



GENDER-BASED PARTICIPATION IN PHYSICAL EDUCATION ACROSS PRIMARY AND SECONDARY SCHOOLS

Elena Avraam¹ⁱ,
Garyfallos Anagnostou²

¹PhD Candidate,
Department of Education,
Physical Education and Sport Sciences,
Frederick University,
Limassol, Cyprus
²Assistant Professor,
Department of Education,
Physical Education and Sport Sciences,
Frederick University,
Limassol, Cyprus

Abstract:

A growing body of international research has documented what many physical educators observe daily: girls consistently participate less actively in school-based physical education than boys. This troubling pattern manifests differently across developmental stages, while minimal divergence appears in early primary years (ages 5-11), pronounced disparities emerge during the critical transition to secondary education (ages 12-18). This systematic examination interrogates this phenomenon through multiple analytical lenses: first, by mapping participation trajectories across institutional contexts; second, by deconstructing the psychosocial dimensions of motivation and engagement; third, by evaluating pedagogical efficacy across instructional paradigms. Furthermore, these findings are situated within broader sociocultural frameworks, analysing how institutional policies and extracurricular infrastructures both constrain and enable equitable access to physical literacy development. A comprehensive literature search of peer-reviewed studies from 2015–2025 was conducted using databases including Scopus, SPORTDiscus, and Inclusion criteria focused on quantitative or qualitative research, reviews, and intervention trials examining gender differences in PE participation and related factors among school-aged youth. Data were extracted and thematically organized. Methodological quality and biases were noted to contextualize findings. Results showed that girls exhibit consistently lower PE participation frequency and intensity than boys, with the gender gap widening during adolescence. In addition, policy interventions have had mixed effects. While policies ensure access, they do not

ⁱ Correspondence: email eavraam@hotmail.com

automatically close the participation gap without supportive implementation. Notably, positive PE experiences (enjoyment, supportive climate, sense of competence) are strongly linked to higher physical activity both within and outside school. However, interventions have achieved moderate success in sustaining girls' participation.

Keywords: gender differences, physical education, motivation, youth equity, participation

1. Introduction

Few subjects in school curricula carry as much lifelong importance as physical education (PE). While its primary goal is teaching movement skills, PE's greater purpose lies in shaping lasting habits of health and activity. But for all its universal adoption, one persistent problem continues to trouble educators: year after year, study after study shows girls participating at lower rates than their male classmates. These disparities first appear in childhood, grow more pronounced during the adolescent years, and mirror broader societal inequalities between genders. Recent scholarship has intensified its focus on understanding both the roots of this participation gap and potential solutions (Preece & Bullingham, 2022; Salvatori & Cherubini, 2024). While European policymakers have made gender equity in education a priority, measurable differences in PE engagement persist.

The global data paints a concerning picture. When researchers examined physical activity levels among 1.6 million adolescents (ages 11-17) across 146 countries - the largest study of its kind - they found that 85% of girls weren't meeting WHO activity recommendations, compared to 78% of boys. This divergence begins around puberty and manifests clearly in school environments, where girls report significantly lower participation rates in vigorous exercise and organized sports. Perhaps most troubling is the pattern seen in multiple national contexts: this gender gap expands as students' progress through secondary education. For instance, international surveys consistently show that by secondary school, girls are significantly less likely than boys to engage in regular sports or high-intensity PE activities (Kalman *et al.*, 2015; Guthold *et al.*, 2020). In England, one study noted only 16% of 11-12-year-old girls met daily activity guidelines, dropping to 9% by ages 13-15, whereas boys' rates, though also declining, were higher (21% falling to 14%) (Harrington *et al.*, 2018). Such trends suggest that girls may not be receiving the full benefits of PE and are at risk of dropping out of physical activity altogether as they approach adulthood.

This literature review critically examines gender-based participation in PE across primary and secondary schools. Primary education is defined as roughly ages 5-11, and secondary as ages 12-18. "Participation" is considered broadly, including not only attendance in PE (which is often mandated) but also active engagement levels (e.g., time in moderate-to-vigorous activity), the quality of participation (effort, intensity), and psychological engagement (enjoyment, motivation, sense of belonging). The focus is

global, drawing on research from diverse cultural and policy contexts for a comprehensive comparison. Within this review, only findings on extracurricular sports participation were included, where they explicitly link to school PE, since experiences in PE and in out-of-school sport can influence each other (for example, a positive PE experience might encourage a girl to join a sports team, or vice versa).

A thorough search was conducted for empirical studies and reviews published in the past 10 years that address gender differences in school PE. This included quantitative studies (surveys, interventions, accelerometer-based activity monitoring), qualitative studies (interviews, focus groups with students or teachers), and mixed-methods research. Over 70 relevant articles from Europe, North America, Oceania, and other regions were identified. Each study was mapped to one or more key themes derived from the literature and the review's aims. The themes, established a priori based on common topics in the field, were refined as the literature was reviewed to ensure they captured the range of issues discussed by researchers. The themes are presented in the sections below: (1) Participation Patterns, (2) Attitudes and Motivation, (3) Instructional Strategies and Teacher Influences, (4) Sociocultural Factors (including developmental considerations), (5) Policy Impacts, and (6) Extracurricular Links. Within each thematic section, findings from different studies are compared. Consistencies (e.g., multiple studies finding girls less active than boys in class) as well as inconsistencies or context-specific nuances (e.g., cases where gender gaps are minimal or where boys face their own challenges) are noted. The authors considered study quality—such as sample sizes, whether activity was measured objectively or via self-report, and cultural contexts—though no formal quality scoring was applied, given our narrative synthesis aim. Greater weight is given in the discussion to large-scale or multi-country studies (for example, Guthold *et al.*, 2020, on global activity trends) and to systematic reviews (e.g., Duffey *et al.*, 2021, on girls' physical activity barriers) to ground conclusions in robust evidence.

The analysis that follows organises key discoveries thematically, weaving together statistical evidence with qualitative observations. This dual approach reveals the complex ways gender shapes PE participation from elementary through high school, capturing both measurable patterns and the lived experiences behind them.

2. Participation Patterns in PE by Gender

2.1 Gender Gaps in Frequency and Intensity

Research consistently shows that, on average, boys participate more vigorously and frequently in PE classes than girls (Avraam & Anagnostou, 2022). In primary schools, boys spend significantly more lesson time in moderate-to-vigorous physical activity (MVPA) than girls do. A recent meta-analysis by Silva *et al.* (2023) found that in primary-level PE classes across numerous countries, boys achieved about 5–10% more MVPA per lesson than girls, amounting to several additional active minutes per class. Similarly, in secondary school PE, boys are more likely to meet the widely recommended benchmark of 50% of class time in MVPA, although in general, neither gender often reaches this

target (Hollis *et al.*, 2017; Kokko *et al.*, 2019). For example, one UK study reported that Year 8 boys (age ~13) averaged around 40% of class time in MVPA compared to about one-third for girls, highlighting a notable gap (Fairclough & Stratton, 2016, as cited in Hollis *et al.*, 2017). These differences begin in childhood and tend to widen with age. Harrington *et al.* (2018) observed in a sample of English youth that 11–12-year-old girls accumulated less daily physical activity than boys of the same age, and that girls' activity levels declined more sharply by mid-adolescence. By secondary school, many girls are falling short of recommended activity levels during PE and beyond.

Importantly, some studies indicate that gender gaps in basic PE participation (e.g., attendance or enrolment in elective PE) can also emerge. In contexts where PE becomes optional in later years, girls often elect out or take fewer PE classes than boys (Biemmi, 2015; O'Reilly, Talbot & Harrington, 2023). For instance, Biemmi (2015) noted that in Italy, traditional school culture and scheduling led some adolescent girls to drop PE when it was no longer compulsory, whereas boys were more likely to continue. In a Canadian study, senior high school girls had higher non-participation rates in PE compared to boys, especially when other academic electives competed for their schedules (Rauscher & Cooky, 2016). These patterns suggest that beyond in-class activity intensity, mere presence and continuity in PE classes become gender-differentiated at the secondary level. It should be noted that not all research finds large gender differences in every context. In early primary school, many studies find no significant difference in young boys' and girls' enjoyment of and willingness to participate in PE, most children at that age are active and generally positive about PE (Navarro-Patón *et al.*, 2024). Some programs and schools also show relatively small gender gaps, indicating that local culture and practice matter. For example, a study in Finland found only minimal differences in MVPA between girls and boys during PE in lower primary grades, attributed to a highly inclusive curriculum and pedagogy (Jaakkola *et al.*, 2017). The evidence suggests these gender disparities aren't set in stone - when conditions are right, we see participation rates begin to equalize. Yet the overwhelming body of research paints a consistent picture: in most school settings, girls engage less actively in PE compared to boys. This persistent gap becomes especially troubling as students progress from childhood through adolescence, often deepening during the critical transition to secondary school.

At the heart of these participation differences lie fundamental psychological factors. How students feel about PE, whether they find it enjoyable, feel motivated to participate, or see themselves as competent, profoundly influences their engagement levels. Decades of educational research confirm a simple but powerful truth: when students genuinely value an activity and find personal meaning in it, they participate more actively and consistently. This psychological dimension helps explain why boys and girls often experience PE so differently, and why these differences manifest in unequal participation patterns.

2.2 Overall Enjoyment and Attitude

By the time students reach secondary school, large-scale surveys consistently indicate that boys, on average, have more positive attitudes toward PE than girls. In a recent nationwide survey in England, only about 64% of adolescent girls said they enjoyed PE, versus 86% of boys (Youth Sport Trust, 2019), a striking “enjoyment gap” that was especially pronounced in the later teen years. While this statistic comes from a non-academic report, it aligns with trends reported in academic studies. For example, an earlier review by Subramaniam and Silverman (2007) found that middle school boys held significantly more favourable attitudes toward PE than girls did, and that attitudes for both genders declined with age, with girls’ attitudes declining at a steeper rate. By high school, a substantial proportion of girls express ambivalence or dislike toward PE. One UK study reported that only 52% of 14-year-old girls said they liked PE, compared to ~85% of 14-year-old boys (Brooks & Magnusson, 2006). Similarly, in Ireland, Fraleigh and Byrne (2022) noted that adolescent girls were far less likely than boys to agree that PE was one of their favourite classes. In contrast, at the primary level, many studies find little to no gender difference in enjoyment of PE, most young children of both sexes say they have fun in PE class (Navarro-Patón *et al.*, 2024). Qualitative research by Constantinou, Manson, and Silverman (2009) revealed that girls entering middle school often started out liking PE and considering themselves “athletic” and “competitive” like boys. It is typically during the middle school years (ages ~11–14) that girls’ enjoyment and enthusiasm for PE drop markedly.

One reason frequently cited for this decline is the change in the PE environment at the secondary level, which often becomes more competitive, sport-focused, and performance-oriented, which may appeal less to many girls (Ennis, 1999; Kirk, 2019). Whereas primary PE is usually more game-based and inclusive, secondary PE curricula tend to prioritize traditional team sports and skill drills, which some girls find alienating, especially if they lack prior sport experience. Girls who are less skilled or simply less interested in competitive sports can feel sidelined or discouraged, leading to lower enjoyment (O’Reilly *et al.*, 2023). In focus groups, adolescent girls frequently voice that PE is “for the sporty” and not designed for the average girl (Clark *et al.*, 2021). By contrast, boys often derive social status and enjoyment from the competitive aspects of PE, which can reinforce their positive attitudes.

2.3 Motivational Constructs

Self-determination theory and related motivational frameworks have been widely applied to PE to understand gender differences in motivation. Key motivational factors include perceived competence, intrinsic vs. extrinsic motivation, task value, and goal orientations. Research consistently shows that boys tend to report higher perceived competence in physical activities and sports than girls, which in turn boosts their motivation and enjoyment (Xiang, McBride & Bruene, 2006; Leisterer & Gramlich, 2021). Girls, on average, have lower confidence in their physical abilities, a gap that can stem from both actual skill differences and gender-biased feedback. By early adolescence,

many girls believe they are “not good” at PE or sports, even when their skill levels are objectively like boys’ (Belabbes *et al.*, 2025). This lower perceived competence is associated with weaker intrinsic motivation. Girls also more often cite external barriers or extrinsic reasons (e.g., exercising for appearance or because they “have to”) for PE participation, whereas boys more frequently mention intrinsic reasons (having fun, wanting to compete) (Portela-Pino *et al.*, 2020).

Further, goal orientation research indicates some gender differences: boys tend to be more performance or ego-oriented (focused on winning or being the best), whereas girls are often more task- or mastery-oriented (focused on personal improvement), though this is not a strict dichotomy (Xiang *et al.*, 2018). A mastery climate (emphasizing personal progress, effort, and cooperation) appears to benefit girls’ motivation in PE more than a performance climate does. If PE classes are very publicly competitive, for instance, posting fitness scores or having captains pick teams, many girls find it discouraging or embarrassing, which undermines their motivation (Fisette, 2013). Boys, on the other hand, might be more comfortable or even motivated by competitive ranking. Thus, differences in what motivates boys vs. girls in PE can influence their participation: approaches that enhance girls’ sense of competence, autonomy, and social connection tend to foster their engagement (Aelterman *et al.*, 2012), whereas approaches that simply increase competition and comparison can widen the gender gap in motivation.

3. Instructional Strategies and Teacher Influences

The delivery of physical education, from what gets taught to how teachers engage with students, plays a crucial role in shaping girls’ and boys’ experiences differently. Recent studies have begun unpacking how specific teaching methods and classroom dynamics either reinforce or help break down these persistent participation gaps. When we examine the nuts and bolts of PE instruction, including the activities chosen, the way skills are taught, and even how teachers give feedback, we start seeing why some approaches consistently disadvantage one group over another. This line of inquiry proves particularly valuable because unlike fixed factors like school infrastructure, teaching practices represent changeable elements where meaningful intervention can occur.

3.1 Curriculum Content and Activity Choices

Traditional PE curricula often prioritize team sports (e.g. football) and competitive activities. These have historically been considered “masculine” domains and can be less appealing to many girls, especially those without prior sport experience or confidence in those activities. Studies have shown that when PE programs diversify their offerings to include activities with broader appeal (e.g., dance, aerobics, gymnastics, or noncompetitive fitness activities like yoga), female participation and enjoyment tend to increase (Girls’ Schools Association, 2018; López-Morales *et al.*, 2023). For instance, an intervention in Spain introduced non-traditional games and dance into middle school PE

and reported a significant uptick in girls' active participation, without any drop for boys (Martín *et al.*, 2022). Girls often express interest in a wider array of physical activities beyond the standard team sports. By incorporating options that are culturally perceived as more "female-friendly" or simply less competitive, PE programs can better engage girls.

Conversely, a curriculum that remains heavily sport-centric and competitive may inadvertently favour boys' participation. Constantinou *et al.* (2009) noted that the hyper-competitive atmosphere in many mixed-gender PE classes negatively influenced girls' willingness to participate. The girls in their study said that when PE felt like "serious competition", often dominated by boys who had higher skill or took control of games, it became intimidating rather than fun. In such settings, less-skilled students (disproportionately girls) might hang back, participate minimally, or opt out. In contrast, girls responded more positively to activities emphasizing personal improvement, cooperation, and fun over winning. Empirical interventions support these observations. For example, Lonsdale *et al.* (2013) implemented a "Game Sense" approach (a teaching games for understanding model emphasizing strategy, teamwork, and inclusive play) in Australian secondary PE classes. This pedagogical shift led to improved engagement among both genders, but particularly helped girls feel more included and competent in games. Similarly, a curriculum experiment in the UK that integrated creative movement and fitness workouts alongside traditional sports found that girls' lesson enjoyment and moderate-to-vigorous activity increased significantly, whereas boys' participation remained high (Kirk *et al.*, 2018). These findings suggest that broadening the PE curriculum can reduce gender disparities in participation.

3.2 Teacher Expectations and Biases

Teachers play a pivotal role in shaping the classroom climate. Studies have probed whether PE teachers hold different expectations for boys and girls or interact with them differently, often without conscious intent. Research from the past has documented instances of gender-based teaching behaviours, for example, giving more skill feedback to boys, praising boys for performance but girls for effort, or assuming boys will be "naturally" more interested in sports (Nicaise *et al.*, 2007; Preece & Bullingham, 2022). Such differential treatment can influence student confidence and participation. In recent years, awareness of these issues has grown, and some teachers have adjusted practices to be more equitable. However, subtle biases may persist. A study by Mateo-Orcajada *et al.* (2021) surveyed PE teachers and found that a significant subset still held stereotypical beliefs (for instance, that boys are more suited to competitive sports and girls to dance or aesthetic activities). These beliefs can manifest in how teachers organise classes, e.g., letting boys take lead roles in games, or being more lenient with girls in physical tasks, which can reinforce gender norms and affect participation. Girls may internalise lower expectations (feeling that the teacher doesn't expect them to be as skilled or competitive), leading to reduced effort or interest. Boys, conversely, might get more encouragement to push themselves.

Encouragingly, professional development programs can help teachers become aware of and counteract biases. Kollmayer *et al.* (2020) evaluated a teacher training program in Austria (“REFLECT”) aimed at promoting gender equality in schools. PE teachers who underwent this program reported increased consciousness of how they treated students in PE and made deliberate changes, such as rotating leadership roles and ensuring equal attention. In follow-up observations, those teachers provided more balanced feedback and actively included girls in demonstrations and game strategy discussions, which corresponded with better engagement from female students. Another intervention involved teachers video-recording their own PE classes and reviewing them with a coach; upon viewing, some were surprised to catch themselves saying things like “let’s have a boy demonstrate this skill” or grouping students by gender in ways that limited interaction (Bailey *et al.*, 2021). With feedback, teachers learned to distribute attention more evenly and encourage both genders equally. This kind of reflective practice has been shown to reduce unintentional bias in instruction.

3.3 Mixed-gendereducational vs. Single-Sex Class Organisation

Instructional grouping is a major debate in gender and PE. One long-standing question is whether separating PE classes by gender leads to better outcomes, particularly for girls, or whether mixed-gendereducation is preferable. Proponents of single-sex PE argue that girls participate more freely and confidently when boys are not present, free from fear of judgment or dominance by male peers (Lirgg, 1994; Hastie *et al.*, 2018). Indeed, several studies have found that girls’ self-reported comfort and activity levels increase in all-girls PE settings (e.g., Hills & Croston, 2012; Timken *et al.*, 2019). In one study in Scotland, girls in single-gender PE classes spent significantly more time in MVPA than girls in mixed-gender classes, and they attributed it to feeling less self-conscious and not having to compete with boys (Hastie *et al.*, 2018). Qualitative data often show that many girls prefer single-sex PE; they cite reasons like being able to participate without feeling judged on their appearance or skills by boys and enjoying physical activity more when among other girls with similar comfort levels (O’Reilly *et al.*, 2023). Interestingly, some research indicates boys may also appreciate single-sex classes, not for confidence reasons, but because they feel they can be “less restrained” or not worry about accidentally injuring girls during aggressive play (Hastie *et al.*, 2018).

On the other hand, critics of single-sex PE note that it can reinforce gender segregation and stereotypes, and that mixed-gendereducational PE has social benefits when done. Some studies find no clear advantage of single-sex classes for objective outcomes. For instance, a controlled study by Koopman *et al.* (2019) in the Netherlands randomly assigned some PE units to be single gender and others mixed-gender, and measured girls’ enjoyment and effort. They found no overall difference in girls’ enjoyment between the single-sex vs. mixed-gender conditions on average; however, interviews revealed a more nuanced picture: high-skilled, sport-oriented girls often favoured mixed-gender classes (enjoying the competition with boys), whereas less confident girls favoured single-sex settings where they felt less embarrassed. The authors concluded that the effectiveness of

single-sex grouping may depend on the student composition and the quality of teaching. A poorly run single-sex class could still marginalise less skilled girls (through internal competition or cliques), while a well-run mixed-gender class can be inclusive with the right pedagogy (Koopman *et al.*, 2019).

In practice, some schools have implemented hybrid approaches, for example, running single-sex PE during certain units or during early secondary years when body image concerns peak, and mixed-gender classes at other times (Rauscher & Cooky, 2016). This combines potential benefits: giving girls a comfortable space when most needed, while retaining mixed-gender experiences to foster gender integration and equality. The research remains mixed on this issue. The consensus emerging is that context and implementation matter more than the class format itself. A respectful, inclusive classroom climate can be achieved in mixed-gender classes if teachers deliberately structure activities to ensure equal participation (e.g., mixed-gender teams where everyone has a role, or non-elimination games). Conversely, single-sex classes could be more engaging for girls in some cases, but they are not a panacea, and they do not address issues of gender equity outside the single-sex bubble. The debate is still unsettled, but it highlights that instructional strategy (how we group and teach students) has significant implications for gendered participation.

In summary, instructional factors are a powerful lever in either exacerbating or reducing gender gaps in PE. When PE is taught in a gender-responsive way, with an inclusive curriculum, diverse activity offerings, supportive feedback, and equitable expectations, the gender gap in participation can shrink markedly. Conversely, if one-size-fits-all, traditionally masculine methods are used without regard for gender dynamics, they often end up favouring boys and disengaging many girls. The literature suggests that many of the apparent “gender differences” in participation are not fixed traits of boys vs. girls, but rather products of the learning environment. Thus, educators and schools have considerable capacity (and responsibility) to change those environments to be more inviting for girls (and indeed for all students).

4. Sociocultural and Developmental Factors

Students don't come to PE class as blank slates - their participation is shaped by powerful social forces and the natural changes of growing up. This section examines two key influences: first, the unspoken rules societies create about how boys and girls should behave, and second, the physical and emotional transformations of adolescence. Together, these forces create different PE experiences for different genders.

4.1 The Hidden Curriculum of Gender

Long before children ever pick up a basketball or put on gym clothes, they've absorbed countless messages about what's "appropriate" for their gender. These invisible rules profoundly affect how students engage with physical activity. Consider the typical stereotypes: boys get praised for being aggressive and competitive on the field, while

girls often receive subtle cues that grace and restraint are more valued than athleticism. Although these norms are gradually shifting, their legacy persists in gyms and playgrounds worldwide. In some communities, you can still hear echoes of the old belief that vigorous exercise might somehow compromise femininity, while boys face equal but opposite pressures to prove their masculinity through sport. A stark example is seen in certain conservative societies: in some Arab countries, traditional norms long viewed vigorous sport as unfeminine or even immoral for girls (Sharara *et al.*, 2018). Girls in such contexts often grow up with limited opportunities or encouragement for sport. Even when PE is introduced in schools, there may be social resistance or logistical barriers, for instance, a lack of female PE teachers, or cultural dress codes (like requirements for modest attire) that make typical PE activities difficult (Sharara *et al.*, 2018). Until recently, places like Saudi Arabia had outright bans on PE for girls in public schools. Those bans have been lifted, but deep-rooted attitudes do not change overnight. Sharara *et al.* (2018) systematically reviewed physical inactivity in Arab countries and highlighted gender as a consistent determinant: across studies, women and girls were far less active than men and boys. Reasons included cultural expectations that girls prioritize modesty and domestic roles over sport, fewer sport facilities deemed acceptable for females (e.g., women-only gyms are scarce), and, in some cases, restrictive policies (now evolving). At the same time, the review noted that these cultural barriers are not insurmountable; it gave examples of women in these societies finding ways to participate by framing physical activity in culturally acceptable terms (for health, in women-only settings, etc.). The implication is that culture heavily influences participation, but it can evolve with policy support and shifting attitudes.

Even in Western contexts, gender norms play a role. For instance, in many Western countries, sport is still often masculinized in school culture, athletics may be more strongly associated with male identity. Girls who are athletic can face a double bind of either being seen as less feminine or feeling they must downplay their competitiveness to fit gender norms (Velija & Kara, 2020). PE classes, which often foreground physical prowess, become a stage where gender norms are enacted: boys may feel pressure to perform machismo; girls might hesitate to “sweat” or exert fully in front of peers due to fear of looking unfeminine (Cárcamo, Moreno & del Barrio, 2021). A qualitative study of Spanish primary schools captured this in the phrase “girls do not sweat”, reflecting a stereotype that vigorous physical exertion is not ladylike (Cárcamo *et al.*, 2021). Such stereotypes can dampen girls’ participation, especially as they approach adolescence and peer perceptions intensify. On the contrary, boys can also be constrained by norms; a boy who dislikes competitive sports or prefers dance might face ridicule due to gender expectations, which can affect his PE experience. Thus, rigid gender norms hurt everyone by limiting the range of acceptable engagement.

4.2 Peer and Social Influences

In the school setting, peers significantly shape one’s willingness to participate. Adolescent girls consistently report that fear of negative judgment, especially by male

peers, is a barrier in PE (Clark *et al.*, 2021; O'Reilly *et al.*, 2023). If the class climate tolerates teasing or if boys openly mock girls for “playing poorly,” many girls will withdraw. Even without overt teasing, just the presence of adolescent boys can heighten girls’ self-consciousness, especially for activities that involve body exposure (like changing for PE or doing activities that draw attention to one’s body). A UK survey by Women in Sport (2017) found that a majority of 14–16-year-old girls felt uncomfortable being active in front of boys due to concerns about being judged on appearance or ability. Boys are not immune to peer influence either; some boys might hold back if the peer norm is that “PE isn’t cool” or if they fear failing in front of others. However, on balance, the literature suggests peer approval for sports is generally higher for boys than for girls in many cultures (Smith & Leaper, 2019). This means boys often get social rewards for being good at sport, whereas girls might get mixed messages (they may equally value being seen as “feminine” or academically successful over being sporty).

Another social factor is parental influence. Parents’ attitudes toward physical activity can differ for sons and daughters. Some studies indicate that parents are more likely to encourage vigorous play and sports in boys, while being more protective or emphasizing other activities for girls (Dumith *et al.*, 2011). Parental support has been identified as a key predictor of children’s physical activity. Girls who receive strong encouragement and support from parents to be active (e.g., parents play sports with them, attend their games, buy equipment) are more likely to participate in PE and sports, and the gender gap narrows in families with egalitarian attitudes (Lisinskiene *et al.*, 2019). Conversely, in families with traditional views, girls may lack encouragement or even face discouragement for sports, affecting their engagement in PE at school.

4.3 Puberty and Developmental Changes

One cannot overstate the impact of puberty and adolescent development on girls’ PE participation. As girls go through puberty (typically between ages 10–14), they experience physical and emotional changes that can affect their comfort in PE. Puberty often brings rapid increases in body fat, changes in body shape, and for many girls, the onset of menstruation, all of which can make the PE context more challenging. Girls frequently report heightened body self-consciousness during these years; they may feel uncomfortable in PE uniforms or during activities that make them feel exposed (Slater & Tiggemann, 2010). This is compounded by comparison and the feeling of being “on display,” especially in mixed-gender settings. Early maturing girls tend to withdraw from physical activity more than later-maturing peers (Baker *et al.*, 2007). An early-developing girl might suddenly feel out of place if, for example, she is the first in her class to need a sports bra or to deal with menstrual symptoms during PE. Without sensitive handling by PE teachers, these girls can lose confidence and opt out of vigorous activity. In contrast, boys’ puberty generally boosts their physical capabilities (increased muscle mass, strength, aerobic capacity), often making them more competitive and confident in sports as they get older. Thus, the timing of puberty can exacerbate gender gaps: around early adolescence, many girls’ physical self-perceptions and actual performance in

certain activities dip relative to boys', who are hitting a testosterone-fuelled spurt of strength and speed. This can create a divergence in PE experiences; the activities remain the same, but suddenly girls may feel they can't keep up with boys, reinforcing perceptions that "PE is for boys."

Girls also face practical developmental challenges: managing periods in the context of PE is a well-documented concern. Surveys show a significant percentage of girls skip PE or sit out at least occasionally because of menstrual issues (headaches, cramps, fear of leakage, etc.) (Hammer *et al.*, 2014). If PE facilities lack private changing areas or if teachers are unsympathetic, this can greatly deter participation. Meanwhile, adolescent boys do not have an equivalent routine physiological hurdle to participation. All these factors mean that early adolescence is a critical period where many girls' trajectory in physical activity veers downward. Indeed, data from multiple countries confirm that around age 12–15 is when girls' dropout from sports and activity accelerates (Women's Sports Foundation, 2018). They reported that by age 14, girls drop out of sports at roughly twice the rate of boys. Puberty is not solely responsible; social factors we discussed are intertwined, but it plays a substantial role by introducing body image issues and physical changes that the PE environment must accommodate. Efforts like providing girls more choice in activities during this phase, offering female mentors, addressing body image and nutrition in the curriculum, and ensuring PE uniforms are comfortable and modest can all help mitigate the negative impact of puberty on girls' participation (Frühauf, Hundhausen & Kopp, 2022). It is also worth noting that not all girls react the same way: some athletic girls continue with high engagement through puberty, especially if they have a strong sport identity or a supportive environment. The key is that puberty tends to widen variability among girls; some drop out, others persist, whereas boys more uniformly continue, often because their developmental changes align with improved sport performance.

4.4 Body Image and Self-Consciousness

Closely linked to both sociocultural and developmental factors is the issue of body image. By middle school, many girls experience increased self-consciousness about their bodies, which can be triggered in PE settings (changing clothes, wearing form-fitting gym uniforms, being watched while performing physical skills). Body image concerns have been shown to significantly deter participation in PE, especially for girls who develop early or who internalize narrow ideals of female bodies (Lyu & Gill, 2019; Sabiston *et al.*, 2019). Adolescent girls who feel dissatisfied with their bodies or who believe others are evaluating their appearance often withdraw effort or avoid activities in PE that they fear will draw attention (such as swimming, gymnastics, or even running). Qualitative accounts abound of girls saying they sit out swimming units due to embarrassment or avoid raising their hand to demonstrate exercises because they don't want peers looking at their bodies (Fisette, 2013; O'Reilly *et al.*, 2023).

A narrative review by Sabiston *et al.* (2019) on body image in sport and physical activity contexts highlighted that body image can be both a deterrent and an outcome of

participation. On one hand, negative body image (feeling overweight, unattractive, etc.) predicts lower engagement in PE and sports for girls. On the other hand, positive experiences in PE can improve girls' body confidence. Interventions that address body image, for example, discussions on media images, emphasis on what bodies can *do* rather than how they look and having strong female role models, can help girls feel more comfortable being active. Kerner *et al.* (2018) focused specifically on body image disturbances in PE and found that a significant portion of girls reported feelings of embarrassment about sweating or getting red-faced in front of classmates, which made them hold back in exertion. Some even said they avoided trying too hard to not appear "too muscular" or "tomboyish," reflecting internalized societal pressures.

Efforts to create a body-positive PE environment are crucial. This could involve establishing norms that ridicule or comments about bodies are not tolerated, incorporating lessons about healthy body image into health/PE curriculum, and providing uniforms that offer options (for instance, allowing girls to wear looser track pants instead of shorts if they prefer). Duffey *et al.* (2021), in a systematic review of reviews on girls' physical activity barriers, identified body image and social evaluation concerns as one of the most pervasive barriers, but also noted that programs involving peer support and female mentors had some success in alleviating these concerns. For example, the Girls Active program in the UK included mentoring and discussions around body confidence; its evaluation noted small improvements in girls' self-esteem and a modest increase in activity (Harrington *et al.*, 2018). While the effect sizes were not large, they point to the importance of addressing the psychosocial domain, not just providing activities.

The cumulative evidence reveals how sociocultural forces and developmental changes create unique challenges for girls in physical education. From deeply ingrained gender stereotypes about athleticism to the social pressures of adolescence, girls navigate a complex web of barriers that frequently discourage PE participation. What makes these findings particularly valuable for educators is that these influences aren't fixed - they respond to intentional intervention. Schools that implement strategies like single-gender classes during sensitive developmental periods, curricula emphasizing body competence over appearance, and exposure to diverse female athletes demonstrate that these patterns can change. This perspective shifts the conversation from viewing girls' lower participation as individual preference to understanding it as the product of social conditioning a crucial distinction for creating truly equitable PE programs.

5. Policy Impacts and Initiatives

School and education policies set the context within which PE is delivered and thus can have profound impacts on gender-based participation. Policies can be formal (laws, mandates, curricula requirements) or informal (school-level practices and traditions). This section discusses how policy decisions, from scheduling and resource allocation to equality legislation, influence gender participation in PE.

Curriculum Requirements and Time Allocation: One basic policy factor is whether PE is mandatory and how frequently it is offered. In some countries or regions, PE becomes optional after a certain age. Where PE is elective, gender disparities can emerge as noted earlier: girls may be less likely to choose PE when given the choice. For instance, in parts of Canada and the USA, PE is compulsory only up to Grade 9 or 10; enrolment data show boys enrol in optional PE classes at higher rates than girls in the later grades (Rauscher & Cooky, 2016). Thus, a policy of making PE optional can inadvertently result in more girls dropping out of PE. Some education systems have recognized this and introduced policies to keep girls in PE. For example, an Australian state policy ensured that all students (male and female) must take PE or a health/PE integrated course through Grade 12, partly to promote lifelong activity for both genders (Kokko *et al.*, 2019). Policy can also dictate minimum PE minutes per week; if those are increased, it gives more opportunity to engage all students, though without addressing qualitative factors, increased time alone may not reduce the gender gap.

5.1 Single-Sex Provision Policies

As discussed under instructional strategies, whether to allow or encourage single-sex PE is partly a policy matter. Some jurisdictions have explicit policies either requiring mixed-gender PE or, conversely, permitting single-sex classes under certain conditions. For example, in the U.S., Title IX allows single-sex physical education classes in limited circumstances (such as contact sports or when used to remedy past discrimination), but generally, schools default to mixed-gender. In the UK, schools have more leeway; some secondary schools choose to separate PE by gender, especially at KS4 (ages 14–16). Policy debates revolve around whether single-sex classes violate equality mandates or, on the contrary, are necessary to achieve equality of outcomes. The *policy on single-sex PE* thus varies. Where allowed, some schools implement it to boost girls' participation. Evaluations of such policies suggest they can be effective if thoughtfully applied (Timken *et al.*, 2019 found girls in a pilot single-sex program in Wales had higher activity levels), but there is also concern about reinforcing gender segregation. Policymakers often strike a balance: for instance, a policy might encourage mixed-gender PE generally but permit single-sex activities during units like swimming or health education (when students might be more comfortable discussing sensitive topics in single-gender groups). The key from a policy perspective is flexibility to adapt to student needs while upholding the spirit of gender equity.

5.2 Resource Allocation and Facilities

Policy decisions on resource allocation can also impact gender equity in PE. If equipment and facilities are biased toward traditionally male activities, girls can be disadvantaged. A common historical example is giving priority to boys' football for field space while girls do calisthenics on the sideline, something Title IX tried to eliminate. Even today, if a school's budget prioritises certain sports (often boys' teams) or if scheduling gives prime gym time to boys, it sends a message about whose activity is valued. Ensuring that girls

have equal access to quality equipment, locker rooms, and facilities is a policy and administrative responsibility. On a larger scale, government or district funding for programs specifically targeting girls can make a difference. For instance, some governments have funded initiatives like “Girls in Sport” or provided grants for schools to run after-school physical activity clubs for girls. Schools that have utilized such funding often see upticks in girls’ engagement (e.g., Canada’s FitSpirit program described a model where external resources helped schools set up girl-friendly activities and events, leading to thousands of girls becoming more active (Mathieu *et al.*, 2021)). In this way, supportive policy and funding can catalyse change on the ground.

5.3 Extracurricular and Community Link Policies

Some education policies extend beyond PE classes per se and aim to integrate school PE with community sports opportunities. For example, Australia’s “Sporting Schools” initiative (launched in 2015) provided funds for schools to partner with local sports clubs and deliver age-appropriate programs within PE or after school, with an emphasis on including girls (Kokko *et al.*, 2019). The idea was that introducing girls to community sports in the safe space of school PE might bridge the gap to sustained participation. Evaluations of such linkages suggest they can modestly increase girls’ uptake of community sport when programs are free and conveniently offered at school (Kokko *et al.*, 2019). This blends into the next section on extracurricular links, but it’s mentioned here to illustrate how policy initiatives (often at government or sport-agency level) deliberately targeting the gender gap can influence outcomes. Another example: some countries have policies for female coaching and leadership in school sports (e.g., mandating or incentivizing a certain percentage of female PE teachers or coaches). Research indicates that having female PE teachers and coaches can positively affect girls’ participation. Girls often relate better and see a role model (Preece & Bullingham, 2022). Thus, policies that promote hiring and training more women in PE roles are indirectly a gender-participation policy as well.

In summary, policy shapes the landscape of PE participation. Broad anti-discrimination laws have removed formal barriers and increased access, but they have not by themselves achieved parity in participation. More fine-tuned policies, such as those that adjust class grouping, ensure equitable resources, fund targeted programs, and encourage female representation among PE staff, play an important role in addressing the remaining gaps. Policy impacts are often realized over the long term and interact with school culture. Achieving gender equity in PE likely requires a combination of top-down mandates (to ensure opportunities and resources) and bottom-up changes (in teaching practice and school climate). Progressive policies in some regions have shown promise in narrowing the participation gap, but policy alone is not a magic bullet. It must be coupled with on-the-ground implementation that is sensitive to the needs and voices of students.

6. Links Between PE and Extracurricular Sports Participation

A growing body of research examines the interplay between school PE and extracurricular sports or physical activity involvement. Participation in organized sports or physical activity outside of school often correlates with higher engagement in PE classes, and vice versa. This section explores how experiences in PE can influence extracurricular sport participation (and vice versa) and how bridging these domains can help address gender disparities.

6.1 The Feedback Loop Between PE and Out-of-School Sport

Students who are involved in sports or physical activity clubs outside school tend to be more confident and active during PE. They often bring skills and motivation from their extracurricular experiences into the class. Not surprisingly, boys have historically had higher rates of extracurricular sport participation than girls, which partly feeds into the gender gap in PE. A pan-European study noted that by age 15, a significantly higher proportion of boys participate in sports clubs compared to girls (Kokko *et al.*, 2019). Those sport-involved boys come to PE with greater fitness and often a positive attitude, reinforcing their active participation. In contrast, girls who do not do any sport or activity outside of school may rely solely on PE for physical activity and might feel less adept or less interested.

However, positive PE experiences can spark interest that leads a student to join an extracurricular sport. For example, a girl who discovers in PE class that she enjoys badminton or basketball might be encouraged by her PE teacher or peers to join an after-school team or community league. Many girls report that a supportive PE teacher who noticed their interest and guided them to a local club was instrumental in getting them involved in sport (Martín *et al.*, 2022). On the other hand, if a girl has a negative experience in PE (feeling embarrassed or bored), she may be unlikely to seek out sport opportunities outside school, or may even quit ones she was involved in. There is evidence that girls who drop out of extracurricular sports are often also disengaged in PE, since their primary source of physical activity enjoyment was gone (Slater & Tiggemann, 2010). Therefore, sustaining girls in extracurricular sports can help maintain their engagement in PE classes as well, and *vice versa*.

6.2 Mutual Benefits and Transfer

Being active outside school can improve fitness and skill, which can make PE classes easier and more enjoyable, creating a positive cycle. Conversely, a quality PE program can equip students with fundamental skills and confidence that make them more likely to seek out activity on their own. This is particularly relevant for girls, who might not otherwise get an introduction to certain sports. Telford *et al.* (2016) found that girls with any sports club experience were significantly more physically active during PE and recess than girls with no club experience, suggesting club sports can build habits and self-assurance that carry into school life. Likewise, Cowley *et al.* (2021) noted that adolescent

girls involved in community sport perceived greater social support for being active and had higher self-efficacy in PE. The interplay is complex and influenced by socioeconomic factors (access to clubs, parental support, etc.), but the general idea is that school PE and extracurricular sport are synergistic.

6.3 Bridging Programs

Recognising this, some policies and programs explicitly aim to connect PE with community sport. One approach has been to invite community coaches or sports clubs into PE classes as guest instructors or to run short programs. For example, the Sporting Schools program in Australia brought in coaches from sports like netball or cricket to lead a series of PE lessons, with information for students on how to join local teams (Kokko *et al.*, 2019). Evaluations showed these bridge programs increased girls' awareness of sport opportunities and, in some cases, led to higher sign-ups in community clubs, especially in sports that were traditionally male-dominated (Eime *et al.*, 2021). Similarly, in England, the "This Girl Can" campaign (a national initiative to promote women's sport) provided schools with materials to encourage girls to try local sports sessions, using inspirational messaging in PE classes. Schools reported that some previously inactive girls found an entry point into activities like dance fitness classes or girls-only running groups via this campaign (Women in Sport, 2017).

6.4 Extracurricular Disparities

It is important to note that disparities in extracurricular sport mirror those in PE. Boys not only participate more but also have a wider range of sports offerings in many communities. Girls' sports programs (outside of school) are growing, but in some areas, opportunities for girls, especially in certain sports or at certain ages, remain limited. This has a circular effect: fewer outside opportunities for girls means fewer girls gain outside experience to bring into PE, which can perpetuate lower confidence and participation in PE. A study in six European countries concluded that increasing girls' extracurricular sport participation could be a "key lever" to reducing the overall gender activity gap, as girls who played sports outside school were far closer to boys in total activity levels (Kokko *et al.*, 2019). That study recommended schools actively collaborate with community sports to recruit and retain girls, highlighting that schools are uniquely positioned to reach girls who might not otherwise consider joining a team.

6.5 Role of School Sports Teams

In many secondary schools, extracurricular sport is not separate from school; interscholastic teams and clubs are part of the school culture. Here, the link with PE is nuanced. On one hand, school sports teams (e.g., the girls' soccer team) can raise the profile of female athleticism in the school, giving other girls role models and perhaps increasing overall interest in PE/sport. On the other hand, there can be a divide: the "athletes" vs "non-athletes." Research by Simon, Marttinen & Phillips (2021) on marginalized girls in an afterschool program found that many girls outside the

mainstream sports culture felt PE and school teams did not cater to them. They benefited greatly from an alternative, more inclusive afterschool physical activity program (the REACH program in that study), which was less competitive and more socially supportive. This suggests that extracurricular offerings within school need to be diverse as well, not just traditional competitive teams, but also recreational clubs or fitness groups that appeal to a broader range of girls. Schools that have implemented non-competitive physical activity clubs (like lunchtime dance clubs, hiking clubs, etc.) have seen increased overall activity levels and an engagement of girls who otherwise sat on the sidelines (Belansky *et al.*, 2016). Thus, bridging PE with extracurriculars isn't only about feeding girls into competitive sports; it can also be about creating a continuum of activity opportunities, from informal to formal, that reinforce each other.

In summary, there is a dynamic bidirectional link between PE participation and extracurricular sport participation. Both reflect underlying interest and motivation, and each can influence the other. Efforts to improve gender equity in physical activity should leverage this link: success will likely come from a whole school and community approach, where gains made in PE (such as increased confidence and skill among girls) are channelled into after school and lifelong activity, and where experiences from extracurricular programs feed back into more enthusiastic PE participation. Schools serve as a critical bridge in this regard, especially for girls, who may require more encouragement to either stay active or become active in a world that has often given them fewer invitations to play.

7. Discussion

The findings of this literature review paint a comprehensive yet nuanced picture of gender-based participation in physical education. Over the last decade, research has deepened our understanding of how and why girls' PE engagement typically differs from boys', and what strategies might close this gap. In this discussion, we integrate insights across the thematic areas, reflect on practical implications for policy and practice, and outline directions for future research. Two broad themes emerge: (1) addressing persistent gender gaps in PE requires changes at multiple levels (pedagogical, sociocultural, and policy), and (2) many disparities are context-dependent, meaning one-size solutions may not fit all schools or student populations.

First, it is evident that no single factor explains girls' lower participation, it results from an intersection of factors. By early adolescence, girls face a convergence of motivational challenges, social pressures, and structural inequities that collectively reduce their PE involvement. Any interventions must therefore be multi-faceted. For example, simply mandating mixed-gender PE or providing access (a structural fix) is necessary but not sufficient; it must be accompanied by teacher training to foster inclusive pedagogy (an instructional fix) and by efforts to shift peer norms and student attitudes (a sociocultural fix). This multi-level approach aligns with socio-ecological models of youth physical activity, which posit that individual behaviour (like a girl's decision to

fully engage in PE) is influenced by interpersonal, organizational, and policy factors (Sabiston *et al.*, 2019; Kokko *et al.*, 2019).

The review highlights that progress has been made in certain areas. Awareness of the gender gap is higher now among educators and policymakers than in decades past. Many schools have adopted at least some changes, such as offering a greater variety of activities or implementing programs aimed at girls. Some countries show a narrowing of gender differences in overall youth physical activity in recent years, for instance, a Eurobarometer analysis noted a small reduction in the gender gap in meeting activity guidelines in countries that made concerted efforts to engage girls (Knox *et al.*, 2022). This suggests that interventions and policies may be having an effect. Also, the rise of female sport role models and societal pushes for girls' empowerment in sport (e.g., campaigns like "This Girl Can") have started to chip away at stereotypes. Compared to 10 or 20 years ago, it is more normalized in many places for girls to be sporty and for schools to invest in girls' athletics (Stone, 2022). These cultural shifts likely contribute to gradual improvements in girls' attitudes toward PE.

However, significant gaps persist, and in some contexts have even widened. Particularly during late middle school and into high school, female participation levels drop markedly relative to males in PE classes (Harrington *et al.*, 2018; Salvatori & Cherubini, 2024). The challenge is both retention (keeping girls interested and enrolled in PE) and quality of engagement (ensuring they are active and deriving benefit during class, not just present). The evidence underscores that gender equity in PE is both a challenge and a necessity. It is a challenge because it requires dismantling deep-rooted cultural norms, overcoming biological hurdles of adolescence, and reforming entrenched educational practices. But it is a necessity because without equitable PE participation, we risk entrenching broader gender inequalities in health and opportunities. PE is one of the few chances to reach virtually all youth and instil habits for lifelong physical activity; if girls are disengaging, they stand to suffer health consequences and lose out on the well documented benefits of active lifestyles.

What, then, are the implications for practice? Several evidence-based strategies emerge from the literature:

- **Diversify the Curriculum:** Offer a mix of activities that appeal to different interests and skill sets. Incorporate non-competitive and individual activities (e.g., dance, fitness circuits, outdoor pursuits) alongside team sports. Studies show this boosts girls' participation without harming boys' outcomes (López-Morales *et al.*, 2023; Martín *et al.*, 2022).
- **Student Choice and Voice:** Providing choice within PE, letting students opt among activity stations or elective units, can increase engagement, especially for students (often girls) who feel alienated by certain activities (O'Reilly *et al.*, 2023). Solicit student feedback on the PE program; girls' input can guide what offerings might re-engage them.
- **Supportive, Mastery-Oriented Teaching:** Teachers should emphasize personal improvement, effort, and fun rather than competition and comparison. Avoid

public ranking and body shaming. Research shows a mastery climate can improve girls' enjoyment and reduce anxiety (Dudley *et al.*, 2018). Teachers can set goals like "each student will improve their own fitness" instead of "who is the fittest in class."

- **Address Perceived Competence:** Especially for girls, building confidence is key. This means explicit skill instruction in a non-judgmental atmosphere for those who lack experience. Celebrating small victories and providing positive feedback equally to girls and boys helps (Nicaise *et al.*, 2007). Peer mentoring (pairing skilled with less skilled in supportive ways) can also raise competence perceptions.
- **Single-Gender Opportunities:** While full separation of classes might not be feasible or desirable in all contexts, offering occasional girls-only sessions or units can be beneficial. For instance, a few weeks of girls-only fitness or sport units can jump-start confidence, which girls can then carry back into mixed-gender classes (Timken *et al.*, 2019). Importantly, any single-sex program should have equivalently engaging content and not be seen as remedial.
- **Foster a Positive Body Image Climate:** Schools should take measures such as allowing flexible PE attire, educating students about body changes and media images, and ensuring privacy for changing. Teachers can intentionally de-emphasize appearance (no comments on bodies) and emphasize health and strength. Bringing in female athletes or older students to talk about body confidence in sport can also inspire younger girls (Sabiston *et al.*, 2019).
- **Increase Female Representation:** Having more female PE teachers and coaches can encourage girls. Schools and districts should strive to hire, retain, and prominently involve women in PE programs. Even male PE teachers can invite female community instructors (for yoga, dance, etc.) periodically to provide relatable role models.
- **Parental and Community Engagement:** Educating parents about the importance of physical activity for daughters, and encouraging them to support girls' participation, can reinforce efforts. Community sports organizations can partner with schools to run girls' clinics or after-school programs. When girls see support for their involvement both at school and at home, they are more likely to continue (Lisinskiene *et al.*, 2019).
- **Professional Development for Teachers:** Training on gender-inclusive practices should be provided. Many teachers have good intentions but may not realize subtle biases. Workshops, peer observations, or training modules (like the REFLECT program in Kollmayer *et al.*, 2020) can equip teachers with strategies to engage all students and check their own assumptions.

At the policy level, implications include ensuring equal resources for girls' PE and sports, considering flexible scheduling that does not disadvantage either gender, and supporting programs that target girls' physical activity (such as funding girl-focused initiatives and evaluating their impact). Policymakers should recognize that PE is as critical for girls' development as for boys', and therefore requirements and accountability

for schools should reflect not just overall PE provision but also equitable outcomes (e.g., tracking participation rates by gender as an indicator).

7.1 Future Research Directions

While much has been learned, there are areas needing further exploration. One is the intersectionality of gender with other factors, for instance, how do race/ethnicity, socioeconomic status, or disability intersect with gender to affect PE participation? Marginalised girls (such as girls of colour or from low-income communities) might face unique or compounded barriers that were beyond the scope of many studies. Simon *et al.* (2021) began to address this by looking at marginalized girls in an afterschool program, but more work is needed to tailor solutions to diverse groups of girls. Additionally, longitudinal research tracking students through puberty while measuring changes in attitude, self-esteem, and participation would help pinpoint critical intervention windows (Aartun *et al.*, 2022). Intervention studies that experimentally test specific strategies (e.g., introducing a choice-based curriculum or a body image intervention) and measure effects on girls' versus boys' activity levels in PE would provide stronger causal evidence of what works. Finally, research should continue to evaluate policy implementations (such as single-sex PE policies or national campaigns like "Girls Active") to build knowledge on best practices for scaling up successful interventions.

8. Implications

8.1 Implications for Teaching Practice

Teachers are on the front lines of addressing gender disparities in PE. The literature suggests several evidence-based strategies for making PE classes more gender-inclusive:

- **Create an Inclusive Environment:** Establish ground rules that promote respect and discourage comparisons. Intervene against any teasing or gender-based commenting. An environment where students feel safe from judgment is especially vital for girls (Clark *et al.*, 2021).
- **Provide Diverse Activity Options:** Incorporate a balance of activities (competitive and non-competitive, team and individual) within the PE program. Allow students some choice to cater to varied interests. This has been shown to keep more students, notably many girls, engaged (Martín *et al.*, 2022).
- **Use Cooperative and Mastery-Oriented Teaching Styles:** Avoid an overemphasis on competition and public ranking. Instead, use cooperative games and personal goal setting. For example, teachers can use small-sided games where everyone must touch the ball, or fitness challenges where students aim to improve their own score rather than beat others. Such approaches have improved girls' participation in multiple studies (Kirk, 2019; López-Morales *et al.*, 2023).
- **Be Aware of Biases in Interaction:** Teachers should reflect on whether they are giving equal attention and encouragement to all genders. Simple practices like alternating which gender are asked to demonstrate, or intentionally calling on girls

to lead activities, can make a big difference in student perceptions of fairness (Preece & Bullingham, 2022). If possible, soliciting student feedback or peer observation can help teachers catch unintentional biases.

- **Address Motivation and Confidence:** Implement practices that build self-efficacy, especially for girls who are less confident. This might involve skill-building sessions, positive reinforcement for effort, and framing difficulties as learning experiences. Teachers could, for instance, explicitly acknowledge that it's normal to struggle with a new skill and emphasize progress. Encouraging a growth mindset in PE benefits those who are initially less active (Dweck, 2017).
- **Accommodate Developmental Needs:** Being sensitive to issues like body image and menstruation can remove barriers. For example, have a system where students (of any gender) can opt out of an activity or modify it if they are uncomfortable, without interrogation, this could help a girl participate at her own pace on a tough day rather than skipping entirely. Offering alternatives (e.g., a less vigorous activity for a student with menstrual cramps) keeps them moving in some capacity.

Implementing these strategies requires effort and sometimes a shift in mindset, but numerous success stories in the literature demonstrate that when teachers make these changes, girls' participation and enthusiasm for PE improve, often dramatically, and boys' engagement remains strong or even improves in a more positive class climate (Frühauf *et al.*, 2022; Timken *et al.*, 2019).

8.2 Implications for Policy and School Programs

At the institutional and policy level, a multi-faceted approach is needed to ensure gender equity in PE:

- **Ensure Mandated PE Opportunities:** Education authorities should require that all students receive adequate PE time, and that scheduling does not inadvertently push girls out. If PE is optional, consider policies to encourage equal uptake (for instance, offer appealing PE electives like dance or outdoor education, which might draw students who wouldn't take traditional PE).
- **Invest in Girls' Physical Activity Programs:** Schools and districts should devote resources to initiatives focused on engaging girls, for example, after-school clubs just for girls, or inviting motivational guest speakers. Such programs, when well-designed, have shown benefits (Harrington *et al.*, 2018).
- **Provide Teacher Training on Gender-Inclusive Pedagogy:** Ministries of education and teacher training institutions should include content on gender in PE in their curricula. In-service professional development on this topic can be made widely available. Policy can support this by funding workshops or creating online modules that teachers must complete (Kollmayer *et al.*, 2020).
- **Encourage Female Leadership:** Policies to recruit, retain, and promote female PE teachers and coaches will provide role models and mentors for girls. Additionally, schools can empower interested senior female students to serve as PE leaders or

assistants for younger grades, a strategy that has worked as peer mentoring in some programs (Duffey *et al.*, 2021).

- **Monitor and Evaluate:** Education departments might track participation metrics (such as the percentage of students excused from PE, or time spent active during class by gender). By making gender-disaggregated data visible, schools can be held accountable and encouraged to address gaps. If a school finds, for example, that 30% of girls are failing PE or not dressing for PE compared to 10% of boys, that's a red flag requiring intervention.
- **Promote Community Partnerships:** Policies that facilitate school-community links (like the Sporting Schools program or partnerships with local sports clubs, as discussed) are recommended. When schools act as a hub connecting girls to outside opportunities (community leagues, fun runs, dance studios, etc.), it reinforces active lifestyles beyond just PE classes (Eime *et al.*, 2021). Schools and districts can drive real progress by implementing practical, well-designed policies. For example, budgeting specifically for student transportation to sports facilities, creating paid partnerships with local coaches to supplement school staff, and hosting special events focused on girls' athletic participation have all shown promise. These aren't abstract concepts but concrete steps that directly address known barriers to participation.

Lasting improvement requires more than temporary fixes; it needs sustained buy-in from everyone involved. Classroom teachers understand daily challenges, administrators control resources, policymakers shape priorities, families influence attitudes, and students themselves know what motivates them. Only by valuing each group's unique contribution can schools build PE programs that work for all students. Current research confirms the viability of this goal, with documented successes from various localized programs. However, translating these isolated successes into systemic reform remains the fundamental challenge facing the field. Importantly, enhancing girls' participation does not require diminishing boys' experiences. Evidence suggests that reimagined physical education programs emphasizing cooperation, skill development, and mutual respect yield benefits across gender lines. Boys equally benefit from learning environments that balance traditional competitive elements with opportunities for personal growth and social-emotional learning.

In summary, the persistent gender gap in physical education participation mirrors broader societal inequities. While recent progress offers encouragement, substantial work remains. When schools commit to implementing proven strategies with fidelity, they create physical education programs capable of meeting every student's needs. These transformed programs do more than teach skills; they help young people develop fundamental movement competencies, find genuine pleasure in physical activity, and build exercise habits that persist into adulthood. At its core, this approach reflects what quality physical education should be: an experience that gives all students the tools, self-assurance, and drive to maintain active lifestyles throughout their lives.

Acknowledgements

We wish to extend our grateful thanks to **Nordine Ibnmejd** for his continued help and support.

About the Authors

Elena Avraam, Doctoral Candidate, Department of Education, Physical Education and Sport Sciences, Frederick University, Cyprus.

Garyfallos Anagnostou, Assistant Professor, Department of Education/BSc Physical Education and Sport Sciences, School of Education and Social Sciences, Frederick University, Cyprus.

References

- Avraam, E., & Anagnostou, G. (2022). A literature review on gender stereotypes in physical education. *European Journal of Physical Education and Sport Science*, 8(6). <https://doi.org/10.46827/ejpe.v8i6.4404>
- Aartun, I., Walseth, K., Standal, Ø. F., & Kirk, D. (2022). Pedagogical considerations of embodiment and gender in physical education: A systematic review. *Sport, Education and Society*, 27(4), 373–389.
- Aelterman, N., Vansteenkiste, M., Van den Berghe, L., De Meyer, J., & Haerens, L. (2012). The motivational landscape of sports: A self-determination theory perspective on how coaching and parenting practices shape youth's interest and participation. *Physical Education and Sport Pedagogy*, 17(1), 1–23.
- Arenas-Arroyo, D., Vidal-Conti, J., & Muntaner-Mas, A. (2021). Gender stereotypes and differential treatment between boys and girls in physical education: a narrative review. *Retos*, 43, 342–351.
- Baker, B. L., Birch, L. L., Trost, S. G., & Davison, K. K. (2007). Advanced pubertal status at age 11 and lower physical activity in adolescent girls. *Journal of Pediatrics*, 151(5), 488–493. <https://doi.org/10.1016/j.jpeds.2007.04.017>
- Belabbes, L., Ben Rakaa, O., & Hafidi Alaoui, M. S. (2025). Impact of the PE programme on gender equality and personal development: an empirical study of school basketball. *Cuestiones de Fisioterapia*. (In press). <https://doi.org/10.48047/a8qrb70>
- Biemmi, I. (2015). Gender in schools and culture: Taking stock of education in Italy. *Gender and Education*, 27(7), 812–827. Retrieved from <https://doi.org/10.1080/09540253.2015.1103841>
- Cárcamo, C., Moreno, A., & del Barrio, C. (2021). “Girls do not sweat”: The development of gender stereotypes in physical education in primary school. *Human Arenas*, 4(2), 196–217. <https://doi.org/10.1007/s42087-020-00118-6>
- Clark, H., Quill, B., & Mio, S. (2021). “Girls Aren’t Meant to Exercise”: Adolescent girls’ perceived influences on physical activity (The HERizon Project). *Children (Basel)*, 8(1), 31.

- Constantinou, P., Manson, M., & Silverman, S. (2009). Female students' perceptions about gender-role stereotypes and their influence on attitude toward physical education. *The Physical Educator*, 66(2), 85–96. Retrieved from https://www.researchgate.net/publication/344177189_Female_students'_perceptions_toward_gender-role_stereotypes_and_their_affect_on_attitude_in_physical_education
- Cowley, E. S., Watson, P. M., et al. (2021). "Girls Aren't Meant to Exercise": Perceived influences on physical activity among adolescent girls, The HERizon Project. *Children (Basel)*, 8(1), 31. <https://doi.org/10.3390/children8010031>
- D'Elia, F. (2020). Teachers' perspectives about contents and learning aims of physical education in Italian primary school. *Journal of Human Sport and Exercise*, 15(2), 279–288. <https://doi.org/10.14198/jhse.2020.15.Proc2.19>
- Derry, J. A. (2002). Single-sex and mixed-gender educational physical education: Perspectives of adolescent girls and female PE teachers. *Melpomene Journal*, 22(4), 19–26.
- Duffey, K., Barbosa, A., Whiting, S., et al. (2021). Barriers and facilitators of physical activity participation in adolescent girls: A systematic review of systematic reviews. *Frontiers in Public Health*, 9. <https://doi.org/10.3389/fpubh.2021.743935>
- Ennis, C. D. (1999). Creating a culturally relevant curriculum for disengaged girls. *Sport, Education and Society*, 4(1), 31–49. Retrieved from https://libres.uncg.edu/ir/uncg/f/C_Ennis_Creating_1999.pdf
- Eime, R. M., Charity, M. J., Harvey, J. T., & Westerbeek, H. (2021). Five-year changes in community-level sport participation, and the role of gender strategies. *Frontiers in Sports and Active Living*, 3. <https://doi.org/10.3389/fspor.2021.710666>
- Fisette, J. L. (2013). "Are you listening?": Adolescent girls voice how they negotiate self-identified barriers to their success and survival in physical education. *Physical Education and Sport Pedagogy*, 18(2), 184–203. Retrieved from <https://doi.org/10.1080/17408989.2011.649724>
- Flintoff, A., & Scraton, S. (2001). Stepping into active leisure? Young women's perceptions of active lifestyles and their experiences of school physical education. *Sport, Education and Society*, 6(1), 5–21. <https://doi.org/10.1080/713696043>
- Frühauf, A., Hundhausen, F., & Kopp, M. (2022). Better together? Analyzing experiences from male and female students and teachers in single-sex and mixed-gender educational physical education classes. *International Journal of Environmental Research and Public Health*, 19(18). <https://doi.org/10.3390/bs12090306>
- Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2020). Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1.6 million participants. *The Lancet Child & Adolescent Health*, 4(1), 23–35. Retrieved from [https://www.thelancet.com/article/S2352-4642\(19\)30323-2/fulltext](https://www.thelancet.com/article/S2352-4642(19)30323-2/fulltext)

- Harrington, D. M., Davies, M. J., Bodicoat, D. H., *et al.* (2018). Effectiveness of the 'Girls Active' school-based physical activity programme: A cluster randomised controlled trial. *International Journal of Behavioral Nutrition and Physical Activity*, 15, 40. <https://doi.org/10.1186/s12966-018-0664-6>
- Hastie, P. A., Buchanan, A. M., & MacMahon, C. (2018). Between gendered walls: Assessing the impact of single-sex and co-educational physical education on girls' physical activity. *European Physical Education Review*, 24(2), 266–281.
- Hills, L. A., & Croston, A. (2012). 'It should be better all together': Exploring strategies for 'undoing' gender in mixed-gender educational physical education. *Sport, Education and Society*, 17(5), 591–605. Retrieved from https://doi.org/10.1080/13573322.2011.553215?urlapend=%3Futm_source%3Dresearchgate
- Hodgkin, K. (2018). Pupils' expectations and experiences of PE across the primary–secondary transition in South Wales. *Wales Journal of Education*, 20(1), 94–117. Retrieved from <https://journal.uwp.co.uk/wje/article/386/galley/405/view/>
- Hollis, J. L., Sutherland, R., Williams, A. J., Campbell, E., Nathan, N., Lubans, D. R., & Wiggers, J. (2017). A systematic review and meta-analysis of moderate-to-vigorous physical activity levels in secondary school physical education lessons. *International Journal of Behavioral Nutrition and Physical Activity*, 14(1), 52. Retrieved from <https://doi.org/10.1186/s12966-017-0504-0>
- Jaakkola, T., Wang, C. K. J., Soini, M., & Liukkonen, J. (2017). Students' perceptions of motivational climate and enjoyment in Finnish physical education: A longitudinal study. *Journal of Sports Science and Medicine*, 16(2), 167–173.
- Kalman, M., Inchley, J., Sigmundová, D., *et al.* (2015). Secular trends in moderate-to-vigorous physical activity in 32 countries from 2002 to 2010: The Health Behaviour in School-aged Children study. *International Journal of Public Health*, 60(suppl 2), 35–45. <https://doi.org/10.1093/eurpub/ckv024>
- Kerner, C., Haerens, L., & Kirk, D. (2018). Body image in physical education: Gender and action research. *PRISM: Casting New Light on Learning, Theory and Practice*, 2(1), 4–21. <https://doi.org/10.1080/13573322.2022.2076665>
- Kirk, D. (2019). Precarity, gender and physical education. *Rethinking Gender and Youth Sport*, 27, 15–28. <https://doi.org/10.4324/9780429326301>
- Kokko, S., Martin, L., Geidne, S., *et al.* (2019). Does sports club participation contribute to physical activity among children and adolescents? A comparison across six European countries. *Scandinavian Journal of Public Health*, 47(8), 851–858. <https://doi.org/10.1177/1403494818786110>
- Kollmayer, M., Schultes, M. T., Lüftenegger, M., *et al.* (2020). REFLECT, A teacher training program to promote gender equality in schools. *Frontiers in Education*, 5, 136. <https://doi.org/10.3389/feduc.2020.00136>
- Koopman, B., Lubans, D., & Rehrer, N. (2019). A comparison of adolescent girls' MVPA in single-gender vs. mixed-gender physical education. *European Physical Education*

-
- Review*, 25(1), 121–137. https://doi.org/10.1177/1356336X19849456?urlapend=%3Futm_source%3Dresearchgate
- Leisterer, S., & Gramlich, L. (2021). Having a positive relationship to physical activity: Basic psychological need satisfaction and age as predictors of students' enjoyment in physical education. *Sports*, 9(7), 90. <https://doi.org/10.3390/sports9070090>
- Lisinskiene, A., Sachdev, P., & Majauskienė, D. (2019). Family support for female physical activity: A crosscultural comparison. *Physical Culture and Sport. Studies and Research*, 81(1), 48–57.
- López-Morales, J., Urrea-Solano, M., García-Taibo, O., & Baena-Morales, S. (2023). Quality education and gender equality as objectives of sustainable development in education: An experience with teachers in Spain. *Retos*, 48, 43–53. <https://doi.org/10.47197/retos.v48.93287>
- Martin, C. S., López, L. M. G., & Reyes, L. (2022). Benefits of an activist approach to physical education in the participation of primary school girls in games. *Retos*, 46, 1123–1130. <https://doi.org/10.47197/retos.v46.94629>
- Martínez, L., García-Taibo, O., Ferriz-Valero, A., & Baena-Morales, S. (2023). Contributing to SDG Targets 4.5 and 5.5 during physical education sessions: The effect of a collective sports intervention on gender attitudes. *Societies*, 13(3), 73. <https://doi.org/10.3390/soc13030073>
- Mathieu, M-E., Drapeau, A., & Poulin, K. (2021). The FitSpirit approach for increasing physical activity in Canadian teenage girls: Protocol of a longitudinal, quasi-experimental study. *BMC Public Health*, 21, 1020. <https://doi.org/10.1186/s12889-021-10200-5>
- Mateo-Orcajada, A., Abenza-Cano, L., Vaquero-Cristóbal, R., *et al.* (2021). Gender stereotypes among teachers and trainers working with adolescents. *International Journal of Environmental Research and Public Health*, 18(24). <https://doi.org/10.3390/ijerph182412964>
- Moya-Mata, I., Ruiz-Sanchis, L., Martín Sanchis, J., & Ros Ros, C. (2019). Gender stereotypes in the pictures that represent activities in the wild in PE textbooks. *Cultura, Ciencia y Deporte*, 14(40), 15–23. Retrieved from <https://repositorio.ucam.edu/handle/10952/6088>
- Moya-Mata, I., Stieg, R., Loro, A. P., Soares, D. J. M., & dos Santos, W. (2023). Physical activity according to gender in Brazilian physical education textbooks. *Retos*, 48, 732–741. <https://doi.org/10.47197/retos.v48.96872>
- Navarro-Patón, R., Rodríguez-Negro, J., Muíño-Piñeiro, M., & Mecías-Calvo, M. (2024). Gender and educational stage differences in motivation, basic psychological needs and enjoyment: Evidence from physical education classes. *Children (Basel)*, 11(12), 1503. <https://doi.org/10.3390/children11121503>
- Nicaise, V., Cogérino, G., Bois, J. E., & Amorose, A. J. (2007). Students' and teachers' perceptions of teacher feedback in physical education: Effects of gender and student engagement. *Journal of Teaching in Physical Education*, 26(4), 399–415. <https://doi.org/10.1123/jtpe.25.1.36>

- O'Reilly, M., Talbot, A., & Harrington, D. (2023). Adolescent perspectives on gendered ideologies in physical activity within schools: Reflections on a female-focused intervention. *Feminism & Psychology*, 33(2), 175–196. <https://doi.org/10.1177/09593535221109040>
- Preece, S., & Bullingham, R. (2022). Gender stereotypes: The impact upon perceived roles and practice of in-service teachers in physical education. *Sport, Education and Society*, 27(3), 259–271. <http://dx.doi.org/10.1080/13573322.2020.1848813>
- Portela-Pino, I., González-Víllora, S., Estevan, I., et al. (2020). Gender differences in motivation and barriers to youth participation in physical activity. *Sustainability*, 12(4), 1567. <https://doi.org/10.3390/ijerph17010168>
- Rauscher, L., & Cooky, C. (2016). Ready for anything the world gives them? Girls, PE and the problem of 'additional' benefit. *Gender and Society*, 30(5), 818–839.
- Sabiston, C. M., Pila, E., Vani, M., & Thériault, D. (2019). Body image, physical activity, and sport: A scoping review. *Psychology of Sport and Exercise*, 42, 48–59. <https://doi.org/10.1016/j.psychsport.2018.12.010>
- Salvatori, M. L., & Cherubini, D. (2024). Gender stereotypes in physical education: State of the art and future perspectives in primary school. *Pedagogy of Physical Culture and Sports*, 28(3), 231–238. <https://doi.org/10.15561/26649837.2024.0308>
- Sharara, E., Akik, C., Ghattas, H., & Obermeyer, C. M. (2018). Physical inactivity, gender and culture in Arab countries: A systematic assessment of the literature. *BMC Public Health*, 18(1), 639. <https://doi.org/10.1186/s12889-018-5472-z>
- Silva, P., Luz, C., Simões, F., et al. (2023). Gender differences in students' moderate to vigorous physical activity levels in primary school PE: A systematic review and meta-analysis. *Journal of Sports Sciences*, 41(4), 453–465. <https://doi.org/10.1123/jtpe.2024-0027>
- Simon, M., Marttinen, R., & Phillips, S. (2021). Marginalized girls' gendered experiences within a constructivist afterschool program (REACH). *Sport, Education and Society*, 26(6), 579–591. <https://doi.org/10.1080/13573322.2020.1764926>
- Smith, A. L., & Leaper, C. (2019). Self-perceived gender typicality, peer relations, and physical activity in middle school. *Journal of Sport and Exercise Psychology*, 41(3), 138–149. <https://doi.org/10.1111/j.1532-7795.2006.00123.x>
- Stone, G. L. (2022). 50 years of Title IX. *Sports Health*, 14(6), 793–794. Retrieved from <https://doi.org/10.1177/19417381221129265>
- Subramaniam, P. R., & Silverman, S. (2007). Middle school students' attitudes toward physical education. *Teaching and Teacher Education*, 23(5), 602–611. <https://doi.org/10.1016/j.tate.2007.02.003>
- Timken, G., McNamee, J., & Coste, S. (2019). A comparison of activity levels of girls in single-gender and mixed-gender physical education. *European Physical Education Review*, 26(1), 258–273. <https://doi.org/10.1177/1356336X19849456>
- Telford, R. M., Telford, R. D., Olive, L. S., Cochrane, T., & Davey, R. (2016). Why are girls less physically active than boys? Findings from the LOOK longitudinal study. *PLOS ONE*, 11(3). <https://doi.org/10.1371/journal.pone.0150041>

- Velija, P., & Kara, S. (2020). 'Well you don't need to be too attractive': Women, sport and hegemonic femininity in Turkey. *Sociology of Sport Journal*, 37(2), 149–158.
- Vera, J. G., Arrebola, I. A., & García, N. A. (2018). Gender and its relationship with the practice of physical activity and sport. *Apunts. Educación Física y Deportes*, 136, 123–141. [https://doi.org/10.5672/apunts.2014-0983.es.\(2018/2\).132.09](https://doi.org/10.5672/apunts.2014-0983.es.(2018/2).132.09)
- Xiang, P., McBride, R. E., & Bruene, A. (2006). Fourth graders' motivation in an elementary physical education running program. *The Elementary School Journal*, 107(3), 253–266. <https://doi.org/10.1086/499752>
- Xiang, P., McBride, R. E., Lin, S., Gao, Z., & Solmon, M. (2018). Students' gender stereotypes about running in schools. *Journal of Experimental Education*, 86(2), 233–246. <https://doi.org/10.1080/00220973.2016.1277335>
- Youth Sport Trust. (2019). *Girls' Active Survey Report 2019*. Loughborough, UK: Youth Sport Trust. Retrieved from <https://www.youthsporttrust.org/media/f5lds3o/girls-active-time-for-change-research-report.pdf>