gender equity is a stated goal.

Strengths and Limitations of the Review

This review offers a comprehensive analysis of barriers and facilitators to girls' PA participation, integrating the ecological framework and PL dimensions to provide a nuanced understanding of engagement. It highlights underexplored areas, such as the role of cognitive engagement, and offers actionable insights for educators and policymakers. However, the review is limited by its binary approach to gender and the exclusion of intersectional factors, such as race and socioeconomic status. Future research should adopt more inclusive methodologies to capture diverse experiences and address systemic inequities. Finally, in terms of analysis, we do not focus on how intersecting identities such as race and socioeconomic status might affect girls' PA levels and interest, nor do we analyze the differences in barriers and facilitators according to grade level. These two aspects should be explored, to gain more information about individual and environmental influences on facilitators and barriers to girls' participation in PA.

Perspectives and Policy Implications

The findings of this review underscore the need for multisystemic interventions to address the barriers and facilitators identified. Schools, as central environments for adolescent development, offer a unique opportunity to implement such initiatives. Teachers should adopt inclusive pedagogical strategies, such as Teaching Games for Understanding (Bracco et al., 2019) and universal design principles, to create equitable learning environments.

Conclusion

The aim of this scoping review was to explore the barriers and facilitators to adolescent girls' PA through the intersection of the ecological framework and PL, and to identify gaps in the literature. This review highlights the need for multifaceted interventions, including programmatic changes, to increase girls' PA and emphasizes the significant impact of social factors on both mental and physical engagement. Prominent barriers include body image concerns and the influence of peers and teachers, while competence, autonomy, and social interactions are key facilitators. Notable gaps include a lack of experimental studies and research on policy and global influences. Surprisingly, the review found limited studies on PE contexts and teacher training in gender equality, despite their potential impact. Addressing social barriers and including cognitive aspects in future research are crucial for fostering sustained physical involvement. The review advocates

for comprehensive approaches that address the complex interplay of these factors in girls' PA participation.

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Appendix: Keyword Selection and Boolean Operators

Criteria	Keyword
Population	Girls and boys/girls/teenagers/students/children/gender/pupil/learner/Middle/high school students
Context	PE/physical education/physical activity/sport/hobbies/sports activities/sporty leisure/club/sport club/free sport practice/physical and sports activity
Concept	Gender/sex inequality/inequity/gap/difference/Involvement/participation/commitment/motivation/interest/motives for action/grounds for action/Decrease/increase in sedentary behaviour/lifestyle/lack of practice/disengagements/disinterested/inactivity/Quantity/amount/nature/type/access/offer/possibility Causes, factors, origin, reason, element, relationship, parameter
Boolean operators	<ol style="list-style-type: none"> 1. ("gender inequality" AND (factors OR reason OR origin) AND ("physical activity" OR "physical education" OR sports)) 2. girls AND (motivation OR engagement OR pleasure) AND ("physical activity" OR "physical education" OR sport) AND factors 3. (disengagement OR sedentary) AND girls AND (factors OR reason OR origin) AND ("physical activity" OR "physical education" OR sport) 4. ("gender inequality") AND (participation OR engagement OR investment) AND (physical activity OR physical education OR sport) 5. ("gender inequality") AND ("physical activity" OR sport OR "physical education") AND (quantity OR level) 6. ("girls' engagement" OR "girl participation") AND (physical activity OR physical education OR sport) AND (program OR intervention) 7. girls AND ("physical activity level" OR "sport participation" OR "sport engagement" OR "physical education participation" OR "physical education engagement") AND (factors OR solution) 8. (Girls OR "gender equality") AND ("physical education program" OR "physical activity sport" OR "sport program")